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PLANNING FOR POST-DISASTER RECOVERY: NEXT GENERATION

James C. Schwab, AICP, Editor

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ON THE COVER

View of Jamaica Bay, Queens. (*Used with permission of the New York City Department of City Planning. All rights reserved.*)

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FOREWORD

Wherever disaster may strike, the Federal Emergency Management Agency (FEMA) is committed to supporting our fellow citizens in healing their communities and moving forward on the road to recovery. As part of that mission, we coordinate to ensure that communities have the tools they need to make informed decisions to reduce their risks and vulnerabilities. Effective pre-disaster planning is an important process that allows a comprehensive and integrated understanding of community objectives and connects community plans that guide post-disaster decisions and investments.

A key element of our national approach to disaster recovery is embodied in the National Disaster Recovery Framework. The Recovery Framework acknowledges that recovery depends heavily on local planning, local leadership, and the whole community of stakeholders who support recovery. It emphasizes principles of sustainability, resilience, and mitigation as integral to successful recovery outcomes. In addition, the National Mitigation Framework establishes a common platform for coordinating and addressing how the nation manages the reduction of risk on a national scale. Mitigation is not far removed from recovery, and it serves as the thread that permeates emergency management. By taking active steps to lessen the impact of disasters before they occur, mitigation reduces the loss of life and property endured by affected communities, and it supports more rapid recovery. This report represents a partnership between FEMA and the American Planning Association (APA) to provide valuable guidance to assist communities in strengthening their approaches to prepare for and implement resilient disaster recovery which will lead to reducing disaster risks on a national scale.

If a community is planning for the future, development and redevelopment must incorporate reduction of future risks. In particular, stressors including climate change and extreme weather necessitate the need to plan smarter. We need to ensure that we do not build or rebuild in harm's way where future risks can be anticipated. Communities also need to be ready to act with recovery plans in hand and to apply their mitigation and climate adaptation policies in the fast-moving post-disaster period. The rapid change brought on by a disaster requires an equally rapid and adaptable post-disaster recovery process so communities are able to take advantage of opportunities to rebuild smarter by integrating mitigation into redevelopment.

The issues that communities must address vary across states, such as lack of adequate replacement housing in one place and access to health services in another. At a fundamental level, disaster recovery requires the balancing of practical matters with broad policy opportunities. For example, understanding the range of federal assistance and how funding can be used or combined to meet needs and managing project development are necessary skills that should only be executed with the community's broader long-term recovery goals in mind. To effectively recover, state and local communities must have the ability to manage their needs. The capacity may not currently exist, but there needs to be a foundation to build capabilities. Pre-disaster recovery and mitigation planning, when integrated with other local planning efforts, aligns community priorities, sets roles and expectations, and enables rapid implementation.

Established building codes that provide safeguards for people at home, at school, and in the workplace are a type of pre-disaster capability. However, despite the strength of the International Codes, adoption of model codes can be uneven across and within states. Post-disaster assessments have shown a direct relationship between building failures and the codes adopted, the resources directed toward implementation and enforcement, and the services available to support those codes. The most effective codes are those that are current and widely adopted and enforced. Communities with a recovery plan can be prepared to rapidly act and implement adopted codes or adapt to changed circumstances to seize on the opportunities and challenges during the recovery period.

Several pieces of legislation have been passed recently that will alter the way FEMA administers its programs, and these changes have direct effects on communities and individuals as they understand their hazard risks and make decisions about how to plan for, respond to, recover from, and mitigate those risks. First, in January 2013, Congress passed the Sandy Recovery Improvement Act (SRIA), authorizing several significant changes to the way FEMA delivers disaster assistance. The SRIA's various provisions are intended to improve the efficacy and availability of FEMA disaster assistance and make the most cost-effective use of taxpayer dollars. Second, the Biggert-Waters Flood Insurance Reform Act (BW-12) and the corresponding Homeowner Flood Insurance Affordability Act of 2014 (HFIAA) were signed into law. This legislation is intended to stabilize the National Flood Insurance Program financially. In addition, FEMA is now directed by Congress to also look at future conditions, such as weather patterns, erosion, development, and other key factors, and incorporate them into our risk analysis.

At FEMA, we seek constant improvement to better support America's disaster survivors, citizens, first responders, and communities. As leaders at all levels implement the Recovery Framework and the Mitigation Framework, we will learn new lessons. We will be more effective and efficient in supporting communities with the assistance, flexibility, and incentives necessary to speed recovery, reduce risks to future events, and become more resilient.

I acknowledge the contributions of David Miller, FEMA's Associate Administrator for the Federal Insurance and Mitigation Administration. While serving as the Administrator of the Iowa Homeland Security and Emergency Management Division, Dave partnered with APA to begin shaping the scope of this report. Dave has shared his experiences and lessons learned from his years with the State of Iowa, where he oversaw recovery for 11 presidentially declared major disasters. His valuable input is clearly demonstrated in the real-world practical advice in this report.

Finally, FEMA thanks the APA for its continued partnership. APA's research and education on natural hazards mitigation and disaster recovery target a critical profession that is traditionally not associated with emergency management. The more than 45,000 community planners and local officials that make up APA's membership are among those that have the leadership, partnering, and planning capabilities necessary to foster resilience from future disasters.

W. Craig Fugate, Administrator
Federal Emergency Management Agency

EXECUTIVE SUMMARY

OVERVIEW: THE VISION OF A RESILIENT COMMUNITY

Many are called, but few are well trained. That may well sum up the state of affairs for most planners facing a disaster in their community for the first time, which underscores why it is essential for a professional organization like the American Planning Association (APA) to undertake the role of preparing them for the task of managing post disaster recovery. Most learn on the job when disaster strikes. For that reason, APA developed and prepared a PAS Report in 1998, *Planning for Post Disaster Recovery and Reconstruction*, and it is now releasing this second, updated version.

But times have changed. Today there is a significant body of planning literature addressing post disaster recov ery. So many laws, programs, and conditions have changed, however, that there is still considerable need among plan ners for this new report. In fact, APA undertook an ex tensive needs assessment for the Federal Emergency Man agement Agency (FEMA) to demonstrate the value of this undertaking. One thing learned in the interim is that com munities are subject to major catastrophic events that are, quite literally, game changers that alter the understanding both of the extent of the vulnerabilities of communities and the magnitude of the events that are possible. Events such as Hurricane Katrina and the Tohoku earthquake in Japan have demonstrated that the best plans may not fully envision the magnitude of what is possible. Equally impor tant, federal disaster officials and local planners have had to grapple with the implications of mitigating flood hazards in densely developed waterfront neighborhoods. There is also growing appreciation of the value of green infrastructure in helping to mitigate coastal hazards, an appreciation that is being reflected in changes in federal policy priorities.

While preparing this report, the APA team had the op portunity to learn from direct involvement in the recovery from Hurricane Sandy in New York and New Jersey, where APA presented a series of training workshops on recovery planning in April 2013. This was just a small part of the overall level of effort by federal, state, and local planners in the region, but it helped the project team gain perspective on the event and what followed. One factor that became clear in the report of the Hurricane Sandy Rebuilding Task Force headed by Shaun Donovan, then secretary of Housing and Urban Development, was that there was a much greater emphasis on concepts of resilience than in any previous di saster. That emphasis included explicit recognition of the long term impacts of climate change. Considerably greater emphasis was also placed on the development of green in frastructure as part of an overall resilience strategy than had been the case before Sandy. At the same time, Sandy exposed operational challenges for the federal government and explic itly for the new National Disaster Recovery Framework.

These new lessons do not obliterate ongoing challenges that predated Sandy. These include:

- the need to accept the inherent complexity of post disaster recovery; and
- the need for communities to take local ownership of their situation and gain a full understanding of the relation ships among federal, state, and local entities.

Still, amid all the frustrations and sorrows of post disas ter recovery, there are opportunities. The most resilient com munities are those with the civic mindset to seize on those opportunities to create new visions for the future.

What is resilience? According to the National Academy of Sciences, resilience is *the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events*. Part of the purpose of this report is to make clear that one effective way in which communities can advance public health, safety, and welfare is to think and plan in advance for their foreseeable recovery needs following a disaster, in ad dition to taking appropriate steps to mitigate hazards before a disaster. Opportunities to advance community resilience may arise during long term recovery from a disaster that may not arise at any other time. Being prepared to optimize those opportunities is one purpose of a resilient community.

It is important to embed the concept of resilience within the wider framework of sustainability. It is equally impor tant that sustainability incorporate the concept of resilience. Resilience allows a community to respond to and recover effectively from specific events; sustainability is a frame of reference that aims to preserve for future generations the re sources and opportunities that exist for current generations.

ANTICIPATING DISRUPTION

Planning is by its very nature an optimistic enterprise, but life can be messy. Setbacks of all sorts happen to individu als, their neighborhoods, whole communities, and even na tions. In this context a community's willingness to examine its hazards and to anticipate and plan for potential disasters becomes important. Unless communities incorporate an awareness of their hazards into their long term planning, they may not confront the fact that land use choices greatly affect the outcomes with their resulting losses of lives and property. Planning for setbacks is an essential ingredient of resilience. What distinguishes disasters from most other set backs in a community is the speed of their occurrence and the compressed time frame in which recovery must occur. Thus, the important focus is on the problem of anticipating disruption by disasters and planning to minimize their det rimental impacts.

State Roles in Recovery Planning

States control the statutory framework for local planning and zoning authorities. This has some bearing on the state role in influencing local planning for post disaster recovery, but so do emergency management policies. The most common feature of states is that their planning institutions are not set up in a fashion that is parallel to those in cities, counties, and regions. Often there is no state planning office or function, al though states perform numerous other functions that have a direct bearing on planning, and particularly on hazard iden tification and post disaster recovery. States also act as agents of numerous federal programs, often acting with authority delegated to them from federal agencies.

Resilient Management

The most essential element of resilient management may be a purely human one: the courage to make tough decisions. Without that, all else may fail. But it is also important to per ceive the city as a system of systems, within which resilience can be embodied at a number of levels. Resilient systems have identifiable characteristics that include diversity, redun dancy, decentralization, transparency, collaboration, grace in failure, flexibility, and foresight.

Risk management, closely related to resilient manage ment, can be achieved through cost benefit analysis. The Governmental Finance Officers Association has established a framework for such analysis to help ensure that commu nities have the resources to overcome foreseeable setbacks. Risk management also occurs through mitigation, which in part is a matter of properly investing resources to achieve risk reduction, for instance, by removing homes from the flood plain and thus reducing the amount of vulnerable property in need of protection. The challenge with hazard mitigation as a risk reduction tool lies in incorporating it into the rest of the planning process rather than isolating it. It is equally im portant for a community to understand how to incorporate mitigation into the recovery planning process.

It is important to build resilience capacity in communi ties. This capacity is most likely to manifest itself in greater flexibility and ability to adapt.

The Planner's Role

In some states, the planner's role is made clear through state requirements to include some type of hazards related element in the local comprehensive plan. California provides one ex ample, where state law mandates the inclusion of a "safety" el ement, which has evolved to cover numerous hazards, such as floods and earthquakes. California is one of at least ten states with mandates or prescriptions for such elements.

Even without such prescriptive requirements, planners have skill sets that are vital in designing processes for public participation in hazards planning, including plans for post disaster recovery. They are or can become familiar with spe cific kinds of scenario planning and visualization software that can help make public participation more meaningful. The array of these tools is almost certain to grow in the future.

Plans for Recovery

There are distinct advantages for communities that take the trouble to plan for and assess their recovery needs ahead of an actual event. These can be summarized as:

- building a local culture of disaster awareness
- providing a focus for pre disaster exercises
- establishing clear lines of responsibility
- considering and reviewing financial needs
- assessing overall preparedness stance

This report offers a three part typology of recovery plans, based on their focus and whether they are prepared prior to or after disasters:

1. Operational (limited pre disaster)
2. Policy (pre disaster)
3. Recovery (post disaster)

The first is primarily rooted in a focus on short term recovery and emergency management needs. The second, based on recent Florida practice, takes a much broader ap proach in attempting to establish the organizational frame work for managing recovery and creating certain policies that will guide redevelopment decisions after a disaster. Or ganization and policy seem to be the primary areas of good practice in pre disaster planning. Recovery plans developed after a disaster, ideally, will then focus on the physical and urban design needs precipitated by a documented pattern of damages known after the disaster has occurred.

DISASTER RECOVERY PLANNING: EXPECTATIONS VERSUS REALITY

Disasters can provide valuable planning lessons and are in creasingly likely to become part of planners' experiences dur ing their careers. Learning from others may ease the stress of learning on the job, but reality will often depart from what can be anticipated. It is thus important to review the ground rules of disaster management as they apply to planning.

Components of Disaster Management

The traditional model of the disaster management cycle involves four phases: mitigation, preparedness, response, and recovery. All are interconnected, but mitigation can help reduce requirements of the others. Moreover, for best outcomes, mitigation and recovery should be integrated through effective planning because they reinforce each other. If possible, they should both also happen before a disaster, as well as after. Federal law provides much of the funding after disasters, but it is important that a commu nity develop a more long term perspective. This point is il lustrated by case examples from Florida of the value of pre event planning for recovery.

New Dynamics of Organizational Relationships

One salient feature of such plans is the emphasis on coor dination and integration among city departments involved in recovery. APA has previously explored the same theme with regard to mitigation, but it becomes even more im portant in recovery because of the compressed time frame within which planners must act, a point reinforced by the case study of Cedar Rapids, Iowa, following the 2008 floods. Equally important are the city's relationships with relevant state and federal agencies, which are best established in a pre disaster time frame. These relationships are essential in allowing a community to take charge of its own recovery.

Where Anticipation and Reality Part Company

There are fundamentally two ways of trying to anticipate the issues a community is likely to face in recovering from a major disaster. One is to focus on the probabilities of events of various types and magnitudes (probabilistic risk assessment) and to concentrate on the most likely scenarios. The other is to focus on the worst possible case, or worst case scenario, and try to imagine what precautions would be necessary to minimize its impact. Each has its limitations. Increasingly, planners have ac cess to sophisticated software tools to facilitate such analyses.

Understanding the Scale and Spectrum of Damages

A key starting point in recovery planning is the ability to characterize a disaster event in terms that directly identify the severity and extent of damage, death, and destruction in or der to determine processes, general levels of effort, sources of financing, and likely duration of recovery. With the help of an analytical matrix, planners can identify differences between "restoration" and "redevelopment" in recovery, with the latter following disasters involving substantial destruction of physi cal structures and replacement of existing buildings. The clas sification system also designates differences in scale ranging from neighborhoods to entire regions. These differences indi cate major differences in recovery strategy. In addition, there can be differences between urban and rural settings, wealth and poverty, and other factors.

Institutional Learning after Disasters

Disasters afford opportunities for communities to learn from their experiences and those of others. Those opportunities can take a number of forms related to all elements of the di saster management cycle and ideally will lead to the creation of a sustainable recovery management framework, including a recovery management organization and a recovery plan. A number of balancing considerations need to be part of this learning process.

FEDERAL FRAMEWORK OF DISASTER RECOVERY

It is important for planners to learn about the national system of disaster management before a disaster happens in their own communities. A number of key federal laws directly address

disaster management, as do secondary laws largely adminis tered by agencies other than FEMA that have some bearing on disaster assistance. Such agencies include the Small Busi ness Administration, the U.S. Department of Transporta tion, and the U.S. Department of Housing and Urban Devel opment, whose Community Development Block Grants for Disaster Recovery are playing an increasingly prominent role in recent recoveries.

The two dominant laws involving FEMA are the Nation al Flood Insurance Act and the Stafford Act. Each has en gendered numerous reforms and revisions over the decades following their original enactment. What is important for planners is not to assume that it is solely the job of the local emergency manager to understand how all this works. Plan ners who know ahead of time what to expect and what to do when a disaster strikes can make a real difference during re covery. They are far better positioned to assist the community in accomplishing a faster, more complete recovery than those who are initially unaware of this system and must learn on the job after a crisis has struck.

It is also important to be aware of the evolution of federal administrative policy related to disasters and how that has shaped the current structure of the National Preparedness Goal, under which the National Disaster Recovery Frame work is now one of five mission areas. It is also important to recognize that there are wide differences in planning capabil ities among states and communities, resulting in inevitable tensions within the federal system, including unreasonable demands and resistance to new ideas. In the end, recovery planning demands patience and a steady vision, as well as a willingness to engage meaningfully with the public.

LONG TERM RECOVERY PLANNING: GOALS AND POLICIES

The fundamental purpose of planning for disaster recovery is to improve the quality and efficiency of the community's recovery over that of an ad hoc approach. A local recovery plan provides a basis for requesting resources in a coordinat ed manner as well as a demonstration of capability to main tain local control. It also provides an opportunity for public input. Through planning, a community's stakeholders can determine their vision for the recovered community, identify obstacles and opportunities they may encounter in reaching that future, and measure their progress in achieving recovery as they defined it.

Goals

The following three overarching goals inform almost all re covery plans.

Increase the Speed of Recovery

The speed of recovery is essential to many businesses reopen ing, the amount of population loss the community might ex perience, and the psychological well being of residents. This does not mean a community cannot also acknowledge the downfalls of rapid restoration in situations where redevelop ment should be thoughtfully considered for its long term re percussions on sustainability.

Effective Use of Resources

The recovery plan can help by providing implementation or ganization as well as a guiding policy framework for focus ing and prioritizing local resources. A community should not think only of FEMA and disaster specific sources of fund ing but look at bigger community goals beyond the disaster situation. The National Disaster Recovery Framework also embraces the idea of effectively using various sources of as sistance, and the expanded organization of the agencies as sociated with the Framework's Recovery Support Functions should assist in better coordination of resources less tradi tionally used in disasters in the future.

Increased Opportunity for Community Betterment

Ideally, the community will want to emerge from the disaster as a more resilient and sustainable place as a result of recovery programs. This goal can also identify other aspects of whole community recovery, such as seeking sustainable industries as part of economic recovery initiatives or assisting commu nity organizations to increase the resilience of socially vul nerable populations.

Together, these three goals will in most cases form the foundation of more community specific recovery goals whether a community creates its recovery plan pre- or post disaster.

Policy Areas

Long term recovery planning is similar to comprehensive planning in the breadth of topics that must be addressed, such as land use, infrastructure, and housing. Many dif ferent aspects of a community may have to be simulta neously restored or redeveloped since each is dependent upon the others. While it is not necessary to follow the grouping of six policy areas outlined in this report, which

mirror those in the National Disaster Recovery Framework, they may be helpful. All, however, should somehow revolve around a seventh concern, hazard mitigation, which should occupy a central role in any recovery plan. The following discussion touches on the importance of each policy area.

Post Disaster Hazard Mitigation
Including hazard mitigation in recovery projects will in most cases require additional time for planning; communities that have developed recovery plans before a disaster will be at an advantage in seizing opportunities for hazard mitigation during reconstruction. Communities with local hazard mitigation plans that have examined post disaster opportunities for mitigation will also reap benefits.

Land Use and Reconstruction Standards
Addressing land use and reconstruction standards will almost certainly be the most controversial component of the recovery planning process, but it could also be the most substantial in working towards a goal of community betterment. Land use policy considerations are typically complex and include several key considerations with regard to recovery, such as:

- timing of reconstruction
- quality of reconstruction
- redevelopment patterns

This short list, however, is far from exhaustive and does not include various special considerations such as treatment of historic structures, sustainable building practices, and placemaking goals, among others.

Infrastructure and Transportation Restoration

While these issues are often addressed in response and short term recovery plans, those mostly deal with stopgaps rather than long term considerations relevant to larger disasters. These include:

- short term restoration decisions that may impact long term community recovery
- regional interdependencies
- opportunities to improve infrastructure and transportation services
- post disaster changes in service demands or locations

Housing Recovery
Providing emergency sheltering and safe temporary housing is commonly the first recovery priority after a disaster and it is therefore not a coincidence that it is one of the most examined aspects of post disaster recovery planning. However, returning citizens to permanent housing is an underpinning for the success of whole community disaster recovery. Various policies considerations include:

- temporary or interim housing
- transitioning to permanent, affordable housing

Economic Redevelopment
The return of jobs, tourism, and other indicators of economic health are intertwined with housing recovery, infrastructure restoration, and health and social service provision. Sustainable and resilient economic recovery planning should focus not only on the rebuilding of damaged structures but also issues like the resumption of business activity and retention of the local workforce. This should be done in a pre disaster mode. Considerations include:

- business resumption
- workforce retention
- advancement of sustainable economic development goals
- image, rebranding, and tourism

Environmental Restoration
Environmental restoration is often not a high priority goal after a natural disaster due to more immediate needs. Degraded ecosystem services, though, can impact the health, economy, quality of life, and hazard protection levels of the recovering community. Precautions should be included in recovery planning. These include:

- contamination and post disaster pollution
- habitat restoration
- new parks and conservation properties

Health and Social Recovery
A key determinant of successful community recovery is the level of social vulnerability that exists and the extent to which health and social services are effectively provided. Access to health care, lifelines, and social capital are all important factors. Considerations include:

- public health during recovery
- reopening schools and childcare programs
- increased and extended social service provision
- quality of life and healthy, safe communities

Resilience is best accommodated by communities being proactive and pre planning for disaster. It requires the inte gration of ideas across the functional areas of concern.

LONG TERM RECOVERY PLANNING: THE PROCESS OF PLANNING

An overall framework for the recovery planning process lays out key steps and stages as well as describing the benefits and challenges involved in undertaking recovery planning both before and after disaster strikes, Several crucial aspects of the planning process deserve special attention: leadership and collaboration, public input, and "visioning."

Recovery Planning Process

There are few regulatory triggers for the decision to prepare a pre- or post event recovery plan. Recovery planning has largely been a function performed by communities affected by significant disasters but has also been undertaken, in far fewer instances, by communities that faced significant and imminent threats. However, federal and state initiatives have made these efforts more frequent in recent years. The Na tional Disaster Recovery Framework is likely to further such efforts. Factors in the recovery planning process that should be considered carefully include:

- organizing public participation
- conducting research and analysis
- facilitating input
- developing and adopting the plan
- implementing the plan

Planning before Disaster Strikes

Pre disaster recovery planning can help a community to accelerate the recovery process once disaster strikes by pre defining roles and responsibilities and, through the plan ning process itself, building the institutional and commu nity awareness and capacity to engage in recovery efforts. Pre disaster recovery plans, along with other plans, can also provide a strong foundation for post disaster reconstruction planning and implementation. Disaster-affected communi ties with well established planning functions have tended to be the most effective at managing reconstruction. Pre di saster plans are also important in recovery because they rep resent consensus policies about the future and demonstrate that the community has an active planning process, active channels of communication, and strong planning tools and documents.

Planning after Disaster Strikes

While pre disaster planning is recommended, it will not al ways happen. There are nonetheless some opportunities in post disaster recovery planning that have resulted in success. The challenge is that all previous and new plans following disasters will compete with the image in residents' minds of the city as it existed before disaster struck. Extensive damage may render such rebuilding impossible. Successful disaster recovery plans and processes find a way to effectively attain a baseline of community recovery while also moving the com munity's vision forward in adapting to the "new normal" and taking advantage of post disaster opportunities to transform and thrive. The post disaster period can be a time to promote more sustainable rebuilding, generate new ideas, and assess alternative recovery strategies. However, the biggest challenge to such planning is the compressed timeframe within which this must happen. Thus, it remains the case that pre disaster planning buys valuable time for deliberating and planning more efficiently and effectively after the disaster. To save time otherwise, three general approaches have been most success ful in the post disaster period:

1. Decentralized planning with many planning efforts go ing on simultaneously
2. Increased planning capacity with a surge in planning and decision making resources
3. Iterative planning

Ensuring Buy In and Adoption

Strong, collaborative leadership is critical to recovery and to planning for recovery. Collaboration is common among planners and in comprehensive planning, and it may well ex plain how local planners quite often take on significant lead ership roles once the long haul of post disaster community recovery begins.

Broad community leadership support for recovery plan ning requires earnest engagement with all the community leaders who may be involved in a key aspect of disaster re covery and its successful implementation. Key positions of leadership include the local governing body, a local recovery planning task force, and a stakeholder group, which can pro vide a critical feedback loop for planning and communication design. Two considerations regarding that group's composi tion are the following: (1) Whose participation is essential for

guaranteeing technical accuracy and thoroughness? and (2) Whose participation and support will enhance the plan's political acceptability?

Broad public participation is important because plans are unlikely to succeed if imposed from the outside or lacking broad community support. These efforts necessarily make planning more complicated, but community consensus can increase the speed of reconstruction. Best practice recommendations include the following:

- See public participation as a core mechanism that drives the recovery planning process forward.
- Develop a public participation and communications strategy for the recovery planning process.
- Ensure broad and inclusive involvement.
- Set and maintain the planning focus on disaster recovery.
- Balance communicating the big picture with an astute focus on priority issues.
- Design meaningful discussions on alternatives.
- Ensure a full and final round of public input into the recovery plan.

Finally, a clear and inspiring planning vision can significantly motivate many actors in the process. It should be inspirational, even a challenge to attain, but not so lofty that it seems unrealistic, naïve, or disingenuous. Recovery planning can be a unifying element and a guiding light that captures the public's imagination. This can occur at two levels: catalyzing projects and visionary planning outcomes.

Making It All Work Together

Recovery plans can take the form of either a standalone plan or a plan integrated into existing plans. Both have their advantages; the critical factor is to take stock of the various plans that may be linked to recovery. Recovery plans and the process of building public consensus can restore collective faith in the community, but holding onto the vision of recovery can be challenging.

PLAN IMPLEMENTATION: THE LONG, HARD ROAD OF RECOVERY

The collective understanding of the planning implementation phase of post disaster recovery is far more limited than the understanding of the planning processes. In part, this is because government programs rarely work in practice as envisioned. What is uniquely different post disaster is that all these activities are now happening concurrently, and a community, which previously took years and even generations to build, now wants to be restored within a matter of months to years. This pace varies considerably both spatially across the community and in time. This in turn creates unevenness and allows some urban activities to get out of order compared to normal times. Among the broad considerations planners must keep in mind:

- Early decisions can impede or undermine long term recovery priorities.
- Competing demands for limited resources can exacerbate pre disaster inequities.
- Mismatches exist between the flow of money and the pace of recovery.
- Bureaucracies do not adapt well to the post disaster decision environment.
- The rules keep changing because post disaster challenges require significant adaptations.

Gearing Up for Implementation

Several recovery related planning actions should be taken before a disaster. These include:

- adopting necessary rebuilding policies and procedures
- conducting additional studies on specific hazards and regulatory matters
- developing advance contracts and mutual aid agreements
- training staff on elements of the plan
- reviewing and maintaining the plan regularly

Planners must also anticipate certain implementation needs most notably whether, when, and how activation of a recovery plan must take place. It may be useful to have some recommended triggers as well as the decision authority defined in the recovery plan or the implementing ordinance. The activation process needs to include a process for reviewing and modifying pre disaster recovery plans once the actual damage patterns, estimated local revenue impacts and recovery costs, and other implementation issues resulting from the disaster have been considered.

If planning is undertaken post disaster, there will need to be a final review and formal adoption process by the appropriate elected bodies. Once the plan is adopted, it is important to commemorate this important post disaster milestone. Finally,

the community needs a mechanism for periodically reviewing and amending the plan once implementation begins.

The point at which community recovery and recovery plan implementation ends and normal local management processes resume is never clear. Considerations include completing implementation actions and reaching an acceptable level of normalcy. The recovery leadership and management organization should make a recommendation to deactivate and update the plan based upon lessons learned during its implementation. Deactivation should also include a formal process of administrative closure.

Managing Recovery Implementation

Personal leadership, the ability to act, and knowledge of disaster management and available resources are three of the most influential factors affecting community recovery and should be carefully considered in any recovery organizational design. The National Disaster Recovery Framework provides a set of criteria shown to help ensure successful recovery that includes effective decision making and coordination among local government leaders, stakeholders, and the community. There is no set standard for the design and authority of a local recovery management organization, but most models emphasize flexibility, improvisation, collaborative decision making, and organizational adaptability. In addition, strong and engaged executive leadership is a key determinant of both the quantity and quality of human, physical, and financial resources devoted to community recovery. While there are several possible ways to do it and to finance it, local governments rarely regret the decision to augment staff to handle the additional burdens of recovery management.

Financing Recovery

In recovery, there never seems to be enough money, and it seldom is available when needed. Money is a driving force in a community's recovery process, but it can come too fast and there can be too much. Managing the flow is central to success. It is important to understand the overall fiscal and economic impact of the disaster. From there, a community can develop a comprehensive recovery implementation financing strategy. All the while, it is critical to ensure transparent, inclusive, and accountable approaches to local recovery financing.

Key sources of public funds include federal disaster grants and loans, which can and should come not only from FEMA, but also the U.S. Department of Housing and Urban Development, the Small Business Administration, the U.S. Department of Transportation, the Economic Development Administration, the U.S. Department of Agriculture, and other state and federal agencies. In addition, insurance will play a major role, but its nature will largely depend on the nature of the disaster in question. Cities can generate their own funds through a variety of mechanisms like capital improvements and redevelopment that are typically well known to planners. Finally, private business and philanthropic investment can fill many gaps in recovery finances.

Strategies, Milestones, and Timetables

Realistic timeframes and desired outcomes should be established and monitored for every recovery program and project. Timeline strategies can be used to parse problems and manage uncertainties, moving from broad goals to particular challenges. These can take both spatial and systematic forms.

Legal Considerations

Recovery managers and organizations must be mindful of legal concerns that can become particularly vexing during the recovery process. These include:

- moratoria and temporary restrictions
- nonconforming uses
- emergency demolitions
- environmental review
- historic preservation
- property acquisitions and relocations
- hazard mitigation and resilience measures
- controlling blight

As noted elsewhere, many of these can be alleviated and addressed in a recovery ordinance adopted pre disaster.

Measuring Success

Determining the level of success in recovery is a process riddled with questions that require careful consideration and tracking. The questions include the scale at which success will be measured, the length of time involved, and who will be responsible for the evaluation. There is also the qualitative question of what constitutes successful recovery. There is not yet a centralized system for collecting and archiving recovery indicators, nor are there comprehensive models of the recovery process itself.

Thus, communities must first decide on a clear definition of recovery before they can measure it, and this definition can have numerous dimensions: environmental, physical, economic, social, and institutional, among others. This needs to include some holistic description of the "new normal." Both

local government and the public can use a recovery measurement system to monitor progress and evaluate achievement of the desired results.

NEXT STEPS IN CREATING RESILIENT COMMUNITIES

The question that dominates planning for post disaster recovery is what a positive outcome should look like. Some general principles seem to make sense, such as the fact that the community should emerge safer and stronger, ideally by relying, to the extent possible, on natural systems to mitigate the impact of hazards. In addition, recovery should include removing the built environment from harm's way to the extent possible and restoring and improving its economic situation. It is of paramount importance in this process for planners and public officials to seize opportunities during long term recovery to move their communities forward. Excellent examples exist of the results of such leadership in places like Greensburg, Kansas, and Cedar Rapids, Iowa.

Adaptive thinking is critical to this process. It is also important for planners to grasp the relationship between the concepts of sustainability and resilience. These are not contradictory but complementary concepts. Planners and their communities should strive for both. In truly thinking about the welfare of future generations whose abilities to meet their own needs should not be impaired, they should go about the business of developing the culture of sustainability that contains within it the seeds of a culture of preparedness, to ensure that potential current disasters do not foreclose those future opportunities. Long term sustainability that builds serious resilience in the face of increasing natural hazard threats as a result of climate change may actually increase sustainability for future generations. If communities are to remain resilient and sustainable into an extended future, climate change must become a consideration with regard to both hazard mitigation planning and pre disaster and post disaster recovery planning.

In the end, the opportunity to combine aspects of community economic revitalization with environmental restoration and serious considerations of social equity draws upon some of the most powerful, creative, and visionary skill sets that planners can offer to a community. The planning profession must rise to this opportunity while realizing that disasters are sobering reminders of all that society may not have gotten right in the way it has chosen to build in the past. It is not enough merely to repeat those mistakes.

CHAPTER 1

THE VISION OF A RESILIENT COMMUNITY

Planners often learn on the job that, when a disaster strikes their communities, they are in for a wild ride until the mission of recovery and rebuilding is complete. They learn that this mission may take many years in the worst cases, and certainly more than one in all but the simplest cases. Few planners have been adequately trained, if at all, during their graduate planning education for the task of managing post-disaster recovery. It has thus been essential that professional associations, especially the American Planning Association (APA), take on the role of preparing them for the day they mostly wish would never come. APA first took on this task in 1993 in a cooperative agreement with the Federal Emergency Management Agency (FEMA) to prepare *Planning for Post-Disaster Recovery and Reconstruction,* PAS Report 483/484 (Schwab et al. 1998). After a path-breaking process that lasted over five years, this effort finally came to fruition and was presented to APA leadership during the 1999 National Planning Conference in Seattle. It quickly became the leading reference work in the field of disaster recovery not only because of the comprehensive approach it took, but because of the dearth of other literature on this topic.

Times have clearly changed.

Today, there is a good deal more academic and professional literature on the topic of disaster recovery, but none of it changed the fact that this seminal work deserved reexamination. Numerous changes in federal and state law and policy, planning practice, technology, science, practical experiences, and other factors have significantly altered perceptions of best practices in planning for post-disaster recovery. APA, during the post-Katrina years, began to explore—with FEMA and other federal agencies—what a new version of the 1998 report might contain, what a new project including the report might accomplish, and the rationale for a complete overhaul to adapt what is known for the twenty-first century. To provide the rationale, APA developed for FEMA a needs assessment for a new project that can be found in its entirety on the APA website (www.planning.org/research/postdisaster/rationale.htm) but is summarized in "Key Points in APA Needs Assessment for This Project." That needs assessment already dates to 2009, and additional factors have emerged since then that have influenced the content of this report.

One lesson of the years since 1998 has been that communities are subject to major catastrophic events that are, quite literally, game changers that alter the understanding both of the extent of the vulnerabilities of communities and the magnitude of the events that are possible. Hurricane Katrina smashed all previous records for the cost of a disaster in the U.S. by mercilessly exposing vulnerabilities that had languished for years in Gulf Coast communities. The cascading events in Japan in 2011, in which an earthquake triggered a tsunami that then produced a nuclear power emergency, showed that the best plans may not fully envision the magnitude of what is possible. And Hurricane Sandy demonstrated some of the possible manifestations of climate change and how, under a devastating combination of circumstances, the most densely populated urban area in America could be laid low for weeks afterwards with power failures, flooded hospitals, and fuel shortages. It is now apparent that merely dismissing or ignoring the most unlikely scenarios is not a wise strategy for the future. Communities must take worst-case scenarios much more seriously.

Sandy also reminded communities of both unintended consequences and previously underappreciated opportunities. Just months before the superstorm assaulted the Northeast, Congress had passed the Biggert-Waters Flood Insurance Reform and Modernization Act of 2012. This major shift in federal flood policy is discussed in more detail later in this report, but it introduced the notion that owners of all properties should eventually pay actuarially sound rates for flood insurance. Previously, those structures that predated the adoption of flood insurance rate maps under the National Flood Insurance Program enjoyed "grandfathered" subsidized rates, but those are now being phased out. Perhaps inevitably, the impact of the increased rates on people in areas that were rebuilding after

KEY POINTS IN APA NEEDS ASSESSMENT FOR THIS PROJECT

The American Planning Association needs assessment (completed in 2009) pinpointed a series of major changes affecting post-disaster recovery planning that have developed since the 1998 report *Planning for Post-Disaster Recovery and Reconstruction*, PAS Report 383/384, including:

- Passage of the Disaster Mitigation Act of 2000
- Implementation of ESF-14, the Long-Term Community Recovery function of the National Response Framework (this was subsequently superseded by the provisions of the National Disaster Recovery Framework, adopted in 2011)
- Placement of FEMA within the Department of Homeland Security
- Lessons from Hurricane Katrina
- Map Modernization and RiskMAP (FEMA programs for advancing flood mapping and risk management)
- Florida requirements for including a Post-Disaster Redevelopment Plan within the comprehensive plans of coastal counties and municipalities (subsequently de-mandated)
- Evolving science and lessons from climate change
- Emerging web-based technology
- Plans underway for a National Disaster Recovery Framework

For the full rationale, see www.planning.org/research/postdisaster/rationale.htm.

suffering major losses from Sandy triggered concerns about affordability and some calls for reversing certain provisions of Biggert-Waters. The result in Congress, by early March 2014, was the passage of HR3370, the Homeowner Flood Insurance Affordability Act, also known as Grimm-Waters-Richmond after its major sponsors. That bill calls for an affordability study by FEMA (as did Biggert-Waters), removing a previous $750,000 ceiling on the cost of that study, and delayed the impacts of flood insurance adjustments in several categories of properties. Later segments of this report will go into greater detail on Grimm-Waters, but clearly Congress had not fully anticipated some of the impacts of its 2012 legislation.

Equally important, federal disaster officials and local planners have had to grapple with the implications of mitigating flood hazards in densely developed waterfront neighborhoods (New York City Planning Department 2013a, 2013b; Schwab 2013). At the same time, the report of the Hurricane Sandy Rebuilding Task Force (2013) shows a growing appreciation of the value of green infrastructure in helping to mitigate coastal hazards, an appreciation that is being reflected in changes in federal policy priorities. The task force report defined green infrastructure as

> the integration of natural systems and processes, or engineered systems that mimic natural systems and processes, into investments in resilient infrastructure. Green infrastructure takes advantage of the services and natural defenses provided by land and water systems such as wetlands, natural areas, vegetated sand dunes, and forests, while contributing to the health and quality of life of America's communities. (2013, 72)

Other developments in disaster recovery planning that have risen to the forefront since publication of the 1998 PAS Report include:

- Environmental justice (e.g., social equity and the disproportionate impact of disasters on vulnerable populations as highlighted by Katrina)
- Impacts of disasters on public health (environmental, physical, and mental)
- Emergence of new data sources, technological applications, and tools (e.g., the National Oceanic and Atmospheric Administration's Digital Coast) to inform planning for post-disaster recovery

Lessons from Hurricane Sandy

In the month after Hurricane Sandy struck the Northeast on October 29, 2012, APA's New York Metro and New Jersey chapters requested assistance from the national organization in training members on the demands of planning for post-disaster recovery. This provided not only an opportunity for APA to provide such professional education but also to learn from the event and discern the implications it might have for future planning practice. One obvious aim would be to incorporate that information into this project and this report.

APA staff, led by the Hazards Planning Research Center, spent the next four months working with chapter leaders, allied and supportive organizations, the major contributors to this report, and FEMA recovery staff to develop a curriculum for what became a series of workshops whose results are online at www.planning.org/sandy. The series of one full-day and four half-day workshops at five locations in New York City and New Jersey during the first week of April were the culmination—but not the only result—of this collaboration. APA's efforts also included tours of affected areas, assisting in the training of neighborhood charrette facilitators on Staten Island, meetings with local leaders facilitated by the two chapters, and a workshop and plenary presentation at the New Jersey APA conference in New Brunswick in February 2013. The major contributors to this report made up the instructional team for the April workshops.[1]

What was learned from the Sandy recovery efforts? In many ways, this question is hard to answer in the most general sense because the region was complex and the interactions among agencies at all levels of government were even more so. As a result, people's individual reactions tend to depend on their positions and perspectives. Nonetheless, one theme that bears repeating is that "none of us are immune to disasters," a point made by both James Rausse, the president of APA's New York Metro Chapter, and Lincoln Walther, a member of the Sandy workshop team. While much time had passed since the Long Island Express hurricane of 1938, an event easy to forget after a generation or two, what happened before was clearly waiting to happen again, with or without the added impetus provided by climate change. Now is the time to start planning for the next event rather than assuming that it will not happen again for a long time.

Whether they qualify as lessons or not, some clear policy changes resulted from Hurricane Sandy, particularly at the federal level. The most obvious shifts emerged in *Hurricane Sandy Rebuilding Strategy,* the concluding report of the Hurricane Sandy Rebuilding Task Force (2013) headed by U.S. Department of Housing and Urban Development Secretary Shaun Donovan. First, there was a much greater emphasis on concepts of resilience than had emerged from any previous disaster. That emphasis on resilience included explicit recognition of the long-term impacts of climate change. As the report noted, "in the Sandy region and across the country, communities once thought to be safe from risk are now beginning to recognize they face greater vulnerability to extreme weather and other natural disasters than previously imagined" (41). Aside from those recommendations that resulted in the Rebuild by Design competition, the report also emphasized the need for a sea-level rise tool to help incorporate sea-level rise assessments into rebuilding efforts and account for both current and future risks in federal investments for flood risk reduction. Second, as previously noted, there was considerably greater emphasis placed on the development of green infrastructure as part of an overall resilience strategy than had been the case before Sandy. Green infrastructure was featured in a series of recommendations for valuing its contributions to the environment, creating opportunities for innovation, and improving decision-making tools through projects funded by the Sandy supplemental budget. Green infrastructure became an explicit recovery strategy of the federal government.

At the same time, Sandy exposed operational challenges for the federal government and explicitly for the new National Disaster Recovery Framework (NDRF), which is discussed in detail in Chapter 3. Shakedown cruises for new federal programs are challenging, but they are important in garnering lessons for future events, and Sandy was unquestionably the shakedown cruise for the NDRF. Nonetheless, the NDRF will likely remain the operative framework for future federal assistance in recovery operations, and state disaster agencies and FEMA will need to evaluate the performance of these operations in order to improve coordination and performance following future events that are certain to occur.

Ongoing Challenges

No single disaster, no matter how catastrophic, changes everything known about recovery. Most existing knowledge remains pertinent despite new lessons. Sandy forced planners and emergency management officials at all levels to revisit familiar lessons from the past, and their experience in many cases eased the burden of long-term recovery.

One ongoing challenge is the need to accept the inherent complexity of post-disaster recovery. With larger disasters, this need becomes even greater. Frustration and even confusion in the face of complexity are more likely among members of the public than among disaster and planning

professionals. Even among professionals, however, the complexity of some situations can be difficult to grasp, especially from a distance. As a result, it becomes very easy to assume that everyone should simply move away from the shore, at the same time that affected residents and the elected officials who represent them wonder aloud why it takes so long for federal or state assistance to reach the intended recipients. There are, of course, grains of truth in many of these observations, but there are also numerous complicating factors—and even contradictory incentives and potentially conflicting public policies—that must be carefully sorted out and disentangled. Many of these policies have consequences not adequately foreseen, even if they were drafted and adopted with the best intentions. Perhaps it is not surprising, then, that Biggert-Waters was amended within two years of its original passage, largely as a result of the impacts of Hurricane Sandy. There are lessons to be learned from each major event, but planning for such learning is a constant factor in all of them.

A second ongoing challenge is the need for communities to take local ownership of their situations and gain full understandings of the relationships among federal, state, and local entities so that they can assume the leadership in determining their own destinies. That is the only viable path to local resilience. Relying entirely or even heavily on outside guidance means surrendering a great deal of local autonomy. It may provide numerous opportunities for finger-pointing, but that is not a conscionable or reasonable objective for local government. Preparation, on the other hand, is an objective.

This report devotes considerable discussion to how communities can take control of their own futures in the face of natural hazards and why they should. Of course, this is an easier task for larger jurisdictions with adequate resources and staff capacity than for smaller communities, where technical expertise pertaining to disasters, and especially to climate change, may be at a premium. A role clearly exists here for states and for regional planning agencies, councils of governments, and universities (including extension services) in making such expertise available where it is needed. It is equally important for communities to seek out and avail themselves of such expertise to the greatest extent possible. The bottom line is that informed local decision making is critical to establishing the resilient communities of the future. Some of that will also involve fostering a robust public discussion of the issues at stake and the means to resolve them. As noted in the case studies in *Hazard Mitigation: Integrating Best Practices into Planning,* PAS Report 560 (Schwab 2010), the most successful communities have nurtured and developed a local civic culture of preparedness.

Finally, what also has not changed is that, amid all the frustrations and sorrows of post-disaster recovery, opportunities exist, the silver linings in a seemingly dark cloud. The most resilient communities are those with the civic mindset to seize on those opportunities to create new visions for the future. These can include identifying emerging economic opportunities that can be developed as part of the plan for reconstruction, incorporating environmental improvements within hazard mitigation strategies, or crafting a new image for a community while it lingers in the national or regional spotlight as a result of its tragedy. The case studies in this report try to highlight those examples. This is a theme that was prominent in the 1998 report and is likely to be an ongoing theme for decades to come. Pre-event planning for recovery after disasters can help to identify those opportunities in advance, although others may surface from very specific circumstances that were not foreseen. Either way, planners and public officials who can think opportunistically about the prospects for long-term recovery will be doing their communities a major favor.

VISION OF A RESILIENT COMMUNITY: WHERE NEXT?

Talking about resilient communities requires some clear operational definitions. It also requires some clear concepts of why achieving resilience is important and what purpose it serves. Without all that, the term is unlikely to be meaningful to the broad public, and discussions of resilience will achieve little if any political salience.

If elegant simplicity is the standard for clarity, the definition of resilience used by the National Academy of Sciences (NAS) (2012, 16) may well fit the bill: "the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events." This definition has the dual benefits of using straightforward language that is comparatively easy to explain to the public and of already being in use by a prestigious national research body. The NAS study also noted that the definition was "developed by the study committee based on the extant literature and is consistent with the international disaster policy community, U.S. governmental agency definitions, and [the National Research Council]" (16). In other words, instead of trying to plow entirely new ground, it synthesizes the best of existing research.

An operational definition that offers planners a bit more detail for their own professional contexts, however, comes from Godschalk et al. (2009):

> The goal is to assist communities in withstanding an extreme event without suffering devastating losses and without requiring a great deal of outside assistance. The impacted communities survive and continue to function; they might bend from disaster stresses, but they do not break. Instead of repeated damage and continual demands for federal disaster assistance, resilient communities proactively protect themselves against hazards, build self-sufficiency, and become more sustainable. Resilience is the capacity to absorb severe shock and return to a desired state following a disaster. It involves technical, organizational, social, and economic dimensions.[2] It is fostered not only by government, but also by individual, organization, and business actions.

How does this apply to planning? In an earlier article, Burby et al. (2000, 100) anticipated many of the themes APA later developed in *Hazard Mitigation: Integrating Best Practices into Planning* by identifying the ways in which "integrating natural hazards mitigation into land-use planning can help a community become more resilient":

- *Intelligence* about long-term threats posed by natural hazards to the safety and viability of human development and environmental resources
- *Problem solving* to cope with imminent threats prior to, during, and after a disaster
- *Advance planning* to avoid or mitigate harm from a future disaster and to recover afterwards
- *Management strategies* to implement plans through policies, regulations, capital improvements, acquisition, and taxation

The purpose of creating a resilient community is important to understand and broadcast. Why worry about recovering from and adapting successfully to adverse events? It is useful to recall that the planning movement originally grew out of concerns about public health, particularly in urban areas. Early judicial decisions supporting public regulations for planning and zoning were largely based on the need to control public nuisances and advance public health, safety, and welfare, which themselves are enshrined as justifications for congressional authority in the U.S. Constitution. Part of the purpose of this report is to make clear that one effective way in which communities can advance public health, safety, and welfare is to think about and plan in advance for their foreseeable recovery needs following a disaster, in addition to taking appropriate steps to mitigate hazards before a disaster. Simply put, there are opportunities to advance community resilience that may arise during long-term recovery from a disaster that may not arise at any other time. Being prepared to optimize those opportunities is one purpose of a resilient community. Although there is no question that some decisions and actions, and some types of planning, must inevitably await the outcome of a disaster in order to focus appropriately on the problem created, pre-planning can inform and expedite the ability to do such post-event planning when the time comes.

Why is this important? In short, resilient communities should be better at saving lives, preventing injuries and disease, and protecting property from unnecessary damage as a result of smart decisions made through deliberative decision making processes like planning. It is hard to find a larger public purpose.

In all the discussions of resilience, however, it is important to embed the concept of resilience within the wider framework of sustainability. It is equally important that sustainability incorporate the concept of resilience. Chapter 8 discusses this relationship in greater detail, but fundamentally, resilience allows a community to respond to and recover effectively from specific events; sustainability is a frame of reference that aims to preserve for future generations the resources and opportunities that exist for current generations. Resilience can help to ensure that those resources and opportunities are not squandered through poor preparation for adverse events. It is not in and of itself, however, a broad enough framework for the more long-term goals of truly visionary planning. The two concepts need to work hand in hand.

In closing this discussion, it is worth making one other observation. It was noted above that the Hurricane Sandy Rebuilding Task Force (2013) offered several recommendations for advancing green infrastructure as part of a larger mitigation strategy for coastal storms. The shift toward green infrastructure—which can involve a number of ecological elements, including urban forestry, coastal dune systems, tidal wetlands, and riparian open space—signals a physically softer form of resilience that seeks to take full advantage of the ecosystem services that nature offers. Resilience is not merely about highly designed engineering systems but also well-managed ecosystems, in addition to a well-informed and active citizenry that supports these goals. Resilience has a number of aspects and characteristics, but green infrastructure is one that is likely to assume greater importance over time.

ONLINE FEATURES OF *PLANNING FOR POST-DISASTER RECOVERY: NEXT GENERATION*

One crucial joint decision between the Federal Emergency Management Agency and the American Planning Association (APA) in the conception of this project was not to make the planning community wait three or more years for a new PAS Report with no news of progress in the interim. Instead, the goal was to use the capacity of the APA website, and the Internet generally, to disseminate valuable information about disaster recovery throughout the term of the project. As a result, the APA website section devoted to this project (www.planning.org/research/postdisaster) provides an online resource with the following major features:

- Model Pre-Event Recovery Ordinance (annotated)
- The *Recovery News* blog
- Online case studies in addition to those in this report
- Background on the scoping symposium that launched work on this project
- Online database of federal resources to support post-disaster recovery

In addition, readers can find materials from the series of post-Sandy recovery training workshops that APA conducted in New Jersey and New York in April 2013 at www.planning.org/sandy.

IN THIS PAS REPORT

As this introduction suggests, there is a journey ahead for the reader. It is valuable to know in advance where it leads. Chapter 2 places planning for resilience in the face of disasters in the context of larger themes of resilient governance and the position planning occupies in that larger system. It places planning for post-disaster recovery within that context with respect to the typical goals of community planning, then concludes with a typology of recovery plans that seeks to differentiate the underlying rationale of pre-disaster planning for recovery versus that planning which must follow an actual event.

Chapter 3 explores why planning and preparation matter for communities in confronting their vulnerabilities and preparing for recovery, how these issues affect organizational relationships both within and outside the community, and the limits of prediction and foresight. It provides a typology of disaster types to help planners understand the importance of the scale and spectrum of damages that are possible depending on various disaster scenarios, and the lessons to be drawn from the differences between them.

Chapter 4 equips planners and allied professionals with an understanding of the structure of federal assistance in disaster recovery. It includes a summary history of the evolving array of federal legislation and programs affecting disaster recovery operations, in order to provide readers with an adequate sense of the overall direction of federal policy in this arena. A model pre-event recovery ordinance complements this discussion with precise suggestions for establishing the proper authorities to expedite recovery at the local level in concert with state and federal efforts.

Having laid that groundwork, the report then introduces a sequence of three chapters devoted to dissecting the actual process of developing and implementing plans for post-disaster recovery. Chapter 5 discusses the goals and policies that should be included in recovery plans, and how these can relate to each other to create a full, coherent plan. Chapter 6 discusses the process of preparing and adopting recovery plans, including where and when to start, the opportunities and challenges involved, and the roles of leadership, collaboration, and public involvement. Chapter 7 concludes the sequence with an in-depth analysis of the challenges in successfully implementing such plans, including crucial issues of finance and timing, legal authorities, and the effective measurement of success.

Finally, Chapter 8 concludes the report with a series of overall findings and recommendations. Most chapters in-

clude one or more case studies intended to supplement the broader discussion with an examination of specific experiences with disaster recovery in cities and regions with significant lessons to share.

1. The one exception was that Lincoln Walther, FAICP, of Continental Shelf Associates, Inc., in Florida served in place of Allison Boyd, who had already left the firm.

2. Tierney and Bruneau (2007) describe a four-part resilience framework based on robustness (ability to withstand disasters without significant degradation or loss of performance), redundancy (extent to which system elements are substitutable), resourcefulness (ability to diagnose and solve problems), and rapidity (capacity to restore functionality in a timely way).

CHAPTER 2

ANTICIPATING DISRUPTION

Planning is by its very nature an optimistic enterprise. Long-term, comprehensive planning is at its core an attempt to envision a better community at some point in the future, using some sort of reasonable horizon like the next 20 or 25 years. To anchor those visions in realistic assumptions, it also involves taking stock of the community's current assets and liabilities with the idea of building upon those assets and overcoming those liabilities. But the underlying idea is that communities can make improvements.

Life, however, can be messy. Setbacks of all sorts happen to individuals, their neighborhoods, whole communities, and even nations. Major employers, even if they have long been viewed as anchors of economic stability, eventually face new competitive challenges in national and international markets. If they fail to adapt, the resulting loss of jobs or closures of company facilities can dramatically alter a community's economic fortunes. Larger economic trends can have significant impacts on housing markets that had been stable or even booming. The impacts are felt both by families and at city hall, necessitating a wide array of adjustments to new circumstances. Some individuals and communities will have planned for such contingencies. Many others will have not, and the mayhem is exacerbated as a result of their failures to anticipate such setbacks. The concept of resilience is built around the ability to absorb and withstand such setbacks and recover from them. It applies to individuals, households, communities, and even whole nations. There are few assumptions in life more dangerous than the illusion that today's positive trends will continue uninterrupted into the indefinite future.

It is in this larger context that a community's willingness to examine its hazards and to anticipate and plan for potential disasters becomes important. Communities cannot consign their hazards strictly to the domain of emergency management. Everyday planning and zoning decisions deeply influence the amount of damage and destruction faced by first responders. Preparation for response to disasters is unquestionably important, but it is also important to understand that disasters are not the inevitable outcome of natural events such as storms or earthquakes. Disasters occur as the result of the interaction between those events and the built environment—in short, as a result of the human presence in hazardous areas. Unless communities incorporate an awareness of their hazards into their long-term planning, they may not confront the fact that land-use choices greatly affect the outcomes and the resulting losses of lives and property. For that reason, if no other, planning cannot simply assume a future devoid of such disruptions to normal activities. These setbacks are a part of life that can well be anticipated, and planning for them, both through mitigation and an understanding of what must be done to facilitate recovery, is an essential ingredient of resilience.

Although it will be used again elsewhere in this report, one definition of resilience in the urban planning literature deserves consideration in this context:

> Instead of repeated damage and continual demands for federal disaster assistance, resilient communities proactively protect themselves against hazards, build self-sufficiency and become more sustainable. Resilience is the capacity to absorb severe shock and return to a desired state following a disaster. It involves technical, organizational, social and economic dimensions. . . It is fostered not only by government, but also by individual, organization and business actions. (Godschalk et al. 2009)

What distinguishes disasters from most other setbacks in a community, such as economic decline, is the speed of their occurrence and the compressed time frame in which recovery must occur. With the singular exception of drought, involving a slow onset and often a prolonged change in precipitation patterns (Schwab 2014), most natural disasters occur within a matter of days, hours, or even minutes—some-

times with moderate warning, but in the case of earthquakes with almost no warning at all. The long-term recovery from the events of a day or two can last years, but generally homeowners and businesses have expectations that rebuilding should happen much more quickly. Planning can expedite that process but only with good leadership and management. This chapter thus focuses on the problem of anticipating disruption from disasters and planning to minimize their detrimental impacts. It concludes with a discussion of the specific values and functions of plans drafted both before and after disasters for managing and implementing recovery goals and objectives.

STATE ROLES IN RECOVERY PLANNING

Before discussing resilience in local government, it is useful to review the larger context in which those jurisdictions operate because what they can and cannot do is for the most part established by state governments with significant federal influence.

The federal role in disaster recovery planning has grown significantly in recent years and is covered in some detail in Chapter 4, which includes a discussion of both the statutory and programmatic evolution of that role. However, the more direct impact on local preparations for disaster recovery comes from the state level. States control the statutory framework for local planning and zoning authorities, and those structures vary widely—from highly permissive authorities to those mandating local comprehensive plans and specific elements within those plans. States also vary in the degree of consistency they require between land-use decisions (e.g., zoning, subdivision controls, and site plan reviews) and comprehensive plan policies. These issues naturally have some bearing on the state role in influencing local planning for post-disaster recovery, but they are not the only factor. State emergency management policies also have a significant influence, particularly in the degree to which they recognize important distinctions between the roles of planning and emergency management.

State Regulatory and Technical Assistance Functions

While significant differences exist among state government structures in the ways in which they structure responsibilities for hazards and emergency management, the most common feature is that their planning institutions are not set up in ways that parallel the institutions in cities, counties, and regions. Often, there is no state comprehensive plan, no planning department, no context in which development plans and engineering plans are integrated, and no equivalent to the weekly city council meeting where policy is crafted and administered. Almost all states, however, do perform these functions:

- natural resources management
- environmental quality
- community development services and grants management
- emergency management
- disaster recovery management
- infrastructure system management
- codes and standards adoption, such as a state building code

Special aspects of these functions relating to hazards identification include:

- water quality, river systems, floodplain management, legal status of streams, and public access
- protection of resources such as open space, parks, wetlands, sensitive environmental areas
- infrastructure planning, especially state department of transportation
- mapping of geologic hazards, such as landslides and earthquake faults

Special aspects of these functions relating to pre- and post-disaster planning include:

- inventories of critical facilities
- preparedness programs
- grants administration for Federal Emergency Management Agency (FEMA) hazard mitigation funds
- grants administration for FEMA post-disaster recovery funds

States as Agents of Federal Programs

In most of these subject areas, there is an alignment and partnership with units of federal government agencies, such as the U.S. Environmental Protection Agency or U.S. Department of Transportation. Significantly for both hazards management and emergency matters, the state is typically designated as the implementing agency for federal law and regulations. The effect is that state departments have field personnel and sub-state regional administrative arrangements. At the time

of an emergency, these resources cannot only be redeployed to help in early response phases and long-term recovery; they are also crucial sources of information and guidance. Operation of a wastewater treatment system, for example, may need to be altered during a flood, and the state's regional water quality engineer may be helpful in granting authority for regulatory exceptions. During recovery, state agencies can offer technical support to rebuilding decisions, including the issuance of permits. States are often repositories of system data on both natural resources and infrastructure, such as roads, bridges, lakes, and reservoirs.

RESILIENT MANAGEMENT

Many officials in local government are familiar with some sort of risk management. The goal is to assess potential threats to community assets and operations, find ways to minimize those threats, and implement the chosen strategies. Those threats can take the form of financial losses, deterioration of physical infrastructure, unexpected increases in crime, industrial accidents, or storms, among a wide range of possibilities. This topic was the focus of an earlier PAS Report, *Planning for the Unexpected* (Johnson, Samant, and Frew 2005). When combined with strategies or capabilities for facilitating recovery when setbacks occur nonetheless, the result can be a degree of organizational resilience in local government. This organizational or institutional resilience speaks to the ability of local government to sustain operations during a crisis. It is very different from the way in which, say, engineers might use the term when referring to resilient physical systems that are built to withstand various impacts. It stems in large part from the mindset of those in positions of leadership.

One critical aspect of that mindset is the willingness, perhaps even the courage, to make tough, critical decisions in the face of an emergency. Some of this willingness is related to the level of trust between citizens and leaders in a community and the degree of transparency that people perceive in the decision making process. Trust, however, extends in many other directions. Community resilience depends in part on the strength and quality of the lifelines between the community and its leadership and potential sources of assistance both within and beyond the community's borders. Much of a community's recovery after a disaster relies on the strength of the relationships its officials have built with officials in those state agencies that will be responsible for assisting with recovery. The midst of a crisis is the worst possible time to begin nurturing such relationships. Competing pressures and short timelines become a serious obstacle to overcoming a deficit of preparation.

What follows below is an examination of some specific aspects of risk management and what roles they may play in the context of anticipating disruption from disasters, starting with the overall awareness that the city itself is a system that should embody some overarching risk management principles.

Resilience through Systems

A community is essentially an urban system of systems, a network of networks. These systems are expected to function efficiently, but there is a great deal of thoughtful design and engineering behind their resilience if they in fact function effectively during a crisis or natural disaster. Futurist James Cascio (2009), whose work has been cited by both the Government Finance Officers Association (GFOA) and the International City/County Management Association (ICMA), has identified a series of characteristics that underlie resilient systems:

- **Diversity:** Avoid a single point of failure or reliance on a single solution.
- **Redundancy:** Have more than one path of escape.
- **Decentralization:** Centralized systems look strong, but the failure may be catastrophic when they fail.
- **Transparency:** Systems should not be hidden. Transparency makes it easier to determine where a problem may lie. Sharing plans and preparations lets others help find the flaws.
- **Collaboration:** Working together helps systems become stronger.
- **Failing gracefully:** Failure happens. A system goal is for a failure state that will not make things worse.
- **Flexibility:** Do not anticipate stability. Be ready to change when the system is not working.
- **Foresight:** Monitor change, analyze trends, and identify emerging vulnerabilities.

Planners traditionally seek designs that embody resilience. In the layout of new residential neighborhoods or industrial parks, it is common to configure streets so there is more than one way to enter or exit the development. Such design is governed by regulation, typically by standards in the subdivision ordinance. In this instance, the design is resilient because it can maintain access even if one street is temporarily blocked for any reason.

RESILIENCE THROUGH AVOIDING RISK: DAVENPORT, IOWA

David Morley, AICP

With a population just shy of 100,000, Davenport, Iowa, is the largest riverfront city in the U.S. without an extensive structural floodwall. As a result, downtown residents and visitors alike treasure the city's unobstructed view of the Mississippi River and extensive network of riverfront parks. In essence, Davenport has given the river room to flood, proactively mitigating future flood damage and serving as an embodiment of community resilience.

The floods that inundated much of Iowa during the spring and summer of 2008 caused an estimated $16.1 billion in damage across the Midwest, making it the twelfth costliest natural disaster since 1980 (Lott et al. n.d.). While national headlines largely focused on the extent of damage in Iowa's major cities, the floods caused more disruption than destruction in Davenport. The city's long-standing commitment to a free and open riverfront may have meant the difference between widespread cleanup and major reconstruction.

According to Davenport's city administrator, Craig Malin, AICP, the cities that tried to hide behind floodwalls in 2008 suffered grievously. In contrast, Davenport's long-term strategy has been to pull back from the river and to use engineered solutions sparingly to protect selected historic structures.

Apart from building-specific floodproofing measures and an ongoing U.S. Army Corps of Engineers (USACE) project to construct a small floodwall around a water treatment plant, Davenport's riverfront has no system of structural flood controls. Almost 10 miles of Davenport's riverfront, stretching from downtown to the wastewater treatment plant, is barrier-free.

Malin emphasizes there are both deeply felt and well-considered reasons for the city electing to forgo a permanent floodwall. Since Davenport is located along Rock Island Rapids on the north bank of the Mississippi River, the city is bathed in reflected light. Residents have long enjoyed the unobstructed views of the river from downtown, and in recent years there has been an increasing awareness among residents of the fallibility of traditional, engineered flood controls.

Dennis Hamilton, project management branch chief for the USACE's Rock Island District, agrees that Davenport's approach to managing flood risk is unique among larger riverfront cities. However, Hamilton emphasizes that the city's decision to forgo a floodwall is not due to resident preferences alone. Unlike many other flood-prone cities, most neighborhoods in Davenport are located on relatively high ground.

"It's a different circumstance than Fargo, North Dakota, where the whole city is relatively flat," says Hamilton. "In Davenport, the area that's really flood-prone is just a few blocks off the river, and while there have been substantial damages to local businesses, a lot of the newer businesses and the vast majority of the citizens live on much higher ground."

The city owns 99 percent of nine miles of riverfront property. While various industries have made their home on the waterfront since the city's founding, the city has retained ownership of the land. In 1909 Davenport created a levee improvement commission and charged it with making public improvements and engaging in economic development along the riverfront. Since commission members serve six-year terms spanning three election cycles, the commission tends to emphasize long-range goals over short-term gains, says Malin.

Like many mid-sized Midwestern cities, Davenport felt the economic pain of deindustrialization in the latter half of the twentieth century. In response to this shift, the levee commission gradually removed factories and warehouses along the river by simply letting their leases expire.

From the 1960s through the 1990s, major floods often sparked local debates about whether or not the city should change course and embrace structural levees to minimize flood damages. When Malin arrived in Davenport after the 2001 floods, he perceived a renewed interest among many residents and business owners in building a floodwall. Floodwaters had inundated the city's historic riverfront ballpark, causing an abrupt end to a promising season for its minor league baseball team, and some businesses were closed for weeks to accommodate cleanup and repairs.

Malin voiced his support for the city's vision of a free and open waterfront, while also emphasizing that the city must improve its flood response efforts in order to remain credible in the eyes of the nation. This sentiment informed Davenport's participation in a joint brownfield planning initiative with Rock Island, Illinois, to chart a course for their shared riverfront. On December 4, 2003, hundreds of residents gathered at the city's convention center to discuss the future of the riverfront. According to Malin, resident after resident spoke in favor of a levee-free public waterfront, and the resulting plan, River Vision, affirmed Davenport's commitment to closing out

leases, demolishing buildings, and converting brownfields to public parks.

The city's commitment to protecting its waterfront has translated into a downtown renaissance. Since the 2001 floods, the popularity of downtown housing has soared. "The city made big plans and followed through on those plans," says Malin. "We are literally running out of old warehouses to turn into loft apartments."

Hamilton praises the city for making effective use of both Federal Emergency Management Agency assistance and local investments over the years. "Davenport's approach to managing flood risk during the 2008 floods and subsequent floods has been very successful," says Hamilton. "It's been at relatively low cost, and it hasn't been terribly intrusive because they've been able to do it in stages and in partnership with local businesses."

Risk Management through Cost-Benefit Analysis

The GFOA performs studies and develops policy recommendations on such matters as risk analysis and strategies for dealing with uncertainties, whether those are market variability, unexpected costs, or revenue declines. One definition cited by the GFOA is the following: "A 'risk' is defined as the probability and magnitude of a loss, disaster, or undesirable event" (Hubbard 2009, 8).

The GFOA's framework of risk assessment is based on a cycle that includes the following stages:

- Identify risks.
- Assess risks.
- Identify risk mitigation approaches.
- Assess expected risk reduction.
- Select and implement the mitigation method.

Methods of risk management include purchase of insurance, setting aside funds to offset future loss, or taking measures that reduce the risk factors.

Some recent examples from Colorado illustrate both the value and the occasional limitations of establishing reserve funds for emergencies such as floods and wildfires. In September 2013, the Front Range area of Colorado was struck with what amounted to a summer monsoon over the mountains, with a rainfall of 11.85 inches in 24 hours in the peak area, according to Robert Henson (2014) of the National Center for Atmospheric Research, which is based in Boulder, Colorado. That is well in excess of half of the area's typical annual rainfall.

The city of Boulder had been acquiring open space for a long time to ameliorate the potential impact of floods, expending about half a million dollars per year for high-hazard properties, according to city administrator Jane Brautigan (2014). That served to reduce floodplain flooding, but it did not stop the rise of groundwater into the sewer system, producing largely unforeseen damages and expenses. The city, however, has reserved 10 percent of its annual budget for emergencies, which proved very useful in supporting its ability to front money where needed until it could be reimbursed. This problem of upfront expenses is one that routinely plagues cities less financially well prepared.

But Boulder also benefits from its relative size, with a population in excess of 100,000, many of whom were not directly affected by the flood. This factor tends to offset the percentage of revenues needed for emergencies compared to small towns such as Lyons, Colorado, about 15 miles north of Boulder. With just over 2,000 people, all of whom were evacuated as the floods swept out of the mountains at high velocities down the confluence of the North and South St. Vrain Creeks, Lyons functions on a $1 million annual budget that is a tiny fraction of Bolder's annual budget. But the entire town was devastated by the deluge. Every business was closed, and revenue from sales taxes ceased for several weeks. Lyons actually had reserves of $4.4 million, more than four times its annual budget, but even that was insufficient for its local match of $6.5 million for disaster assistance amid $50 million of damages (Simonsen 2014). The contrast suggests that, even with wise fiscal management, small towns like Lyons may still need special assistance from state government for major disasters in ways that much larger communities do not.

Another example of offsetting disaster costs can be found in a recent Colorado Springs study (see "Colorado Springs, Colorado"). In this instance, the GFOA recommended fund

COLORADO SPRINGS, COLORADO

Colorado Springs, Colorado, is subject to extreme events that pose a significant threat to life and property. However, the city's historical experience is that the financial impacts of these events have been manageable. For example, the most recent fire was the worst in Colorado history, but the total cost to the city was only $3.75 million versus an annual city budget of about $220 million. Taking into account the uncertainty associated with the scale of future extreme events as well as the timing of the Federal Emergency Management Agency reimbursement and the portion of event response costs likely covered by existing budgeted resources, a reserve for extreme events of $5 million seems reasonable; however, an argument for a reserve of up to $7.5 million could also be made (Kavanagh 2013).

In its 2012 analysis for the City of Colorado Springs, the GFOA was focused on fund reserves for a city affected significantly by forest fires earlier that year. In 2013 the city was giving the fire territory additional scrutiny because of new post-event threats of flooding and mudslides due to the destruction of protective vegetation. While the estimated (unreimbursed) disaster cost to the municipality of $3.75 million was considered a manageable expense to be covered by special reserve funds, the infrastructure costs to upgrade the stormwater management system to handle increased runoff may be much higher—in the range of $10 million.

reserves to manage risk in six categories: sales tax uncertainty, economic uncertainty, pension system uncertainty, infrastructure uncertainty (failure), extreme event uncertainty (disaster), and legal uncertainty (lawsuits). The GFOA calls attention to estimates of uncertainty where there is little historic experience versus those with many data points over time. With little historic experience and high uncertainty, a multiplier of 1.5 or 2 is recommended in calculating reserves.

Two factors about reserves are worth keeping in mind. First, the statistical probability of any one demand for drawing upon reserves is low. To an extent, multiple reserve categories may be combined to achieve lower overall risk and a reduction in total reserves for unexpected events. Second, reserves can be accumulated over a period of time, making the annualized cost similar to amortization.

Placing disasters and mitigation planning in the context of a financial strategy represents a wise management method for local government. Investments in safety can thus be viewed from a benefits perspective, where avoidance of cost, human misery, and economic disruption are compared holistically as management choices more broadly than only (or mainly) as a physical land-use plan, emergency preparedness project, or environmental policy.

Risk Management through Mitigation

Planners interested in promoting hazard mitigation planning and pre-disaster recovery planning as a programmatic investment can gain executive support by presenting it within the context of broader community resilience. Hazard mitigation is a clearly established mechanism for achieving risk reduction. Mitigation planning is thus a legitimate local government tool for risk management. There are many examples, but one of the more obvious is that moving homes out of a floodplain lessens flood risk. After this is accomplished, the neighborhood that remains becomes more resilient because it has less need to rebound after a flood; the disaster, if there is one, is far smaller. The need for prevention is reduced because of the decreased need to protect vulnerable property. However, this does not eliminate all concerns. For example, there may still be some environmental impacts, such as erosion.

The larger issue for hazard mitigation in anticipating disruption of community plans is one addressed in a report on integrating hazard mitigation throughout the planning process by the American Planning Association (APA) (Schwab 2010). It is not enough to isolate hazard mitigation planning in the local hazard mitigation plan developed for FEMA under the Disaster Mitigation Act and fail to incorporate that information into other plans or link it to such implementa-

tion tools as zoning and subdivision ordinances or capital improvements programs. Equally important, and related to the subject covered in the last section of this chapter, preplanning for disaster recovery, is the need to anticipate how mitigation can be effectively incorporated into the recovery planning process. This is especially important because hazard mitigation often requires investments that may demand precious resources, and some significant outside resources for hazard mitigation, most notably the federal Hazard Mitigation Grant Program, are available only after disasters. That fact puts a premium on preparation for the effective use of such resources when those circumstances arise.

Building Resilience Capacity

What organizations are most likely to respond constructively when faced with adversity? Natural disasters, terrorist attacks, and fiscal crises have increased curiosity about how some organizations recover even though they have been stressed to the breaking point. Janet Denhardt and Robert Denhardt refer to resilience as a more flexible and greater ability to adapt to future challenges. They and other researchers argue that it is the practice of everyday resilience in responding to myriad daily stresses that best equip organizations to handle catastrophic and unexpected challenges. Organizational resilience increases as managers build the capacity to adapt (Alliance for Innovation 2009).

The capacity to handle a disaster recovery challenge is greatly affected by the availability of routine operations that need only be shifted into a disaster mode. These are matters of degree. Not all jurisdictions perform all the functions described here, but they are common. Some of the standardization comes from federal program guidelines. A significant share originates in the management literature, particularly that of the ICMA. In addition, professional organizations such as APA, Transportation Research Board, American Society of Civil Engineers, International Economic Development Council, and National Community Development Association foster the adoption of best practices related to urban development, standards, and planning processes. In the daily operation of cities and counties, these program specialties are active in problem solving, project development, strategic planning, and collaboration of all local government services. While much of this is common knowledge, the broad scope needs to be explained for those others unfamiliar with planning institutions.

Following a disaster, the decision about how to set up a recovery planning process is left to local governments. The management choice is influenced by the capacity of local government to mesh this specialized need with routine planning processes that are familiar and well understood by the whole community and its leadership. A major objective of this report is to inform this choice by presenting a context for evaluation and illustrating examples of community experiences from prior disasters. Figure 2.1 shows that a modicum of time in the overall process devoted to organizing the planning effort and then planning for recovery is needed following the immediate response activities, even as the first steps toward implementing recovery begin to take hold. This investment of time should be anticipated as a perfectly natural element of the first phase of recovery, and not as one that delays real action.

The framework for complex evaluation of government planning alternatives is largely a partnership of planners and

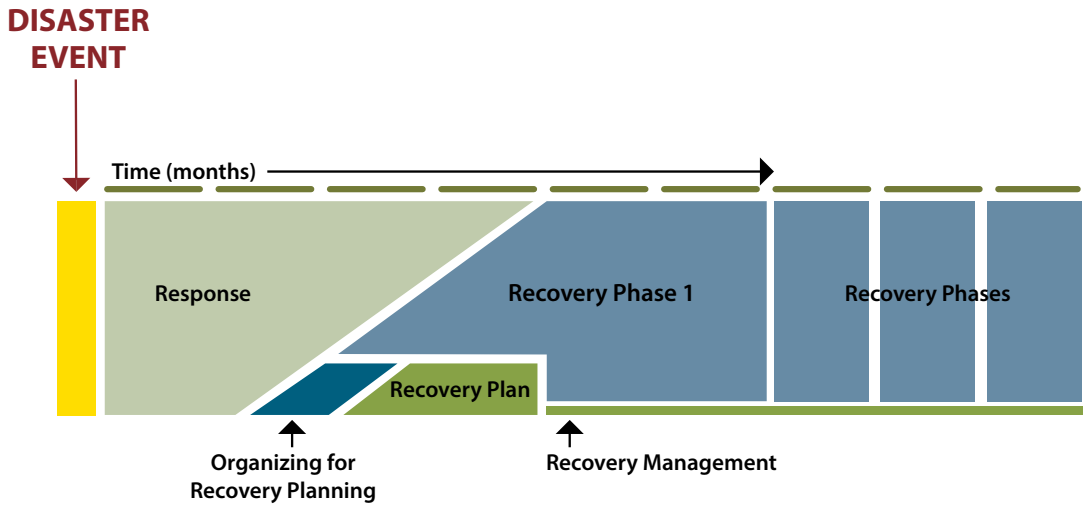

Figure 2.1. Organizing for recovery planning in advance of the plan (Barry Hokanson)

city managers (county managers for counties, or chief executives in other forms of government). Beginning in 1968, *The Practice of Local Government Planning* was a joint production of the ICMA and APA (or its predecessor, ASPO), up to its 4th edition in 2006, now replaced by *Local Planning: Contemporary Principles and Practice* (Hack et al. 2009). Underpinning this guide is the ICMA principle favoring professional management and the council-manager form of government, also advocated by the National Civic League since 1915. Altering these organizational designs to fit post-disaster recovery may be necessary, but the foundation has intrinsic value for most communities as compared to starting from scratch. The diagram in Figure 2.2 illustrates typical transportation and land-use planning processes in place for nearly every U.S. city and county. These structures embrace similar themes as suggested by government arrangements for planning economic development, housing programs, and others.

Certain management characteristics are also features of good planning and display the capacity to adapt to change, including:

- studying the organization's own strengths and weaknesses
- setting goals, objectives, and priorities
- budgeting for operations and capital investments
- building systems and programs that can be sustained

These characteristics result from collaboration between planners and risk management professionals and go much further than simply creating physical resilience in the face of flooding or coastal storm surge. They also help facilitate effective recovery from crisis. In major disasters, the scope of system failure can be substantial, affecting community assets, business enterprise, the local economy and residential properties. Organizing a recovery planning mission is affected by the degree to which leaders can respond competently to the challenge.

A strong parallel exists between the resilience of management capacity throughout the organization and general practices of community planning preceding a disaster. It is also important to coordinate efforts between sectors of the community. Much of this is also embodied in the adoption of such measures as continuity-of-operations plans. When an organization boosts its effectiveness in handling small everyday crises, it essentially adopts processes for inventorying conditions, analyzing causes and effects, considering alternatives, and taking steps toward planning problem avoidance. Well-managed organizations figure out how to institutionalize these practices through multidepartment collaborations. For cities and counties, these are clear building blocks of community planning. The result is not necessarily a community safe from hazards and unexpected events but one that has operating systems, staff, and leadership organized to know the value of the community's plans, policies, and strategies and to shift into a recovery planning mode after encountering a major crisis.

In the management literature, the idea of adaptability sometimes references the notion of "bricolage," generally meaning the capacity to work creatively with available tools and assets during a crisis. (The term, from a French word meaning "tinkering," has a rather broad variety of specific meanings in various disciplines.) Weick (2000) identifies the following requirements for successful bricolage in organizations:

- intimate knowledge of resources
- careful observation and listening
- trusting one's ideas
- self-correcting structures, with feedback

These concepts are generally similar to the idea of recasting a community's planning capacities to fit the urgent challenge of disaster recovery planning. In the field of transportation planning, where the suitability for disaster circumstances is an obvious and viable management alternative, it is important to realize that hazards planning is one more in a wider set of linkages that planners should expect to incorporate into the local or regional planning process, and not a completely unique set of demands. Figure 2.2 shows the typical planning process in place in nearly every U.S. city and county, incorporating some expectation of disaster damage and subsequent repair.

Recovery planning is a form of change management. It has parallels to non-disaster events that routinely affect cities, counties, and states. While some communities experience natural or human-made disasters very rarely, the experience of community disruption is not uncommon. Economic turmoil is an example, such as loss of a major employer or the decline of a whole industry. Even retail shifts can result in loss of tax base or serious declines in special revenues. Some downturns are catalysts for negative change, causes of ongoing decline. To varying degrees, each is a crisis, often forcing local governments and states to alter programs and plans. Similarly, each kind of crisis can lead not only to hardship but to new opportunities.

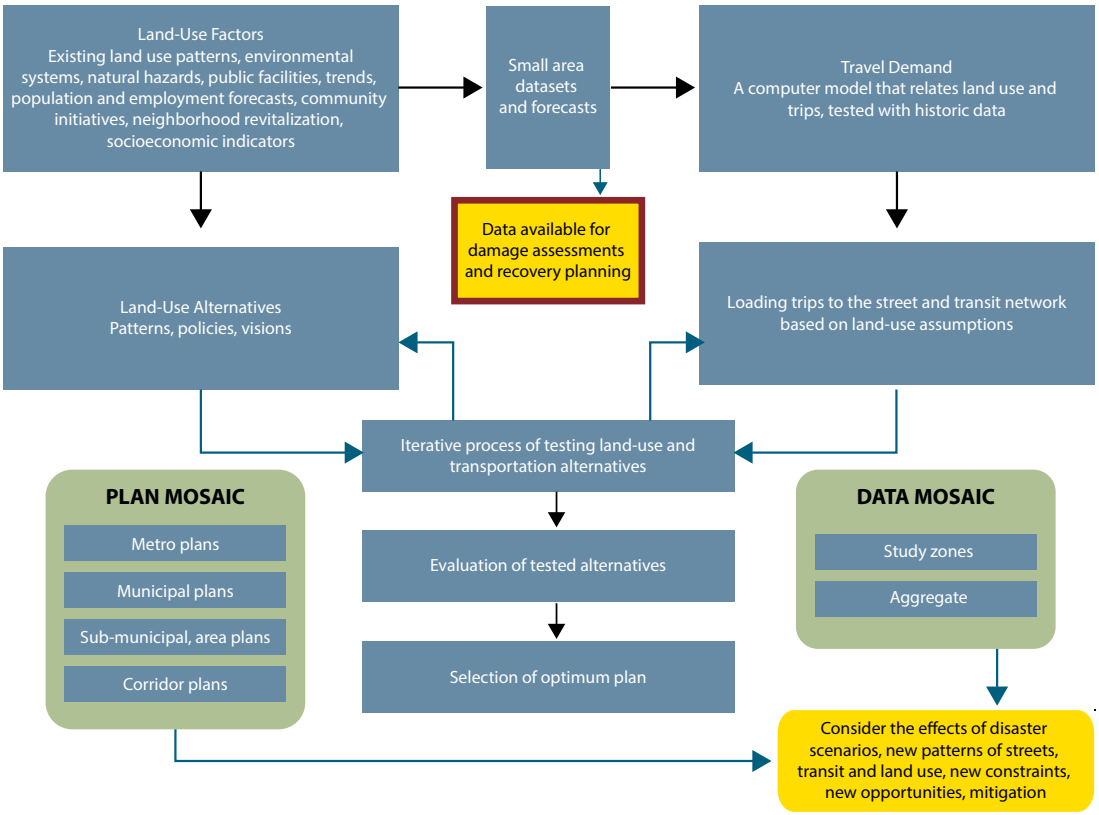

Figure 2.2. Transportation and land-use planning (Barry Hokanson)

THE PLANNER'S ROLE

As communities transition after a disaster from emergency response to short-term and then long-term recovery, planners should take on more significant roles in the process because, increasingly, the issues and processes are consistent with their roles under more normal circumstances—with the singular exception that these activities occur in a compressed time frame. These roles are discussed in much greater detail in Chapters 5 through 7, but it is important here to at least outline broadly why planners are so important to the process of planning for and implementing post-disaster recovery, and why they must prepare for this role. While the previous sections addressed the larger state and local systems within which recovery planning must operate, planners can bring unique skills sets to particular aspects of these operations, with an important bearing on prospects for successful recovery.

State-Prescribed Hazard Planning

In a minority of states, planners already have statutory responsibilities within the context of comprehensive planning to address hazards. Most of this pertains to hazard mitigation, not recovery, but it nonetheless serves the express purpose of involving planners in thinking about and identifying the hazards facing their communities, and presumably in developing strategies to address those threats as well. PAS Report 560, *Hazard Mitigation: Integrating Best Practices into Planning* (Schwab 2010), details the functions of many of these state-prescribed plan elements and discusses their relationship to the local hazard mitigation plans prepared for FEMA under the Disaster Mitigation Act. The example of California law illustrates how this type of mandate delineates a clear role for planners with regard to preparation for disasters.

California mandates the preparation of a safety element as part of a required general plan for all communities. It also prescribes a process for the general (comprehensive) plan, including a step titled "Alternatives Analysis," which includes the following steps:

- Work program
- Formulate goals
- Collect and analyze data
- Refine goals

GEOGRAPHIC INFORMATION SYSTEMS AND VISIONING: SOUTHERN CALIFORNIA SUSTAINABILITY SCENARIO TOOLS

Following a state mandate in 2008, new applications of visioning software have been blended with geographic information systems (GIS) to prepare and evaluate alternative development strategies. A chief criterion of this GIS-enhanced process is to find ways to reduce the emission of so-called greenhouse gases, the levels of which are related to both density of land uses and the resulting transportation effects. The process allows communities to compare choices and consequences, develop strategies to optimize outcomes, and plan for anticipated growth. Criteria include:

- Land Use: density and mix of uses
- Transportation: mode choice
- Housing: mix and affordability
- Fiscal Impact: local revenue and infrastructure
- Environment: open space and agricultural land consumption
- Sustainability: energy use, carbon footprint, water, and wastewater

In principle, all components of this planning system are convertible at the time of a disaster for the input of damage patterns and other community conditions to evaluate alternative rebuilding or transformative recovery strategies (including the system's original purpose) and to facilitate a more sustainable community influenced by the new disaster reality. The process is essentially a repeat of the original one, with the same basic steps to compare choices and consequences. The community's prior experience allows it to do the new round more quickly and more effectively. Previous practice guides leadership, citizen involvement, policy development, and technical expertise.

- Alternatives analysis
- Plan adoption
- Implementation

Related to the safety element, the alternatives would include degrees of mitigation, achieving relative levels of resilience and sustainability. In cases where a comprehensive plan addresses concepts of neighborhood revitalization or redevelopment, the range of scenarios or "futures" would show patterns of intervention and investment that have close parallels to disaster recovery strategies. Having been through those community deliberations, local governments become better prepared to handle recovery from a disaster or other unexpected event. As shown in Figure 2.3, intervention can include a mix of land assembly, subsidies, and redevelopment. For example, special means of targeted investment come about via tax policy such as a district of tax increment financing or business improvement district supported by special handling of property taxes, business license fees, or other methods. Such initiatives require identification of needs, remedies, and strategies suited to the conditions in the specified area. Notably, this is an escalation of public policy attention, beyond regulatory means such as zoning, subdivision regulations, or standards for public infrastructure. The concept is typically one of seeking betterment or reversing decline, improving the community's ability to function, and responding to the full dynamic of the community, not merely its physical form.

Other states with various mandates or prescriptions for hazard-related comprehensive plan elements include Florida,

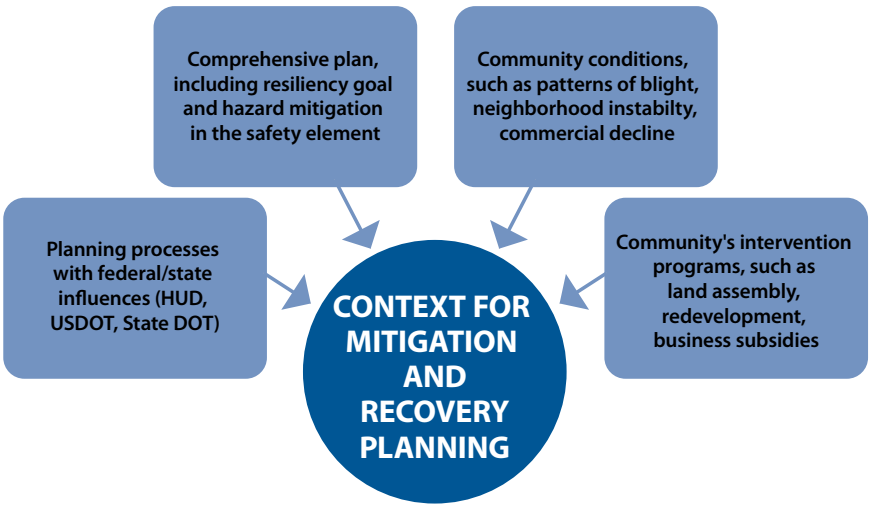

Figure 2.3. Context for recovery planning (Barry Hokanson)

North Carolina, Idaho, and most recently, Iowa, where the Smart Planning Act states that such elements shall be prepared with reference to the local hazard mitigation plan prepared for FEMA. There is some variety among these state provisions, but the common element is to place hazard mitigation, in some form, squarely within the comprehensive planning process, and thus ensuring both some degree of integration and some role for planners in addressing it.

Increasingly, communities, some states, and FEMA personnel involved in the National Disaster Recovery Framework, reviewed in Chapter 4, have discussed the value of predisaster planning for recovery as a local function. Such plans certainly implicate planning much more deeply in community disaster preparations but are not yet widespread outside Florida. The final section of this chapter discusses this trend in much greater detail.

Public Participation

Planners also have a key role in designing processes for citizen participation. Formal recognition of its importance emerged in the 1950s and 1960s, particularly with the transportation planning process in the postwar U.S. and the framework of the "3-C" planning process: continuing, coordinated, and cooperative.

Advocacy planning and "ladders" of participation followed, especially with the 1970 establishment of the Council for Environmental Quality and its emphasis on outreach and involvement as specified in the National Environmental Policy Act (NEPA). NEPA practices strongly emphasize steps for analysis of alternative actions, a method needed in disaster recovery planning because of choices that involve transforming basic features of the damaged community or reconfiguring the community to be more disaster-resistant and therefore more sustainable. Typically, there are many pathways of mitigation and complex cost and equity considerations, which require formal alternatives analyses and cost-benefit calculations.

Yet planners also know that involvement alone is insufficient to guide the political process, and meaningful participation is difficult to achieve. Commonly, very small percentages of the population get involved in local government decision making, except for periodic routine elections. Forms of representative group structures (such as nominal group technique) and methods of collective decision making have been mandated in many planning programs via state or federal initiatives. While some of the literature on recovery planning leans in the direction of group brainstorming as the kickoff, in reality, many communities engage in strategic thinking and management routinely around matters such as school reorganization, budget crises, and infrastructure collapse, which include citizen involvement and communication elements. A contemporary trend is toward electronic means and the use of social media.

Chapter 6 examines issues of public participation in recovery planning in much greater detail. It may suffice here to note that this is a rapidly evolving field in which the latest technological tools are being customized in some instances to assist with such processes as community visioning. "Geographic Information Systems Software for Hazard Planning" (p. 36) highlights the use of one such tool, CommunityViz, to share scenarios with the public in clarifying alternative solutions.

PLANS FOR RECOVERY AFTER DISASTER

So far this chapter has discussed the concept of community resilience, particularly within the structure of local government, and how that relates to planning functions, both generally and with regard to particular functions such as transportation, land use, and economic development. The question for the remainder of this chapter is how planning for recovery after disasters is actually manifested in plans. Within this chapter, the focus is on a typology of plans dealing with disaster recovery. The detailed practice entailed in creating successful plans will be addressed in considerable detail in Chapters 5 through 7.

As was the case in *Planning for Post-Disaster Recovery and Reconstruction* (Schwab et al. 1998), the PAS Report that has served for more than a decade and a half as the predecessor to this volume, the emphasis here is on a seemingly simple idea: a community that has considered its options for post-disaster recovery before disaster strikes is in a much better position to implement and expedite its recovery when that day comes. This idea is seemingly simple, however, because it seems to embody a great deal of common sense, but it is also a complex concept that requires considerable unpacking to grasp its most essential message. While a community can anticipate the possibility of disaster, can it reasonably anticipate the full dimensions and character of the event before it occurs? And if not, then what is the objective of any pre-event planning, and what can it hope to accomplish? Who should be involved in making these critical decisions, and what skills and talents would they ideally bring to the task?

The simple reality is that most communities traditionally have not considered this a central function of planning, and the community that takes this idea seriously remains the exception. Federal policy, however, is beginning to encourage such

GEOGRAPHIC INFORMATION SYSTEMS SOFTWARE FOR HAZARD PLANNING

Doug Walker and Amy Anderson

Geographic information systems (GIS)-based software tools to assist with hazard planning are increasingly available. FEMA's Hazus-MH (multi-hazard) is the most widely used. It combines a huge nationwide database of built assets with models for estimating the potential physical, economic, and social impacts of earthquakes, floods, and hurricanes. This means that planners can put a virtual price tag (or set of price tags) on the cost of actual or potential disasters.

Many planners are also familiar with Placeways' CommunityViz® (Walker and Daniels 2011), the multipurpose GIS software for all aspects of comprehensive planning. CommunityViz provides a flexible environment for creating and modeling what-if scenarios to help inform planning decisions using a process called geodesign. It is a natural fit for modeling "what if" a hypothetical future hazard event occurs, particularly in conjunction with other potential future events, such as new development in particular areas.

CommunityViz® has the capability to exchange data with Hazus-MH using simple wizards. Thus a community planner who has just used Hazus-MH to calculate the effects of, say, a 100-year flood can pull those results into CommunityViz® for further work. The exchange automatically creates a large set of user-friendly charts and map layers within CommunityViz®, and the data becomes available for additional CommunityViz®-driven analyses on topics not addressed by Hazus-MH.

For example, a planner may wish to use the Hazus-MH results as inputs, along with other locational factors, in a CommunityViz®-weighted suitability model that helps select locations for future development. Conversely, the planner may choose to export data out of CommunityViz® and into Hazus-MH to evaluate the hazard risks of a future growth scenario developed using tools like the CommunityViz® allocator or build-out tools.

Planner-oriented GIS software tools like Hazus-MH, CommunityViz®, and others, working separately or in conjunction, open up a broad array of possibilities for hazard analysis. Some examples include:

- Comparing future build-out scenarios under alternative hazard mitigation policies, such as with and without building restrictions in hazardous areas
- Performing broad-spectrum vulnerability analyses identifying details of at-risk populations, buildings, and infrastructure for both current conditions and future scenarios
- Visualizing post-disaster rebuilding concepts using 2-D maps or interactive 3-D scenes
- Educating the public about hazards and risk trade-offs using visual presentation tools and analyses
- Prioritizing hazard mitigation strategies—such as upgraded building codes versus restrictive land use—by comparing costs, effectiveness, and noneconomic impacts of various alternatives
- Rating community-wide or property-by-property vulnerability—now or in future scenarios—using scoring systems such as the National Fire Protection Association's Firewise checklist (NFPA 2014).

efforts, and state legislation prescribing it has been in place in Florida since 1993 (though guidance for implementing it was not developed until 2010). More recently, the state, under Governor Rick Scott, has removed the mandate that had applied to coastal jurisdictions. Nationwide, pre-event planning for post-disaster recovery has been the domain only of the most proactive communities, almost always with significant motivation stemming from recent disasters or near-misses.

Unlike mitigation planning, the federal encouragement is not statutory, but rather it is programmatic. Mitigation has gained significant status through the Disaster Mitigation Act of 2000, which amended the Stafford Act passed in 1988, to make FEMA approval and adoption of a state or local hazard mitigation plan a prerequisite for eligibility for a variety of mitigation grants. Most notable of these grants is the Hazard Mitigation Grant Program, which provides grants for mitigation projects based on a percentage of overall disaster aid in a presidentially declared disaster. No such incentive yet exists for any form of recovery planning, but it is finding endorsement within the National Preparedness Goal established under Presidential Policy Directive 8 (U.S. Department of Homeland Security 2011b). For instance, planning under the "Recovery Mission Area Capabilities and Preliminary Targets" includes the following: "Convene the core of an inclusive planning team (identified pre-disaster), which will oversee disaster recovery planning" (U.S.

Department of Homeland Security 2011a, 16). While that pertains to a recovery plan following disaster, it is significant that it notes parenthetically the need to have identified such a planning team beforehand. The National Disaster Recovery Framework (FEMA 2011b) has made clear since its release that pre-disaster planning is deemed a desirable development at the local level.

The slowly gathering momentum behind pre-disaster planning for post-disaster recovery is the result of some noteworthy advantages such planning affords, compared to allowing a disaster to spur the first motions toward considering recovery a function of local planning.

Building a Local Culture of Disaster Awareness

Such planning inevitably involves confronting the unpleasant realities all communities would like to avoid while considering the nasty contingencies that might follow from a disaster event. Pre-event planning for recovery provides the opportunity for communities to think about those contingencies and the kind of place they wish to rebuild if the need arises. Given a clean slate in even one part of a community, what might a community like to do differently, and how can it prepare to facilitate a desired outcome? Motivated by past disasters and spurred by local champions of improved disaster awareness, communities such as Roseville, California, and Charlotte-Mecklenburg County, North Carolina, have spawned heightened awarenesses of the need to foster resilience.

Providing a Focus for Pre-Disaster Exercises

Many communities already practice emergency response through exercises involving public safety officials such as police and firefighters. Pre-disaster planning can extend that preparedness to the recovery phase following disasters by including planners, city managers, public works officials, and others vital to successful recovery planning. The mere act of pre-identifying those who need to be involved in recovery planning at least expedites recovery by putting in place a team of officials responsible for overseeing the process once a disaster happens. Los Angeles discovered that a plan developed by Kenneth Topping, FAICP, its former planning director, for managing recovery, while not followed directly in the aftermath of the Northridge earthquake, at least provided a common frame of reference for officials from its use as a practice tool. Regularly scheduled exercises exploring potential recovery scenarios help to extend the learning curve for a real event.

Opportunity to Establish Clear Lines of Responsibility

The process of planning for recovery before an event can help to make clear lines of responsibility for local recovery management that make sense in the context of the local governmental structure. Furthermore, these can be codified, as suggested in the model recovery ordinance in Appendix A.

Opportunity to Consider and Review Financial Needs

Recovery costs money. Some of that money is likely to be available from federal sources, such as FEMA and the U.S. Department of Housing and Urban Development, and some from the state, but there is no guarantee that all these outside sources are going to make the community whole. Nor is there the guarantee that such external resources will always arrive in a timely fashion. Many funding sources involve audited reimbursement schemes that require some degree of financial sophistication and training. Therefore, a community should have given some thought to what needs are likely to arise and how they will be met, so that deficiencies in funding do not impede or slow the recovery.

Assessment of Overall Preparedness Stance

Finally, pre-disaster planning allows the community to take stock of its preparations in the broadest sense and to identify and shore up potential weaknesses that may be revealed in a disaster. One of the most troubling outcomes of a disaster for many mayors and city managers is the highlighting of glaring weaknesses in the community's preparations for any type of crisis, including a natural disaster. In the worst cases, the resulting embarrassment has cost public officials their jobs, either through dismissal or at the ballot box. It is almost a hallmark of modern public administration that preparedness is seen as the mark of an effective manager and a way of building and maintaining public confidence.

Typology of Recovery Plans

Fundamentally, recovery plans can be divided into two categories: (1) those prepared before a disaster and (2) those prepared after a disaster. This report will outline three types of plans, but the first (operational plans) will receive considerably less attention than the others because it is, in effect, a hybrid that incorporates elements of both emergency management and short-term recovery. It is an abbreviated form of a pre-disaster plan because, growing largely out of emergency response functions rather than focusing on long-term planning, it effectively limits its vision to short-term recovery

issues. Thus, this typology is based on the functions of the plans, with each function largely dictated by its timing and to a lesser extent by its focus. The three types of plans are (1) operational plans (limited pre-disaster), (2) policy plans (pre-disaster), and (3) recovery plans (post-disaster).

Operational Plans

Florida planning legislation (F.S. §163.3178) has made the post-disaster redevelopment plan (PDRP) an official designation within that state for an element of comprehensive plans that is intended to establish policies for governing recovery functions after disasters. However, a long gap occurred between the passage of the relevant statutory provision in 1993 and issuance of state guidance in 2010 on how such plans should be prepared and what they should include. The result was that those jurisdictions that attempted to comply with what effectively was an unenforced mandate had to rely on their own judgment as to what the plan should accomplish. Because local officials typically had turned to emergency managers for advice on disaster policy, the logical result was that many of the early PDRPs became, for the most part, extensions of existing emergency management plans by addressing needs of the community with regard to both response and the early stages of recovery. The emphasis, logically enough, was more on the operations involved in response and short-term restoration of utility services and infrastructure but not on long-term community reconstruction. While operational plans related to recovery certainly serve a useful purpose, it is important to recognize their limitations. They tend to lack the visionary components that certainly should be part of a plan for long-term reconstruction.

Policy Plans

Communities developing an approach to planning for post-disaster recovery must take into account certain stark realities. One is that it is impossible to know before disaster strikes what the dimensions, damages, and economic and social impacts of that disaster will be. Thus, it is nearly impossible to develop a meaningful plan focused on the physical reconstruction of the community until the disaster happens and the situation becomes clear. That leaves the important question of just what can be known and addressed in a pre-disaster plan. What has become clear from experience in those communities that have made this leap is that these plans can both establish a managerial structure for handling the recovery and lay out general policies regarding issues like hazard mitigation, adjustments in land-use policy and priorities, and policies and procedures for funding of recovery activities. In short, planners can focus on the policy issues that communities will face regardless of the specific pattern of destruction a disaster may cause.

More importantly, the pre-disaster plan can establish as an overriding policy the community's willingness to identify the silver lining in any disaster that occurs. Disasters need not be entirely negative events, even though no one wants to minimize the impact on survivors of the loss of loved ones or property. Disasters can be catalytic events that cause a serious reassessment of community goals and values and open opportunities to capitalize on new opportunities to achieve a greater good. The willingness of citizens and community leaders in Greensburg, Kansas, to establish green redevelopment as their mantra in the immediate wake of an EF-5 (Enhanced Fujita scale) tornado that devastated more than 90 percent of the town is a classic example of this type of civic thinking (see the Greenburg case study in Chapter 6). That magic cannot always be captured on the fly without planning. More often than not, a community discussion of such options launched well before disaster strikes may help, so that the need to rebuild is not an entirely novel idea when the community is facing it. The willingness to contemplate and examine an alternative future, and to implement it in the wake of such destruction, is a collective asset that can benefit from cultivation through civic leadership and visionary planning.

Pre-disaster plans prescribing policies for managing post-disaster recovery have a relatively short history. Most date no earlier than the 1990s, and they were rare even then. Hilton Head Island, South Carolina, developed a plan for mitigation and recovery in 1991 (Hilton Head Island 1993) largely in compliance with South Carolina's Beachfront Management Act, but also as a result of realizing how easily Hurricane Hugo in 1989 could have struck there rather than in nearby Charleston (Schwab et al. 1998). The town has maintained such a plan with periodic updates ever since, as does Beaufort County, of which it is a part (Beaufort County 2011). *Planning for Post-Disaster Recovery and Reconstruction* (Schwab et al. 1998) also notes other plans of the 1990s—from Lee County, Florida; Nags Head, North Carolina; Palm Beach, Florida; and Los Angeles—and compares their post-disaster recovery task force structures. These and relatively few other communities were the pioneers of pre-disaster recovery planning.

These earliest post-disaster recovery plans tended to focus on a somewhat narrower range of essential issues than is the case more recently. One key point that stands out consistently is the effort to establish some sort of task force or managerial structure for recovery management, creating

clear lines of responsibility and involvement before disaster occurs. Certain other areas of concern typically involved interaction between planners and emergency managers. Lee County, Florida, for example, engaged both groups in mutual exchanges around such issues as adapting public facilities for use as emergency shelters during the permitting process. Lee County also succeeded in creating a special taxing district in hazardous areas to support such facilities. Other plans dealt with priorities for utility restoration and the locating of sites for disaster debris disposal. Planning for emergency staffing for building permits was another concern that showed up in some plans, along with the identification of financial assistance sources and arrangements for damage assessments after a disaster. Finally, however, it is worth noting that post-disaster mitigation projects were a frequent concern. A prime example in this regard emerged in Nags Head, North Carolina, which sought very early to protect its tax base, much of which was found to be within 300 feet of the shore. Determining beforehand how to use disaster recovery resources effectively to protect those assets motivated much of the planning in Nags Head (Schwab et al. 1998).

Florida's legislation (F.S. §163.3178(2)(f)) that required post-disaster redevelopment plans led communities there in a more specific direction as a result of the law and subsequent rulemaking (Rule 9J-5.012(2)) by the Department of Community Affairs. (The legislative mandate, which applied to coastal jurisdictions, has since been removed.) Five counties and one city participated in the development of prototype plans as Florida developed its guidance for such planning, issued in 2010 (Florida 2010a, 2010b), which basically borrowed many typical comprehensive plan elements—such as economic development, housing, infrastructure, and land use—as the focal points for PDRPs, on the assumption that a PDRP must ultimately deal with many of the same issues.

Perhaps the best example of the challenges involved in both preparing to seize the unique opportunities posed by disasters and clarifying what issues the pre-disaster planning can address is the bold concept of priority redevelopment areas (PRAs) in the Hillsborough County, Florida, PDRP. While readers can find more detail on this plan in the case study in Chapter 3, it is worth outlining the essence of the idea here. The approach fundamentally seems simple: after a disaster, the county and its municipalities will attempt to steer redevelopment toward safer areas in order to make the area more resilient in the face of future disasters. The 2009 plan notes in its introduction that, while hurricanes pose the biggest threat, "the county has been fortunate to not have experienced a direct hit by a hurricane entering via the bay for over 50 years" (Hillsborough County 2010, 1-5). That statement is accompanied by a figure showing hurricane tracks within 65 miles over the preceding century that makes perfectly clear that such a hurricane is only a matter of time.

In its land-use section, the plan makes clear the logic of its approach: "Waiting until after a disaster to make land use decisions, including identifying priority areas for redevelopment, may not allow a community to take advantage of these opportunities" (Hillsborough County 2010, 7-1). Consequently, the choice was made to undertake a process of identifying PRAs in advance. With 12 percent of the unincorporated county and 27 percent of the city of Tampa within Category 1 to 3 storm surge zones, the task of finding appropriate land for redevelopment after a disaster is compelling. In addition, some of the remaining land is also susceptible to either wildfires or sinkholes, both common hazards in most of Florida. The plan lays out in detail the acreages and percentages of land subject to various hazards, including floods.

What is intriguing is the set of three land-use issues the plan identifies, starting with prioritizing areas for rebuilding. The plan defines a PRA as "a regional or community center or a critical installation essential for disaster recovery and consistent with future land use plans" (Hillsborough County 2010, A-1). It then confronts some common dilemmas in land-use planning. These include the need to distribute PRAs among the populated jurisdictions in order to facilitate efficient recovery, and the fact that some PRAs may still need to be in vulnerable areas because the cost of relocating certain facilities—such as Tampa International Airport, MacDill Air Force Base, or the port—is prohibitive. Thus, the plan distinguishes between "sustainable PRAs," which would logically be placed in less hazardous areas, and vulnerable ones dictated by existing land-use and economic development considerations but for which more stringent hazard mitigation procedures can be prescribed. The complexities become evident in assigning planners to make determinations about such priorities, even before knowing that the plan discusses transfer of development rights (TDR) as a means of shifting development from problematic locations to safer areas. Smaller jurisdictions with less capacity to manage a TDR program, for example, might find this approach daunting, although many could still apply some aspects of the underlying principles of the PRA approach.

Recovery Plans

The term "recovery plan" here refers to those developed specifically after disaster has occurred to deal directly with the known consequences of the disaster. The distinguishing fea-

ture of such plans is not only the timing of their preparation, but their orientation toward physical planning and urban design. Ideally, such a plan, necessitated by circumstance, could neatly complement the pre-disaster policy plan (or PDRP) with a focus on implementing established policies in the context of the actual disaster. To date, however, the overwhelming majority of post-disaster recovery plans have been created in the absence of such pre-planning. Even Cedar Rapids, Iowa, the focus of a case study in Chapter 3, prepared a stellar recovery plan on the basis of recovery goals established by the city council five days after the flood on June 13, 2008. The city also had the good fortune to benefit from a recent governmental reorganization that established clear lines of responsibility. But the city had not developed any plan for recovery before the flood struck, and there was certainly no precedent in its history for any disaster on that scale. Its leaders largely deserve credit for thinking and acting with remarkable calm and speed.

Several key points regarding the content of recovery plans have become clear in recent years through APA research on the subject:

- **Use of damage assessments:** Such plans need to assess and document conditions in the community (or region) resulting from the disaster and use this analysis as a way to detail the most likely recovery needs it will face. This is basically making effective use of the damage assessments that should begin to occur immediately, in order to inform decision makers of the scope of the rebuilding challenges that lie ahead with regard to the restoration of infrastructure, housing, and business activity.
- **Knowing that damages can vastly exceed forecasts:** Planners and the appropriate allied experts must contemplate the lessons from the disaster, particularly when the event involves an unexpected scale or newly revealed sources of hazards. In terms of scale, for instance, Cedar Rapids learned in rather traumatic fashion that a river whose previous high-water level had registered 20 feet was capable of rising above 31 feet. Japan in 2011 learned that its communities in northern Honshu could suffer a more intense earthquake and resulting tsunami than experts had anticipated. Likewise, unanticipated infrastructure failure, as in the case of the levee breaches in New Orleans, may teach us a great deal about what needs to be done in the future to strengthen such defenses. In addition, Louisiana and the nation also learned a great deal about the need to restore coastal wetlands as part of the defenses already provided by nature but diminished by human development.
- **Harnessing the chance to change development patterns:** The PRA strategy for increasing resilience in Hillsborough County suggests strongly that one function of the recovery plan in a post-disaster setting is to identify potential new opportunities for land-use changes as a result of the damage patterns created by the disaster. This entails identifying specifically where the community can move forward with buyouts to create open space in hazardous areas, where it may be able to implement land readjustment for policy goals, and where other opportunities for improving resilience against future events exist.
- **Opening new forms of economic development potential:** Finally, the recovery plan must train a keen eye on new opportunities for economic development during the recovery process. Clearly, Greensburg, Kansas, established an entirely new vision of its economic existence, converting itself into a town entirely dependent on renewable sources of energy and acquiring an international reputation for green post-disaster redevelopment.

CONCLUSION

This chapter has focused on the mechanisms in local government that either are used or can be used to advance recovery planning goals, and it has concluded by outlining a typology of plans to establish and implement those goals. Chapter 3 will take the next logical step by focusing on the components of disaster management, looking at the methods for predicting disaster impacts, and discussing how the scale and impact of disasters will affect the scope of recovery management and planning. It concludes with a look at how institutions ultimately learn from disasters and improve their recovery planning and management as a result.

CHAPTER 3

DISASTER RECOVERY PLANNING: EXPECTATIONS VERSUS REALITY

Disasters can provide valuable planning lessons for planners, public officials, and citizens alike. With the increase in numbers and intensities of disasters, post-disaster community recovery will more likely become part of planners' experiences during their professional careers. Learning from the post-disaster experiences of others may ease somewhat the stress of learning recovery directly on the job. Yet every significant disaster recovery experience entails its own unique challenges and lessons. It is almost inevitable that there will be differences between what a community can anticipate before a disaster and the realities that emerge from the actual circumstances. The purpose of this chapter is to review the ground rules of disaster management, examine the role of preparedness and planning, discuss why the scale of the disaster matters, and determine how planning and other institutions can learn from disasters.

COMPONENTS OF DISASTER MANAGEMENT

Evolution of U.S. disaster laws and systems has progressed unevenly over the past half century. Although federal and state disaster laws have been evolving incrementally, both tend to reflect broad components of disaster management. These include hazard mitigation, preparedness, response, and recovery. Definitions of these components vary considerably depending on guidance sources and user applications. For example, variable meanings are presented in recent federal publications such as the National Disaster Recovery Framework (NDRF) (FEMA 2011) and Presidential Policy Directive 8 (PPD-8) (U.S. Department of Homeland Security 2011b). In general practice, however, these terms tend to have the following common meanings.

Mitigation

The hazard mitigation phase is commonly defined by the Federal Emergency Management Agency (FEMA) as "any sustained action taken to reduce or eliminate long-term risk to human life and property from hazards" (44 CFR Part 201.2—Definitions). *Hazard Mitigation: Integrating Best Practices into Planning*, PAS Report 560 (Schwab 2010, 16, emphasis added) clarifies this definition by describing the nature of "sustained action" as "a loss prevention function characterized by *planned, long-term alteration of the built environment* to ensure resilience against natural and human-caused hazards." Commonly deployed mitigation practices include applying modern building codes to new construction in earthquake- and hurricane-prone regions, elevating structures in flood hazard zones, relocating households from landslide hazard zones, and minimizing residential development in wildland-urban interface areas.

Preparedness

The term preparedness generally is used in practice in its traditional, narrower sense to represent short-term actions taken before a disaster to minimize potential impacts of hazards, risk, or vulnerability not previously reduced through mitigation. Preparedness typically refers to preparations related to what to do during a disaster, what food and supplies to have on hand, how to evacuate, where to go, who to contact, and where to seek emergency shelter. Familiar preparedness examples include boarding up houses in advance of hurricanes, pre-earthquake "drop-cover-hold" exercises, distribution of sandbags to control minor flooding, planning of evacuation routes, the identification of shelters, and storage of emergency food and equipment supplies.

Response

The response component includes actions taken to respond to the actual disaster once it has occurred, such as rescuing survivors, conducting mass evacuations, feeding and sheltering victims, providing emergency medical care, and restoring communications. Emergency response activities are conducted routinely by local governments on a daily basis for emergencies that draw only upon locally available resources. A substantial share of local government budgets are dedicat-

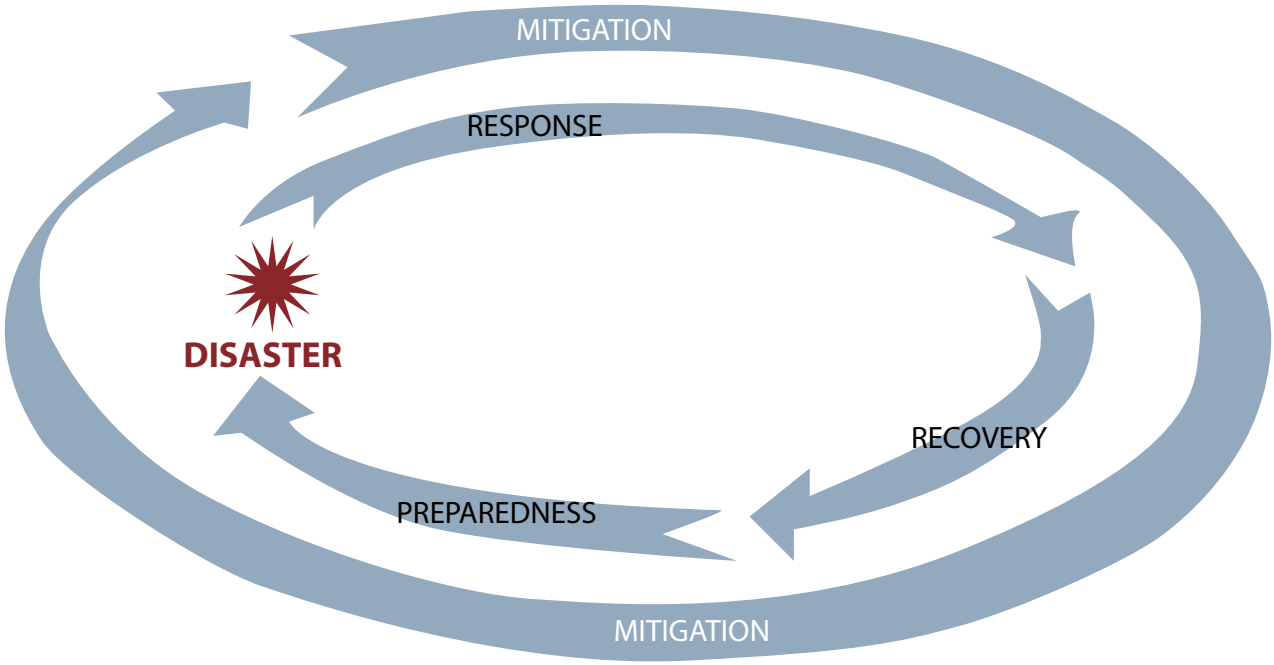

Figure 3.1. Phases of emergency management and the disaster life cycle (Schwab et al. 1998)

ed to supporting day-to-day emergency response activities, such as fire suppression and ambulance calls. These emergency response needs are amplified in a disaster and will prompt local governments to call upon other entities for assistance, support, and resources.

Recovery

This component includes restoring housing, transportation, and public services; restarting economic activity; and fostering long-term community redevelopment and improvements. Recovery is the least-understood disaster management phase, and it involves a complex management process that includes not only relief and short-term restoration of facilities and services but also intermediate recovery and long-term redevelopment phases. Recovery requires sustained commitment over time to rebuilding goals and objectives often formed or articulated after a disaster has happened. On the other hand, effective recovery may be enhanced by pre-event planning that identifies linkages between all four disaster management components.

Other Preparedness Definitions

It is important to note here that a more inclusive meaning of preparedness is offered in the Presidential Preparedness Directive 8 (PPD-8) released in 2011. PPD-8 was an effort to holistically integrate prior and ongoing emergency management laws and directives related to the national goal of strengthening the security and resilience of the U.S. with particular attention to homeland security. It defined "preparedness" as including five mission areas: prevention, protection, mitigation, response, and recovery (later included in the National Mitigation Framework published in 2013) (U.S. Department of Homeland Security 2013). For additional discussion of PPD-8, see Chapter 4, which summarizes disaster management laws and administrative systems related to major actions by Congress and various administrations.

Relationships between Components

Often depicted as phases in a disaster life cycle, all four components are distinguishable yet interconnected (Figure 3.1). Mitigation can help reduce preparedness, response, and recovery requirements. The stages tend to be somewhat sequential, but they may also overlap. For example, recovery can begin during the emergency response phase, and mitigation can happen at any time.

As noted in connection with PPD-8, mitigation can be seen as part of preparedness. However, in practice there is a basic distinction between mitigation and preparedness.

Mitigation permanently alters physical conditions of risk, hazards, and vulnerability, thereby lessening the potential severity of future disaster impacts that can threaten life and property. Preparedness, on the other hand, is more temporary and provisional, focused on short-term measures to minimize the effects of existing risk, hazard, or vulnerability in the absence of mitigation actions. Since preparedness does not fundamentally alter existing conditions, it is not a substitute for mitigation. In emergency management parlance, "what you can't mitigate, you prepare for."

Mitigation and Recovery Planning

For best outcomes, mitigation and recovery should be integrated through effective planning as they reinforce each other. If possible, they should both also happen before and after a disaster. However, that is not always likely or possible. Despite the presence of newer and more disaster-resilient structures, many communities have a preponderance of older, more vulnerable ones. Residual risks posed by natural hazards thus are inherent in the built environment of communities.

Due to the structure of the Stafford Act and other federal disaster laws, funding for mitigating risks associated with older structures is often not available until after a disaster happens. Thus communities may feel it is necessary to wait for a disaster to happen to gain access to federal hazard mitigation grant funding. By that time, however, losses incurred from the disaster may outweigh the longer-term benefits to be gained by the inflow of post-disaster mitigation grant funding. From a long-term perspective, effective mitigation, preparedness, response, and recovery actions can be advanced over time through pre-event planning that acknowledges critical linkages between all four components. Various case studies of pre-event planning illustrate this point, including the post-disaster redevelopment plan completed in 2010 by Hillsborough County, Florida.

HOW PRE-EVENT PLANNING CAN MATTER: SOME CASE EXAMPLES

Hillsborough County, Florida, has not experienced a major hurricane in more than 50 years. However, its post-disaster redevelopment plan is remarkably blunt about the fact that this represents dumb luck more than it does a reasonable expectation for the future. In its introduction, it states that "the County has been fortunate to not have experienced a direct hit by a hurricane entering via the bay for over 50 years. However, as more development takes place, the potential for hurricane-related deaths and damages increases" (Hillsborough County 2010, 1-5).

Immediately following that statement, to underscore the point, the plan includes a map from the NOAA Coastal Services Center. Hillsborough County, which includes Tampa and St. Petersburg, sits astride the bay in the middle of that map with lines representing hurricane tracks from 1909 to 2008 that were within 65 miles of the county. By the end of 2013, the county was still lucky, but county officials seem well aware that someday that luck will run out. The point of the plan is to start planning now for the issues that will inevitably arise when that day comes.

The case study of Hillsborough County in Chapter 5 discusses the value of the plan document itself, but the plan describes its interaction with other plans in the community: "Each of these plans, and possibly others, has pre-existing policies and procedures that affect post-disaster redevelopment. For instance, the comprehensive plan has many policies that determine where and to what extent redevelopment can occur" (Hillsborough County 2010, 1-4). It goes on to state that the post-disaster redevelopment plan (PDRP) serves in part to identify overlaps among plans by analyzing them in terms of relevant post-disaster topics.

The underlying idea is to give planners the advantage of a premeditated understanding of how both short- and long-term decisions made after a disaster will affect ongoing development priorities. All too often, this is gained largely after the fact. The plan anticipates that most redevelopment will take place over a three- to five-year period following a major hurricane or other disaster, and attempts to establish a framework (see "The Hillsborough County, Florida, Post-Disaster Redevelopment Plan," p. 46) for integrating this understanding into the redevelopment process.

A Florida-style plan developed before a disaster is not the only way to ascertain the benefits of preparation and planning for post-disaster reconstruction. Such preparation, even without such a full-scale plan, has affected outcomes in other communities that have suffered serious disasters.

For instance, years of preparation and practice of drills in Linn County, Iowa, related to the Duane Arnold Nuclear Energy Center in nearby Palo, served to make both county and city officials more aware of and better prepared for the types of emergency decisions they needed to make when the Cedar River reached record flood levels in June 2008. While most of those benefits clearly relate to the immediate post-disaster response period, they affect the framework of decision making that is part of the much longer process of managing reconstruction. (See "Cedar Rapids, Iowa," p. 48.)

THE HILLSBOROUGH COUNTY, FLORIDA, POST-DISASTER REDEVELOPMENT PLAN

The *Hillsborough County Post-Disaster Redevelopment Plan* includes an implementation conceptual framework to help with the transition between short-term emergency activities and long-term redevelopment strategies. The framework includes the following guidelines:

1. *Nurture an ongoing Post-Disaster Redevelopment Stakeholder Structure that interfaces with the Local Mitigation Strategy (LMS) Working Group during pre-disaster implementation and with the Redevelopment Task Force established in Ordinance 93-20 during post-disaster implementation.*
2. *Provide criteria for considering long-term impacts of disaster response and short-term recovery decisions.*
3. *Set up processes for transitioning from the Emergency Support Function operational structure to long-term redevelopment processes that are sustainable over a 3- to 5-year period of implementation.*
4. *Develop inclusive lists of organizations and resources that may be available to assist in pre- and post-disaster plan implementation.*
5. *Integrate long-range policy initiatives from local plans.*
6. *Capitalize on disaster mitigation and public assistance funds to improve disaster resiliency through pre-disaster research, training, and project planning.*
7. *Incrementally prepare the community for a more rapid and higher quality disaster recovery through implementation of priority pre-disaster actions each year.*
8. *Revisit the assumptions and actions of the PDRP [post-disaster recovery plan] every 5 years to adjust for changes in the community and to continually improve the plan.* (Hillsborough County 2010, 1-3)

Preparedness Value

A more pertinent example of the benefits of preplanning emerges from the case study of the city of Los Angeles (see "Building Capacity through Pre-Event Planning in Los Angeles," p. 54). As opposed to the luck of multiple near-misses in Hillsborough County, Los Angeles provided an unforeseen lesson in the value of pre-event planning when the Northridge earthquake struck in February 1994, not long after the completion of a pre-event plan.

Los Angeles provides an early example of a very thorough pre-disaster plan for post-disaster recovery. The effort grew out of the 1971 San Fernando Valley earthquake experience but took root starting in 1988, with a study called *Pre-Earthquake Planning for Post-Earthquake Recovery* (Spangle 1986). The Los Angeles plan was still awaiting adoption by the city council when the ground began to shake. Its utility for city staff was not only just during the reconstruction process but, almost as important, in its preparation and the exercise drills that trained staff for the recovery tasks required following the earthquake. Telling insight on the training value of pre-event planning is buried within the plan in Policy Statement No. F.2—Disaster Related Stress, which states the following: "It is the city's policy to recognize that one of the most serious impacts of any disaster is the psychological trauma which the disaster creates for public service and volunteer personnel who must respond to it. The city's plans to prepare for, respond to, and recover from disasters shall include provisions to deal with disaster-related stress" (Los Angeles 1994, 64).

There are two aspects to this policy that are important in the context of planning for post-disaster recovery. One is the toll that burnout and exposure to massive damage and chaos can have on the staff of local governments as they help to sort out the impact of the disaster. The other is the likelihood that some staff will have suffered direct personal loss—of their own homes and property or, even more seriously, from the death or injury of family members. Both types of loss will involve grief to degrees that may vary greatly from individual to individual.

More important is the insight that follows (Policy Statement No. F.3—Stress Management): "It is the city's policy that stress management should not be limited to intervention by mental health professionals after a disaster. Disaster-related stress can be alleviated to a significant degree by the pre-incident preparations which are made to cope with a disaster's occurrence. Because city employees represent a critical resource in disaster response and recovery, priority should be given to programs which will help mitigate their post-traumatic stress" (Los Angeles 1994, 65).

The city was recognizing explicitly that pre-disaster training matters for those who must manage recovery, not only in terms of better understanding the recovery process but also in mitigating stress and thus improving the planning outcome by making those employees more productive and confident in their post-disaster roles. It is worth noting two specific types of situations in which such preparation can go a long way toward easing certain other sources of post-disaster tensions ahead of time: resolving disputes and clarifying lines of responsibility.

Dispute Resolution

Schwab, et al. (1998) noted that demolitions, particularly of badly damaged historic buildings, can cause conflict when the rules guiding such determinations are less than clear or simply inadequate. Disputes that can be resolved over time under ordinary circumstances can assume great urgency when post-disaster devastation creates serious dangers to public health and safety. Issues surrounding moratoria following disasters—designed to give planning staff adequate time to assess conditions that must be addressed during redevelopment—can be equally contentious. The point of the two sections in the model pre-event recovery ordinance in Appendix A is to provide an opportunity, to the extent possible, to resolve these issues under non-crisis conditions so that the criteria for such decision making are already understood in the post-disaster framework.

Lines of Responsibility

In far too many states and communities, much valuable time is wasted after a disaster determining who will take charge of the reconstruction agenda and how lines of responsibility for implementing that agenda will be organized. For example, Hurricane Katrina struck the Gulf Coast on August 29, 2005. Governor Kathleen Blanco appointed the Louisiana Recovery Authority more than seven weeks later on October 18. That may be an extreme case, but in most disasters room for improvement still exists. The model ordinance provides a mechanism whereby a community can establish these lines of responsibility beforehand, and a simple order from the mayor or city manager can activate them. Moreover, with the advent of the NDRF, federal policy now envisions a local disaster recovery coordinator acting on behalf of local government within that intergovernmental framework and interacting with recovery coordinators at the state and federal levels (FEMA 2011).

THE NEW DYNAMICS OF ORGANIZATIONAL RELATIONSHIPS

Another salient feature of the 1994 Los Angeles pre-event recovery plan was its emphasis on coordination and integration among city departments involved in recovery. APA has previously introduced the theme of the integration of hazard mitigation priorities throughout the planning process as a means of ensuring effective implementation (Schwab 2010). That theme has subsequently been echoed in a series of FEMA guidance documents on mitigation planning (FEMA 2013). Planners can be effective facilitators and orchestrators of change, but they must also engage with engineers, emergency managers, finance officers, and many others whose cooperation is essential in moving projects forward.

The same is true of recovery, with two additional factors that must be considered. First, mitigation is likely to be a high priority in many recovery situations, particularly for those hazards that are more conducive to effective mitigation, such as floods, hurricanes, earthquakes, and wildfires. Second, the time frame for action is more compressed as compared to normal planning activity. This second factor makes a community's relationships with state and federal agencies, as well as other outside entities, more fundamentally critical.

An excellent example was the ability of Cedar Rapids, Iowa, following the 2008 floods to help fund and accelerate a feasibility study by the U.S. Army Corps of Engineers (USACE) (2010) for a flood risk management project on the Cedar River by 2010—years ahead of when it would normally have been undertaken had the city relied solely on USACE funding (Schultz 2010). This was not a rarity for Cedar Rapids, particularly with regard to relationships with business and civic organizations that gained a real voice in recovery operations through the city-coordinated Recovery and Reinvestment Coordinating Team (Prosser 2011).

The central point is that productive, ongoing relationships within the community and between local, tribal, state, and federal agencies are the oil that keeps the engine of recovery running more smoothly. The ongoing nature of those relationships does not mean they are easy. However, regular gatherings to address community recovery challenges establish an expectation of results. Precisely which relationships are most critical depends on the most pressing post-disaster recovery needs. Given the increasing complexity of natural disasters, including complications introduced by climate change, the value of such relationships, not only for funding but for expediting recovery, will only increase in coming years.

CEDAR RAPIDS, IOWA

James C. Schwab, AICP

Many of the details and statistics of the flood that overtook Cedar Rapids, Iowa, in June 2008 are by now familiar to the community of hazards professionals. The Cedar River had never previously risen higher than 20 feet. On June 13, it crested at more than 31 feet, inundating 10 square miles, or 14 percent of the city. Of the city's 125,000 residents, 18,623 people were forced to evacuate from 5,390 residences and1,133 industrial and commercial properties. The flood overtook most of the city's main service buildings, including its city hall, and forced massive relocation of city staff. At five feet above the 500-year flood level, it was definitely one for the record books.

In many communities, this would have been a prescription for chaos. For many people at the time, that surely seemed to be the case. Yet the city's recovery process has won national accolades, including an APA National Planning Excellence Award in 2011 for Best Practices in Hazard Mitigation and Disaster Recovery. Unlike many cities following a major disaster, Cedar Rapids actually gained population (4 percent) in the five years following the flood. The back story of how the city turned chaos into success is one that connects the structure of governance to the quality of planning in a crisis. That connection is also a lesson in resilience.

Dissatisfaction with the structure and performance of city government had led the voters in June 2005 to support changes in city governance that shifted to a city manager and council with an elected mayor. "People wanted transparent government," says Christine Butterfield, who served as director of community development until May 2013, "and people wanted to see visible improvements." That desire, however, produced an impatience with planning, and Butterfield credits city manager Jim Prosser with fearlessness and courage in imposing some structure on the system. People realized later, she says, that this allowed the city to make primary policy decisions that enabled Cedar Rapids both to qualify for vital grants and to perform problem solving. In many cases during the recovery planning process, that focus allowed the city to press federal officials not with a single desired solution to a problem but rather with several possible solutions that opened dialogue about the best approach (Butterfield 2012).

The change in city government structure led to a visioning process and the production of the comprehensive *Vision Cedar Rapids* plan (Cedar Rapids 2007). The city council had begun "deployment" of this vision just six months before the flood. This vision statement engaged the public and municipal employees in a conversation about sustainability values for the city's future. Elected officials became leaders in the transition to a values-driven local government. What was not clear at the time was that this vision would provide a useful tool for assessing the utility of a variety of ideas put forth to advance flood recovery (Prosser 2011).

If the proof of a city's resilience is the ability to respond to crisis quickly but thoughtfully, Cedar Rapids was resilient. For starters, the city council exercised its prerogative of leadership by adopting a set of recovery goals within five days after the flood. These goals empowered city staff to develop a flood management strategy because it was clear what city leaders wanted to achieve. Few things are more disconcerting after a disaster than a welter of disparate voices and a lack of clear direction.

As part of this rapid movement toward plan development and implementation, the city brought together leaders from multiple sectors and organizations, both business and civic, who formed the Recovery and Reinvestment Coordinating Team. According to Prosser (2011), this group began its operations within a week of the flood. It played a major role in keeping stakeholders informed about the allocation of limited resources and helping reduce conflict over such decisions. It also addressed issues of business recovery, interim housing, and service delivery, among other efforts. One of the city's more remarkable achievements in this regard was finding ways to use Community Development Block Grant (CDBG) funds, with the state's support, to support small business recovery. Butterfield (2012) notes that both the city and state were concerned initially that the CDBG program does not typically work well for business assistance (Butterfield 2012).

Two other challenges may have gone much further in demonstrating the value of the city's approach to decision making. Both involved replanning the Cedar River waterfront to create a more flood-resilient community and establish effective hazard mitigation strategies.

The first involved Sasaki Associates, an urban design firm based in Watertown, Massachusetts. The city had contracted earlier in 2008 with Sasaki for a new riverfront master plan. The city council was, in fact, interviewing firm members on the very day that the city chose to evacuate the city hall building—which before the flood sat on May's Island, a strip of land that sits in the middle of the Cedar River but had not previously experienced serious flood issues because of its elevation. (The city

no longer uses May's Island, and city hall, which for nearly four years was relocated to a northwest side neighborhood, has been relocated to a downtown building on First Street.) The city brought Sasaki representatives back on June 17, four days later, during which the community development department discussed with the city council the new priorities for recovery planning:

- Protecting the city from the risk of future flooding
- Restoring housing
- Restoring businesses and public facilities

The city made clear it needed a new contract with Sasaki focused on these new priorities and the new reality of the need for flood recovery. It also asked Sasaki to take on Stanley Engineering as subcontractors for hydrological studies. Sasaki had a new assignment, and principal Jason Hellendrung ultimately spent 191 days in the city becoming, Butterfield says, "like an extension of [the city's] own staff." Soon, the community development department was engaged in a series of eight community meetings that attracted more than 2,600 participants to discuss the outlines of what became a series of neighborhood plans for the affected areas, all completed by the following spring.

Butterfield credits Sasaki with "taking direction from the city." She praised Hellendrung and team member Gina Ford with being "great listeners" who could also bring additional expert resources to bear on problems when they were needed. The end result was both an early framework plan (Cedar Rapids 2008) and the later combination of neighborhood plans (Cedar Rapids 2009). Citizen input defined the elements and details of each plan. In addition, the plans provided a sustainable hazard mitigation strategy and 10 neighborhood plans within less than a year following the disaster.

The second and closely related riverfront planning challenge involved the city's relationship with the U.S. Army Corps of Engineers (USACE), which needed to complete a feasibility study for Cedar River improvements before federal investments in flood mitigation could move forward. The city took the unprecedented step of offering its own money to expedite the study, which required a federal waiver, rather than wait for the usual federal allocations to authorize USACE studies. The result was that a process that can often take years—and was projected to take seven years in this case—was complete by the fall of 2011, followed shortly thereafter by congressional approval, which greatly accelerated forward movement on the implementation of the city's flood recovery plan. Chris Haring, with USACE in the Rock Island, Illinois, district, has said he is unaware of another case where the city took the lead in this manner (Schultz 2010). All of this was assisted by the voters, who approved in the fall of 2008 a one percent local option sales tax that was expected to generate $78 million over five years to support flood recovery efforts.

Finally, the city directly confronted another problem that has haunted numerous other communities in the past: the quality of repairs to damaged homes and buildings, and the potential for scam artists to defraud vulnerable homeowners who had already suffered in other ways. Butterfield's department drafted, and the city council approved, contractor certification and licensing requirements that had the unexpected benefit of identifying and, in some cases, leading to the arrest of a number of contractors with questionable or false credentials. That approach has been incorporated into the new model pre-event recovery ordinance in Appendix A.

While the complete story of flood recovery in Cedar Rapids is considerably more complex, there are three recovery lessons that seem to stand out with regard to resilient municipal governance:

1. *Communities should take charge of their own recovery.* Christine Butterfield makes this a central point in her presentations. Local governments cannot afford to wait for the state or federal government to tell them how to recover. They need to establish and communicate their own priorities.
2. *Communities should build relationships before a disaster.* Those relationships that pre-exist the disaster will pay big dividends in having also built trust between partners, and that will provide a valuable asset under the pressure of recovery planning and implementation.
3. *Communities should use their vision as a measuring stick.* This is a point Prosser (2011) makes that bears further consideration in light of the discussion in Chapter 5 on the metrics of recovery. How is success measured? There may not be a universal answer. The answer may be rooted in the goals and vision a community establishes for itself, and how well it advances them during recovery.

WHERE ANTICIPATION AND REALITY PART COMPANY

It is important to keep in mind that pre-disaster preparations are unlikely ever to become a panacea for post-disaster recovery planning or implementation. The question is more one of facilitating a smoother path than of eliminating all obstacles. For this, having a pre-event recovery framework in place is critical.

There are fundamentally two ways of trying to anticipate the issues a community is likely to face in recovering from a major disaster. One is to focus on the probabilities of events of various types and magnitudes and to concentrate on the most likely scenarios. The other is to focus on the worst possible case, or worst-case scenario, and try to imagine what precautions would be necessary to minimize its impact. Neither is perfect, and each has its limitations.

The first method is known as probabilistic risk assessment (PRA), which has its roots in evaluating risks associated with complex engineered technology. Guidelines for PRA exist in federal agencies such as NASA (Stamelatos 2000) and the U.S. Environmental Protection Agency (2014). As designed for those purposes, PRA generally is understood to answer three basic questions (Stamelatos 2000):

1. What can go wrong with the studied technological entity, or what are the *initiators or initiating events* (undesirable starting events) that lead to adverse consequence(s)?
2. What and how severe are the potential detriments, or the adverse *consequences* that the technological entity may be eventually subjected to as a result of the occurrence of the initiator?
3. How likely to occur are these undesirable consequences, or what are their *probabilities* or *frequencies*?

PRA necessarily has a numerical focus that is basically the product of the magnitude, or severity, of the event and its likelihood. The complications arise in the various decision trees that are followed in order to reach a particular outcome. More popular parlance for this sort of analysis might be "one thing leads to another," a rather simplistic summation of how most technological accidents lead to undesired or even catastrophic outcomes (e.g., the Bhopal disaster in India in 1984). As the nuclear plant crisis in Japan in 2011 indicates, the initiating event can also be a natural hazard rather than human error or mechanical or electronic failure.

It is not hard to imagine how some variation on this methodology could be applied to natural hazards, given enough historical data on actual occurrences. FEMA, for example, has produced guidance on the use of its Hazus-MH software for risk assessment (FEMA 2004) (see "Geographic Information Systems Software for Hazard Planning," p. 36). However, there are two challenges involved. One is a perfectly natural and logical tendency to focus resources for response, mitigation, and even recovery scenarios on the basis of higher probabilities at the expense of low-probability events with high consequences. Disasters that occur on a more frequent basis are likely to attract more attention while those with more remote probabilities, also known as having long return times, are more likely to be ignored or at least sit on the back shelf with regard to the allocation of resources. An example would be a volcano that is likely to erupt maybe once in a millennium. The other is that reliance on historical information to establish probabilities does not account for (or at least not adequately) the disruptive impact of climate change on both the potential severity of events and potential changes in those probabilities at any level of severity. Add in the additional complications associated with the interactions between technology and natural events, as with the failure of levee systems during Hurricane Katrina, and the consequences of miscalculation become enormous. Probabilistic analysis of risk is at the core of cost-benefit analysis because economics tends to demand such statistically based information.

The biggest challenge surfacing in many of the largest disaster planning scenarios is the inability to fully anticipate and adequately prepare for the worst case that could occur. One problem is that the worst case imaginable is often beyond the ability of any government or its citizens to comprehend and a tendency exists to shy away from focusing too much, if at all, on low-probability, high-consequence events; Cedar Rapids is a good example. The previous record depth of the Cedar River was only 20 feet; in June 2008, it reached 31.2 feet following the convergence of a flood crest reaching downtown at the same time as a major thunderstorm. The result was a flood far beyond anything that city staff had ever contemplated (Schultz 2010).

This is different from Hurricane Katrina, which followed a scenario that had been predicted more than once and had even been a practice scenario for federal and state officials the year before during a hypothetical Hurricane Pam. Even with the subsequent levee failures, what happened in Hurricane Katrina in New Orleans and the surrounding area was less the result of unimaginable circumstances than it was a failure to anticipate an event that was predictable based on historical experience (Freudenburg et al. 2011).

In contrast, planning for the "worst case" scenario focuses on the ability to think the unthinkable. Within the context of FEMA tools, the best means to pursue this is the Threat and Hazard Identification and Risk Assessment, which "allows a jurisdiction to understand its threats and hazards and how the impacts may vary according to time of occurrence, season, location, and other community factors" (FEMA n.d.). Worst-case scenario planning has roots in military planning because of the need in wartime to anticipate the worst damage that the enemy can inflict and then to consider how to forestall or mitigate that damage. However, it has been widely adapted to business and other uses (Schoemaker 1995). It does not matter in such exercises that the event imagined has never happened before, or whether the "never" is local or universal. The operative question is whether it is *possible*. The scale of the earthquake and tsunami events in Japan in 2011 were by and large not anticipated, not so much because they were impossible, but because they were deemed so unlikely on the basis of previous experience. In many cases, it may not be entirely possible to mitigate against such events at any reasonable cost. In most cases, towns flattened by EF-5 (Enhanced Fujita scale) tornadoes did not fail to mitigate. The scale of the tornado that destroyed Greensburg, Kansas, for example, was beyond anything against which the town could have reasonably protected itself. However, contemplating the possibility of such events is not pointless, for it may well allow a community to make vital preparations that will save lives.

The foregoing is an admittedly limited discussion of the use of scenario planning tools. These tools, of course, have acquired much broader use in modern urban planning, principally as a means of assisting community visioning exercises in a collaborative environment, with the goal of managing uncertainty regarding future development (see Holway et al. 2012). This broader use involves best-case as well as worst-case and other scenarios. In the context of planning for hazards, however, the need hews more closely to the military origins of these tools. It also helps, as the next section discusses, to begin to grasp the range of scenarios that may affect a community when disaster strikes, and what implications those scenarios may pose for successful recovery planning.

UNDERSTANDING THE SCALE AND SPECTRUM OF DAMAGES

Disasters come in all sizes and intensities. The characteristics of a disaster in turn affect recovery needs, challenges, and approaches depending upon the exact circumstances in each case. Disaster scale and intensity factors critically determine the nature and duration of recovery. Yet there is relatively little organized knowledge classifying disasters in a manner that would help communities to more systematically anticipate recovery challenges based on the nature and extent of damage and losses.

A key starting point in recovery planning is the ability to characterize a disaster event in terms that directly identify the severity and extent of damage, death, and destruction in order to determine processes, general levels of effort, sources of financing, and likely duration of recovery. In common parlance, a disaster is more than a local emergency such as a structure fire or an ambulance call. Disasters usually reflect multiple losses of life, injuries, and/or extensive property damage, and at a minimum they involve the need for assistance and resources to be brought from other communities and regions. For presidential disaster declarations under the Stafford Act, a "major disaster" is defined as "any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or, regardless of cause, any fire, flood or explosion, in any part of the United States, which in the determination of the Presi-

WHAT IS HAZUS-MH?

Hazus-MH is a nationally applicable software program and standardized methodology for estimating potential losses from earthquake, flood, and hurricane hazards. The Federal Emergency Management Agency developed Hazus-MH in partnership with the National Institute of Building Sciences. Loss estimates developed with Hazus-MH are based on current scientific and engineering knowledge about the effects of earthquake, flood, and hurricane hazards. These loss estimates can support the risk assessment component of a community's planning effort (FEMA 2004).

dent causes damage of sufficient severity and magnitude to warrant major disaster assistance under this Act to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship or suffering caused thereby" (42 U.S. Code §5122—Definitions). At that point the circumstances are cumulatively more than those which have qualified the situation for a governor's emergency proclamation mobilizing state resources, and they are sufficient to give rise to a request for a presidential declaration mobilizing federal resources.

In the two decades since Congress passed the Stafford Act, informal minimum thresholds have been used by FEMA regions to determine whether or not a disaster in a community or region qualifies for a presidential disaster declaration. In light of the absence of any clear disaster typology or specific indicators of what qualifies as a disaster, however, this leaves unspecified the general scale in terms of numbers of deaths, injuries, property losses, or devastated areas by which to systematically classify a community or region as a disaster area.

In short, existing disaster law is vague in identifying a situation which can reasonably qualify as a "disaster." For some, this is perhaps as it should be, allowing a wide range of discretion for emergency response professionals, public agencies, and private sector stakeholders to address situations in terms of their unique circumstances. However, a common difficulty emerging from experience is the "one-size-fits-all" perspective reflected in disaster laws and a similar mindset that disaster management professionals bring to widely varying recovery situations.

Recovery Type

In addressing any recovery situation, it is important to understand its *type* and *scale* to determine the processes likely to be needed. The term *recovery type* refers to both the intensity of impacts and the combined social, economic, and physical processes by which an area regains "normal life" and adapts to new circumstances. Recovery types can be characterized by the physical actions upon which they are centered: restoration or redevelopment.

Restoration

The more common type of recovery is known as restoration, which follows disasters creating damage sufficiently minimal to allow existing buildings to remain intact, obviating the need for replacement. General characteristics of this recovery type include, but are not limited to, minimal losses of life, limited population or economic dislocation, and largely repairable damage. Within a restoration-oriented recovery, primary emphasis is on cleanup of debris, repairs to existing structures, and utilization of existing foundations. Restoration is also characterized by minimal or no land-use changes. Opportunities for hazard mitigation are present, but since building configurations are not being altered, safety upgrades are largely confined to what can be accomplished within the framework of the preexisting built environment. An example of restoration might include actions taken following a flood to remove mold and damaged furnishings, replace damaged dry wall, and repaint. In such a case, the building remains essentially intact, and the primary emphasis is to restore rather than replace it.

Redevelopment

A less common recovery type is redevelopment, which follows disasters resulting in substantial destruction of physical structures and substantial damage requiring replacement of preexisting buildings to assure safe occupancy. General characteristics of this recovery type include, but are not limited to, heavy losses of life and injuries, major population and economic dislocations, destruction of existing structures to the point where they cannot be reoccupied, and extensive building demolition and replacement. This recovery type allows for major reconfiguration of foundations and building mass, primarily in new structures. Reconstruction affords a wider range of hazard mitigation opportunities, such as options for land-use changes and buyouts of development in hazardous areas. An example of redevelopment might be reflected in the need for demolition, re-planning, and total rebuilding of structures destroyed by a large earthquake or tornado. In such a case, time is taken to create a new plan envisioning a built environment simultaneously capable of being resilient enough to withstand recurrence of the hazard leading to the disaster as well as to adapt to changing social, economic, or environmental circumstances.

Recovery Scale

The term *recovery scale* refers to the size of the area affected by the disaster in terms of geographic area, numbers of individuals and households, numbers of structures, and types of facilities which must be restored or reconstructed. In recovery planning, the scale can be geographic, as in neighborhoods, districts, communities, or regions. For example, in the Southeastern U.S., small-scale flooding disasters occur frequently in neighborhoods near riverbeds. However, a large-scale disaster like Hurricane Katrina destroyed large

portions of the Gulf Coast region, including substantial parts of New Orleans and other communities.

Recovery Levels

Table 3.1 shows a simple, workable recovery classification with brief examples given for each category. It shows some fundamental relationships between scale and type of recovery. Scale is designated by three geographic categories: neighborhoods, communities, and regions. Combining these two variables (type and scale), the classification reflects a series of categories shown as Recovery Levels 1 through 6. These levels tend to reflect a generally increasing scale in the extent and intensity of recovery processes with increasing scale and complexity of process.

Why develop a recovery classification system? The answer to this question lies more in the establishment of a frame of reference before or after a disaster to view the recovery process in its proper context so that the levels of resources are adequate and appropriate to the particular situation. This also allows everyone involved to begin thinking about what it will really take to restore some form of normalcy and to address the magnitude and depth of the social, economic, physical, and environmental changes which may be needed.

Not clearly reflected in this recovery typology are complexities associated with both recovery type and scale. For example, a Type B: Redevelopment recovery setting is inherently more complex than a Type A: Restoration recovery setting, regardless of scale. Similarly, increases in scale also tend to increase complexity, and these in turn affect recovery duration. For example, the timeline for a Type A, Level 1 recovery is more likely to be a few months to a year, while a Type B, Level 3 recovery might require half a decade. A Type B, Level 6 recovery, however, might require multiple decades.

Additionally, other variables associated with a disaster not shown in Table 3.1 can affect recovery duration and approach. These may include:

- **Urban versus rural settings:** Disasters occurring in densely developed, heavily populated urban areas are more likely to create devastation than those which happen in lightly settled and populated rural areas.
- **Severity of cleanup circumstances:** Local land-use variables, such as the presence of major quantities of hazardous and toxic materials (e.g., oil or a chemical tank farm), can intensify and complicate restoration procedures.
- **Variations in wealth and poverty:** Low-income communities have been shown in the planning and disaster management literature to be harder hit by disasters than those possessing substantial wealth; correspondingly,

TABLE 3.1. RECOVERY CLASSIFICATION SYSTEM: SCALES, TYPES, AND LEVELS

Scale	Type A: Restoration	Type B: Redevelopment
Can be discontinuous, involving multiple locations at each geographic scale	Characterized by limited life losses and population-economic dislocation, repairable damage, minimal land-use changes	Characterized by major life or structure losses and population-economic dislocation; demolition, reconstruction, and land-use changes; mitigation opportunities
Neighborhoods	**Level 1: Neighborhood Restoration** Example: Yountville, California, mobile home park flood wall and restoration	**Level 2: Neighborhood Redevelopment** Example: September 11 World Trade Center attack
Communities	**Level 3: Community Restoration** Example: Oakland, California, hills firestorm	**Level 4: Community Redevelopment** Example: Greensburg, Kansas, tornado
Regions	**Level 5: Regional Restoration** Example: Northridge earthquake	**Level 6: Regional Redevelopment** Example: Tohoku earthquake and tsunami

(Source: Ken Topping)

BUILDING CAPACITY THROUGH PRE-EVENT PLANNING IN LOS ANGELES

David Morley, AICP

When a magnitude (M_w) 6.7 earthquake struck the Northridge area of Los Angeles's San Fernando Valley on the morning of January 17, 1994, it triggered damage and disruption over 2,200 square miles. Prior to the earthquake, city staff had completed a draft of the first known example of a pre-event recovery plan, the *City of Los Angeles Recovery and Reconstruction Plan*. While the document itself is of historical interest, it was the planning process—more than the plan—that merits further consideration.

Los Angeles' pre-event planning process is a natural touch point for any contemporary discussion of planning for post-disaster recovery. It focused on pre-event hazard mitigation actions and established decision making and administrative procedures that have made the city's organizational structure more resilient to shock.

The first seeds for the pre-event planning process were planted after a M_w 6.6 earthquake rocked the San Fernando Valley in February 1971. In addition to causing 65 fatalities and an estimated $505 million in damages, the quake highlighted both the risks posed by older structures and the potential for confusion in aftermath of a major disaster (Stover and Coffman 1993). As a result, the city committed to taking a more proactive approach to preparing for and responding to future earthquakes.

Over the next decade, city leadership adopted ordinances strengthening building requirements for new high rises and retrofits of unreinforced masonry buildings, added a seismic safety element to the city's general plan, and created a new transdepartmental Emergency Operations Organization (EOO) to centralize response efforts. In 1981 the city hired a multidisciplinary team headed by Spangle Associates to analyze projected damages from multiple earthquake scenarios. The team's 1987 final report, *Pre-Earthquake Planning for Post-Earthquake Rebuilding,* recommended a continuing program of pre-event planning for recovery, including the development of policies and procedures for post-event planning and rebuilding (Los Angeles 1994).

Concurrent with the preparation of the report, the EOO formed a recovery and reconstruction division, charging it with developing a work plan. According to former Los Angeles planning director Kenneth Topping, FAICP, the recovery division established the basic framework for the pre-event plan by 1988. The process of fleshing out and refining this framework included training and plan evaluation exercises involving multiple city departments as well as federal, state, and nonprofit organization representatives, stretching over several years into the early 1990s. The final draft of the Los Angeles plan was awaiting city council approval at the time of the Northridge Earthquake.

While a post-event analysis indicated that few rank-and-file city staffers directly consulted the plan in the aftermath of the earthquake, many department heads acknowledged that the planning process likely enhanced decision making in the recovery period (Spangle Associates and Robert Olson Associates 1997). According to former Spangle Associates senior planner Laurie Johnson, AICP, some departments, such as the Los Angeles Housing Department, carried out many of the actions prescribed in the action program section of the plan. In short, the planning process gave department heads and middle managers an opportunity to work through roles and responsibilities and to discuss actions and programs that would be helpful in recovery (Olshansky, Johnson, and Topping 2005).

Both Topping and Johnson also credit the planning process with building relationships and trust with state and federal recovery partners. This trust may have been responsible, in part, for increased funding and spending discretion, given that federal agencies dispersed large sums as flexible block grants.

As a postscript, the planning department led a plan revision process in the months following the earthquake aimed at incorporating lessons learned from the event (Spangle Associates and Robert Olson Associates 1997). On the first anniversary of the earthquake, the Los Angeles city council adopted the updated recovery and reconstruction plan.

low-income communities have much more difficult challenges and harder times recovering.
- **Access to financial support:** Communities that have greater access to financial resources—such as private assets, insurance, or federal grants—have a less difficult time recovering; such access may be limited by other than income-related factors such as variations of participation in flood insurance or details of federal grant and loan eligibility rules (e.g., more limited for mudslides or roof damage than for flooding, or restrictions of Small Business Association loans on damaged condos versus single-family homes).
- **Local governance capabilities:** An important unseen variable is the capacity of local governments to function effectively in the post-disaster environment, partially reflecting strength of leadership, administrative professionalism, and stakeholder interest in community affairs, as well as the preceding variables.

The recovery classification in Table 3.1 represents an initial step toward creating a workable typology to facilitate communication regarding the magnitude and complexity of recovery situations. It is intended to be used as a tool by which to test real-world experience and to identify additional factors that might be relevant for inclusion. The classification is intended to foster discussion leading to a recovery typology that can serve as a useful tool in quickly sizing up recovery situations as they emerge and organizing recovery decisions appropriately according to the level.

INSTITUTIONAL LEARNING AFTER DISASTERS

In addition to loss of life and property, disasters greatly disrupt daily life in a way that is normally alleviated in fits and starts over an extended recovery period—usually with differing levels of time, money, and effort, depending upon the severity of a particular event. These variable recovery experiences can yield valuable lessons about ways to more effectively mitigate, prepare for, respond to, and recover from future disasters. This learning opportunity can benefit the communities affected by a particular disaster but also many others.

Figure 3.1 captured the phases of a disaster, with useful lessons to be learned from each phase of the cycle. This learning cycle is more commonly understood and experienced by residents of areas with frequent repetitions of disasters than in areas where they tend to occur more infrequently. Residents of the Gulf Coast and Eastern Seaboard, for example, have learned how deal with hurricanes—including mitigation, preparation, response, and recovery—that hit these states annually. In contrast, residents of the Northeast and the Plains states deal with disasters less frequently and therefore may not be as knowledgeable about and familiar with this learning cycle.

Mitigation Lessons

Through careful post-disaster evaluation, valuable lessons can be gleaned about reducing, minimizing, or avoiding similar losses in the future though changes in risk, hazard, and vulnerability conditions. During the past half century, valuable lessons were learned in California about rebuilding more safely after devastating earthquakes. For example, after the 1933 magnitude (M_w) 6.3 Long Beach earthquake, the 1971 M_w 6.6 Sylmar earthquake, the 1989 M_w 6.9 Loma Prieta earthquake, and the 1994 M_w 6.7 Northridge earthquake, changes were made in building codes for schools, hospitals, and homes and led to reduced damage in new homes during subsequent events.

Upgrading of structural codes following seismic events represents a useful example of the mitigation learning cycle, which has resulted in construction of new buildings strong enough to withstand earthquake magnitudes which previously caused building collapses or substantial damage under previous, less stringent codes. Other examples of improved mitigation practice from this learning cycle include:

- the requirement of fire-safe construction of homes within wildland-urban interface areas following the 1991 Oakland Hills conflagration
- the raising of structures above base flood elevations in flood-prone areas of New Orleans following Hurricane Katrina in 2005
- improved land-use planning practices guiding development away from various kinds of hazardous areas
- preparation of over 28,000 local hazard mitigation plans following passage of the Disaster Mitigation Act of 2000
- the use of current data sources to anticipate new and atypical events related to climate change

Preparedness Lessons

The growing number of disasters in the U.S. has also improved the learning cycles related to preparedness, response, and recovery. For example, the Great ShakeOut public earthquake drill and readiness campaign was initiated in Southern California in 2008 through the coordinated efforts of a broad base of public and private earthquake education stakeholders

—including the U.S. Geological Survey, the State of California, and the Southern California Earthquake Center at the University of Southern California—under the banner of the Earthquake Country Alliance.

This annual "drop-cover-hold" exercise, undertaken simultaneously at a coordinated date and time, addresses the issue of earthquake preparedness and involves millions of participants. The level of public participation has grown in response to this initiative from an initial five million people in Southern California to over ten million in a dozen states in the U.S. in 2012, along with participants in Canada, New Zealand, and other countries around the world. The primary benefit is greater awareness of personal actions that can be taken to decrease earthquake risk, hazards, and vulnerability (California 2010).

Pre-Event Planning Lessons

Similarly, since the 1980s planners and emergency managers have begun to apply lessons learned from disasters to pre-event planning for recovery. Until that decade, pre-disaster planning was commonly in use for improvement of emergency response operations. However, little, if any, attention had been focused on recovery. This trend has featured the application of scenario-based exercises for training and plan evaluation.

Los Angeles recovery and reconstruction plan. Starting in the mid-1980s, the City of Los Angeles developed scenario-based exercises related to the recovery and reconstruction plan. Covering all phases of the disaster cycle, the exercises were designed for plan development and training purposes and based on a hypothetical major earthquake along the Newport-Inglewood Fault. Plan preparation and training took into account lessons learned from previous earthquake disasters, with expertise brought in from external sources. Valuable lessons were also learned from experience gained in the aftermath of the M_w 6.9 Loma Prieta earthquake, which occurred in the middle of the planning cycle. The primary outcome was preparation of the pre-event plan, refined for nearly a decade and later adopted by the city council one year after the 1994 Northridge earthquake. Another key outcome was the increased capacity of city departmental management staff leaders to adapt more in response to the actual circumstances of the Northridge earthquake (see "Building Capacity through Pre-Event Planning in Los Angeles," p. 54).

Post-disaster redevelopment planning. Perhaps the most far-reaching example of pre-event recovery planning informed by years of prior disaster experience is Florida's state law, which for many years required all coastal communities and encouraged inland communities to prepare and adopt a post-disaster redevelopment plan (PDRP) as part of the coastal management element of state-mandated comprehensive plans. In place for a number of years, Florida's PDRP component—now no longer required but still encouraged by the state—embodies the pre-event planning concept. The benefits of PDRP adoption include: (1) faster, more efficient disaster recovery, (2) the opportunity to build back better, and (3) local control over recovery (Florida 2010a, 2010b). The PDRP component has been implemented in a growing number of Florida's communities as Gulf Coast hurricanes have become more intense and as successive state administrations have encouraged more widespread compliance. To date, it provides the most complete and extensive pre-event recovery planning strategy tied to the comprehensive plan (see "Post-Disaster Redevelopment Planning in Hillsborough County, Florida," p. 77).

Opportunities for Pre-Event Planning

Such post-disaster and pre-disaster learning examples have routinely become part of community planning and emergency management practice in various regions of the U.S., helping many urban and rural communities to become more resilient. From such experiences, however, various dilemmas are revealed that revolve around a series of interrelated questions.

Can a community without direct experience learn disaster lessons from other places? It is clear that a community need not experience a disaster directly in order to apply lessons learned from disasters to better mitigate hazards, prepare for emergencies, respond to a disaster, or recover effectively. Communities all over the nation and the world have shared information and learned from the disaster experiences of others. Since passage of the Disaster Mitigation Act of 2000, over 28,000 local governments have adopted FEMA-approved local hazard mitigation plans, providing a foundation for federal hazard mitigation grant projects that have enabled many communities to become more resilient. According to FEMA, current local plans cover approximately three-fourths of the U.S. population. This progress is tempered by the reality that there are 88,000 local government entities in the U.S., and that plans need to be adopted by many more local jurisdictions in less-heavily populated and rural areas (Topping 2011).

Under what circumstances can a community learn from its own disaster experience? While communities may have a latent capacity for learning from various experiences, in the case of disasters it is not as straightforward as it would

seem. A wide variety of variables may condition a community's capacity to apply mitigation, preparedness, response, and recovery lessons from its own disaster experiences. Factors affecting the level and value of post-disaster learning may include:

- **Disaster level:** Disasters resulting in higher recovery levels in the Table 3.1 typology tend to provide a broader range of experiences yielding more widely useable mitigation, preparedness, response, and recovery lessons than those resulting in lower recovery levels.
- **Repetitive disasters:** As seen in Gulf Coast states, repetitive disasters and the regular reminder of the consequences of neglect tend to provide more permanent, long-lasting lessons for various disaster phases than infrequent disasters.
- **Local leadership:** Communities with greater disaster learning capacity and better post-disaster outcomes tend to be those in which strong leadership is demonstrated by the actions of mayors, local champions, or key community stakeholders; the presence or absence of such leadership is an ingredient which strongly conditions post-disaster experiences for better or for worse.
- **Socioeconomic and environmental variables:** The social, economic, and environmental makeup of a community can influence the value of disaster lessons, both for the community itself and for other places; however, transferable lessons can emerge from disasters which occur in unique settings such the 1906 San Francisco earthquake, the 1991 Oakland Hills wildfire, and the 2005 inundation of New Orleans during Hurricane Katrina, all of which have yielded lessons benefiting other regions and communities.
- **Organizational development:** Another important cluster of variables influencing post-disaster learning capacity is institutional factors such as the clarity and strength of the recovery organization, the pre- and post-event experiences of its members, levels of training, and the adequacy of financing; the previously mentioned Los Angeles *Recovery and Reconstruction Plan* was prepared by a strong emergency operations office, whose strength was matched by active mayoral and city council member leadership.
- **Inherent post-disaster conflicts:** In most post-disaster situations, there is insufficient time to manage a multiplicity of pressing decisions methodically due to the urgency of victims' needs and intense pressures to restore "normalcy." In such circumstances demands for immediate actions on short-term issues are overwhelming, conflicting directly with the need for logical, orderly deliberation and planning related to long-term recovery needs. Pre-event plans indicating a desirable direction for post-disaster recovery can help minimize disorganization, improve efficiency, and coordinate action (Olshansky and Topping 2005). Yet maintenance of post-disaster learning in communities can be threatened by the rapid half-life of disaster memories, where people prefer to push negative disaster experiences out of their minds (Schwab et al. 1998) and erode the recovery plan.

Can pre-event recovery planning really help improve community recovery? A community that undertakes pre-event recovery planning can definitely enhance its own capacity to recover, whether or not it has experienced its own disaster. For example, Los Angeles benefitted from having undertaken pre-event recovery planning. However, pre-event recovery plans must be kept current to reflect changing conditions and knowledge. They must be systematically maintained through an update process which examines assumptions, acknowledges changed conditions, and counters factors diminishing its ongoing relevance. It is a challenge to maintain momentum for pre-event planning over prolonged periods. Recovery plans can "decay" through obsolescence, changes in personnel, or a decline in organizational interest, particularly if a community has not experienced a disaster recently enough to keep memories fresh.

Creating a Sustainable Recovery Management Framework

A primary question emerging from the preceding overview is how to build and maintain local capacity for effective recovery planning and action both before and after a disaster. The simple answer is that local governments need to create a strong, ongoing, self-maintaining institutional framework to support post-disaster recovery by starting it before a disaster happens and sustaining it throughout and beyond recovery in anticipation of a more distant future disaster. This, however, is more easily said than done.

A significant challenge for local governments related to undertaking pre-event recovery planning is the establishment of a local recovery management organization—fully integrated with the local emergency management organization but with the capacity to reach beyond short-term recovery initiatives and actions encompass those pertaining to long-term rebuilding.

Recovery Management Organization

Included within the next chapters of this report is the concept of a local recovery management organization simultaneously capable of dealing with two activities: (1) the short-

term recovery actions more clearly related to post-disaster emergency operations center activities and (2) the long-term rebuilding issues which have broader community participation requirements through public workshops and formal public hearings. Recovery reflects a blend of both needs, and a recovery management organization can help manage them to make activities proceed more smoothly and expeditiously.

The recovery management organization concept reflected in the remainder of this chapter and in other chapters reflects an institutional arrangement that accomplishes four essential objectives:

- Offering a foundation for preparation of a recovery plan which anticipates as clearly as possible pre- and post-disaster recovery needs, as well as short- and long-term recovery requirements
- Providing an administrative umbrella for recovery management under which both short-term emergency-related and long-term development-related recovery initiatives can be coordinated
- Creating an action-oriented organizational venue for kick-starting effective short-term recovery initiatives and actions
- Coordinating short-term recovery initiatives and actions with visioning, exploration of options, and public policy making more characterized by long-term recovery for rebuilding

Pre-Event Recovery Plan

Central to the concept of pre-event recovery planning is protecting the health, safety, and welfare of all community members. Preparing a pre-event plan for post-disaster recover in advance of a disaster is preferable. That becomes the primary initial task of the recovery management organization. Beyond that, the recovery plan should recognize recovery initiatives that can be seen as primarily short-term in nature, versus those that are long-term.

Short-Term Recovery Actions

Within the range of recovery initiatives and actions often reflected in a local recovery plan are those associated most directly with the emergency operations center (EOC), where post-disaster response commonly uses Incident Command System (ICS) management processes. ICS is a concept for organizing activities within an EOC based on the application of administrative command and control principles (command, operations, planning, logistics, finance, and administration) to matters demanding urgent, closely collaborative action across organizational boundaries.

ICS can be especially helpful in kick-starting and nurturing short-term recovery initiatives and actions, and it can also provide a platform for visioning and policy development associated with long-term rebuilding. Examples of short-term recovery initiatives and actions lending themselves well to the EOC organizational context include, but are not limited to, damage assessment and placarding, hazards identification and abatement, debris clearance, development moratoria, temporary use and repair permits, establishment of one-stop service centers, management of nonconforming buildings and uses, and demolition of damaged historical buildings. Though customarily associated with the local emergency period, ICS has the flexibility to be stretched well beyond the emergency through short-term recovery and into long-term recovery and rebuilding (Johnson 2012).

Because ICS is essentially an administrative process, however, particular attention is needed as to where it intersects with formal policy making by the local governing body. The policy-making process is more fundamentally attached to long-term recovery initiatives and actions.

Long-Term Recovery Actions

Long-term recovery initiatives tend to move into the policy-making arena rather quickly, first with the common issue regarding whether or not to rebuild differently or "as was." Using the Figure 3.1 typology as reference, this issue may not emerge at all in many Level 1: Neighborhood Restoration or Level 3: Community Restoration situations because the predominant need is to repair existing structures or rebuild on existing foundations. This issue more frequently emerges within Level 2: Neighborhood Redevelopment or Level 4: Community Redevelopment situations where major decisions need to be made about the character and intensity of rebuilding, including possibilities for changing land use, modifying building footprints, or adding new public facilities.

In such circumstances, long-term recovery actions related to rebuilding may tend to be spread out over a period of months, if not years, much like a comprehensive plan and consist of a sequence of distinct yet interconnected and sometimes parallel actions by separate local government departments. Often requiring initial governing body approval, long-term recovery actions are then coordinated through the office of the chief executive or city manager over an extended period of time.

Need for a Recovery Plan Essential to the expeditious guidance of this long-term process is the need for an overarching recovery plan, whether adopted prior to or after the disaster. The recovery plan provides the goals, policies, and strategies

for recovery and outlines desired social, economic, physical, and environmental outcomes. Like short-term recovery planning, it requires the active collaboration of various local government departments as well as state and federal entities and community stakeholder groups to be successful. However, because long-term recovery often involves sensitive code enforcement, land-use, construction, property rights, condemnation, and other constitutional due process issues, it can be more fragmented and chaotic in nature. Public policy-making processes for long-term rebuilding issues inherently require greater transparency, input from multiple stakeholders, public workshops and hearings, and formal votes by the local governing body.

Moreover, long-term recovery actions can lead to delays associated with time-consuming special engineering and technical studies and local, state, and federal environmental reporting or hearing requirements. While such laws usually contain emergency exemptions, actions taken under such exemptions are subject to political and legal challenges that can lead to such activities as public hearings by the governing body and lawsuits and extended court action.

Short-Term Action versus Long-Term Policy: A Balancing Act

Traditional linkages exist between recovery and other emergency management phases of the disaster management cycle, including mitigation, preparedness, and response; a close relationship between these phases must be maintained both before and after a disaster. ICS operations can provide an excellent administrative platform upon which to maximize coordination of short-term recovery processes with vital response, preparedness, and mitigation action priorities.

When a local emergency has subsided and short-term recovery actions have been effectively taken, primary responsibility for guiding long-term recovery tends to shift to non-emergency officials, such as planning, building, public works engineering, and legal staff. At that point, the question becomes how to continue to apply valuable ICS coordination principles to long-term rebuilding issues. Also by this time, the venue for deliberation may have shifted from the EOC or from staff committee meetings to the city council, and they may be characterized by evaluation of alternative long-term goals and policies. At this point, governing body deliberations tend to be focused on the most desirable built environment outcomes, possibly taking years to fulfill.

Long-term recovery provides a more challenging context within which to test the limits of ICS management principles. The trick within this mixed administrative-political context lies in integrating ICS and recovery management principles over as long a period as possible following a disaster to obtain the maximum amount of feasible coordination. In short, the most efficient and effective handling of long-term rebuilding actions may require a creative blend of administrative and governing body policy-making processes.

Need for Recovery Management Organization

For these reasons, early establishment of a strong recovery management organization capable of reconciling ICS administrative principles with traditional public policy formulation and decision-making mechanisms, such as formal public hearings, can make a great difference in the efficacy of recovery execution. The opportunity and challenge are to establish an umbrella recovery management organization that embraces and actively utilizes the local government's emergency management organization for coordination of pre- and post-event short- and long-term recovery outcomes within the broader political and governmental framework of which it is inescapably a part.

The great value of pre-event formation of a recovery management organization is in educating its members in two ways: (1) by informing planners, building officials, and engineers about the EOC context and the coordination benefits of the ICS administrative management framework and (2) by teaching emergency managers about the hardcore building, planning, and redevelopment issues they may face during the long years needed to fully rebuild after a severe disaster. The model pre-event recovery ordinance in Appendix A reflects this approach.

CONCLUSION

The system of disaster management in the United States has evolved considerably over time, but the fundamental elements of the traditional cycle of emergency management remains important. One key point is that planning for mitigation and planning for recovery are not mutually exclusive but can and should reinforce each other. For this reason, pre-event planning for recovery matters because it allows a community to become better prepared to handle recovery tasks and incorporate mitigation into recovery, in addition to establishing clear lines of responsibility for recovery management.

CHAPTER 4

THE FEDERAL FRAMEWORK FOR DISASTER RECOVERY

Most planners in the U.S. are probably not very well versed on the nationwide system of disaster management that has evolved at the federal government level in the past half century. Yet it is important for planning professionals to learn about this system before a disaster happens in their own community so they will have a better sense of what to expect and how to approach the tasks at hand. This chapter builds on the conceptual framework considerations in Chapter 3 by outlining the history of federal disaster legislation and supplemental administrative directives important to recovery planning.

MAJOR FEDERAL LEGISLATION DEFINING DISASTER POLICY

Federal disaster laws and administrative directives generally tend to reflect one or another component of disaster management—sometimes called "phases" of the emergency management cycle—including mitigation, preparedness, response, and recovery. For a summary description of these components see "Components of Disaster Management" (p. 43).

Disaster Management Laws

Table 4.1 (p. 62) identifies key federal laws which directly address disaster management, classifying their primary content under four categories: mitigation, preparedness, response, and recovery. Prominent among these are the National Flood Insurance Act of 1968 (amended in substantial ways by the National Flood Insurance Reform Act in 1994), the Biggert-Waters Flood Insurance Reform Act of 2012, and the Homeowner Flood Insurance Affordability Act (2014). The nation's basic disaster law is the Robert T. Stafford Disaster Relief and Emergency Assistance Act (also known as the Stafford Act), which was adopted in 1988 and amended substantially by the Disaster Mitigation Act of 2000 and the Post-Katrina Emergency Management Reform Act of 2006. These laws are primarily implemented by the Federal Emergency Management Agency (FEMA) and the U.S. Department of Homeland Security (DHS).

Paralleling these laws are others that directly address related topics—such as transportation, housing, and small business—and indirectly address disaster management through their emergency provisions. Table 4.2 (p. 64) identifies the disaster management emphasis of such laws within their emergency provisions, using the same four categories used in Table 4.1. Examples include the Small Business Act (1953), the Federal-Aid Highway Act of 1956, the Housing and Community Development Act of 1974, and the Emergency Planning and Community Right-to-Know Act (1986), which amended the previously adopted Comprehensive Environmental Response, Compensation, and Liability Act and the Superfund Amendments and Reauthorization Act (1986). These are largely implemented by agencies other than FEMA and DHS. Programs governed by these laws often carry more substantial long-term funding than those dealing directly with disaster management.

Environmental regulations that interact with the preceding federal laws include the National Environmental Policy Act of 1969, the Clean Air Act (1970), the Coastal Zone Management Act of 1972, and the Endangered Species Act of 1973, as well as various state equivalents.

FEMA-Administered Disaster Laws

Among the key disaster laws in Table 4.1, several are especially pertinent for planners: (1) the National Flood Insurance Act of 1968 (and its principal reform amendments), (2) the Robert T. Stafford Disaster Relief and Emergency Assistance Act (1988) (the Stafford Act, the nation's basic disaster law), and (3) the Disaster Mitigation Act of 2000 and the Post-Katrina Emergency Management Reform Act (2006), both of which amended the Stafford Act.

National Flood Insurance Act of 1968

The National Flood Insurance Act of 1968 established the National Flood Insurance Program (NFIP), which offsets flood losses through insurance sold by private companies.

TABLE 4.1. DISASTER MANAGEMENT LAWS ADMINISTERED BY FEMA

Law*	Mitigation	Preparedness	Response	Recovery
Disaster Relief Act, 1950 Provided for disaster relief without Congressional act			Established federal provision of relief under presidential declaration upon governor request	Established forerunner of Stafford Act Individual and Household Assistance Program (relief)
National Flood Insurance Act of 1968 Established National Flood Insurance Program; modified by substantial amendments (National Flood Insurance Reform Act, 1994; Biggert-Waters Flood Insurance Reform Act of 2012; and Homeowner Flood Insurance Affordability Act, 2014)	National flood hazard mapping system shows 100- and 500-year floodplains; amended in 1994 to provide Flood Mitigation Assistance Program grants			Provides private flood insurance backed by federal government; rates based on performance; rate subsidies reduced by recent legislation
Robert T. Stafford Disaster Relief and Emergency Assistance Act, 1988 "The Stafford Act"; basic disaster law integrating earlier laws dating back to 1950	Established post-disaster Hazard Mitigation Grant Program; amended by Disaster Mitigation Act of 2000	Formalized bottom-up emergency management procedures (state proclamations, federal declarations)	Formalized bottom-up emergency management procedures (state proclamations, federal declarations)	Established Individual and Household Assistance Program (relief) and Public Assistance Program (infrastructure)
Disaster Mitigation Act of 2000	Required hazard mitigation plans as grant precondition; added funding through the Pre-Disaster Mitigation Grant Program			
Homeland Security Act of 2002		Established new homeland security framework, including preparedness grants	Established new homeland security framework, including response protocols	
Post-Katrina Emergency Management Reform Act, 2006	Modified existing statutory mitigation provisions of the Stafford Act	Modified existing statutory preparedness provisions of the Homeland Security Act	Modified existing statutory response provisions of the Homeland Security Act	Mandated National Disaster Recovery Framework

**See Appendix B for complete citations.*

(Source: Kenneth Topping)

The federal government is the re-insurer for losses not covered by standard premiums. The NFIP encourages mitigation through lowering flood insurance rates relative to the extent to which communities mitigate flood hazards identified on FEMA's 100-year and 500-year flood maps. Insurance rates for homeowners can be reduced as much as 45 percent for extraordinary mitigation performance. The National Flood Insurance Act was substantially amended by the National Flood Insurance Reform Act of 1994 through the inclusion of local flood hazard mitigation plans as a precondition for Flood Mitigation Assistance grants. Other significant amendments have included the Biggert-Waters Flood Insurance Reform Act of 2012, which represented a major reform of the NFIP to correct underfunding by charging higher premiums and reducing program subsidies, and the Homeowner Flood Insurance Affordability Act of 2014, which modified many

key provisions of the Biggert-Waters Act to reduce and limit the additional costs of flood insurance it imposed following public backlash after Hurricane Sandy.

Robert T. Stafford Disaster Relief and Emergency Assistance Act

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act) is the nation's basic disaster law. At the time of its passage in 1988, the Stafford Act was considered landmark legislation for offering for the first time a comprehensive approach to disaster management and replacing the piecemeal approach of previous laws passed in 1950 and 1974. Under the Stafford Act, help is requested from the state when local resources are insufficient to handle an emergency. If state resources are insufficient, the state may request federal assistance, and the president may issue a federal disaster declaration enabling deployment of federal resources.

Three major Stafford Act programs jointly administered by FEMA and counterpart state organizations are particularly important for local communities:

- **Individual and Household Assistance Program:** This is the basic disaster relief and emergency assistance program providing limited post-disaster grants to homeowners and renters for mortgage and rent payments and for minor repairs. The maximum allowance for a household of four is approximately $28,000, functioning mainly as a stopgap supplement to insurance.
- **Public Assistance Program:** This is a critically important source of federal financing for local infrastructure and public facilities restoration. State, local, and other governmental entities and eligible nonprofits receiving Public Assistance grants must submit detailed information about infrastructure restoration project costs, and they must incur such costs before being reimbursed. State and local governments must pay up to 25 percent of restoration costs; jurisdictions wishing to fully replace an infrastructure facility must pay up to 40 percent of replacement costs.
- **Hazard Mitigation Grant Program:** This program provides grants to state and local governments for mitigation of hazards that pose risks for future disaster losses under Section 404 of the Stafford Act. Section 406 additionally authorizes grants for hazard mitigation incidental costs associated with infrastructure restoration funded by Public Assistance grants. These grants are an important source of post-disaster mitigation investments under the federal disaster management system.

Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 amended the Stafford Act with two requirements for states. First, it required states to prepare multi-hazard mitigation plans in order to be eligible for post-disaster assistance. Second, it required states to prepare local hazard mitigation plans as a precondition for local government eligibility to receive hazard mitigation grants. By requiring states and encouraging local governments to prepare hazard mitigation plans, the intent was to encourage more effective hazard mitigation projects, thereby reducing disaster losses. As of 2014, over 20,000 local jurisdictions have locally adopted, FEMA-approved local hazard mitigation plans.

The Disaster Mitigation Act also introduced the competitive Pre-Disaster Mitigation Program, which provides competitive grants for pre-event hazard mitigation plans and projects. This program and the Hazard Mitigation Grant Program authorized by the Stafford Act have represented important initial steps toward reducing disaster losses. However, effectiveness is hampered by relatively low funding levels.

Post-Katrina Emergency Management Reform Act

The Post-Katrina Emergency Management Reform Act addressed the need following Hurricane Katrina to strengthen disaster management procedures in order to cope with catastrophic events. This act included amendments to the Stafford Act, the Homeland Security Act, and other disaster laws and made incremental adjustments to the existing disaster management system, including hazard mitigation grant funding. Among other things, it enabled the president to move quickly in deployment of federal resources to facilitate evacuations and provide accelerated federal support in the absence of a specific state request. It also restored FEMA as a distinct entity within DHS, with direct access to the president during emergencies. Potentially significant to recovery was the direction to FEMA to work with other departments in developing a National Disaster Housing Strategy and a National Disaster Recovery Strategy, to be adopted as part of a series of administrative directives to supplement disaster laws. These strategies outlined the most efficient and cost-effective federal programs meeting the recovery needs of states and local governments, defined responsibilities of federal agencies in providing recovery assistance, encouraged cooperative efforts to provide recovery assistance, and promoted the provision of housing assistance in connection with factors such as the availability of jobs, the concerns of special-needs and low-income populations, and the repair of existing rental housing.

Disaster Laws Administered by Other Agencies

Planners should also become familiar with the key disaster laws in Table 4.2, especially the following: (1) the Small Business Act (1953), (2) the Federal-Aid Highway Act of 1956, and (3) the Housing and Community Development Act of 1974. These provide substantial support for post-disaster community recovery, often interacting closely with previously described FEMA-administered programs.

Small Business Act

The Small Business Act, established following World War II to support small business formation and expansion, is administered by the Small Business Administration (SBA). The SBA loan program, which primarily provides low-interest loans and other services for small businesses, is the primary traditional source of economic assistance to small businesses across the country. After disasters, SBA low-interest rate loans can be

TABLE 4.2. EMERGENCY PROVISIONS ADMINISTERED BY OTHER AGENCIES

Law*	Mitigation	Preparedness	Response	Recovery
Small Business Act, 1953 (as amended)				Small business resumption loans; homeowner damage restoration loans
Flood Control and Coastal Emergency Act, 1955	Provides for "advance measures" for imminent flood threat	Authorizes preparedness activities, such as exercises with other agencies	Allows U.S. Army Corps of Engineers to assist state/local entities in flood fighting	Authorizes reimbursement for levee damage resulting from high-water events
Federal-Aid Highway Act of 1956 (Section 125, U.S. Code, Title 23: Emergency Repairs)			Grants for freeway and highway repair	Grants for freeway and highway restoration
Housing and Community Development Act of 1974				Section 235 rental assistance; Section 8 rental vouchers; Community Development Block Grants
Public Works Employment Act, 1976				Assistance to small businesses; assistance to local governments for economic development
Emergency Planning and Community Right-to-Know Act, 1986	Required disclosure of onsite hazardous chemicals storage	Required federal/state chemical release emergency response plans and committees	Established federal/state chemical release emergency response protocols	
Water Resources Development Act, 1986	Required federal/state dam safety reviews and upgrade funding			
National Dam Safety Program Act, 2006	Separately updated federal/state dam safety reviews and upgrade funding	Required federal/state dam rupture emergency plans and committees	Required federal/state dam rupture emergency protocols	

**See Appendix B for complete citations.*

(Source: Kenneth Topping)

made available to small businesses and to homeowners in areas covered by presidential disaster declarations. For small businesses impacted by disasters, such loan assistance can be a critically important resource expediting business recovery.

Federal-Aid Highway Act of 1956

The Federal-Aid Highway Act of 1956 is overseen by the U.S. Department of Transportation (USDOT), and it supports engineering and construction of basic links in the interstate highway system. Following World War II, this program fueled expansion of the nation's economy during the 1950s and 1960s through development of the nation's freeway system. After a disaster, USDOT provides grants for the rebuilding of damaged or destroyed segments of the national network within states covered by presidential declarations. Operated jointly under cooperative agreements with states, the Federal-Aid Highway Act disaster assistance program provides a major boost to physical and economic recovery in areas devastated by disasters.

Housing and Community Development Act of 1974

Administered by the U.S. Department of Housing and Urban Development (HUD), the Housing and Community Development Act of 1974 was enacted primarily to stimulate housing and community improvements in both urban and rural areas. It is the source of billions of dollars of federal block grants made available to state and localities through the Community Development Block Grant (CDBG) program to finance low- and moderate-income housing and local facilities for service provisions to low- and moderate-income residents. The Housing and Community Development Act contains provisions under the Community Development Block Grant Disaster Recovery program to provide block grants to states and localities for the financing of post-disaster recovery. CDBG funds were used in Los Angeles after the Northridge earthquake to support housing recovery through no-interest loans for the repair of rental housing. After Hurricane Katrina, these funds were used for the Road Home program, which provided grants of up to $150,000 for housing restoration in New Orleans.

FEDERAL DISASTER ADMINISTRATIVE DIRECTIVES

Also important to recovery planning is the evolution of administrative directives instituted to guide coordinated execution of statutory responsibilities. Because of the growing complexity of underlying laws, heavier reliance is being placed on these directives. Table 4.3 (p. 66) identifies the primary content of administrative directives using categories related to disaster management.

Key examples in Table 4.3 are the National Incident Management System (2004), the National Response Framework (2008), the National Disaster Recovery Framework (2011), and the Presidential Policy Directive 8 (PPD-8): National Preparedness (2011). Administrative directives emerging under the new National Preparedness System include the Threat and Hazard Identification and Risk Assessment program (2012) and the National Mitigation Framework (2013). This section provides a brief summary of such directives as they pertain to recovery planning.

Top-Down Emphasis

Notwithstanding the combined bottom-up and top-down aspects of the Stafford Act, after a presidentially declared disaster there is a definite top-down, chain-of-command emphasis on coordination from the federal government to state governments, and from state governments to local governments. Federal officials interact primarily with state officials, and local governing units—such as cities, counties, and special districts—interact primarily with state agencies. The state serves as key agent or ombudsman on behalf of local governments seeking to secure federal funding and resources. The most productive step a community can take before, during, or after a federally declared disaster is to develop an understanding of federal and state agency roles and to build close relationships with state officials.

Federal Disaster Declarations

The national system for disaster declarations is a pyramidal structure. Local governments deal with a wide variety of emergencies on a regular basis—structural fires of all sizes, crimes to which police respond, and small-scale natural and human-caused disasters, such as snowstorms, flood-induced sewer backups, and small industrial accidents. Typically, the snow plows come out, areas are sealed off for public safety, and city officials take other steps to handle the problem without outside assistance.

If localities need additional assistance and resources, they usually first turn to neighboring communities for emergency help under pre-existing mutual aid agreements. If resources available from neighboring communities prove insufficient, they can then possibly appeal to the state emergency management agency with a request for a declaration by the governor to enable such aid from state agencies. All states have laws

TABLE 4.3. FEDERAL DISASTER MANAGEMENT ADMINISTRATIVE DIRECTIVES

System*	Mitigation	Preparedness	Response	Recovery
44 CFR 201—Mitigation Planning, 2002 (as amended)	Established regulations implementing the Disaster Mitigation Act of 2000			
National Incident Management System, 2004			Established incident command system standards for state/local compliance	
National Response Plan, 2004 (superseded 1992 Response Plan)		Updated 1992 federal preparedness guidelines	Updated 1992 federal response guidelines	Established long-term community recovery guidelines
National Response Framework, 2008 (superseded National Response Plan)		Updated 2004 federal-state preparedness guidelines	Updated 2004 federal-state agency response guidelines	Expanded 2004 federal/state recovery guidelines
National Preparedness Goal, 2011 (Presidential Policy Directive 8)		User guides show connections between preparedness and other components		
National Disaster Recovery Framework, 2011				Established federal/state/local recovery framework
Threat and Hazard Identification and Risk Assessment, 2012		Multi-hazard risk and capabilities assessments for states and urban areas of significant interest		
National Mitigation Framework, 2013	Established federal/state/local framework for mitigation			

**See Appendix B for complete citations.*

(Source: Kenneth Topping)

governing the procedures to request aid and the conditions under which it can be delivered.

The intent of the Stafford Act was to codify at the federal level a combined bottom-up and top-down system by which states could act as intermediaries to manage local needs and federal resources. The bottom-up aspect is reflected when emergency resources are insufficient to handle a disaster at the combined local-state levels, and the state requests a federal disaster declaration by the president. The top-down aspect is reflected by federal actions stemming from a presidential disaster declaration authorizing and making available a wide variety of federal emergency resources in response to local and state needs.

EVOLUTION OF FEDERAL ADMINISTRATIVE POLICY

Another reason for planners to be familiar with this system is that the federal system governing disaster management is not static and has evolved considerably in recent years. There is an underlying consistency in the direction of federal administrative policy which has affected state policy as states rely heavily on federal funds for disaster services. Planners should therefore understand the fundamental ways in which federal disaster administrative policy has evolved in order to anticipate possible future changes.

One of the most fundamental and consistent trends in federal disaster administrative policy has been a movement toward holistic and comprehensive approaches to response and recovery. For instance, FEMA's (2011a) "whole community" approach has emphasized the engagement of all sectors of the community in preparing for disasters of all types; this approach recognizes that community resilience depends on not just effective government but a shared culture of preparedness involving citizens, businesses, and institutions, as well as government. FEMA defines "whole community" as follows: "A means by which residents, emergency management practitioners, organizational and community leaders, and government officials can collectively understand and assess the needs of their respective communities and determine the best ways to organize and strengthen their assets, capabilities, and interests" (FEMA 2011a, 3). This underlying "whole community" concept should be familiar to experienced planners already accustomed to an array of public involvement techniques. It borrows heavily from existing ideas and practices concerning stakeholder involvement and buy-in, as well as the use of partnerships between the public and private sectors to better capitalize on community assets and capabilities.

Equally important for planners has been a growing emphasis on integrating disaster management actions into comprehensive planning. This concept was explored in PAS Report 560, *Hazard Mitigation: Integrating Best Practices into Planning* (Schwab 2010). While this comprehensive planning emphasis is remarkably well suited to local hazard mitigation plans, it is also highly applicable to recovery planning. For example, Florida's post-disaster redevelopment plans were designed by statute to be part of local comprehensive plans in that state (although the mandate requiring these plans was repealed in 2011).

Policy Impacts of September 11

It is almost impossible to understand the evolution of federal emergency management policy over the past decade or more without examining the impact of the September 11, 2001, terrorist attacks on the World Trade Center and the Pentagon. Previous terrorist incidents, such as the Oklahoma City bombing in 1995, produced minor tremors in public policy, but the events of September 11 produced an earthquake. Those events led to the creation of the Transportation Security Administration (TSA) and the passage of the Homeland Security Act of 2002. Both TSA and FEMA fell under the new U.S. Department of Homeland Security (DHS). Stepped-up resources for security were largely devoted to counterterrorism initiatives, with a reduced emphasis on natural disasters. This new approach favored an all-hazards approach to federal planning that encompassed both the natural disasters that had been FEMA's primary focus and human-made threats that included terrorism. The horrendous and highly visible effects of Hurricane Katrina caused a shift back to a national policy focus on natural hazards and reignited public debate over priorities. Yet the move to a comprehensive approach was already in motion by then. FEMA and DHS would work to establish an overarching system that would somehow encompass this full range of concerns.

This shift is important to urban planners because only part of this system falls reasonably within their set of professional skills or concerns. Planners had been gradually asserting their roles in planning for both hazard mitigation and post-disaster recovery, while leaving response in the hands of emergency managers and public safety officials. Local planners and emergency managers were interacting more frequently, in part due to their shared influence in local hazard mitigation planning. But planners are not police or investigators, and the new FEMA emphasis on counterterrorism through protection and prevention offered no suitable role for them. Moreover, outside of major central cities, most communities were not potential terrorist targets with resources or infrastructure that would raise questions about balancing security with aesthetics and urban design. For the overwhelming majority of planners, natural hazards posed a far more credible ongoing and daily threat than terrorism.

Early Administrative Directives

Two administrative directives emerging in the post-September 11 era, before Hurricane Katrina, were the National Incident Management System (NIMS) and the National Response Plan (NRP), both released in 2004. NIMS is a uniform nationwide protocol for use by all levels of government during emergencies. NIMS identifies standard Incident Command System processes—including command, operations, planning, logistics, and finance/administration—for uniform application in emergency operations centers throughout the nation by agencies seeking to receive federal emergency management funds. The purpose of the NRP—like its predecessor, the Federal Response Plan (FRP), adopted in 1992—was to more effectively coordinate response actions horizontally between federal departments and vertically with state counterparts.

The NRP added security issues that were not there before September 11 and expanded a system of 12 emergency support functions (ESFs) under the earlier FRP to 15, add-

PPD-8 FIVE MISSION AREAS OF NATIONAL PREPAREDNESS

Preparedness: "the actions taken to plan, organize, equip, train, and exercise to build and sustain the capabilities necessary to prevent, protect against, mitigate the effects of, respond to, and recover from those threats that pose the greatest risk to the security of the Nation" (U.S. Department of Homeland Security 2011b).

1. **Prevention:** *"those capabilities necessary to avoid, prevent, or stop a threatened or actual act of terrorism."*
2. **Protection:** *"those capabilities necessary to secure the homeland against acts of terrorism and manmade or natural disasters."*
3. **Mitigation:** *"those capabilities necessary to reduce loss of life and property by lessening the impact of disasters."*
4. **Response:** *"those capabilities necessary to save lives, protect property and the environment, and meet basic human needs after an incident has occurred."*
5. **Recovery:** *"those capabilities necessary to assist communities affected by an incident to recover effectively" (FEMA 2014).*

Note that "Preparedness" is described as a precursor to all actions needed to successfully carry out the five mission areas under its umbrella. For a more common definition of preparedness, which emphasizes actions taken to soften immediate impacts of a disaster, together with the distinction between preparedness and mitigation, see "Components of Disaster Management" (p. 43).

ing most notably ESF-14, Long-Term Community Recovery Planning. ESF-14 built upon a history of federal experimentation with such assistance to communities dating to 1997, when FEMA provided planning assistance to Arkadelphia, Arkansas, and subsequently to a series of small towns devastated by tornadoes. This ultimately led to FEMA helping five Florida counties with recovery plans after four hurricanes crisscrossed that state in the fall of 2004.

The NRP put the new administrative directives to the test. It essentially formalized the ESF program just in time for Hurricanes Katrina and Rita to test it in the months that followed. The result was a series of local plans for twenty Louisiana parishes and three Mississippi counties. Almost all these plans, which have tended to function as lists of desired local projects during the recovery phase, have been made available online. However, ESF-14 was an odd element of the NRP because it was not really an emergency support function. Instead it served more long-term purposes and its timing tended to be out of sync with other ESFs by not starting immediately. During this post-Katrina era, FEMA was busy developing target capability lists with the help of numerous experts nationwide.

Passage of the Post-Katrina Emergency Management Reform Act (2006) clarified the need for coordinated federal-state-local recovery strategies. It directed FEMA to work with other departments in developing recovery strategies, which resulted in adoption of the National Disaster Housing Strategy in 2009 and the National Disaster Recovery Framework in 2011. This cross-connection between legislative and administrative policy was highlighted by the fact that the Post-Katrina Emergency Management Reform Act amended the Stafford Act to explicitly include direct references to NIMS and the NRP, including its Catastrophic Incident Annex which offered new direction for catastrophic events.

The NRP was replaced in 2008 by an updated version called the National Response Framework. The framework also included a recovery annex, Emergency Support Function #14, Long-Term Recovery (note the term "planning" was removed). Early in the Obama administration, however, the White House assigned both HUD and DHS/FEMA to co-chair an interdepartmental effort to craft the National Disaster Recovery Framework, which ultimately was released in September 2011 and replaced ESF-14 of the 2008 framework. Meanwhile, work was proceeding on a National Mitigation Framework, as well as two other frameworks dealing with prevention and protection.

Presidential Preparedness Directive

Against that backdrop, President Barack Obama issued the

Presidential Policy Directive 8: National Preparedness in March 2011. Its intent was to serve as the administrative policy umbrella under which DHS would develop a National Preparedness Goal, which was issued in September 2011 and was followed by the National Preparedness System in November 2011. From these developments, it was clear that preparedness had emerged as a focus for DHS and FEMA efforts in addressing all types of disaster threats.

This represents a shift from viewing preparedness as action taken before an event to minimize the immediate impacts to a much broader concept of preparedness. Under the new system, the term "preparedness" encompasses five mission areas containing the range of activities needed to achieve resilience: Prevention, Protection, Mitigation, Response, and Recovery (see "PPD-8 Five Mission Areas of National Preparedness").

In the National Preparedness Goal, planning is regarded as one of three core capabilities common to all five mission areas. What that means in practice may still be determined over time, but it signals an increasing federal commitment to planning in the context of national disaster preparedness. To accomplish that shift in perspective and practice, DHS and FEMA developed a series of framework documents, one for each mission area. Issuance of some of these framework documents preceded PPD-8, while others followed. All these concepts have been evolving largely through discussions within federal agencies, particularly DHS.

National Disaster Recovery Framework

Of the five frameworks under the National Preparedness System, the two most applicable to the work of planners are the National Mitigation Framework and the National Disaster Recovery Framework. Planners are at least generally familiar with the concepts and techniques of hazard mitigation, explored more fully in *Hazard Mitigation: Integrating Best Practices into Planning* (Schwab 2010).

The National Mitigation Framework redefines mitigation as a more inclusive process, encompassing preparedness, response, and recovery activities as well as hazard mitigation. Although it also includes the "whole community" concept as context, this definition blurs distinctions between mitigation and the more common definition of preparedness outlined in Chapter 3, and it obscures the linkage between hazard mitigation with the built environment (U.S. Department of Homeland Security 2013).

The National Disaster Recovery Framework, however, outlines some new concepts and procedures that merit special attention here. It establishes a system for federal assistance in recovery planning that is somewhat analogous to the older National Response Framework. This framework and its predecessors offer a menu of designated emergency support functions, such as Communications; Mass Care, Emergency Assistance, Housing and Human Services; Public Health and Medical Services; and Communications. A lead agency is designated for each function and supported by other agencies providing assistance. The National Disaster Recovery Framework set up a parallel system of six Recovery Support Functions (RSFs) to help expedite recovery in the affected disaster areas: Community Planning and Capacity Building; Economic, Health and Social Services; Housing Recovery; Infrastructure Systems; and Natural and Cultural Resources (FEMA 2011b).

Much like the National Response Framework, the National Disaster Recovery Framework establishes for presidentially declared disasters a pyramid of local, state, federal, and tribal disaster recovery coordinators in the joint field offices. For RSF-1, Community Planning and Capacity Building, DHS and FEMA have been assigned responsibility. This is the single function most likely to engage local planners, although all RSFs have some relevance. The nature of relationships with local officials in connection with particular functions may vary depending on the structure of local government, which often can be quite different between villages and cities within the same disaster area. Some of those issues, as they relate to questions of local resilience, were explored in Chapter 2.

The larger point is that recovery, as a mission area, has taken on a much clearer and more prominent role than in the past. As with any new initiative at any level of government, it may take some time and experience to learn how best to operationalize many of the concepts behind the National Disaster Recovery Framework. Despite extensive consultations with experts and local and state officials in drafting the framework, it is highly unlikely that FEMA and DHS have anticipated all the operational issues that may arise in the field under various scenarios. What can be said is that the framework was able to draw upon much more sophisticated theories of the recovery process than might have been possible before, and it warrants further study over time. Figure 4.1 illustrates how the framework envisions its activities relating to sequential phases of the recovery process under each mission area.

The National Disaster Recovery Framework also lays out nine principles intended to establish the operational philosophy behind the system. Two of those are of particular interest to planners: (1) Pre-Disaster Planning and (2) Resilience and Sustainability. The emphasis on pre-disaster planning to establish a viable system for managing post-disaster recovery

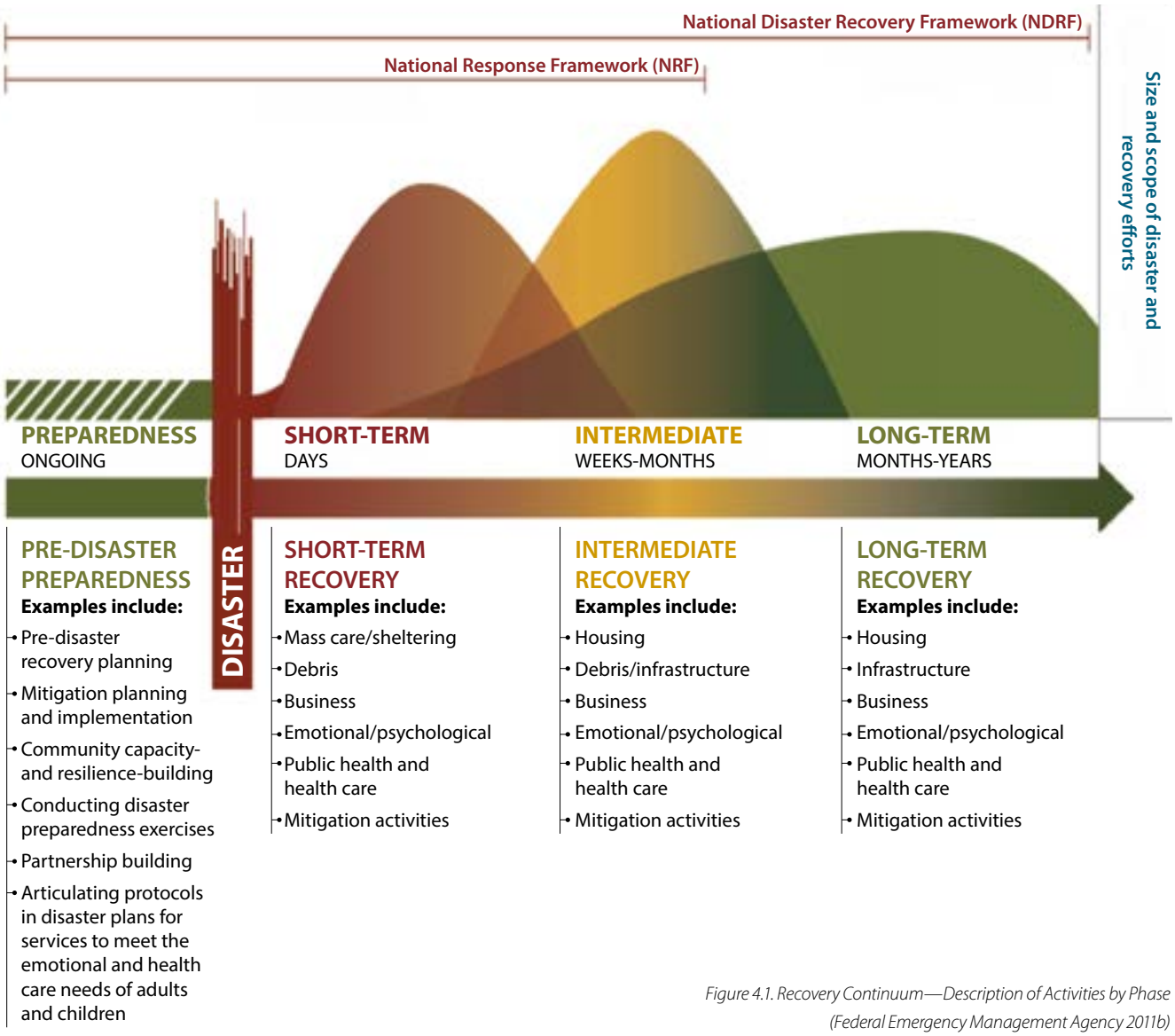

Figure 4.1. Recovery Continuum—Description of Activities by Phase (Federal Emergency Management Agency 2011b)

is relatively new in the federal context and indicates a shift toward greater awareness of the benefits of considering such issues prior to an event. The framework distinguishes what can be achieved through pre-disaster planning from what must await the post-disaster context for consideration.

Another evolution of the federal vision for recovery involves the identification of varying levels of assistance and related coordinating structures for catastrophic disasters. One key problem—clearly illustrated in the handling of Hurricane Katrina—was the need for a clear differentiation between large, more typical disasters and those that are truly catastrophic in scale and impacts. Catastrophic disasters, including the extensive levee failures in New Orleans, place far greater demands on all levels of government than is the case in more typical, localized disasters. As compared to more predictable disasters, these catastrophic events have a tendency also to result in far more widespread questioning of previous assumptions and norms. "Understanding the Scale and Spectrum of Damages" (p. 51) in Chapter 3 examines some of the related planning issues and why scale matters in

gauging recovery planning needs.

CAVEAT FOR PLANNERS

Many planners assume it is the sole job of their local emergency manager to understand how the federal disaster management system functions. However, planners who take the time to understand the federal-state system behind disaster declarations can be invaluable assets to their communities during crises. That recovery knowledge can greatly expedite access to many planning and redevelopment resources a community may need for long-term recovery. Planners who know ahead of time what to expect and what to do when a disaster strikes are far better positioned to assist the community in a faster, more complete recovery than those who are unaware of this system and must learn on the job after a crisis has occurred.

It is no secret among those who have worked in disaster recovery that, for planners who are inexperienced in this area, recovery planning may be an activity fraught with unmet expectations; friction between citizens and local officials; and tensions between local, state, and federal officials. Planning capabilities vary widely among states and communities due to local history, fiscal capacity, political will, and culture. No national framework is going to resolve those inevitable difficulties. Any system will face some unrealistic demands and resistance to new ideas that may benefit public safety. It is also critical that the people in charge locally be capable planners, emergency managers, allied professionals, and community leaders. Recovery planning demands patience and a steady vision as well as a willingness to engage meaningfully with the public.

What is possible, however, is for local planners and local officials to prepare themselves adequately for the tasks that lie ahead, no matter how likely they think a disaster may be. Planners must think through the capabilities of normal planning routines in coping with the abnormal circumstances that a community may face following a major or catastrophic disaster. That alone is reason enough to gain a basic understanding of the evolving federal disaster laws and systems in order to make the recovery process more effective and beneficial.

CONCLUSION

While most planners in the U.S. are not well versed in disaster law, the value of such knowledge is increasingly important. The overall legal framework can be categorized into three main areas:

- Those laws administered by the FEMA, primarily centered around the National Flood Insurance Act and subsequent amendments; the Stafford Act and its subsequent amendments, notably including the Disaster Mitigation Act of 2000; and some aspects of the Homeland Security Act of 2003.
- Those administered by other agencies, mostly involving specific disaster recovery assistance programs under agencies such as HUD, the Economic Development Administration, and the Small Business Administration.
- Administrative directives within the U.S. Department of Homeland Security or FEMA or emanating directly from the White House.

In the latter case, administrative policy has evolved very noticeably in the past two decades, particularly under the impacts of the September 11, 2001, terrorist attacks, which tilted policy heavily toward addressing national security issues, and Hurricane Katrina, whose impacts on the Gulf Coast pushed the policy emphasis back in the direction of addressing natural disasters. The end result has been PPD-8, the White House policy directive that has established the National Preparedness Goal with five underlying frameworks. Two of those are of particular importance for planners: the National Disaster Recovery Framework and the National Mitigation Framework.

Ultimately, it is not just the job of the local emergency manager to understand and appreciate this legal and administrative framework for disaster management. Planners who study and understand it can be important assets to their community after a disaster and will be better prepared to play a meaningful role in leading their community out of the chaos to produce positive results in the recovery process.

CHAPTER 5

LONG-TERM RECOVERY PLANNING: GOALS AND POLICIES

Long-term recovery planning is an opportunity to improve a community's quality of life and disaster resiliency. It has the potential to inspire communities to set goals beyond restoration of the status quo. The fundamental purpose of planning for disaster recovery is to improve the quality and efficiency of a community's recovery beyond an ad hoc approach.

In addition to this basic premise of planning, however, there are other motivations for local governments or community organizations to invest time in developing a recovery or redevelopment plan before or after a disaster occurs. From a practical viewpoint, a local recovery plan provides a means to request resources in a coordinated manner as well as a demonstration of the capability to maintain local control. Local consensus on recovery goals and priorities can be essential in expediting assistance from state, federal, and other nonlocal sources. A local recovery planning process can also provide opportunity for public input that may improve the quality and perceived equality of recovery. Through planning, a community's stakeholders can determine their vision for the community after recovery, identify obstacles and opportunities they may encounter in reaching that future, and measure their progress in achieving recovery as they have defined it.

Ideally, local governments will begin the recovery planning process pre-disaster by laying out a framework of goals and policies that will guide their decisions after a disaster. Through this preparation, they will be better able to maximize the efficiency of the recovery timeframe without sacrificing quality. For those who are proactively identifying recovery goals prior to a disaster event, this chapter provides a starting point for determining the policy content of plans. For a community dealing with disaster recovery without the luxury of a pre-disaster plan, the topics in this chapter are designed to help it quickly center in on potential policy areas of concern in order to set goals early in the process and to minimize delays and missed opportunities. While a broad overview of issues pertinent to disaster recovery and redevelopment are addressed in this chapter, it is important to remember that each disaster event is different and communities vary in their institutional capacities, public values, and strengths and vulnerabilities. The role of planners is to serve

DEVELOP AND COMMUNICATE COMMON GOALS TO GUIDE RECOVERY

"Defining common recovery goals can enhance collaboration by helping stakeholders overcome differences in missions and cultures. After the Grand Forks/Red River flood, federally-funded consultants convened various stakeholders to develop recovery goals and priorities for the city of Grand Forks. The city used these goals as a basis to create a detailed recovery action plan that helped it to implement its recovery goals" (U.S. Government Accountability Office 2009, para. 2). Specifically, the plan identified five broad recovery goals covering areas such as housing community redevelopment, business redevelopment, and infrastructure rehabilitation. The plan detailed a number of supporting objectives and tasks to be implemented in order to achieve the stated goals. Additionally, the plan identified a target completion date for each task.

as subject matter experts and to facilitate participatory discussions of these issues in order to identify those topics that are most relevant to the community. Planners then can develop a flexible policy framework that can adapt to dynamic post-disaster environments.

A universal goal for recovery plans is to increase the speed of the recovery, particularly as it relates to the restoration of essential services and a general sense of normalcy. Regardless of other reasons to develop a plan for long-term recovery, the first goal will always be to regain a sense of normalcy as soon as possible. The speed of recovery is essential to the reopening of many businesses, the amount of population loss the community might experience, and the psychological well-being of residents. Acknowledging the need for speed, however, does not mean that communities should not also acknowledge the downfalls of rapid restoration in situations where redevelopment needs to be carefully considered for its long-term repercussions on the quality of life.

This leads to a second overarching goal of the recovery plan—effective use of resources. The recovery plan will assist in using local resources, such as staff and community expertise, to their fullest by providing implementation organization as well as a guiding policy framework. In most major disasters, local resources will be greatly supplemented by an influx of state, federal, and private disaster assistance. The challenge is to effectively use these outside assistance programs even though much of the regulations may be unfamiliar to the staff of local governments and nongovernmental organizations. The first edition of *Planning for Post-Disaster Recovery and Reconstruction* (Schwab et al. 1998) pointed out that to effectively use disaster assistance a community should not think only of funding from the Federal Emergency Management Agency (FEMA) and disaster-specific sources but should look at bigger community goals beyond the disaster situation. The National Disaster Recovery Framework also embraces the idea of effectively using various sources of assistance and the expanded organization of the agencies associated with the framework's recovery support functions should assist in better coordination of resources less traditionally used for disasters. Planners can use their knowledge of community development resources outside of the disaster realm to develop recovery projects and to effectively leverage traditional disaster assistance programs while simultaneously addressing long-standing community goals during recovery.

Finally, the overarching goal of the long-term recovery plan is to increase the opportunity for community betterment—ideally to have a community to emerge from a disaster as a more resilient and sustainable place as the result of recovery programs. Depending on the community and the disaster impacts sustained, this goal could focus on physical resiliency, such as rebuilding housing to new building codes that minimize future disaster-related damages or relocating structures from hazardous areas. But this goal could also identify other aspects of whole community recovery, such as seeking out sustainable industries as part of economic recovery initiatives or assisting community organizations to increase the resilience of vulnerable populations. This is where the capability to leverage resources creatively, local knowledge of community issues, and the ability to take time to plan an alternative to status quo restoration plans combine to create an ideal recovery project.

The speed of recovery, effective use of resources, and community betterment are universal goals that will in most cases form the foundation of more community-specific recovery goals, whether a community creates its recovery plan pre- or post-disaster. In addition to a basic set of principal goals, a community's recovery framework will also need specific goals or objectives related to policies for restoration or redevelopment after a disaster, such as ensuring adequate long-term housing or supporting small business resumption. The following sections discuss common policy areas of concern for communities recovering from a natural disaster that should assist them in developing community-specific sets of goals or objectives for their plans.

POLICY AREAS OF LONG-TERM RECOVERY PLANNING

Long-term recovery planning is similar to comprehensive planning in the breadth of topics that must be addressed, such as land use, infrastructure, and housing. This is especially the case if the disaster is of a scale that requires major redevelopment. However, instead of setting goals and policies for 10 to 20 years of incremental community development, the recovery plan is intended to restore and redevelop the community in a compressed timeframe from a few years to ideally no more than 10 years. Many different aspects of a community may have to be simultaneously restored or redeveloped since each is dependent upon the other. For instance, goals to restore the local economy are dependent on simultaneous efforts, including restoring infrastructure, rebuilding housing, and reopening public schools. And what if the entire region is affected? What if the local economy was already on a downward trend? The level and scale of damage as well as existing community factors can increase the complexity

and interconnectedness of recovery efforts. Doug Ahlers, a member of New Orleans mayor Ray Nagin's Bring New Orleans Back Commission, colorfully recalled how paralyzing it was to face such an array of problems: "The first few months, all we were doing was turning over rocks and seeing what creepy-crawly things were under them," he said. "As we looked into each issue, all we found were complex problems. They were all interrelated; each solution was dependent on other problems we were trying to solve simultaneously. It was like trying to untie a Gordian Knot" (Wooten 2012).

The recovery plan and those implementing it, however, cannot address all aspects of community recovery at once without splitting up the work into manageable policy areas (Figure 5.1). A recovery project may extend across several policy areas, however, and developing and implementing that project may require a great deal of interdisciplinary collaboration between different local government departments and community organizations as well as regional, state, and federal agencies. While a community does not need to use the policy area categories included in Figure 5.1, these areas do mirror those used to create the Recovery Support Functions in the National Disaster Recovery Framework (see Chapter 4) and are similar to policy areas used in other planning efforts such as the *Unified New Orleans Plan* and Florida's post-disaster redevelopment plans. In addition, these policy areas are most likely similar to those used in many communities' everyday comprehensive planning processes, which could assist in integrating redevelopment policies into the comprehensive plan.

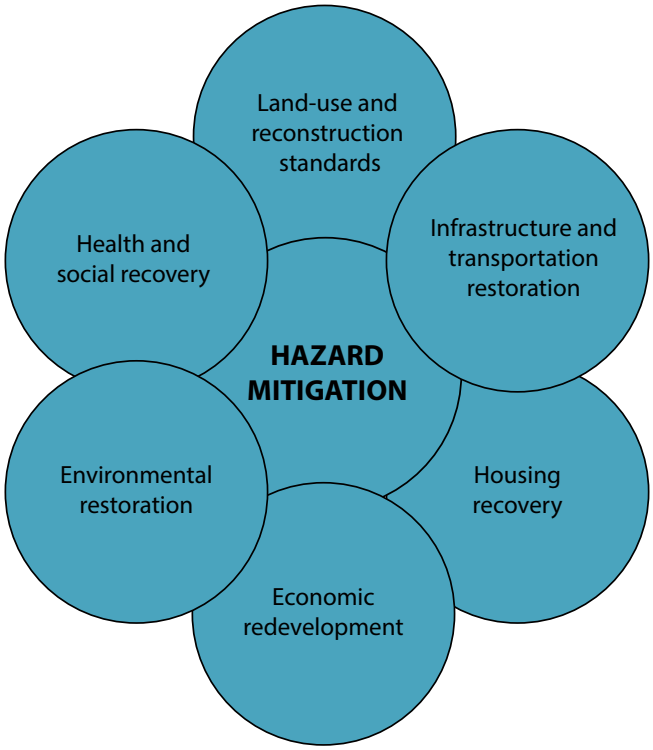

Figure 5.1. Policy areas to consider in developing a recovery plan (Allison Boyd)

Opportunities for Post-Disaster Hazard Mitigation

Including hazard mitigation projects in recovery is fundamental to achieving a disaster-resilient community. The recovery process should improve a community's ability to recover from future disasters, or a major opportunity has been missed. As discussed in Chapter 4, the post-disaster period provides a significant influx of funding sources that can be used for hazard mitigation purposes, particularly the Hazard Mitigation Grant Program and the improved or alternate project options under the Public Assistance program. In addition, the so-called "window of opportunity" is open after a disaster for widespread public interest in hazard mitigation efforts, but only for so long. As Schwab et al. (1998, 18) notes, "One of the realities of post-disaster recovery is that public support for mitigation can dissolve easily if achieving it entails serious delays in restoring normal civic and economic activity." Because including hazard mitigation in recovery projects will in most cases require additional time for planning, communities who have developed recovery plans before a disaster will have an advantage in seizing opportunities for hazard mitigation during reconstruction. Communities with local hazard mitigation plans that have examined post-disaster opportunities for mitigation will also reap benefits.

There are a number of ways hazard mitigation can be included in disaster recovery, and goals for hazard mitigation should be integrated within each of the policy areas of a plan. The following discussion presents examples of post-disaster hazard mitigation opportunities.

Incorporating mitigation in post-disaster modifications to building and land development codes. After a disaster, lessons learned can be applied to modifications to local codes. The classic example of this is the increase in building wind-mitigation standards initiated in South Florida after Hurricane Andrew. Changes to mitigation regulations may also be initiated outside of the community based on the disaster impacts. For instance, Hurricane Katrina prompted FEMA to reassess its flood maps for the Gulf Coast region and recommend use of advisory base flood elevations that it

developed quickly after the disaster.

Encouraging private or voluntary structural mitigation during repair and rebuilding. FEMA policy is to encourage hazard mitigation after a disaster, and agency staff will often provide workshops or informational booths for public outreach. For instance, after the 2010 flooding in Nashville, Tennessee, FEMA specialists set up shop at a local Lowe's Home Improvement store for a week to provide advice to residents repairing their homes. Local governments and nongovernmental organizations also typically encourage hazard mitigation during rebuilding through public awareness activities. Programs to offer incentives or technical assistance in obtaining funding for mitigation upgrades could also be initiated locally after a disaster.

Upgrading mitigation structures as part of post-disaster repairs. Often older mitigation or protection structures—such as sea walls or levees—are damaged during a disaster event. The opportunity to increase the level of risk protection of these structures is rarely overlooked when efforts to repair or rebuild the structures commence. A prime example of this is the work to improve the levee and pumping systems in New Orleans after Hurricane Katrina.

Using land acquisition or transfer of development rights programs or changing land use and zoning to relocate development out of areas severely damaged. For hazards that are location-specific, such as floods, removing development from the hazard area is the most effective form of hazard mitigation. Land acquisition is typically the tool chosen for this type of hazard mitigation to avoid property rights issues and because there are post-disaster funding sources available. The Greater Grand Forks Greenway is an example where buyouts of properties flooded by the Red River in 1997 resulted in the creation of a riverfront greenway that greatly reduced the vulnerability of Grand Forks, North Dakota, and East Grand Forks, Minnesota. It also provides recreational amenities that are a highlight of the area today.

Including mitigation in infrastructure repairs or relocating destroyed infrastructure. Rapid post-disaster restoration of infrastructure is critical to the recovery timeline. However, Public Assistance funding can provide an opportunity for hazard mitigation if conditions warrant. In Florida, damages from Hurricane Ivan to the downtown Pensacola wastewater facility—located only about 300 yards from Pensacola Bay—prompted the Emerald Coast Utilities Authority to leverage post-disaster funds to replace the facility. The new advanced wastewater treatment facility is on an inland site more than 50 feet above sea level and constructed to withstand Category 5 hurricane force winds (Emerald Coast Utility Authority 2012).

Restoring natural environmental functions that provide protection from hazards. Restoring natural mitigation features is a very valuable post-disaster opportunity. Efforts to restore wetlands, floodways, and beach and dune systems after a flood or hurricane are most common. It is also common to pair environmental restoration with projects to relocate substantially damaged structures.

LAND-USE AND RECONSTRUCTION STANDARDS

Addressing land-use and reconstruction/redevelopment standards in a plan can almost certainly be the most controversial component of the recovery planning process, but it can also be the most substantial in working toward a goal of community betterment. Including land-use policies in the recovery plan can provide a community with opportunities to change previous development decisions that may no longer be desired, accomplish predefined visions for the future in a shorter timeframe, and increase the community's sustainability and disaster resilience.

The degree to which land-use changes can be made after a disaster is highly dependent on the type and scale of disaster damages incurred, in addition to public and political willingness. When only restoration-type recovery actions are required (i.e., a majority of structures are repairable), not much opportunity exists for wholesale land-use improvements. However, this may be an opportunity to affect the timing and quality of repairs. In a restoration scenario, the most efficient recovery process will involve policies for repair and permitting processes developed pre-disaster. In a redevelopment scenario in which there is substantial damage or total destruction of structures, there are opportunities for altering land use, although it is not a "clean slate" since compensation for property rights limit large-scale changes. For hazards with known geographic-specific risks, such as flooding, intentions for post-disaster redevelopment of high-risk areas can be developed pre-disaster; however, they would need to be a flexible strategies that could be adjusted based on the actual impacts of a disaster event. In most cases, specific redevelopment plans will need to be developed after a disaster. The following discussion describes various land-use policy considerations planners should take into account during reconstruction.

Timing of Reconstruction

A number of factors will have a great impact on the speed of reconstruction, including comprehensive plan policies,

POST-DISASTER REDEVELOPMENT PLANNING IN HILLSBOROUGH COUNTY, FLORIDA

Kirstin Kuenzi

Hillsborough County, Florida, offers an excellent example of the use of a post-disaster redevelopment plan (PDRP) to develop forward-looking policies for addressing changes during a recovery period. Home to more than one million residents, the county has grown three-fold in the past 10 years and is now the fourth-most populated county in Florida. In 1999 the Federal Emergency Management Agency (FEMA) introduced Hillsborough County to Project Impact, which—though short-lived—assisted vulnerable communities in building up their disaster resistance. In 2006 another FEMA-sponsored program known as the Florida Catastrophic Planning Initiative involved the development of a catastrophic plan for the Tampa Bay area focused on response during an event and subsequent recovery.

The Florida Department of Community Affairs, the Division of Emergency Management, and the Department of Environmental Protection sponsored the Post-Disaster Redevelopment Planning initiative, funded by grants from the National Oceanic and Atmospheric Administration and FEMA. A wide array of community stakeholders assisted in the plan's development, including community members, local nonprofits, business representatives, city and county representatives, and regional organizations. The Hillsborough PDRP now serves as a model for other counties developing similar plans.

Hillsborough's PDRP takes a long-term approach to the development and maintenance of planning efforts. Hillsborough County facilitated stakeholder meetings for the first six months of the plan's development and held six supplemental public meetings in different locations in the county. In order to accommodate ongoing needs and threats to the community, the plan was written to allow for annual updating.

More information is available at the following websites:

Hillsborough County Post-Disaster Redevelopment Plan
Available at www.hillsboroughcounty.org/index.aspx?nid=1795.

Post-Disaster Redevelopment Planning: A Guide for Florida Communities
Available at www.floridadisaster.org/recovery/documents/Post%20Disaster%20Redevelopment%20Planning%20Guidebook%20Lo.pdf.

Comprehensive Plan for Unincorporated Hillsborough County Florida: Coastal Management Element
Available at www.planhillsborough.org/coastal-management-element/.

zoning regulations, land development codes, emergency ordinances adopted after the disaster, permitting processes, and post-disaster staffing capacities. For a recovery plan developed pre-disaster or an assessment of needs shortly after a disaster, a number of questions could be posed to the local planning and building departments, including:

- Do building and land development regulations address post-disaster rebuilding?
- How will permitting processes stand up to post-disaster pressures?
- Is there a temporary building moratorium ordinance prepared?
- Will rebuilding be allowed in areas or prohibited in other areas?
- Are value thresholds established for rehabilitation versus reconstruction?
- Has a value been established for public acquisition of private property?

These issues are addressed in the model recovery ordinance in Appendix A, and they are best addressed before a disaster occurs. If a community does not have policies regarding the timing of reconstruction in place prior to a disaster, then addressing these issues through emergency ordinances immediately after the disaster is crucial. Temporary building moratoria, especially those that take into consideration the degree of damage and phasing of reconstruction, are necessary to allow time for the mobilization of resources to process repair permits and for planning redevelopment of severely damaged areas.

Post-disaster actions such as streamlining permitting processes, waiving fees, and setting up one-stop permitting centers are great ways to speed up recovery. However, local staffing capabilities, the speed of debris removal and infrastructure restoration, and the timing of individuals' insurance payouts may still be limiting factors in how fast a community rebuilds. In developing policies for the timing of

reconstruction, other issues to consider are the availability of skilled contractors and building materials. In many Florida communities after the 2004 hurricanes, particularly those that were hit by Hurricane Frances followed by Hurricane Jeanne 20 days later, repairs were delayed for months while residents waited for additional building supplies to reach the region and for contractors to wade through the backlog. While there may not be any good solution to these problems, acknowledging challenges to a speedy reconstruction process in a community's policy development will help prioritize actions and avoid overly high expectations of recovery speed from the public.

Quality of Reconstruction

A major contribution to the resiliency of a community is *how* structures are reconstructed post-disaster. Post-disaster reconstruction is the single largest opportunity to bring existing vulnerable structures up to current or new safety codes. Questions to consider include:

- What are the thresholds of damage in the community that require compliance with current codes and ordinances (e.g., substantial damage is defined by the National Flood Insurance Program as damage repair costs that exceed 50 percent of the structure's market value)?
- What aspects of code compliance are required for set thresholds (e.g., flood mitigation ordinance elevation requirements or seismic building retrofits)?
- Are there nonessential requirements that are waived after a natural disaster (e.g., are architectural standards or nonconforming uses covered by a "grandfather" clause)?

In addition to the above considerations, the quality of reconstruction can also be affected by the objectivity and the rigor of the process in determining substantial damage and code enforcement. Post-disaster code compliance can be very costly for victims of the disaster who are trying to rebuild, and determinations of damage can be contested. Insured property owners may have increased cost-of-compliance clauses that will cover some to all of the additional rebuilding costs to bring the structure up to current codes. Standard flood insurance policies include up to $30,000 for meeting flood mitigation requirements in special flood hazard areas (FEMA 2012). Public understanding of build-back requirements, insurance coverage, and disaster assistance programs is limited in all but the most hazard-prone communities and could be another issue communities should consider in policy development. The quality of reconstruction can also be affected by the quality of contractors and skilled construction workers after a disaster. Public awareness programs to assist homeowners in understanding the need to hire licensed and insured contractors are now common in many states and regions.

Redevelopment Patterns

The most common occurrence of post-disaster changes in land use is voluntary buyouts of repetitive flood-loss properties that occur property by property. Using post-disaster funding, the flood-damaged property is purchased at the pre-flood fair market value, the structure is removed, and the land is held in conservation thereafter. Depending on the willingness of property owners and patterns of damage, there may or may not be a contiguous area of development removed, and often the infrastructure that served the neighborhood is still required for those who remain and rebuild. Opportunities to alter development patterns on a larger scale are rarer but can happen when damage to a neighborhood or community is severe enough that structures and infrastructure are not easily repaired, and a public redevelopment or visioning process is initiated after the disaster. For instance, the Village of Gays Mills in Wisconsin had 50 percent of its homes inundated by the Kickapoo River in 2008. As part of an Emergency Support Function #14—Long-Term Community Recovery (LTCR) process, the village's long-range planning committee, with LTCR team assistance, held charrettes where citizens evaluated four alternatives for relocating part of the village. The four alternatives included no action, levee, partial relocation, and total relocation (FEMA 2011a).

Questions to consider in determining policies for shaping redevelopment patterns after a disaster include:

- Should areas be prioritized to focus redevelopment (e.g., economic activity centers or other areas where development is already encouraged or incentivized)?
- What goals from the comprehensive plan or other master plan/visioning documents can be addressed through the recovery (e.g., areas targeted for increased mixed use or transit-oriented development)?
- Is neighborhood preservation a goal for any of the affected areas?

Creating priority areas for redevelopment can be accomplished both pre-disaster and post-disaster. New Orleans created 17 targeted recovery zones in March 2007 to act as catalysts for private investment in areas identified for rebuilding,

redevelopment, and renewal (Marszalek 2007). Hillsborough County, Florida, included a priority-redevelopment-areas concept as a central component in its countywide post-disaster redevelopment plan, drafted in preparation for future disasters (Hillsborough County 2010). The county's concept rests on its ability to pre-identify areas that are consistent with county and city comprehensive plans, transportation investment plans, and existing economic incentive zones that will (1) become priorities for post-disaster recovery resources and early restoration of services and (2) serve as staging areas for restoring the surrounding community. The idea is that this will decrease uncertainty for investors during the early recovery timeframe and direct post-disaster resources into areas that are less vulnerable or key to economic recovery of the region.

Preserving established neighborhoods and neighborhood character is an essential issue to include in policies that could affect post-disaster land-use patterns. While a disaster can bring opportunities for reducing vulnerabilities and improving areas of the community, many residents will want their neighborhood to be rebuilt much the same to preserve social networks or property value expectations. Extensive post-disaster public involvement should be included in policies for relocation or redevelopment of any community area. Depending on the severity of the disaster and the degree of evacuation that takes place, redevelopment charettes for certain neighborhoods may need to wait until a satisfactory number of residents have returned or can properly participate through remote methods.

Special Considerations

There are many other planning issues that a community may want to consider as part of its reconstruction standards or land-use goals, depending on local priorities. The following questions may assist communities in thinking of special considerations relevant to them:

- How are historic structures going to be identified during damage assessments, stabilized, and restored if affected by a disaster?
- Should sustainable building practices be encouraged or required in some zones during rebuilding (e.g., LEED certifications)?
- Are there opportunities to incorporate walkability, mixed use, or placemaking goals into redevelopment plans?
- How will post-disaster blight be addressed in a timely manner?

REBUILDING IN NEW ORLEANS: THE "GREEN DOT" MAP EXPERIENCE

Within a few weeks after Hurricane Katrina's landfall, the mayor of New Orleans established a rebuilding commission that presented its blueprint to the public in January 2006. This was little more than four months after the storm and a time when a very small percentage of the city's populace had returned or been able to participate in the planning process. The plan acknowledged the pre-existing issues of blight and population and economic decline; it proposed clustering rebuilding in higher-elevation areas and also consolidating and creating open space clusters in some of the lower-elevation and more heavily damaged areas. It also contained a map that identified "a number of areas, shown by dashed circles, within which there [was] potential for future parkland. The circles [were] large to indicate that [they had] not identified properties; those [were to be] be determined with citizen involvement in a process [to be] described later" (Bring Back New Orleans Commission 2006, 9). The local newspaper converted the plan's open, dashed-line circles into a map with solid green dots showing "approximate areas expected to become parks and green space" (Olshansky and Johnson 2010, 57). This portion of the plan became known as the "green dot" map and was met with considerable suspicion and opposition as the community interpreted the map as showing areas where homes would be demolished and bought out, with the areas converted to permanent open space. The entire planning effort was ultimately abandoned, and subsequent planning efforts avoided publicly using maps while still proposing essentially the same concepts.

DEFINING INFRASTRUCTURE

The definition of infrastructure varies widely from structures and facilities, such as a wastewater treatment plant or dam, to services provided by a broader array of community assets, such as telecommunications networks. The U.S. Department of Homeland Security defines critical infrastructure broadly in order to address preparedness for terrorism attacks: "Critical infrastructure are the assets, systems, and networks, whether physical or virtual, so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, public health or safety, or any combination thereof" (U.S. Department of Homeland Security 2014a).

The Presidential Policy Directive 21 (PPD-21): Critical Infrastructure Security and Resilience addresses 16 critical infrastructure sectors (U.S. Department of Homeland Security 2014a):

1. Chemical
2. Commercial Facilities
3. Communications
4. Critical Manufacturing
5. Dams
6. Defense Industrial Base
7. Emergency Services
8. Energy
9. Financial Services
10. Food and Agriculture
11. Government Facilities
12. Healthcare and Public Health
13. Information Technology
14. Nuclear Reactors, Materials, and Waste
15. Transportation Systems
16. Water and Wastewater Systems

INFRASTRUCTURE AND TRANSPORTATION RESTORATION

Planning for rapid restoration of infrastructure and critical public facilities and services after a disaster is often addressed in response and short-term recovery plans of state and regional agencies, local government, and private utility and infrastructure companies. These emergency response plans most likely address the timeframe in which a stopgap is needed to stabilize the community and may not address plans to repair or rebuild damaged facilities or other long-term considerations relevant to higher-level disasters in which damage is more severe or widespread. Coordination among the many transportation and infrastructure agencies will be a key goal from the initial restoration period through long-term reconstruction phases for any disaster, but this is especially true for those disasters affecting a region.

Infrastructure and Transportation Policy Considerations

Policy considerations around infrastructure and transportation run the gamut from short-term to long-term with implications at the local and regional levels.

Short-Term Restoration Decisions That May Impact Long-Term Community Recovery

There are many aspects to transportation and infrastructure restoration that may impact redevelopment patterns, priorities, or goals. Communities should consider the following questions to start with:

- Are debris sites pre-identified? If not, is there an expedited siting process in place to ensure that environmental and historic resources will not be damaged?
- Is there a plan for separating debris to prevent contamination and to allow reuse or recycling of building material debris?
- Will extended closures of any roads or bridges impair the ability of businesses to recover?
- Will reopening of roads and restoration of utilities to severely damaged areas encourage rebuilding prior to the creation of redevelopment plans for the area?
- Will restoration of public facilities in highly vulnerable areas supersede possible relocation or hazard mitigation improvements?
- Is there any coordination arrangement in place between the power providers and the community for identifying critical facilities to expedite restoration and recovery operations?

Decisions on road and bridge closures and reopenings, debris removal priorities and placement, and provision of infrastructure for temporary housing could have inadvertent consequences for the focusing of private and public investment. There also can be missed opportunities, such as making costly repairs to infrastructure or public facilities that could instead be relocated. There are many potential issues specific to a community to be identified and avoided through pre-disaster planning. Even with the best scenario planning, however, there will be issues that were not predicted. The key to preventing infrastructure restoration decisions that have unintended long-term consequences is for post-disaster decision making to include multi-stakeholder coordination as further discussed in Chapters 6 and 7.

Regional Interdependencies

There are many agencies, private companies, and jurisdictions involved in providing transportation, infrastructure, public facilities, and utility services to a community. Many of the systems are interdependent on others; for instance, water treatment and distribution requires a functioning power system. There are several types of interdependencies: physical linkages, such as the multitude of systems reliant on electric power; cyber linkages (e.g., computerized system controls that rely on telecommunications); geographic linkages (e.g., pipelines located on transportation bridges); and economic and market linkages (Chang 2009). A community is probably reliant on regional infrastructure linkages and assets that, depending on the disaster circumstances, could have been more severely impacted than the community itself.

In 2004 a majority of Florida experienced temporary fuel shortages due to increased use prior to the onslaught of hurricanes that shut down two ports with fuel shipments scheduled to come through. The critical network of transportation and infrastructure could include airports, seaports, bridges, rail lines, trucking routes, pipelines, telecommunications networks, and power plants and stations. These different service providers—ranging from large, multistate corporations to small municipally owned utilities—typically have different areas of service as well. In a large-scale disaster, a community's infrastructure or economic recovery timeframe could be impacted by infrastructure that is outside of its jurisdiction's control. Therefore, policies that support coordination and consider interdependencies are important.

Opportunities to Improve Infrastructure and Transportation Services

Across the U.S., infrastructure is aging and there are very few communities that do not have bridges or utility facilities in need of upgrades. Before major repairs for infrastructure are scheduled after a disaster, communities should consider the opportunity to make improvements. With post-disaster financial assistance and service standards already altered, the period after a disaster may be the best opportunity to make changes. Priorities can be placed on infrastructure improvements that were already included in capital and transportation improvement plans and on hazard mitigation project lists. A community, however, can also identify opportunities it did not consider before the disaster through post-disaster community visioning and redevelopment planning. For instance, the post-disaster window of opportunity and goals for the community under redevelopment might lead to public enthusiasm for including more sustainable options in its stormwater systems or relocating a facility—changes that may have never been considered had the system or facility not been destroyed or severely damaged. As mentioned earlier in this chapter, disasters can present important opportunities to decrease the vulnerability of infrastructure systems and increase the protection levels of mitigation structures. This may also be the time to introduce climate change adaptations, as the lifespan of most infrastructure investments is measured in decades. Questions to consider include:

- Is it cost-effective to repair the damaged infrastructure or should temporary restoration or detour arrangements be made so that the facility or infrastructure component can be replaced?
- Are previously planned infrastructure improvements eligible for Alternate or Improved Project funding under Public Assistance programs or would the benefit-cost ratio be sufficient to qualify for Hazard Mitigation Grant Program funds?
- Are there any damaged public facilities or infrastructure that would be more effective if relocated (e.g., facilities located in a storm surge zone or on a road that the community has always wanted rerouted)?
- Are there modifications that can be made during repairs that would make the infrastructure more resilient to future disasters and climate change (e.g., can stormwater outfalls be modified to adapt to sea level rise)?
- If sustainability is a goal of disaster recovery, can improvements to the transit system or investments in alternative energy be included in infrastructure recovery projects?

- Are there opportunities to include or improve multimodal facilities when repairing roadways (e.g. bike lanes, wider sidewalks, and transit stops)?

Post-Disaster Changes in Service Demands or Locations

Population decreases and/or changes in land-use patterns after a major disaster could impact transportation, utilities, and public facility usage. Changes in post-disaster community conditions need to be analyzed so that infrastructure is rebuilt as necessary to meet population changes. A decreased revenue base could pose serious financial issues for utilities who have long-term loans on infrastructure that did not meet full life expectancy. For instance, a study after Hurricane Katrina estimated the effect of decreased revenue base on wastewater utilities in the Gulf Coast to be approximately $163 million while the cost to repair and rebuild wastewater utilities was estimated at $1.2 billion (Black & Veatch Corporation 2006). The authors concluded that although the utilities did not believe they would default on bonds, there would be a need for support beyond typical disaster assistance to cover operating costs, debt service, and maintenance and capital expenditures (Water Environment Federation 2006). There are also issues of changes in transportation nodes and demand that could occur after a disaster due to relocation of neighborhoods or businesses either temporarily or permanently. Questions to consider include:

- If population decreases post-disaster, will fee rates or services—such as utilities, garbage collection, and transit—need to be modified?
- Will a decreased revenue base increase risk of default on debt service obligations of utilities or local governments providing infrastructure services?
- Can temporary relocation sites of residents and businesses be handled with current transportation and transit networks and infrastructure systems?
- Will permanent changes to development patterns require additional investment in modifying transportation and infrastructure systems?

HOUSING RECOVERY

Providing emergency sheltering and safe temporary housing is commonly the first recovery priority after a disaster. It is therefore not a coincidence that shelter and housing are some of the most examined aspects of post-disaster recovery planning. Particularly since Hurricane Katrina, attention has been focused on developing more efficient processes for providing housing options after catastrophic disasters and for ensuring that low-income families are able to transition back to permanent housing. FEMA's (2009) *National Disaster Housing Strategy* provides an overview of principles and practices for sheltering, interim housing, and permanent housing recovery that builds on the lessons learned from Hurricane Katrina. The U.S. Department of Housing and Urban Development has released a series of new guidance documents, *Pre-Disaster Planning for Permanent Housing Recovery*, that focuses on the steps required to plan for building replacement single-family homes after a disaster (Cantrell et al. 2012). Florida's Division of Emergency Management has been working to advance its state-level disaster housing recovery planning and has actively encouraged each county to also develop a plan by preparing a county plan template and training curriculum. A model plan in the state is the *Disaster Housing Plan* of Broward County (2010).

While much attention has historically been paid to the short-term recovery aspects of sheltering and temporary housing, returning citizens to permanent housing underpins the success of whole community disaster recovery. There are obvious connections between housing recovery and transportation and infrastructure restoration and economic recovery. Homes cannot be permanently inhabited or rebuilt if critical infrastructure is lacking, and some residents may choose to relocate if they no longer have jobs in the area. Likewise, a lack of certainty regarding housing recovery could affect business resumption. There is also a large overlap in land-use and reconstruction policy and housing recovery. Many residents will have the means to temporarily house themselves and repair or rebuild their home with limited government assistance, but they will need clear and early guidance from local government on the process and methods they can use. Uncertainty in reconstruction standards can cause serious delays in people transitioning back into permanent housing.

Finally, efforts should be made to ensure that housing is healthy for residents, whether it is refurbished or new. In addition to the immediate health concerns of dampness, mold, and structural integrity that could result from disaster, long-term health should also be taken into consideration. These include ensuring accessibility to and within homes for older adults and people with disabilities, good air circulation within homes, and low risk of lead or other dangerous pollutants that can have significant health impacts, especially for children.

Communities should consider adopting universal design standards that address the needs of aging residents and those

with mobility impairments while also benefitting people of all ages. Strict inspections of repaired and newly built homes should not only ensure structural stability but assess the operability of windows and the soundness of heating, ventilating, and air conditioning systems to make sure clean air circulates well throughout the home. Health department representatives and housing inspectors should test for lead, particularly in older homes. Builders and homeowners should use low-volatile-organic-compound paints and other building materials to reduce toxicity within the home. Finally, efforts should be made to ensure homes are free from pests, including cockroaches, mice, and other vermin that carry disease and are linked to chronic health conditions such as asthma, especially in children.

Housing Policy Considerations

In a post-disaster situation, planners must consider both the short- and long-term housing needs of affected populations.

Temporary or Interim Housing

In disaster situations where enough people are displaced to require housing beyond emergency sheltering, the various methods for meeting this need and the best options will depend on the community's existing housing characteristics and the disaster damage. Where neighborhoods are not destroyed and infrastructure can be quickly restored to the area, providing temporary housing options as near to displaced households as possible is important to foster social and economic stability early in the recovery. In determining a temporary housing siting and provision policy, a community may want to address the following:

- Are there provisions in zoning, land development code, or emergency ordinances that specify allowances for onsite placement of temporary housing (e.g., mobile homes)? If not, can neighborhoods be rapidly delineated, in correlation with building moratoria after the disaster, so onsite placement of temporary housing will be allowed?
- Has the community developed siting, size, and design criteria for group disaster housing? If so, are wrap-around disaster services and transportation linkages with business centers, schools, and other community assets addressed? (Wrap-around services include the delivery of infrastructure and additional social services to affected residents living on temporary housing sites that go beyond just the physical need for housing.)
- Will employers be allowed to provide onsite temporary housing to employees if they are interested in offering this service?

NATIONAL DISASTER HOUSING STRATEGY

The Post-Katrina Emergency Management Reform Act called for a National Disaster Housing Strategy. FEMA developed the strategy drawing on best practices and lessons learned related to sheltering, interim housing, and permanent housing. The strategy is meant to guide improvements in providing a broader array of housing options to meet the human needs of disaster victims beyond simply providing structures. The following goals guide the many agencies and organizations involved in addressing disaster housing needs (FEMA 2009, 4–5):

1. Support individuals, households, and communities in returning to self-sufficiency as quickly as possible.
2. Affirm and fulfill fundamental disaster housing responsibilities and roles.
3. Increase our collective understanding and ability to meet the needs of disaster victims and affected communities.
4. Build capabilities to provide a broad range of flexible housing options, including sheltering, interim housing, and permanent housing.
5. Better integrate disaster housing assistance with related community support services and long-term recovery efforts.
6. Improve disaster housing planning to better recover from disasters, including catastrophic events.

- Have persons with access and functional needs and other special-needs populations been considered in the temporary housing options?
- Are there opportunities to use available, undamaged housing? (Virginia, for example, along with a number of other states, have a Housing Locator system provided through the contractor SocialServe. This system will maximize use of existing public and private housing resources in and around the affected area.)
- If hotels and short-term rental housing are being considered as an option for meeting temporary housing demand, will this conflict with the need to house disaster workers?

As with most post-disaster recovery, well-coordinated, flexible implementation in addition to pre-disaster policies will yield the most successful results. To avoid unintended long-term consequences of temporary housing siting, planners should work closely with emergency managers.

Transitioning to Permanent, Affordable Housing

The National Disaster Housing Strategy points out that while smaller-scale disaster housing needs may be met through sheltering and interim housing options, large-scale catastrophic disaster events will also require long-term reconstruction and rehabilitation (FEMA 2009). Plans for assisting residents in regaining permanent housing in these large-scale disasters are critical. Because the timeframe for temporary or interim housing usage is going to be much longer for a catastrophic disaster, the location of temporary housing placement and its consistency with zoning and policies for removal of temporary housing are important in determining the future land use of the community. A U.S. Government Accountability Office (2009) report found that households living in FEMA group sites encountered various challenges in transitioning to permanent housing, including the availability of affordable rental housing. Other challenges that were cited included insufficient financing to fund home repairs, significantly higher insurance premiums, and need for full-time employment to support a return to permanent housing. The following are questions a community should consider to assist residents in transitioning back to permanent, affordable housing:

- Are there provisions in the zoning, land development code, or emergency ordinances that specify sunset or removal timeframes for onsite temporary housing?
- Are there policies about who decides when a group temporary housing site should be closed?
- Are there provisions for designing group temporary housing sites in a way that would allow for the sites to become permanent housing developments (e.g., Katrina cottages or pre-platted subdivisions)?
- Are there any agencies or organizations that will be handling case management to assist residents in finding adequate permanent housing?
- Are there programs to assist homeowners in navigating insurance, FEMA assistance, and permitting required to rebuild their homes (e.g., one-stop centers)?
- Is the proportion of housing types being built post-disaster matching post-disaster demographic needs? Can incentives be created for developers and nonprofit organizations to provide affordable replacement housing?
- Are there opportunities to create programs to place low-income households in available, existing homes (e.g., bank-owned foreclosures bought and provided as affordable rental housing for an extended period of time)?
- Is affordable replacement housing being located in workforce-friendly areas (e.g., near employment centers and transit options)?

ECONOMIC REDEVELOPMENT

The return of jobs, tourism, and other indicators of economic health are interwined with housing recovery, infrastructure restoration, and health and social service provision. Economic recovery is a complex policy area that is not easily developed through traditional government action, and it requires participation from the private sector. An increasing number of local governments have started including the private sector in emergency operations through an emergency support function (ESF) for business and industry. This ESF is common in Florida counties and is being advanced through specific planning for economic recovery. For example, Seminole County, Florida, recently developed a post-disaster economic redevelopment plan that expanded upon its business and industry ESF by also considering the business community in long-term recovery. Collaboration with the private sector during recovery provides an opportunity for mutual benefits for the government and private sectors.

Economic Policy Considerations

Sustainable and resilient economic recovery planning should focus not only on the rebuilding of damaged structures but also issues like the resumption of business activity and retention of the local workforce. Pre-disaster

MAIN SOURCES OF FEDERAL DISASTER HOUSING ASSISTANCE TO HOUSEHOLDS

A variety of programs through several federal agencies provide post-disaster housing assistance.

Federal Emergency Management Agency

Individual Assistance Programs are based on limited eligibility and provide limited financial assistance for (1) temporary housing to rent a different place to live or a government-provided housing unit when rental properties are not available, (2) repairs to help homeowners address disaster damage to their primary residences that is not covered by insurance, (3) replacement costs for homeowners to replace homes destroyed that are not covered by insurance, or (4) permanent housing construction.

U.S. Department of Housing and Urban Development

The U.S. Department of Housing and Urban Development (HUD) has a national network of 4,000 Public Housing Agencies (PHAs) that provide 1.2 million units of subsidized housing and approximately 2 million housing vouchers to low-income families. Through this network, additional federal funds can be applied so that PHAs can assist disaster-affected families. HUD's National Housing Locator is a website that can assist individuals and families in finding rental housing in a presidentially declared or local disaster area. Through lenders approved by the Federal Housing Administration (FHA), HUD offers insured mortgages for disaster victims to rebuild substantially damaged or destroyed homes or to rehabilitate less-damaged homes. The FHA also may provide homeownership opportunities through discounted home sales programs. Access to HUD-assisted housing counseling agencies is also available.

U.S. Small Business Administration

Through its Office of Disaster Assistance, the U.S. Small Business Administration provides low-interest, long-term loans to homeowners, renters, and businesses following a disaster (FEMA 2009).

recovery planning can help a community prevent a secondary economic disaster that could happen if a permanent employer relocation or shutdown occurs, major supply changes are disrupted, or other chain reactions occur in the business community, causing a major and possibly enduring disruption in the local and regional economies.

Business Resumption

Three variables generally determine whether a business will reopen after a disaster: (1) the ability to recover assets lost in the disaster, (2) the extent of adverse effects to business dependencies (e.g., suppliers, customers, and employees), and (3) the ability to adapt quickly and appropriately to new realities in a post-disaster environment (Alesch, Arendt, and Holly 2008). Even those businesses that do not receive direct damages may suffer extensive disruption from service outages or materials flow (Tierney 1995). Large companies within the community may already be prepared with continuity plans or have resources to ride out business interruptions or losses resulting from the disaster. Small businesses, however, are more likely to never reopen after a disaster or fail shortly after reopening. According to Mileti (1999), the strongest predictor of disaster preparedness among businesses is size, followed by previous disaster experience and owning rather than leasing business property. The following questions provide ideas for policies to combat issues that delay or prevent business resumption:

- Does the community have in place procedures for two-way communications with local business and industry in preparation for and during recovery after a disaster (e.g., an ESF for Business and Industry to allow government to distribute information about response and recovery operations to the business community while also hearing from businesses about what the government can offer to the recovery operations and what business need from it)?
- Does the community have procedures in place for credentialing of business owners or continuity managers to allow early reentry to disaster-stricken areas to assess damage?
- Are there opportunities to provide one-stop centers for business recovery (e.g., the centers could provide information on financial assistance, business counseling, streamlined permitting, and relocation assistance)?
- Are there programs to encourage business continuity planning, particularly for small businesses?
- Do opportunities exist to augment assistance to small businesses after the disaster?

DISASTER FUNDING FOR BUSINESSES

Federal funding for providing post-disaster economic assistance to businesses is a small portion of the total disaster assistance typically allocated. In fiscal years 2008 and 2009, only 4 percent of federal disaster appropriations went to provide post-disaster business assistance, including the Small Business Administration's Disaster Recovery Fund, the Economic Development Administration, and the U.S. Department of Agriculture's Rural Development Disaster Assistance Fund. After the 2008 Cedar Rapids, Iowa, flooding, area businesses took on an excess of $120 million of additional debt load while their revenues decreased more than 40 percent due to the disaster (Ridgeway 2010).

- Can temporary business sites be provided or can codes be modified to allow for temporary business structure placement in certain zones?
- Can government or private-sector partners assist with business relocation (temporary or permanent) if structures are damaged?

Workforce Retention

Hand in hand with business resumption is the issue of workforce retention. However, it is also closely tied to housing restoration. Workers cannot stay in a community if they cannot live in it. In order to ensure the workforce remains a valuable asset to the community or region after a disaster, local government should work with the private sector to assess and track company and job losses, assist displaced workers, and understand the availability of skilled workers to meet employment demands after a disaster. Changes in demographics after the disaster as well as the emergence of disaster-related work could result in a mismatch between available skills and available jobs. The following are some potential issues to consider:

- Is the reopening of schools and daycare programs occurring fast enough to enable the population to return to work?
- Are there regulatory obstacles for employers to provide disaster support services to their employees to assist them in returning to work (e.g., an allowance of onsite, employer-supplied temporary housing)?
- Are job losses being tracked and can case management services be offered to displaced workers?
- Is preference to local unemployed residents being given in temporary disaster work?
- Are local employers communicating with the recovery team about employee losses and skill sets needed?
- Can training programs be offered for skill sets needed to fill disaster-related jobs and jobs at companies with large employee losses?
- Can incentives be offered to companies considering relocation in order to keep jobs in the community?
- Can incentives be offered to attract new businesses that meet the existing workforce skill sets?

Advancing Sustainable Economic Development Goals

The post-disaster "window of opportunity" may provide an excellent time to assess economic development strategies, target industries, and incentive programs for their roles in supporting community resiliency and sustainability. Redevelopment planning and visioning exercises that are undertaken after the disaster may provide public input on economic recovery goals that can either complement pre-disaster "blue skies" economic development strategies or advance new goals.

The best example of this is the economic redevelopment initiated by Greensburg, Kansas, after a tornado devastated approximately 90 percent of the town. The small, rural community saw the disaster recovery as an opportunity to redefine itself as a sustainable hub for business, as reflected in the tag line "Rebuilding Stronger, Better, Greener." The community's vision not only included rebuilding sustainable, energy-efficient buildings, of which many are LEED-platinum buildings (Greensburg 2011), but also attracting green-energy industry. The local John Deere dealership became a wind turbine distributor, a U.S. solar company and a building products company from Germany both are vigorously pursuing financing for offices and manufacturing plants in Greensburg, and another company is planning to build an additional wind farm 10 miles outside of town (National Renewable Energy Laboratory 2012). The Greensburg success story is just an example of how goals to build back better can be translated to economic success. Not every community needs to adopt a green redevelopment goal, but taking the opportunity to examine and possibly refocus economic strategies could

result in new opportunities for the community.

Image, Rebranding, and Tourism

In communities dependent on tourism, a disaster can cause a large decline in the local economy. Even if the recovery of tourism-related amenities is relatively rapid, the public perception of the area as a tourist destination may not return as quickly. The media spotlight tends to leave once recovery begins and the lingering public image of a disaster-stricken community is likely not going to attract visitors and investors. Developing a marketing and branding strategy is a key component of economic disaster recovery in most affected urban areas. Depending on the major economic sectors of a community, the strategy may be focused on tourism renewal or on attracting new businesses or workforce talent to replace those that did not return after the disaster. The post-disaster branding strategy can incorporate and accelerate existing pre-disaster economic, workforce, and tourism development strategies. For instance, Cedar Rapids, Iowa, had completed a downtown redevelopment plan shortly before the record flood of 2008 devastated its downtown business district. Utilizing the public and private sector funds that were given to the community to recover from the flood, the city was able to redevelop its convention center to a state-of-the-art facility and to attract hotels, restaurants, and other attractions to the downtown area.

ENVIRONMENTAL RESTORATION

Environmental restoration is often not a high-priority goal after a natural disaster due to the more immediate needs of housing disaster survivors and restoring critical infrastructure. Degraded ecosystem services, though, can impact the health, economy, quality of life, and hazard protection levels of the recovering community. In addition, the natural environment may not only be affected by the disaster but also by disaster response and recovery operations, if precautions are not included in recovery planning. While environmental restoration may not be an immediate priority, dealing with post-disaster contamination and using recovery funds to acquire new conservation properties for habitat restoration will strengthen a community's recovery plan if a disaster affects the community's natural assets.

Environmental Policy Considerations

Communities should also consider the range of damaging environmental consequences that arise after a disaster as well as the opportunities to restore and develop habitats and open spaces.

Contamination and Post-Disaster Pollution

After Hurricane Katrina and the failure of the levee system, approximately 80 percent of New Orleans' land area was flooded. Within these floodwaters were several chemical plants, petroleum refining facilities, and contaminated sites, including Superfund sites; hundreds of commercial establishments, such as service stations, pest control businesses, and dry cleaners; metal-contaminated soils typical of old urban areas and construction lumber preserved with creosote, pentachlorophenol, and arsenic; biological wastes from both human and animal sources; household hazardous chemicals; and the fuel and motor oil in approximately 400,000 flooded automobiles (Reible et al. 2006). The contamination levels from the "toxic gumbo" were surprisingly lower than feared in the water pumped back into Lake Pontchartrain and soil contaminants in the city were similar to pre-disaster conditions except in isolated locations (Reible 2007). The concern, however, for public health related to the contamination did result in widespread water and soil sampling and lessons learned for dealing with such post-disaster contamination situations. For instance, Reible (2007) notes that the question of whether reconstruction should include cleanup of pre-disaster contamination may become a policy issue in other disaster-stricken communities. Other policy questions to ask involving post-disaster contamination or pollution include the following:

- What are the environmental review needs for temporary staging, debris, and housing sites?
- What post-disaster pollution monitoring programs are necessary for public health and ecological concerns (e.g., the monitoring of water systems, sewers, wastewater systems, local air quality, and soils—particularly near schools, daycare facilities, playgrounds, and in areas with agriculture?)
- What are the needs related to hazardous materials remediation programs and liability?
- What is the public perception of contamination monitoring and remediation programs?

Habitat Restoration

Natural lands and aquatic areas are intricately linked with some communities' identities, and they may also provide natural functions that the community needs, such as hazard mitigation or economic services. A disaster can jeopar-

dize fragile ecosystems and the species that depend on them. Generally, ecosystems are able to recover on their own from natural disasters. For instance, many vegetative species have adapted to wildfires as human impacts on the environment have altered this natural system. Over many decades, fire suppression has been so effective that the accumulation of vegetative fuels has resulted in massive wildfires that are not part of the habitat's natural fire regime. Programs to protect, reestablish, and restore critical habitats are important to the recovery of recreation, ecotourism, and environmental education as well as hazard protection in some environments. Some of the following questions are adapted from a Congressional Research Service Report for Congress on Hurricane Katrina's impact on biological resources, here applied to a broader range of hazard impacts and habitats (Sheikh 2005):

- What has been the impact of the disaster on endangered and threatened species populations and their habitats?
- Will coastal and inland ecosystems be more susceptible to invasive species?
- What is the impact on urban forests?
- For a coastal community, what is the extent of beach, dune, and coastal wetland loss in the region? Is this loss permanent or temporary? How will this loss alter the buffering capacity against future hurricanes? Can coastal beach systems and wetlands be restored?
- If aquatic habitats were disrupted, what are the long-term ecological and economic consequences for fisheries and can they be restored?
- In the event of a windstorm, how much is wildfire risk increased by dead and damaged trees?
- In the event of a wildfire, will flooding and erosion be an issue in restoring destroyed forested slopes?
- If hazardous materials were released, will toxic substances leach into the groundwater? Where and how much leaching may occur, and how long will it take to remediate?
- If hazardous materials were released, will there be bioaccumulation of toxic substances through the food chain? How long will it take for substances to accumulate in aquatic or terrestrial wildlife?

New Parks and Conservation Properties

Many communities have found the post-disaster window of opportunity to be an ideal time to create new parks or conservation areas. These parks may be created for a number of post-disaster reasons in addition to the everyday desires to conserve habitat or create recreational opportunities, including hazard mitigation (e.g., the Greater Grand Forks Greenway in Grand Forks, North Dakota, and East Grand Forks, Minnesota), commemorative monument (e.g., National September 11 Memorial & Museum in Washington, D.C.), scientific research (e.g., Mount St. Helens in Washington State), and economic and tourism stimulation (e.g., Canyon Lake Gorge in Comal County, Texas) (Ibes 2008). Post-disaster funding sources for land acquisition of damaged or repetitive-loss properties is often a motivating factor for creation of parks. The following are some potential considerations for developing policies for the creation of post-disaster park and conservation properties:

- If planning is pre-disaster, can criteria be created to be used after a disaster to quickly prioritize possible land-acquisition projects (e.g., degree of hazard vulnerability, habitat quality, restoration and management costs, and connection with other conservation properties)?
- How will post-disaster acquisitions be used to mitigate future disasters, and how will they be developed for conservation or recreation purposes?
- Can small-lot acquisitions be assembled to create a better recreational or conservation facility?
- Who will manage scattered single-lot acquisitions held in conservation?
- How can post-disaster recovery planning improve access to parks, particularly for poor and underserved populations?

HEALTH AND SOCIAL RECOVERY

A key determinant of successful community recovery is the level of social vulnerability that exists and the extent to which health and social services are effectively provided. Cutter and Emrich (2006) define social vulnerability as the susceptibility of social groups to the impacts of hazards as well as their resiliency or ability to adequately recover from them. They explain that this susceptibility is more than demographic characteristics, such as age and wealth, but also access to health care, lifelines, and social capital. Social recovery functions are largely addressed by nongovernmental organizations—such as faith-based organizations, neighborhood groups, and other volunteer associations—which often have more capacity to respond after a disaster than local governmental social-service agencies. Public health recovery efforts are usually managed by a combination of government agencies and semi-public, private-sector, and nongovernmental agencies. The variety

and number of players involved in addressing health and social welfare after a disaster makes having agreed-upon local goals and policies a critical point of coordination.

Public Health During Recovery

Major disasters result in numerous public health issues—from addressing immediate life and safety concerns to ensuring that long-term reconstruction provides safe and healthy living conditions. Planning for public health during recovery is a large and complex topic that can only be touched upon in this overview of recovery issues. Short-term public health issues are interrelated with infrastructure restoration in many cases (e.g., interruptions to potable water and sewage treatment), and can also include issues such as infectious or vector-borne diseases and the health and safety of disaster workers. Another major short-term issue is the restoration of hospitals and clinics and the provision of mental health support services. Longer-term public health issues may deal with housing conditions, environmental justice, and restoration of safety standards. For instance, a public health challenge encountered after Hurricane Katrina was the inspection of all the food service establishments, including commercial suppliers and institutional settings, to ensure food preparation conditions met health standards (National Research Council 2007).

Public health impacts from post-disaster pollutants is a major issue and is often connected with the quality of temporary or reconstructed homes or the process of repairing and rebuilding damaged homes. Recovery from Hurricane Katrina is again a prime example of these health concerns. In New Orleans, the hot, damp conditions inside flooded homes after the city was dewatered caused heavy mold growth that led to a high concentration of indoor pollutants, in some cases ten times as much as in outdoor flood-contaminated areas (Ashley, Valsaraj, and Thibodeaux 2009). Housing quality and levels of mold in private homes proved to be particularly difficult to address because these issues were not assigned to any particular agency (National Research Council 2007).

In addition to direct pollution, another profound public health concern occurs when disaster impacts are not equally distributed among the different subpopulations in the community, creating environmental injustices, as was the case in post-Katrina New Orleans. This requires special attention in areas and for populations that may be dealing with long-term social challenges—such as poverty, racism, a lack of opportunity, and a high burden of chronic diseases—thus making disaster recovery all the more difficult. However, as with each topic here, the disaster also provides an opportunity for community betterment and health improvement.

When planning for longer-term recovery and improved public health, communities should consider ways to promote social cohesion, improve opportunities for physical activity and access to healthy foods, and increase safety and security for all segments of the community. These objectives should result in improved quality of life and increased resilience for the community's most vulnerable populations.

As a community begins to consider the public health implications of disaster recovery, here are a few questions to consider:

- Are there continuity plans for area hospitals, clinics, nursing and assisted living homes, and other critical healthcare facilities? Are there plans for personnel retention in the case of a catastrophic disaster?
- Is there adequate capacity for an extended period of post-disaster mental health assistance?
- Is there a process or are there criteria for prioritization of post-disaster health risks and a method for public communication of these priorities?
- Are indoor pollutants an issue and is special attention being given to schools and healthcare facilities because of the vulnerable populations who use those buildings?
- Do plans for post-disaster monitoring of external pollutants address environmental justice and vulnerable populations?

Reopening Schools and Childcare Programs

The Joplin, Missouri, school superintendent, C.J. Huff, announced just three days after a tornado destroyed four schools in May 2011 that the school district would be ready to start the fall session in August as planned. The school district managed to accomplish this feat and help the community return to a sense of normalcy. Childcare is also a major issue after a disaster. The City of Grand Forks, North Dakota, listed in its recovery lessons the importance of providing childcare services so that people can return to work and normal routines. With a grant from United Way, the city's park district set up free daycare throughout the community staffed by childcare workers from facilities that had not reopened yet (Grand Forks 2011).

As result of Superstorm Sandy, FEMA established a new Disaster Assistance for Childcare recovery policy that allows eligible individuals to receive financial assistance for childcare services for up to eight cumulative weeks. A study of the effect of Hurricane Katrina on children found that overall trauma symptoms had decreased after two to three years among chil-

dren who had been in heavily damaged New Orleans school districts. The children's resilience was found to be a result of rebuilt schools (e.g., St. Bernard Parish reopened within two and a half months) and supportive relationships, including those of classmates when they returned to school (Society for Research in Child Development 2010). Reopening of schools and childcare can be a symbol of the community returning to normalcy and can provide important social interactions to assist children in recovering mentally from the disaster.

Increased and Extended Social Service Provision

It has been widely recognized that disasters do not completely change pre-disaster conditions, but simply magnify existing trends (Alesch et al. 2001; Comerio 1998; Haas et al. 1977; Spangle 1991). The special needs and socioeconomically vulnerable populations in the community may possibly grow in size and need more assistance after a disaster than they did prior to the event. The capacity of local organizations to provide increased services for an extended period of time during recovery will need to be assessed. An influx of nongovernmental organizations and individual volunteers may relieve some needs but the duration of this influx may be short-lived compared to the long-term needs of certain populations. Special attention may need to be given to providing long-term assistance to special needs and low-income individuals and services to families, children, and the homeless.

Quality of Life and Healthy, Safe Communities

Quality-of-life factors encompass a breadth of topics that vary widely in every community. Restoration or, in some cases, creation of a safe environment that affords opportunities for recreation, access to nutritious foods, and other community amenities—such as cultural activities—provides residents with a sense of well-being and desire to live in the community. Such features, which also include high-quality health care, social support services, and a well-functioning school system, are imperative in helping a community return to a sense of normalcy and rebuild social networks. This will also attract back to the community those who did not return immediately after the disaster, as well as beckon potential new residents who will contribute to economic development.

In addition to restoring pre-disaster amenities, the community should encourage health and safety goals in the reconstruction process because reconstruction can be the impetus for the design of active living communities where people walk more and drive less (National Research Council 2007). Part of the "build back better" mantra that many communities adopt after a disaster should apply not only to the built environment or economic recovery but also to the quality of life and livability of the community. There are many resources on building walkable communities and designing with safety and security in mind that can be used in post-disaster planning. In improving the quality of life and health and safety of the community post-disaster, planners should also consider equity and ensure that the distribution of recovered community services, such as grocery stores and recreation opportunities, is accessible by all in the community.

Some basic principles to consider for post disaster planning include policies, actions, and funding to improve the following:

- Active living: creating opportunities for recreation, active transportation, and improved safety for pedestrians and cyclists of all ages and people with disabilities
- Healthy eating: ensuring all residents have access to culturally appropriate, nutritious food and clean drinking water
- Environmental exposures: monitoring indoor and outdoor air quality, surface water bodies, and brownfields
- Health and human services: providing reliable access to healthcare and other social services, especially for vulnerable populations
- Social cohesion and mental health: guaranteeing public safety, quality housing, and access to green and open space and reducing noise near sensitive land uses

CONCLUSION

Woven throughout each chapter is resilience. Resilience is best attained by communities being proactive and pre-planning for disaster. It requires the integration of ideas across the functional areas of concern. This chapter has focused on key policy areas that all communities need to consider in developing their long-term recovery plan and the need to frame the long-term recovery planning within the context of an overall vision for the community. The policy areas outlined in this chapter—such as housing, land use and reconstruction, environmental restoration, and economic redevelopment—provide a starting point for communities to consider. An effective plan requires that all key stakeholder groups collaborate and communicate regarding the wide range of policy issues specific to the community in order to reach consensus on the best way forward. The process for moving forward is addressed in the next chapter on long-term recovery planning.

CHAPTER 6

LONG-TERM RECOVERY PLANNING: THE PROCESS OF PLANNING

This chapter focuses on the process of recovery planning. It first defines an overall framework for the process with key steps and stages involved. It then explores some of the benefits and challenges in undertaking recovery planning both before and after disaster strikes, along with successful approaches. Lastly, it addresses some crucial aspects of the recovery planning process that deserve special attention: leadership and collaboration, public input, and the importance of "visioning" as part of planning.

THE RECOVERY PLANNING PROCESS

By and large, a recovery planning process follows the typical structure of most community planning initiatives. Figure 6.1 (p. 94) provides a simple chronological outline of the steps to be taken in initiating and completing a disaster recovery planning effort. However, the actual work flow may not be as linear as presented, especially when the process is initiated following a disaster. Steps can be, and may need to be, performed simultaneously. They might also be expanded and their order varied, depending upon the type of recovery plan and contents to be emphasized. Chapters 2 and 5 describe the types of recovery plans and recovery goals.

Initiating the Process

All planning begins with a decision that a need exists for shaping and constructing recommended future policies and actions. For disaster recovery planning, there are few regulatory triggers for such decisions before or after an event. Instead, recovery planning has largely been a function performed by communities affected by significantly damaging disasters. It has also been undertaken, in far fewer instances, by communities that faced significant and imminent threats. With the addition of Emergency Support Function #14—Long-Term Community Recovery Planning in the 2004 update of the National Response Plan (FEMA 2008) as well as state-led recovery planning efforts such as that of Florida (Florida 2010a), more such recovery planning decisions and process initiations have been occurring with much greater frequency in recent years. This trend is likely to continue as further policy development and planning occur in response to the National Disaster Recovery Framework (FEMA 2011b).

A decision to plan should never be made or undertaken alone. Recovery planning, like all planning processes, should be a highly participatory process from the outset, involving key representatives of local government and agencies with disaster recovery responsibilities as well as a wide spectrum of community representatives. The first participatory action taken should be to form a local planning task force to guide the plan development. Before organizing a new committee, a community should look to see if there is an existing organization or committee that has an appropriate composition and focus, or that could be supplemented or its charge modified slightly, to accommodate the needs of the recovery planning process. For example, Gay Mills, Wisconsin, adapted the mission of its long-range planning committee to also include providing leadership for its community recovery planning process after floods inundated over half of the city's housing in June 2008 (FEMA 2011b).

With the task force in place, one local government agency or official should be officially designated to lead the process. This could be the planning department, which is often charged with managing such processes, but it could also be the mayor or city manager's office, or the community development, redevelopment, or emergency management department. What is most important is that this agency or official have the credibility, skills, and time necessary to effectively lead the effort. The 2011 National Disaster Recovery Framework calls for the formal designation of a local disaster recovery manager ahead of disaster, with responsibility for planning, organizing, coordinating, and advancing the recovery at the local level (FEMA 2011b). While these positions often interact with the emergency management community, the Federal Emergency Management Agency (FEMA) states it is

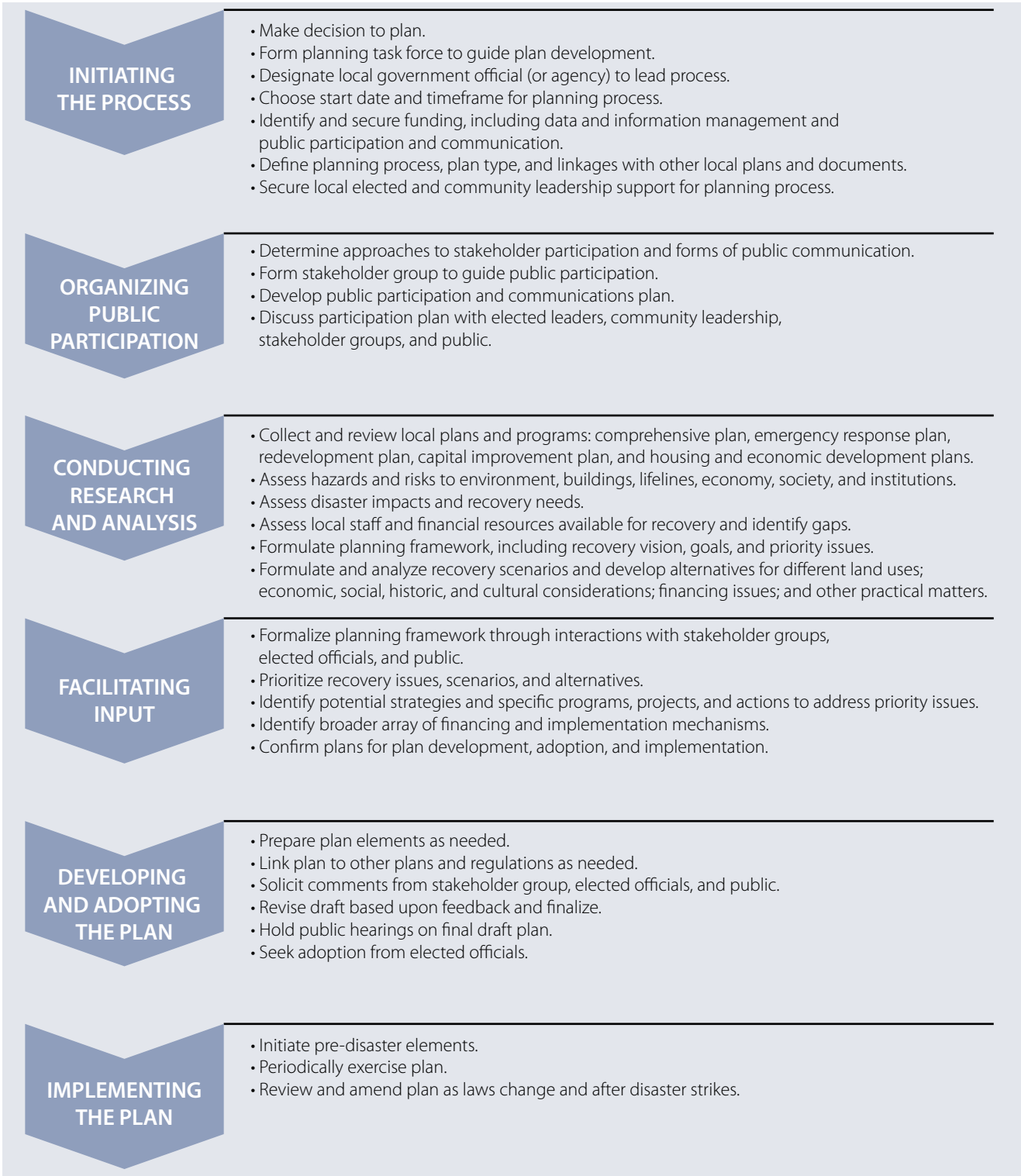

Figure 6.1. Typical steps in the recovery planning process (Laurie Johnson)

not necessary that these individuals be emergency management professionals but that they should have experience and skills that include a strong basis in community development, good knowledge of the community's demographics, and the ability to represent and speak on behalf of their respective chief executives and elected officials.

There are several critical elements to consider in designing a recovery planning process, the first of which is timing. Determining when to start and the length of the planning process are major concerns, especially post-disaster. Post-disaster planning processes compete with the pressures to restore normalcy and return to pre-disaster conditions as quickly as possible (Haas, Kates, and Bowden 1977). When the timing is right, planning can help lead the community's emotional recovery. But, if the timing is wrong, it can be seen as a distraction and inappropriate given that large parts of the community are displaced, still clearing out debris, and just getting by day to day.

Decisions about the planning timeframe are often inextricably tied to the choices to be made about the plan's format, the core elements and focus of the recovery planning, the process design, and the plan's integration with other local plans and documents. Will the plan be predominantly focused on the physical, social, and economic recovery of the community? Will it look at the tasks of managing the process of recovery and the city's capacity for handling important recovery-related tasks, such as issuing building permits, repairing infrastructure, and undertaking redevelopment activities? Will the recovery plan be prepared as a standalone document, an element of the community's comprehensive plan, or an annex to the emergency operations plan, or in another format?

Two of the most common pre-disaster recovery planning approaches used by local governments are a standalone plan and an element of the community's comprehensive plan. The most effective choice is likely to be preparation of a standalone plan, as it "can be easier to revise, has more technical sophistication, is less demanding of coordination, and is simpler to implement" (Berke and Campanella 2006, 194). However, an integrated plan or a plan which has elements integrated into other plans, such as the comprehensive plan or emergency operations plan, can bring more resources together for implementation, broaden the understanding of the integrative nature of recovery issues with other local issues (e.g., transportation, housing, land use, and environment), and provide access to a wider slate of planning and regulatory tools (Berke and Campanella 2006). A community should take time to consider the results to be achieved, where it wants to end up, and the scope of work. It should also ensure that enough time is built into the planning process to collect and process input and consider proposed policies, programs, projects, and implementation mechanisms.

This is also a good time to think about staffing and the resources needed to successfully complete the plan development process. Besides planners, there needs to be information and data management and mapping specialists to help manage the avalanche of data that will be gathered as part of the planning process as well as to create clear and timely summaries of information and maps throughout the process, especially in communicating with stakeholders and the public. Also, communication and public involvement specialists should be involved to support the planning team and assist with public meeting design and execution as well as official briefings, social media, and web communications. Disaster recovery planning also benefits from having expertise in hazard mitigation and assessment of the long-term recovery needs of disaster-affected communities; domain-specific expertise to supplement staff in areas such as infrastructure repair, economic development, public finance, urban design, and redevelopment; and expertise in government disaster funding, programs, regulations, and requirements. To incorporate vision into the recovery process, even the "largest, most experienced and most-resource-rich communities will likely find that they require additional, outside technical assistance" (Sternberg and Tierney 1998, 30).

Planning also costs money, and disaster recovery planning is no exception. There are costs for staff time, technical expertise, equipment, visual aids and graphics, meeting space, and other logistics. Also, a transparent, participatory process requires funds for outreach and communications to get people involved. For example, the costs for communication, community outreach, and public participation in the Unified New Orleans Plan process following Hurricane Katrina equaled the multimillion dollar costs for citywide and district-level planning technical assistance (Olshansky and Johnson 2010). FEMA and the U.S Department of Housing and Urban Development (HUD) have both been sources of funding and support for post-disaster recovery planning following many federally declared disasters. However, federal funds come with a variety of requirements and may not be distributed to a community quickly enough. Moreover, federal agencies have historically provided limited funds for pre-disaster recovery planning, though that might increase with the institutionalization of the National Disaster Recovery Framework. Community foundations and other philanthropic organizations have also underwritten many recovery planning efforts, especially in communities hit by catastrophic disasters. The business community is also a potential source of funding,

especially since it has so much at stake if its workforce and economic base is displaced by disaster.

Finally, once the planning process has been defined, it needs to be sold to local elected and community leadership to garner support for the planning process. Their support can be critical to advertising the process, encouraging residents to attend meetings, and selling the idea of long-term thinking and planning, especially when there are significant competing demands.

Organizing Public Participation

As all planners know, authentic and energetic participation can be difficult to achieve under everyday conditions; it is even harder when the topic can be perceived as a highly unlikely and negative topic, such as the risk of future disaster, or after a disaster happens and there are many competing demands for people's time. However, the wide dissemination of information and attainment of community consensus for rebuilding have long been recognized as two important factors that increase the speed of reconstruction (Haas, Kates, and Bowden 1977).

Forming and involving a stakeholder group to help design and guide public participation can help bring in an invaluable set of local and diverse perspectives. This stakeholder group is not the same as the local planning task force, but rather it should comprise individuals who represent the "face of the community"—different neighborhoods, key community organizations and affiliations, major age cohorts and income groups in the community, and others who are knowledgeable about different local communication networks, both formal and informal. This group should be tasked with determining the most appropriate approaches to planning, public participation, and public communication. Planning communications experts should also be involved as necessary. Communities should consider developing a separate document that outlines the public participation and communications strategy for the planning process. Working with the stakeholder group, this strategy should be presented to and reviewed with elected leaders, community leadership, and the public before it is finalized.

Conducting Research and Analysis

Regardless of when planning is initiated, pre- or post-disaster, disaster recovery is a comprehensive, big-picture kind of effort, and so must be the scope of the data collection, research, and analysis efforts. Recovery affects the physical stock of a community; the environment; businesses and the economy; social, cultural, and household well-being; and the institutions responsible for governing and service provision. Thus, recovery planning research should focus on creating a baseline view of the community across all these dimensions, characterizing what existed before the disaster and how it will likely change or has changed as a result of the disaster. Lessons learned from recent comprehensive planning initiatives can inform such work. The purpose of this effort is to identify priority issues to be addressed in the plan.

It is critical that a cross section of stakeholders within the organization are fully engaged in the data collection effort and sitting at the table. In the short- and long-term, this provides better information. It also will generate higher-quality options and alternatives for the community to evaluate. Furthermore, internal buy-in is as critical as external buy-in. Because it may be 10 to 15 years before implementation is complete, building a culture of commitment will support the plan's long-term efficiency and survival. The complex nature of disaster preparedness and recovery requires extensive technical assistance in order to generate good long-term solutions.

This work is likely to involve document collection and review, interviews, field surveys, and geographic information systems (GIS) data integration and mapping. It should include a review of local plans and programs—such as the comprehensive plan, the emergency response plan, neighborhood and redevelopment plans, the capital improvement plan, the mitigation plan, and housing and economic development plans—to characterize the pre-existing planning and regulatory framework. There should also be an evaluation of the hazards and risks to the environment, buildings, lifelines, economy, society, and institutions—particularly pre-disaster—in order to consider what opportunities might exist to improve the community's resiliency post-disaster. For post-disaster planning, a thorough assessment should be made to document the disaster's impacts and damages across the entire community as well as the resources available for recovery and the potential unmet needs. This planning should definitely include a recovery management assessment of the community's staff capacity and financial resources available for recovery and should identify any gaps. All this information is needed to develop appropriate program and policy responses, and well-documented data on impacts and needs can help reduce disaster politics and issues of equity in the distribution of available resources and funds for recovery.

A synthesis of the research and analysis work can serve as an important work product in the planning process by integrating, in some instances for the first time, a comprehensive picture of the recovery needs with sector-by-sector descriptions of the pre- and post-disaster conditions and needs. The synthesis can be packaged into a proposed plan-

ning framework that outlines the draft vision, goals, and priority issues. Planners should obtain public and stakeholder input on the proposed framework. As a note of caution, not all planning issues have to be fully addressed during this stage of the planning process. The public and stakeholder groups can also help to identify the high-priority issues to be addressed first in the next stages of the planning process.

This stage in the planning process might also involve the creation and analysis of a series of different recovery strategies, scenarios, or planning alternatives that respond to the planning framework and can help guide the remainder of the planning process. Scenarios are sets of reasonably plausible but structurally different futures (Avin and Dembler 2001). They are different from "visioning," which asks what a community wants to happen or would like to see. This is a critical distinction for recovery planning since the future will likely be fraught with compromises and limitations on funding and requires accepting a "new normal" rather than a return to pre-disaster conditions. Generally speaking, scenario building is the right tool to use when "significant change is likely and outcomes are not obvious…, when the timeframe is medium to long (10 to 20 years), [and] where the community is heterogeneous and reflects values and views of the future" (Avin and Dembler 2001, 27). Post-disaster recovery planning certainly fits this bill.

Work on recovery strategies, scenarios, and planning alternatives should consider a range of plausible futures. These could be functions of different land uses; economic, social, historic, and cultural considerations; financing issues; and other practical considerations. Their development should include visual aids, such as maps, as well as narrative descriptions and conversation frameworks that help communicate the strategic opportunities and challenges associated with different options. Collecting and developing this information, however, can be time-consuming and difficult to do when time is limited, especially post-disaster.

Facilitating Input

Input into the planning process should come in phases. Completion of the research and analysis phase can be the first important point at which the stakeholder group, elected officials, and the public are asked to review and formalize the planning framework and prioritize the recovery issues, vision and goals, strategies, scenarios, and alternatives. Those providing input will range from citizens to state and federal officials; the list of participants should be thorough and complete. There should also be opportunities in the process to facilitate input on the identification of potential policies that address the planning framework and then to help define specific recovery projects and identify a broad array of financing and implementation mechanisms for the plan. Also, with each phase of input, it is important to remember to set expectations for what will happen next, confirming the next steps in plan development, adoption, and implementation. This is especially critical in a post-disaster planning effort, where information is so important to residents, businesses, and institutions trying to make decisions about their recovery paths.

Developing and Adopting the Plan

The work performed in the research and analysis phase, along with iterations of public input, will inform the plan development work. The task force and other organizations that may be assigned responsibility for plan implementation should be involved in, or at least consulted regularly throughout, the plan development process. It is at this stage that recovery planning gets more specific.

Recovery plans should provide a comprehensive picture for holistic recovery, addressing both the desired physical outcomes of a city's recovery as well as the management structure, policies, and procedures that a city wants to put in place, which may be different for or require transition between short- and long-term recovery operations. The plan structure should be designed to describe the vision, goals, and policies developed and agreed upon by stakeholders and the public in earlier phases of the planning process. The specific recovery strategies can then be organized according to key recovery operations or functions. For example, the National Disaster Recovery Framework defines six Recovery Support Functions—(1) community planning and capacity building, (2) economics, (3) health and social services, (4) housing, (5) infrastructure systems, and (6) natural and cultural resources—that might provide a useful organizing framework (FEMA 2011b). Within these operational and functional areas, all the proposed recovery projects and programs need to be fully described, ensuring that every goal in the plan has an accompanying implementation strategy that addresses the following:

- estimating the costs for each project and program
- identifying available or recommended funding sources for each project and program
- assigning agencies and organizations with lead responsibilities and deliverables
- suggesting partnerships that will make the actions effective
- identifying local regulations and technical expertise that may be needed
- approximating the start date, duration, and metrics for success

How the plan will be executed also needs to be formally defined, including the recovery leadership and management structure, the timeline and sequencing of projects and activities, how recovery progress will be measured, and how the implementation process will be continually monitored and amended as needed. The recovery implementation financing strategy—which contains an overall budget, recommended funding details, and implementation mechanisms, including a schedule and monitoring process—needs to be outlined. There should also be clear recommendations for how the plan's proposed goals, policies, projects, and programs are to be integrated into other local plans and regulations as needed. Recovery implementation is a communitywide and collaborative process and the recovery plan should not be viewed as a standalone document or process. It needs to be integrally linked with other local plans and regulations, including the local comprehensive plan, neighborhood plans, emergency plans, and the hazard mitigation plan, as well as land-use regulations, subdivision and zoning controls, and building codes.

Finally, a clear process for public review and comment and plan adoption and activation should be articulated in the plan document. Another round of review should be conducted with the stakeholder group, elected officials, and the public, with the feedback integrated into a revised draft plan. A more formalized process of public hearings might also be conducted by the appropriate elected bodies, the city planning commission and city council, responsible for adoption of the plan. This might also include adoption of accompanying regulations, as well as amendments to existing plans and regulatory documents. The comprehensive plan, capital improvement plan, and emergency management plan are three key documents that will likely need to be amended to incorporate recommendations of the recovery plan and ensure consistency.

There may be additional agencies that should formally adopt or, at least, receive the final plan. These might include county, regional, or state agencies that are helping to coordinate recovery activities. For example, all the Louisiana parishes affected by Hurricane Katrina and Hurricane Rita in 2005 had to submit their recovery plans and prioritized recovery project lists to the Louisiana Recovery Authority, a state-level recovery policy and funding advisory body to the governor and state legislature.

Implementing the Plan

If the recovery plan is developed in advance of a disaster, then there may be elements of the plan that also need to be implemented ahead of a disaster. This might include institutionalization of the recovery authorities and operational leadership and management structures. These could be bundled into a recovery and reconstruction ordinance that is formally adopted into the local municipal code. Such ordinances are discussed in Chapter 3.

Furthermore, to be most useful once a disaster happens, advance recovery planning efforts need regular maintenance as well as staff training in the form of exercises and education. Annual exercises of the recovery plan will help keep the institutional knowledge fresh and train staff for their appropriate roles. They also provide concurrent opportunities to review the plan and make recommended revisions as necessary. Major updates and reviews should be undertaken at least every five years with a particular focus on reviewing legislative changes, funding sources, and assignments of responsibilities.

After a disaster strikes, the plan also needs to be reviewed and amended to incorporate the actual damage patterns, repair and reconstruction costs, and financing and implementation issues resulting from the disaster. New projects and program activities will likely need to be added and the timing and metrics for implementation will need to be adjusted. Chapter 7 includes a much more detailed discussion about recovery plan implementation.

PLANNING BEFORE DISASTER STRIKES

This section looks specifically at some of the advantages and challenges in undertaking recovery planning efforts ahead of a disaster. It also identifies some successful approaches that communities have utilized in preparing advance recovery plans.

Opportunities with Pre-Disaster Recovery Planning

Just as emergency operations plans help provide structure and clarity for the response period, pre-disaster recovery planning can help a community to accelerate the recovery process once disaster strikes by predefining roles and responsibilities and, through the planning process itself, building the institutional and community awareness and capacity to engage in recovery efforts (Inam 2005; Olshansky, Johnson, and Topping 2006). This was evidenced in Los Angeles, which undertook one of the nation's first comprehensive local pre-disaster recovery and reconstruction planning processes. A draft plan was in place when the magnitude 6.7 Northridge earthquake struck on January 17, 1994. Post-disaster studies concluded that the city's pre-disaster response and recovery

planning efforts were a major factor in its positive interorganizational and multigovernmental relationships as well as its overall ability to manage the post-Northridge recovery (Spangle Associates 1997).

Along with pre-disaster recovery plans, up-to-date general plans, redevelopment plans, and other planning documents, as well as effective administrative and development management mechanisms (e.g., land-use controls, building permits, information systems, and mutual aid agreements), can also provide strong foundations for post-disaster reconstruction planning and implementation. Disaster-affected communities with well-established planning functions have tended to be the most effective at managing reconstruction (Olshansky, Johnson, and Topping 2006; Spangle Associates et al. 1980).

The city of Kobe, Japan, was struck by a devastating magnitude 6.8 earthquake and subsequent fires on January 17, 1995. Planners who developed the city's restoration plan in just five months after the earthquake credit Kobe's recent three-year process to update the city's general plan as well as the community network that had been cultivated during that effort for their ability to efficiently craft a plan that had broad public support. City officials had the confidence to move quickly on the post-earthquake restoration planning, since it was in large part an adaptation of the 1995–2005 general plan (Ota, Maki, and Hayashi 2009). By identifying options and defining priorities ahead of time, planning helps ensure that the early decisions made following a disaster represent the community's long-term vision and goals. It is also possible to implement plans, or parts of plans, that were not possible before the disaster and turn adversity into opportunity.

Pre-disaster plans are also important in recovery because they represent consensus policies about the future and demonstrate that the community has an active planning process, well-established lines of communication, and strong planning tools and documents. In effect, pre-disaster plans can help make the "business case" for post-disaster reinvestment. They help save critical time and better position a community to access additional post-disaster funds as they become available. These include government funds—such as hazard mitigation, infrastructure, or community development funds—as well as private and philanthropic funds.

Challenges in Undertaking Pre-Disaster Recovery Planning

Planners know how difficult it is to engage elected officials and the public in planning processes. It can be even harder when the topics involve land-use-related issues—already a highly charged topic in many communities—for an event with an uncertain probability. Pre-disaster recovery planning also is not mandated in most places, at least not yet. With the 2011 introduction of the National Disaster Recovery Framework, the federal government has signaled its intent to encourage the formalization of state and local recovery planning in advance of disaster (FEMA 2011b). While a new federal program for advance recovery planning funding has not been created, FEMA has been adding recovery planners to its regional offices and enhancing its recovery planning guides and training offerings.

Previous disasters can also affect perceptions about the risks as well as expectations about a community's preparedness and capability to recover quickly and effectively. For example, in 1989, the Loma Prieta earthquake had a devastating impact on the California communities of Santa Cruz and Watsonville. Damages, however, extended much further away, but to a far lesser extent, in San Francisco, Oakland and other central Bay Area cities more than 60 miles from the earthquake's epicenter. Even today, some of the region's residents, local government staff, and elected officials believe that they survived the "big one" in 1989 and can do so again, even though the expected earthquakes are much closer to the central Bay Area and predicted to have impacts that are orders of magnitude greater than the 1989 earthquake (California Geological Survey and U.S. Geological Survey 2008; Kircher et al. 2006; Sharp 2011).

It is also important to acknowledge that there is an inherent element of failure if a community needs to plan for rebuilding. This is more likely in areas where the hazard is well-known and local governments have some ability, technically or legislatively, to prevent it. An example is riverfront cities of the midwestern U.S. that, in some cases, have to prepare annually for flooding associated with spring snowmelt. For elected officials and senior staff in one at-risk community, a successful "flood fight" was a highly visible and measureable metric of local leadership, and planning for post-disaster recovery and rebuilding was tantamount to acknowledging a failure (or potential failure) to win the fight (Abramson et al. 2011).

But besides perception issues, there are some very real technical, legal, and ethical issues that should not be overlooked in advanced recovery efforts. Developing damage scenarios and discussing alternative futures can present some challenges depending upon the level of specificity. Hazus-MH is a GIS-based loss-estimation software that is publicly available from FEMA and has been used by emergency and mitigation planners nationwide to estimate likely damage

GETTING THE RIGHT FOCUS IN ADVANCE RECOVERY PLANNING

In defining the scope of a pre-disaster recovery planning effort, some questions to ask include:

- What is the impetus or driver that necessitates a recovery planning effort?
- Is the community planning for the right hazards and risks (e.g., expected versus extreme events and the cascading effects) and is it appropriately communicating the uncertainties?
- Is the planning toolkit up to date and appropriate to deal with post-disaster recovery issues and demands? Does the toolkit include land-use plans, zoning, hazard mitigation plans, and building repair and retrofit standards?
- What resources (human, financial, and information) does the community need in order to deal with the likely post-disaster needs (public and private)?
- Are the governing structures and institutional capacities adequate to manage different aspects of recovery?
- What are the measures by which the recovery planning effort will be deemed successful?

levels to buildings, lifelines, and other components of the built environment as well as social and economic losses resulting from scenario earthquakes, hurricanes, and floods. The Hazus damage and loss information is available at the census tract and block levels. More location-specific loss estimates and recovery scenarios that depict actual locations where rebuilding and land-use changes might be likely could raise public and political concerns about the implications for future property rights.

Successful Approaches That Communities Have Employed in Developing Pre-Disaster Recovery Plans

The most extensive set of pre-disaster recovery plans likely exists in the state of Florida. The state's Growth Management Act, first adopted in 1985, has long required that all of Florida's 203 coastal counties and municipalities prepare and adopt post-disaster redevelopment plans (PDRPs), but the implementation of this requirement was limited and inconsistent. In the wake of the historically active 2004 and 2005 hurricane seasons that affected many Florida coastal cities and counties, the state launched a three-year recovery planning initiative in 2007 to draft planning guidelines and test them in several pilot communities (Florida 2010a). The formal planning guidebook, issued in 2010, provides a model PDRP that is based on the consensus input and support of the local governments, planners, emergency responders, business organizations, and other stakeholders participating in the pilot efforts. In 2011, however, the state adopted legislation that dramatically reduced the role of state agency oversight in local planning and eliminated or modified many development review requirements, including PDRP planning (Abberger 2011). Communities in Florida and elsewhere continue to consult the planning guidebook.

In 2012 the Board of Supervisors of Fairfax County, Virginia, endorsed a PDRP that was developed by the county's Office of Emergency Management in collaboration with many other county departments and agencies as well as the chamber of commerce, nongovernmental organizations, citizens groups, and other partner agencies that provide critical support to the country during times of disaster (Fairfax County 2012). The plan is an all-hazards plan, covering early restoration and recovery activities as well as a strategy for long-term recovery and rebuilding, and it assigns roles and responsibilities to departments and agencies to complete the various activities. It is based on the National Incident Management System as the county standard for emergency response operations, and it also reflects the recovery support

function structure proposed in the National Disaster Recovery Framework.

Other communities across the U.S. have developed pre-disaster recovery plans as part of emergency management, continuity of operations, or risk management planning efforts. One such impetus comes from the Emergency Management Accreditation Program (EMAP), which is a nonprofit voluntary assessment and accreditation process for state and local emergency management programs (Emergency Management Accreditation Program 2014b). Since its establishment in 1997, many states and about a dozen city or county governments have received accreditation through the program, and many more have undergone an evaluation and received provisional accreditation (Emergency Management Accreditation Program 2014a). The EMAP *Emergency Management Standard* has a set of 64 standards that are used for the accreditation evaluation. Standards that are related to recovery planning include (Emergency Management Accreditation Program 2014b):

- Development of an all-hazards recovery plan with stakeholders
- Required planning components: purpose/scope/goals/objectives, authority, situation and assumptions, functional roles and responsibilities, logistical support, concept of operations, and plan maintenance
- Requirements to address short-term and long-term recovery priorities and provide guidance for restoration of critical functions, services, vital resources, facilities, programs, and infrastructure to the affected area
- Requirements for continuity of operations and continuity of government plans that address key governmental responsibilities, leadership succession, and safeguarding essential functions and critical applications

How well the emergency management–led planning efforts, such as EMAP, incorporate more traditional planning, land-use, and redevelopment-related issues and strategies is unclear. They certainly are likely to provide operational guidance to help ensure the recovery of core governmental functions, public services and facilities, and infrastructure. Without a mandate or other strong incentive such as EMAP accreditation, strong motivations such as concerns about an imminent threat, or observations of another community's post-disaster recovery challenges, it may be difficult to convince local elected officials and staff leadership to initiate a pre-disaster recovery planning effort and to make the effort a priority.

Observing New Orleans' post-Katrina struggles prompted San Francisco's mayor to initiate in 2008 a comprehensive citywide resilience and recovery initiative to accelerate post-disaster recovery. The initiative has over 75 projects that include the convening of the first known Lifelines Council of major utilities serving the city to address interdependencies and work on restoration strategies; a post-disaster recovery governance project; a robust financial planning strategy; and a community resilience initiative that is coordinated with regional and federal recovery efforts. In June 2012, San Francisco's Planning Commission adopted an updated Community Safety Element of the city's general plan that includes a section devoted to recovery and reconstruction and outlines both pre- and post-disaster policies and activities, including advance recovery planning that must be taken to "assure the sound, equitable and expedient reconstruction of San Francisco following a major disaster" (San Francisco 2012, 46).

PLANNING AFTER DISASTER STRIKES

While it is recommended that communities develop a recovery plan ahead of disaster, the reality is that some will not. This section looks specifically at some of the benefits and challenges in undertaking recovery planning efforts following a disaster. It also identifies some successful approaches that communities have utilized in preparing post-disaster recovery plans.

Opportunities in Post-Disaster Recovery Planning

When disaster strikes a community, there is already a plan for reconstruction indelibly stamped in the mind of every affected resident—the plan of the pre-disaster city (Haas, Kates, and Bowden 1977). This is the "first" recovery plan, and all previous plans or new plans made following the disaster will undoubtedly compete, for many residents, with the first plan, oftentimes intensely. Especially when the disaster's damage is extensive, rebuilding back exactly as the community was before is impossible. Successful disaster recovery plans and successful recovery processes find a way to effectively attain a baseline of community recovery while also moving the community's vision forward in adapting to the "new normal" and taking advantage of post-disaster opportunities to transform and thrive (FEMA 2011b).

The post-disaster period can be an important time to promote rebuilding more sustainably—with higher standards of disaster resilience—and to achieve other community objectives. Post-disaster recovery planning also provides

ACTION PLANNING FOR RECOVERY IN GRAND FORKS, NORTH DAKOTA

David Morley, AICP

The Red River experienced record flooding in late April 1997, devastating the downtowns of Grand Forks, North Dakota, and East Grand Forks, Minnesota, and damaging 83 percent of homes in these communities (U.S. Government Accountability Office 2009). Despite widespread damage and severe economic disruption, Grand Forks acted quickly to repair infrastructure and restore services—thanks, in part, to the focus provided by a short-term recovery plan.

In the aftermath of the flood, Grand Forks' mayor and city council charged the heads of the city's urban development, public works, and finance departments with developing priorities for recovery, submitting action steps for approval, and collectively managing the city's recovery resources. In the first month following the flood, the mayor and these "Tri-Chairs for Recovery" worked together with city staff, elected officials, and local community and business leaders to sketch out a basic vision for recovery focusing on reducing future flood risks and promoting downtown economic development (Johnson 2014).

By early June, the mayor and tri-chairs, working with federal officials, had formulated a strategic plan for using Community Development Block Grant (CDBG) funds and submitted an application for hazard mitigation grant funds from the Federal Emergency Management Agency (FEMA) for voluntary buyouts. During these first two months, the mayor and tri-chairs, along with the leaders of East Grand Forks, were also working with the Army Corps of Engineers on options for permanent flood controls. By late June, city leaders, working with a technical assistance team from the U.S. Department of Housing and Urban Development, had drafted a set of policies and programs in the form of a Recovery Action Plan for the period of June to November 1997 (the "first season of recovery") (Grand Forks 1997). In essence, the plan synthesized the mayor and tri-chairs' previous work, providing more specifics on recovery projects, achievable metrics and milestones, responsible agencies, and the city's recovery management structure (Johnson 2009).

The plan presented a set of specific tasks linked to four broad objectives: (1) voluntary acquisition and relocation of the most heavily damaged housing, (2) provision of both interim and long-term housing and community development, (3) business redevelopment and downtown revitalization infrastructure rehabilitation, and (4) long-term mitigation of the flood hazard along the Red River (Johnson 2009). For each task, the plan designated a leader, target completion date, and funding source.

In order to track implementation progress, the city held weekly action planning sessions rooted in the template for daily planning sessions under the Incident Command System (ICS) framework. These sessions allowed participants to discuss city council actions, funding decisions, meetings, and weekly priorities for each of the plan's five functional areas: (1) management, (2) operations, (3) logistics, (4) finance/administration, and (5) planning (Johnson 2009).

At the one-year anniversary of the disaster, FEMA director James Lee Witt commended Grand Forks for what it had been able to achieve, and public polls about the city's recovery management generally agreed (Kweit and Kweit 2007). Nonetheless, over the next few years, residents criticized city leaders for relying too heavily on "traditional public participation" at city council and committee meetings, and citywide elections in 2000 ousted the mayor; two of the tri-chairs resigned soon after (Kweit and Kweit 2007; Shelby 2003). Kweit and Kweit (2007, 421) conclude that, "at least for major decisions, officials should make sure that there is a very visible participation process. This prescription would seem to be especially relevant to communities attempting to recover from disaster."

According to Laurie Johnson, AICP, a member of the HUD-funded technical assistance team, the Flood Recovery Action Plan provided a clear early roadmap to help city leaders focus their energy and resources on fixing infrastructure and restoring services in time for the fall school year to begin, as well as before the cold of winter set in. Given that 90 percent of city residents were displaced by the flood, Johnson believes the plan's outcomes were instrumental in helping to stem long-term population and business losses.

In 2004 Grand Forks was awarded the Audrey Nelson Award from the National Community Development Association for its positive use of CDBG funds and other federal programs in its downtown recovery. By 2008 the city's population had exceeded pre-flood levels, and its economy was flourishing. Despite criticisms about the lack of public involvement, Johnson (2009) contends that Grand Forks' short-term recovery planning process still represents a planning victory because it established a transparent and accountable framework for the city's actions and its management of federal and state assistance.

the central means for public deliberation to help generate new ideas, elaborate and refine recovery project proposals, and assess alternative recovery strategies. It also helps reduce uncertainty through the collection and analysis of post-disaster conditions and needs, and local leaders have an obligation to reduce uncertainty. Too much uncertainty can slow recovery and lead to wasteful duplication and squandering of resources (Sternberg and Tierney 1998). Common post-disaster uncertainties include future land-use and hazards safety, population, business and economy, and funds for reconstruction.

Post-disaster recovery plans also serve as important demonstrations of leadership to inform and influence stakeholders (Olshansky and Johnson 2010). They demonstrate that local officials have considered a wide range of options and decided how to best use post-disaster funding to further community goals, and that they are prepared to play an active role in the recovery process. They give victims and investors an indication of the future vision—the desired end-state. Perhaps most importantly, plans help make the case for money and justify funds already allocated. To rebuild a community, one of the most urgent needs of local government and affected residents and businesses is money; much of it comes from outside sources. Every entity needs money and a plan to show funders that it will be used well.

Challenges in Undertaking Post-Disaster Recovery Planning

A disaster causes a simultaneous trauma for the community as a whole. To recover, complex city-building processes that normally take years to decades to accomplish must now happen in a matter of months to years (Olshansky, Johnson, and Topping 2006). All these activities must happen simultaneously and in a compressed timeframe, which is a unique characteristic of communities post-disaster.

Taking time to plan during this high-pressure and time-compressed environment can be very difficult. Planning needs time for participants to acquire and comprehend information, build trust, consider alternatives, and feel confidence in the decisions being made. The turmoil of loss and grieving that follows disaster, especially a major or catastrophic disaster, also poses some very specific challenges in engaging public input at a time when public emotions are high. There is also an inherent tension between the need for speed in post-disaster recovery and taking time to deliberate in post-disaster planning. It is well known that, during an emergency and the early days following a disaster, there is a "fog of war" as actions often must happen faster than information flows. In larger disasters, this fog can continue for months, even years, into the recovery period. No one—individuals or agencies—has enough information to make decisions, and information is essential to understanding the situation of the whole community and for planning. However, given the pressures and the many actors and decision makers involved in recovery, planning with speed is of the essence. As described by planners who have been through it, post-disaster planning is "a high speed version of normal planning" (Olshansky and Chang 2009, 208).

It has been shown that communities with up-to-date plans and strong planning institutions in place before a disaster can have an advantage in deliberating and planning more efficiently and effectively in the post-disaster period (Olshansky, Johnson, and Topping 2006). But disaster-impacted communities cannot rely solely on existing plans; the post-disaster environment will inevitably pose new challenges and necessitate a post-disaster planning process. The planning process itself may become the "ends to a means" of overcoming the "fog of war" through the collection and analysis of post-disaster conditions and needs, necessary tasks in any post-disaster planning effort and also part of any formal damage assessments conducted as part of local, state, and federal disaster declaration efforts to validate impacts and associated damages.

Post-disaster planning must be sensitive to community sentiment and the crises of the moment, and the decision process will likely be fraught with compromises. It must evoke the most appropriate, but not necessarily most rapid, actions to address problems (Quarantelli 1982). Yet, there must be time for inclusive deliberation and consensus-building if it is to be successful (Olshansky and Johnson 2010).

Successful Approaches to Post-Disaster Recovery Planning

To combat the time pressures, post-disaster planning processes often are a variation of three general planning strategies: decentralized planning with many planning efforts going on simultaneously, increased planning capacity with a surge in planning and decision-making resources, and iterative planning (Olshansky, Hopkins, and Johnson 2012).

Decentralized planning with many planning efforts going on simultaneously. This is exactly what happened across the Gulf Coast in the first years after the 2005 hurricanes Katrina and Rita. In Louisiana, for example, the Louisiana Recovery Authority (LRA) established a long-range planning taskforce that oversaw "Louisiana Speaks," a long-term community planning initiative that was largely funded by private foundations. Louisiana Speaks decentralized plan-

ning by providing planning resources and guidelines at multiple levels (Louisiana Recovery Authority 2007). It supported neighborhood planning charrettes across the state, developed a pattern book and toolkit for individual building reconstruction, created a set of planning principles that all parishes and local governments had to follow in order to be eligible for LRA funding for public facilities and infrastructure repairs, and developed a regional plan for southeast Louisiana that emphasized smart growth and investment in coastal restoration. Hurricane-impacted parishes were also required to complete recovery plans according to the LRA guidelines and had to submit them to the LRA for formal acceptance. These, in turn, served as the basis for the state's allocation of block grant disaster recovery funds for community recovery projects.

Increased planning capacity with a surge in planning and decision making resources. In the aftermath of Hurricane Katrina, the City of New Orleans' planning staff was drastically reduced with budget cuts made to address dramatically reduced revenues. New Orleans received planning support from the philanthropic community to develop the *Unified New Orleans Plan*. Dozens of planners and other technical experts, from both inside and outside New Orleans, worked on the citywide and district plans. The 2005 hurricanes were also the first large-scale disasters in which FEMA deployed a cadre of staff and planning contractors to help heavily affected communities in federal disaster declaration areas to develop recovery and mitigation plans (FEMA 2011b). It did so as part of its lead agency responsibility in implementing Emergency Support Function #14—Long-Term Community Recovery and Mitigation to support the long-term recovery of states and communities and reduce or eliminate risk from future incidents. Many of these plans served as the basis for the states' requirements for post-disaster recovery plans and the allocation of available HUD-CDBG disaster recovery funds for community recovery projects.

Iterative planning. Iterative planning occurs when some initial actions and decisions move ahead quickly; others happen after more information is available and deliberation is possible; and yet others happen once there have been more extensive analyses and consideration. This is an approach often taken by agencies with facilities, infrastructure, and other physical assets damaged by disaster. Initial focus is given to identifying and staging repairs to assets with less damage or in areas with easier access. Iterations of more detailed planning happen as detailed inspections are completed and future demands and resources for recovery are better understood. Iterative planning was the approach taken by the City of Kobe to complete its restoration plan in June 1995, five months after the 1995 earthquake (Kobe 1995). The plan established the high-level vision for the city's recovery and identified the priority recovery areas, as well as the implementation approach for each recovery area (e.g., redevelopment, land readjustment, and housing reconstruction policies). Planners credited the two-stage plan formulation process that was used to first create a set of guidelines, and then to flesh out those guidelines into a more specific plan, as a way to balance the need for speed while preserving future opportunities during the specific planning process for more deliberation and consensus building (Ota, Maki, and Hayashi 2009). The five-month deadline for formulating a restoration plan was set for two reasons: (1) It was important to provide citizens with a vision for the restoration process as quickly as possible; and (2) the city needed to meet the national budget appropriations deadline (Ota, Maki, and Hayashi 2009). Financial support from the national government was essential because the damage was much too extensive and burdensome for the city to handle on its own.

In the critical months soon after a disaster, trying to develop one all-inclusive citywide recovery plan may not be easy and the political costs of doing so could be futile. Successful post-disaster recovery planning needs to be seen as a continuous process and an ongoing function throughout the recovery and rebuilding process (Spangle Associates 1991). Effective post-disaster recovery plans also tend to provide some means for adaptation, flexibility, and balancing in different directions at various junctures, depending on how things are going and allowing for unanticipated or uncontrollable events. Adaptation does not mean abandoning the plan and having to start again from scratch; it requires working with the reality of the situation to increase the probability of getting where a community wants to be (Alesch, Arendt, and Holly 2009).

ENSURING RECOVERY PLANNING BUY-IN AND ADOPTION

Some aspects of the recovery planning process deserve special attention, particularly leadership and collaboration in the planning process, public input into the planning process, and visioning. The issues associated with each will also vary somewhat depending upon whether recovery planning is initiated before or after a disaster. These variations are explored in greater detail in the following sections.

Leadership and Collaboration in the Planning Process

When disaster strikes, communities want leaders "imbued with new authority to cut through the inherit messiness of disaster and clear the way for centrally controlled, rapid response teams of experts…who will implement measures that are simultaneously prompt, effective, efficient, and just. Beguiling though such man-on-horseback solutions might seem to be, they divert attention away from notions of partnership that have proven their value in reducing hazards and are particularly well suited to the complexities of contemporary American life" (Mitchell 2006, 230). Just as strong command-and-control leadership is critical to the rapid-fire decision making and execution environment of disaster response, strong, collaborative leadership is critical to recovery and to planning for recovery. Collaboration is common among planners and in comprehensive planning, and it may well explain how local planners, who might have had little involvement with emergency planning and management prior to a disaster, quite often take on significant leadership roles once the command-and-control stage of emergency response winds down and the long haul of post-disaster community recovery begins. Both leadership and collaborative partnerships are two core principles of the National Disaster Recovery Framework (FEMA 2011b) and two key determinants of resilience capacity defined in the National Mitigation Framework (U.S. Department of Homeland Security 2013). They can also be key determinants to a successful recovery planning effort whenever it is undertaken, pre- or post-disaster.

Leadership for recovery planning requires at least one or more committed champions and a great deal of of recruiting power. These champions need to come from both within and outside city hall in order to strengthen the planning effort's ability to tackle controversial but necessary issues and to maintain its value as a guide throughout the recovery (Florida 2010a). Champions typically have a high level of awareness and understanding of the planning needs and also actively promote that awareness and advocate for the necessary actions and support. Thus, champions are usually good communicators and also in positions of authority or responsibility that can influence and leverage action.

Support is also needed from across the community since the actual work of recovering and rebuilding a community is a collective action problem (Birch and Wachter 2006). In the post-disaster period, much of this support may need to be recruited before the process begins. For pre-disaster efforts, recruitment can happen incrementally as the planning task force, stakeholder group, and other leadership and communication targets for the process are designed and assembled. Broad community leadership support for recovery planning requires earnest engagement with all the community leaders who may be involved in key aspects of disaster recovery and its successful implementation, including leaders from the private sector, community services, and nongovernmental sectors, as well as influential members of the community, including the media. Leaders of neighborhood associations, local business groups—such as the chambers of commerce, community foundations, and the faith-based community—are all good recruits.

Elected officials and the leaders of local government departments and community service providers—including private utilities, educators, and social services—also are crucial because community recovery is essentially about municipal and institutional recovery. If the city as an institution struggles to fulfill its roles and responsibilities in the post-disaster recovery period, this may result in political instability and the community as a whole will likely suffer (Alesch, Arendt, and Holly 2009).

Figure 6.2 (p. 106) illustrates how the recovery planning organization knits together key leadership roles and collaboration. Besides support, there are key positions of leadership that need to be filled. First is to understand who the *local authorizing and approving body*, or bodies, will be. The city council, city planning commission, or both are likely candidates and their actions have legislative and statutory authority, which are critical to plan acceptance and implementation. Some alternatives can include emergency operations boards, long-range or capital planning councils, or a community board. However, without a binding authority, the recovery plan may not have the necessary legislative authority or endorsement, which could weaken its implementation effectiveness.

Next is the *local recovery planning task force* to guide and be responsible for the plan development and an *officially designated local planning lead agency or official* for the planning process. Besides domain knowledge, credibility, and time, these individuals, particularly the planning process leader or champion, should possess capabilities in facilitation, flexible and creative styles of problem solving, a vision for the community, and strong links to other public and private decision makers (Alesch, Arendt, and Holly 2009; Rubin 1985). These groups will manage the *planning team* and *information and communication specialists*.

Recovery functions should not dictate the recruiting process, and assigned leadership roles for recovery implementation will likely differ from the planning task force composi-

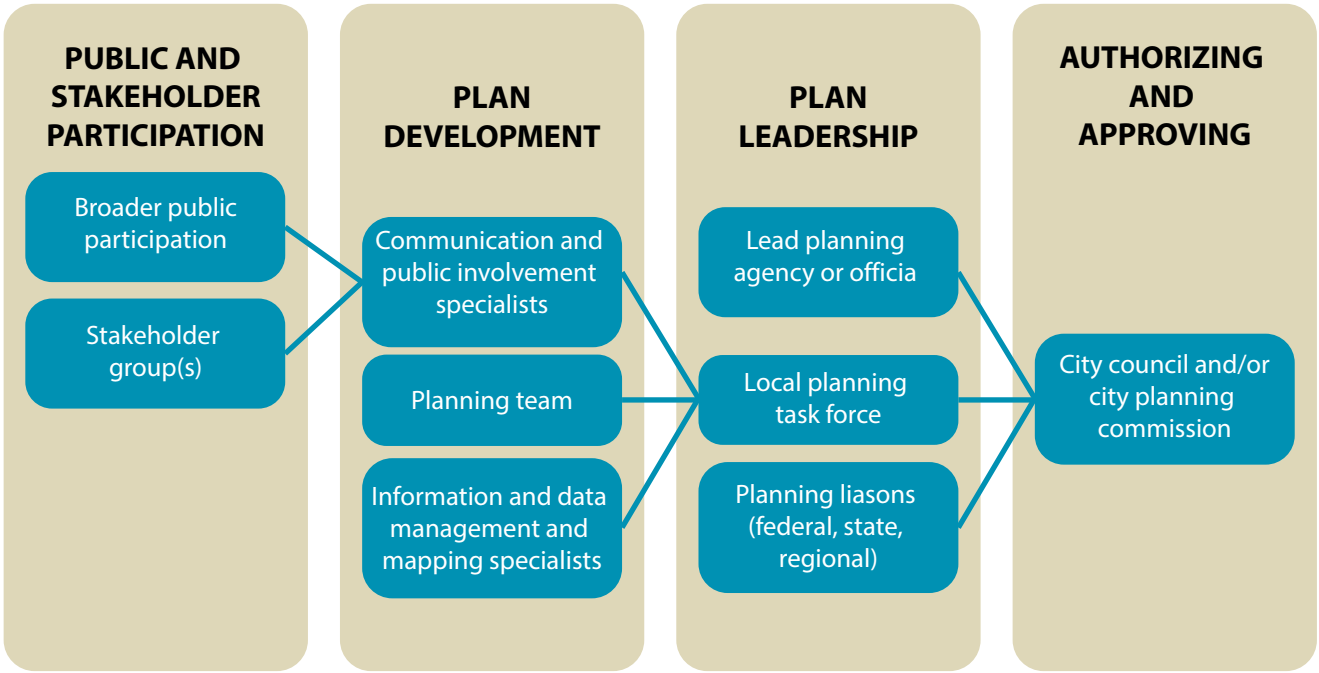

Figure 6.2. Recovery planning organization leadership and roles (Laurie Johnson)

tion. Candidate agencies and departments that might assign personnel to either the local planning task force or planning process leader roles include: planning, building, public works, housing, economic development, redevelopment, emergency management, city planning commission, city council, city manager, and mayor's office. Representatives of the city's planning commission, mayor's office, and city council might also serve on the task force. Community or business representatives and planning professionals or academics might also help to augment the interests and perspectives needed to design and implement a robust process. Also, a community should look to see if an existing organization or committee, such as a long-range planning committee, has the appropriate composition and focus, or if it could be supplemented or have its charge modified slightly to accommodate the needs of the recovery planning process.

Rounding out the local leadership for the planning process should be a *stakeholder group* to provide feedback and guidance into the design of the planning process as well as the public participation and communication efforts. The stakeholder group, its membership, and its responsibilities should be formalized through resolution by the local planning task force, or preferably the authorizing body for the planning process. The stakeholder group is not the same as the local planning task force, but rather it should comprise representatives from local political and technical advisory groups; community, business, and neighborhood organizations; special-interest groups (e.g., university students, elders, disabled groups); and others who are knowledgeable about different local communication networks, both formal and informal. This group should embody the community's composition in order to provide a critical feedback loop in the planning and communication design. It also can function as a test bed for planning and communication ideas such as public participation formats, locations, and dates to help maximize meaningful public participation. Good leadership of and collaboration with a well-designed stakeholder group can help ensure that a workable process for plan development is in place and that ample and bona fide public involvement occurs which will strengthen the plan's likelihood of being adopted as well as its utility in recovery.

Two considerations in deciding the stakeholder group's composition should be "whose participation is essential in guaranteeing technical accuracy and thoroughness for the plan? and whose participation and support will enhance its political acceptability?" (Schwab 1998, 76). A committee structure might be developed to manage the size and function of the stakeholder group, including an executive committee

of top-priority stakeholders and a series of subcommittees or working groups that provide expert advice to the executive committee (Florida 2010a). Some communities may wish to model or integrate the stakeholder group or some of its potential subcommittees or working groups within already existing local committees as some of the representation will overlap. The recovery planning process is also an opportunity to develop partnerships that will enhance a community's capacity long-term and in implementing recovery. "Partnership, in its broadest sense, refers to mutual cooperation and shared responsibility among individuals or groups that pursue a common goal," and it is a defining element of democratic governance (Mitchell 2006, 236).

The *Long-Term Community Recovery Plan: Greensburg + Kiowa County* is the result of a multi-governmental partnership in planning involving the town, county, and state and federal partners. After an EF-5 tornado destroyed more than 90 percent of structures in Greensburg, Kansas, on May 4, 2007, FEMA activated the Long-Term Community Recovery (LTCR) planning program, and Kansas' governor also asked Kansas Communities LLC to utilize its "Public Square" process (Greensburg and Kiowa County 2007). The Public Square process is a comprehensive development approach that focuses on asset-based conversation, citizen engagement, and partnerships among leaders in business, education, health and community services, and government. It usually takes about two years to complete but it was expedited following the disaster. The LTCR and Public Square processes used a variety of public involvement techniques, including community meetings, a community design workshop, a rebuilding fair, group interviews, e-mails, and comment notes. Together, the LTCR and Public Square teams worked with Greensburg and Kiowa County residents and community leaders to craft vision statements, identify key recovery issues and priorities, and develop recovery programs and projects for the draft recovery plan.

In its holistic recovery guidelines, the Natural Hazards Center at the University of Colorado at Boulder recommends developing formal and informal ties with "every conceivable private entity, nonprofit group, neighborhood coalition, church and state, local, federal and regional agency to increase the diversity and imagination of ideas and potential solutions and to build local capacity" (Natural Hazards Center 2006, 9-3). Another suggested approach for building planning capacity is to draw from four levels in a community: within members, within their relationships, within their organizational structure, and within the programs they sponsor (Innes and Booher 2002). Collaborations with capacity "share information and engage in constructive dialogue rather than debate and argument"; they have "well-developed interactions among themselves as well as links to outside groups"; and they "engage diverse interests and allow their decisions to be informed by the knowledge of these differing stakeholders" (Innes and Booher 2002, 16). As rewards for effective collaboration, Innes and Booher (2002, 17) argue that the process will result in "more robust and legitimate strategies"; "more depth and breadth in their leadership"; "roots in their communities" with an ability to mobilize players; innovative solutions to what might have seemed to be intractable problems; and timely abilities to respond to "new challenges, whether they are threats or opportunities." These would all be extremely helpful outcomes, especially in a post-disaster environment.

Formalized linkages with other local plans and non-disaster programs will also help reinforce partnerships and collaborations. Land-use, public safety, housing, and transportation elements of local comprehensive plans should cross-reference recovery planning goals and strategies in order to more effectively influence future policies and actions. Local zoning and subdivision regulations should be reviewed and amended as necessary to ensure consistency with the recovery planning goals and strategies. Capital improvement plans, redevelopment district plans, area plans, neighborhood plans, and corridor plans should acknowledge the relevant recovery programs and projects, and they can help direct resources toward recovery through their multi-year programming and implementation frameworks. Cross-referencing with local mitigation plans and emergency plans can help to heighten awareness, target pre-disaster funding, and improve preparedness for post-disaster recovery implementation.

Broadening Public Involvement

Complementary to leadership is the need for broad public participation throughout the planning process. Studies of large-scale post-disaster redevelopment in the U.S., Japan, and elsewhere have documented the importance of involving residents in recovery planning and have warned that plans are unlikely to succeed if imposed from the outside or lacking broad community support (Olshansky, Johnson, and Topping 2006; Sternberg and Tierney 1998). Individual citizen and community-based input will provide the planning team with a greater understanding of local concerns and help assess community attitudes about proposed policies and programs, (Inam 2005). The plan will also have a far greater chance of successfully guiding the community through its recovery if its vision, goals, policies, programs and projects stem from an

PUBLIC PERCEPTION OF DISASTER RECOVERY PLANNING AND GOVERNMENT: INVOLVEMENT IN THE PLANNING PROCESS

Kweit and Kweit (2007) were some of the first researchers in the U.S. to systematically survey the relationship between citizen participation in post-disaster recovery and citizens' opinions of disaster recovery and their views of city government. Focusing on the recovery of Grand Forks, North Dakota, and East Grand Forks, Minnesota, after the devastating 1997 Red River of the North floods, Kweit and Kweit found that "participation has a symbolic benefit that may be more important than its instrumental role." In essence, "citizens' perceptions of participation opportunities are strongly related to their evaluation of policy and of the legitimacy of government." It is important to remember that "without citizen involvement, it is difficult to pretend that government is democratic" and, "if officials do minimize the opportunities for participation, citizen support of both government decisions and the legitimacy of government may well decrease" (420).

authentic dialogue with the residents, businesses, and institutions that it intends to serve.

Most local governments in the U.S. now routinely involve community members in planning and other key community decisions. There are numerous guides conducting citizen involvement processes and participatory goal-setting processes (Creighton 2005; Faga 2006). Most local governments already have procedures in place for gathering public comment and holding public meetings on planning-related matters. These, in most disaster recovery planning cases, can and should be used since citizens are already familiar with them. However, while most planners consider it vital to involve community members when initiating a planning process, these efforts necessarily make planning and decision-making processes more complicated, and the number of actors involved increases the possibility of unexpected outcomes.

Unfortunately there is little guidance on how to adapt normal practices of public outreach, communications, and participatory processes to the high-speed post-disaster environment (Olshansky and Chang 2009). What is known, however, is that community consensus is one of the most important factors that can increase the speed of reconstruction (Haas, Kates, and Bowden 1977). Citizen-led recovery decisions can also be extremely powerful and fundamentally change the course of a disaster-affected community. Citizen-initiated community relocations have occurred in several flood-ravaged Midwestern communities, such as Valmeyer, Illinois, and Gay Mills, Wisconsin, and citizens of West Oakland, California, successfully stopped rebuilding of the elevated Nimitz Freeway along its pre-disaster alignment after it collapsed in the 1989 Loma Prieta earthquake. But, in cases of considerable neighborhood destruction, the addition of more interested parties can complicate an already difficult reconstruction process (Olshansky, Johnson, and Topping 2006). On the other hand, disaster victims may give less priority to long-term recovery discussions and other participatory methods when they are still focused on basic short-term needs and grieving for their losses (Ganapati and Ganapati 2009). So, within this context, what public participation approaches work best in recovery planning, especially post-disaster? While certainly not comprehensive, some "best practice" recommendations compiled from an array of recovery and hazard mitigation planning experiences are provided in the following sections.

See public participation as a core mechanism that drives the recovery planning process forward. Think of public participation as a central "pivot point" that moves recovery planning forward through each stage of the plan's de-

velopment and adoption and that can help combat the time pressures of post-disaster decision making and also help the public understand how critical they are to the plan's success. Given the extremely tight four-month timeframe of the Unified New Orleans Plan process after Hurricane Katrina, the planning teams designed the process with a series of citywide and district-level planning meetings that simultaneously provided input on key elements of the plan development process and set expectations for the next phase in the process (Olshansky and Johnson 2010). Districts were nonpolitical amalgamations of neighborhoods used in prior citywide planning efforts and thus applied to the recovery planning process as well. By pivoting between city-level and district-level discussions, the series of meetings essentially served as critical focusing, validation, and hand-off points for the simultaneous citywide and district planning efforts.

Develop a public participation and communications strategy for the recovery planning process. Working with the stakeholder group, planners should create a separate document that outlines the public participation and communications mechanisms that will be used in the process and the general timeframe for key activities. Adding a public involvement and communications specialist to the planning team is strongly advised if funds are available, or a skilled volunteer can be recruited. A well-designed strategy should work to address all three recommended levels of two-way communication across the entire community: individuals, small group sessions, and large-scale community meetings. It will also utilize an array of high-touch and high-tech communication mechanisms, including meetings, newsletters, social media, web communications, call centers and surveys, grassroots organizers, and media relations (Lennertz 2011; Olshansky and Johnson 2010).

A planning project website should be a core element of the communication strategy and can serve as a central repository for key products of the process as it evolves. Items that should be included on the website include the project purpose and timeframe information and frequently asked questions about the planning process; all meeting notices, meeting records, and planning products; and a repository of recovery data, previous plans, and other relevant documents. It can also be a place to conduct polls and surveys and to respond openly to questions. If residents have been displaced by disaster, special communication and participation provisions will need to be developed to ensure that they are also represented in the process; this might require conducting meetings in multiple locations or having web-based meetings and interactions (Olshansky and Johnson 2010). The strategy should also be presented to and reviewed with elected leadership, community leadership, and the public before it is finalized.

Ensure broad and inclusive involvement. In their study of 60 local comprehensive planning efforts, Brody, Godschalk, and Burby (2003) found that citizen involvement in the planning process tended to be dominated by an "iron triangle" of local business and development interests, local elected and appointed government officials, and neighborhood groups. However, when planners in these same communities "involved a broader array of stakeholders in plan making, they produced stronger plans and policy proposals that were much more likely to be implemented" (Burby 2003, 39). Planners should anticipate similar participation biases with disaster recovery planning. To combat them, they should work hard to both encourage broader participation and design participation mechanisms that provide genuine opportunities for participants to impact local decision making (Brody, Godschalk, and Burby 2003). Planners should invite a variety of groups to participate in the process and invest in advance advertising, grassroots organizing, and outreach partners to enhance the breadth and diversity of participation. Also, they should consider developing a community profile and surveying public participants as to their composition relative to that profile. Keypad voting or cell phone texting can be used for such "real time" surveys at public meetings and with openly shared results. When there are overrepresented or underrepresented groups, they should be prepared to communicate how the gap will be filled at that stage in the process as well as at future stages.

Set and maintain the planning focus on disaster recovery. There will be challenges, both pre- and post-disaster, in keeping the public's focus on recovery planning-related topics and not slipping off into discussions of other community issues, plans, or disaster phases, such as emergency response planning. There will also always be newcomers at each stage in the process. Therefore, at each "public" step in the process, it may be useful to spend time reviewing the purpose and timeframe of the recovery planning process, what has been accomplished so far, what the purpose of this particular public participation effort is about, and what lies ahead. It may also be helpful to develop a graphic that shows how the recovery plan fits within the community's overall general and disaster planning-related context.

When multiple meetings are conducted simultaneously for a particular stage in the process—for example in different neighborhoods across the city—it may be useful to have a standard set of presentation slides or graphics that offer consistent messaging on the purpose and timeframe for the

COMMUNITY REBUILDING IN GALVESTON, TEXAS

Kirstin Kuenzi

The first of June marks the start of hurricane season, but residents on the island of Galveston, Texas, population 48,000, prepare year-round. In 1900 the area was decimated by a hurricane that is still considered the deadliest disaster to have hit the United States. With nearly 8,000 fatalities during that short event, Galveston locals have since been conscious of the city's hazardous geographic location. Because of this, the U.S. Army Corps of Engineers built a 10-mile-long, 17-foot-high seawall in the early twentieth century to protect the city. But the city has experienced 10 more hurricanes, including Category 2 Ike in September 2008. At its strongest point, Hurricane Ike brought winds swirling around the 600-foot-wide eye that topped 145 miles per hour. Thousands of residents were left stranded without food, electricity, or shelter in Galveston's humid subtropical climate. Ike was the second costliest hurricane in U.S. history at the time, with damages totaling close to $30 billion. Residents and leaders alike recognized the need to plan better for this important commercial shipping port. Hundreds of individuals worked daily on recovery and redevelopment projects, and their collaboration produced success.

After seeing the extent of damage brought by Hurricane Katrina and Hurricane Rita, local leaders created a *Disaster Response for Historic Properties Plan* as well as a comprehensive plan update, complete with a disaster planning element. Unfortunately, the latter plan was two weeks out from adoption when Hurricane Ike hit. Although a hazard-specific plan for the city was not in place, recovery planning saw an extraordinary amount of resident participation. In November and December 2008, more than 300 community members worked alongside planners to offer their ideas on redevelopment. Lori Schwarz, assistant director of city planning (who later took over as director), was present with her colleagues at every meeting. The city began working on cleanup immediately, but financing debris removal while also rebuilding municipal structures was difficult. Still, Galveston had to make payroll, and Schwarz recounts the unwavering solidarity which fellow staff members showed when employees who were due a raise abstained from one. This act freed up thousands of dollars, saving colleagues from being laid off during this difficult period.

The most unique aspect of Galveston's tale of recovery is that, within the Federal Emergency Management Agency (FEMA)-assisted Long-Term Community Recovery (LTCR) Plan released in early 2009, FEMA itself is not mentioned as an author. Schwarz notes that this is due to the fact that "we [Galveston locals] are strong on our own. This plan was crafted by our residents, with wonderful assistance from the government, but we wanted it to be ours. We were proud that we created it instead of an outside entity. We are the only LTCR Plan so far which was written in this manner." The plan designates five goals that were noted by residents as important to Galveston's growth and community character: economic, environment, housing, human services, and elements involving infrastructure, transportation, and mitigation.

Most recently, Galveston has been fulfilling these goals. A local *Hazard Mitigation Plan* for Galveston is in place as well as a Hurricane Preparedness Guide. The comprehensive plan, adopted in 2011, now includes a fully integrated disaster planning element. Innovative initiatives within the plan such as a coastal *Erosion Response Plan* and a community-based *Disaster Recovery Plan* and voluntary involvement in FEMA's Community Rating System will continue to keep Galveston on the cutting edge of not only disaster recovery planning but also community fellowship.

Throughout the summer of 2012, Galveston saw an unprecedented amount of revenue from tourism. Reaching profit levels even higher than during pre-Ike tourist seasons, locals are proud of how quickly they have bounced back from the calamity that occurred only four years earlier. The speed of Galveston's recovery can be attributed to the city's desire to stick together and endorse economic and community development. Although originally attempting to forget or shy away from mentioning Ike, residents are now animated when discussing the hurricane and its effects on the city. Water-level markers have been placed on popular routes and restaurants, an ad campaign for the "Golden Era of Galveston" (the fifth anniversary of Ike) is being aggressively promoted, and brochures noting the hurricane's impact have been produced by the Galveston Tourist Bureau. Galveston has transformed a disaster into a triumph—and it all began with the assembly of a team eager to guide the process.

For more information, visit:

Long-Term Community Recovery Plan
www.cityofgalveston.org/DocumentCenter/View/192

City of Galveston Comprehensive Plan
www.cityofgalveston.org/DocumentCenter/View/1711

recovery planning process. This information could also be posted on the city's website and given to the media and other distribution channels.

Also, organizers should ensure that meeting presenters and facilitators have an advance briefing and clear understanding of the planning purpose and timeframe as well as that particular meeting's goals and tasks. When possible, they should mix the composition of discussion groups so that more experienced and knowledgeable participants are balanced with new participants or those less knowledgeable about the disaster recovery issues (Florida 2010a). In post-disaster planning efforts when participants have many pressing issues to attend to—such as filing insurance claims, submitting applications for federal and state disaster aid, and seeking interim housing—key agencies and providers might set up in a "disaster fair" adjacent to the meeting locations. Also, a designated "parking lot" and dedicated "listening time" during group discussions are respectful ways in which additional concerns can be identified, yet the focus can be kept on the discussion topics at hand.

Balance communicating the big picture with an astute focus on priority issues. Because disasters can affect every aspect of community life—the physical, environmental, economic, social and cultural, and institutional dimensions—a credible recovery planning process must present and discuss a comprehensive array of potential issues. Since disaster impacts tend to unfold over time—as damage, the ripple effects, and the full costs of recovery are revealed—the process must be dynamic and sensitive to incorporating new information and concerns as they emerge. But, when the time available for planning is limited, it will be important to solicit public input early in the planning process to identify and prioritize recovery issues. Not all planning issues, however, have to be fully addressed during the early stages of the planning process. The public and the stakeholder group can also help identify the high priority issues to be addressed first, and those with a lower priority can be reserved for later planning stages or for a more limited strategy development effort.

If public input opportunities are limited, issue prioritization is one distinct point in the plan development process where participation is critical. One set of recommended approaches suggests leveraging large-scale public input with stakeholder group input (Florida 2010a). An interactive activity that is open to the entire community, such as a large-scale public meeting or a web-based survey, could be used to rank the order of the recovery issues. Then the stakeholder group could recommend a final prioritization of issues, or vice versa. For example, Waterbury, Vermont, held a community recovery fair where the entire community was invited to come and learn about all the proposed recovery projects and vote for the top five choices. Using this community input, the Town Select Board and Village Trustees formally prioritized the projects based upon their recovery value to the community.

Theme teams—a small group of staff and community volunteers who distill public meeting discussion in real-time—as well as web and software tools like MindMixer™ and Brainstorm Anywhere™—are effective techniques for collecting a variety of ideas, identifying emerging themes, and providing a means for prioritizing and voting on ideas (Lennertz 2011). It is also important to have clear criteria for any prioritization process. Some suggested criteria for use in prioritizing recovery issues in a pre-disaster planning effort include (Florida 2010a, 35) :

- Degree to which the issue has immediate (life and safety) and public safety implications
- Estimated impact of the issue on ability for local disaster recovery
- Rough percentage of community's population that would be impacted by the issue
- Timing of the issue and whether addressing the issue is a prerequisite for dealing with other issues
- Ability of the issue to be addressed by local actions versus something that might require state or federal policy.
- Public perception of the issue as an important local quality of life factor

Design meaningful discussions on alternatives. Planners can improve participation and make it "meaningful by providing citizens with information about problems and alternative ways of solving them and by providing opportunities for dialogue among citizens and between citizens and planners" (Burby 2003, 44). Public involvement in the consideration of different recovery strategies, scenarios, or planning alternatives is critical for recovery planning to be successful, since the future will likely be fraught with compromises and limitations on funding, and it requires accepting a "new normal" rather than a return to the pre-disaster conditions. Work on recovery strategies, scenarios, and planning alternatives as well as the accompanying public input process can be time-consuming and difficult to do when time is limited, especially post-disaster. Scenario pioneers have encouraged planners not to be dissuaded by these challenges and propose that "scenarios are stories. They are works of art, rather than scientific analyses. The reliability of [their con-

tent] is less important than the types of conversations and decisions they spark" (Arie de Gues cited in Scearce et al. 2004, 30). Scenarios, like "a well-written story, can quickly capture a lot of complexity and leave a lasting message with the reader" (Scearce, Fulton, and the Global Business Network Community 2004, 30).

Planners working on the recovery plan for the City of Olive Hill, Kentucky, developed three alternatives for reconstruction after flooding nearly destroyed their downtown in 2010: (1) No Change—with the existing downtown area maintaining its prominence as the primary commercial district for the city and new businesses being encouraged to locate in renovated buildings there; (2) Reconfigure Existing—where alternative locations for new commercial uses are identified in less flood-prone areas, but existing downtown businesses are allowed to remain; and (3) Relocation of Commercial Core—with a location identified and acquisition strategies pursued to relocate the new commercial district in a less flood-prone area. A community meeting was held, where all three alternatives were presented and anonymous, preliminary, and nonbinding votes were then cast. In this vote, 83 percent of the Olive Hill residents at the meeting voted for the second option, to partially relocate downtown (Olive Hill 2011).

Charrettes are collaborative design techniques where scenarios are constructed and explored in real-time; they are most frequently used by architects and urban designers. They are often conducted in a workshop setting, involving the designers as well as those people who will be directly affected by the design and its outcomes, those with valuable information to contribute to the design process, decision makers, and potential supporters and blockers (Lennertz 2011). In disaster recovery planning, they have tended to be used for more simplistic visioning exercises and in specific neighborhood design efforts. They can, however, be an effective means of communicating and deliberating on different recovery strategies and planning alternatives, and they can help public participants make better decisions about the recovery planning framework and understand the tradeoffs associated with different choices. In many instances, they can help participants modify their beliefs about the future, such as considering the effects of climate change and developing potential adaptation strategies or combating the uncertainties of other potential future risks. However, even when positions are hardened, the workshop format provides an important opportunity to clarify choices and the planning process has a better chance of moving forward when such conversations have taken place. They also can be used to "focus on more specific disaster recovery projects that were not anticipated pre-disaster or for which public outreach had not yet been sought before" (Florida 2010b, 119). For example, meetings with homeowners in severely affected neighborhoods could use charrettes to develop design guidelines as well as financing options for incorporating mitigation, such as flood-related elevations, into the repair and rebuilding process.

Recognize the psychological and emotional challenges that participants are enduring. Disaster recovery is a high-stakes process and there always will be winners and, unfortunately, losers as well (Olshansky, Johnson, and Topping 2006). Thus, the recovery planning process has a responsibility to be sensitive to the psychological and emotional challenges that pre-disaster related conversations can incite as well as the suffering that participants are enduring post-disaster.

In disaster recovery planning, self-conscious and inclusive deliberation can help community leaders "make better decisions that reflect the broader understanding and respect for the lives and well-being of all the affected people" (Birch and Wachter 2006, ix). True deliberation is more than discussion, it has a clear end point—a decision—and it is important to know that it is not "always pretty or easy" and, when done effectively, has "a good deal of controversy built into it and can be really tough" (Birch and Wachter 2006, ix). But there are many advantages to having a true deliberative planning process. It can not only help answer questions, it can also help the community heal. The social activities associated with public participation efforts can also build trust and networks of relationships that can help both individuals and community resilience in recovery (Kweit and Kweit 2007). Some ideas that have been employed by communities undertaking recovery planning include offering free transportation to and from planning meetings and providing daycare, disaster assistance and rebuilding fairs, and counseling services alongside the planning meetings.

Ensure a full and final round of public input into the recovery plan. If public input opportunities are limited, a review of the final draft plan, prior to the plan's official approval and adoption process, is another distinct point in the plan development process where participation is critical (Florida 2010a). The public needs to see the fruits of their efforts and how the entire plan has taken shape. It is also an opportunity to celebrate the process completion, which is particularly meaningful in the post-disaster recovery context when this milestone can mark the community's official transition from "planning" to "action."

Capturing the Public's Imagination

A clear and inspiring planning vision can significantly motivate the many stakeholders and investors in the planning

process and its implementation. But, getting that vision right can be tricky, especially in a post-disaster setting: it should be inspirational, even a challenge to attain, but not so lofty that it seems unrealistic, naïve, or disingenuous.

When disaster strikes a community, many of the "business-as-usual" institutional, political, and social conflicts are momentarily suspended as the community rallies together; as time passes and the challenges of recovery unfold, old conflicts tend to reemerge, along with new ones, and that communal sense and passion tends to erode (Drabek 2007; Kendra and Wachtendorf 2007). While recovery planning and plan implementation can be a victim of this churn, it can also be a unifying element and a guiding light that captures the public's imagination—not just residents, but the general public, donors, and state and national political and agency leaders as well. Sometimes, truly remarkable rebuilding outcomes can be achieved. There are two levels at which this occurs, which for simplicity's sake are termed "catalyzing projects" and "visionary planning outcomes."

Catalyzing Projects

Specific projects, targets, and milestones have been vital in helping disaster-impacted communities coalesce into action and attract and focus outside action and investment as well. In its report on past disaster recovery experiences, the U.S. Government Accounting Office (GAO) placed a strong emphasis on recovery plan goal setting, which it said "can provide direction and specific objectives for communities to focus on and strive for" and "can also help state and local governments prioritize projects, allocate resources, and establish a basis for subsequent evaluations of the recovery progress" (U.S. Government Accountability Office 2008, 12).

A catalyzing project can have immense value to a community but may not necessarily be a part of the recovery planning process. Sometimes, these catalyzing projects and targets are defined before or alongside the community's post-disaster recovery planning processes, and efforts should be made to integrate them into the planning process and the public dialogue. After a devastating tornado struck Joplin, Missouri, on May 22, 2011, and displaced nearly a third of its population, the mayor and leaders of the public schools and health systems quickly set aggressive targets to remove debris and reopen facilities in record times; federal and state partners, philanthropic donors, and other resource providers aligned to help achieve these missions (Abramson and Culp 2012). Commensurately, Joplin with the support of FEMA's Community Planning and Capacity Building team formed a Citizens Advisory Recovery Team which, in barely four months' time, collected and distilled thousands of pieces of citizen input into a set of long-term objectives for local government, the school system, the public health system, the business community, the local nonprofit network, and faith-based organizations (FEMA 2011b). Together, these actions instilled a degree of confidence that Joplin would recover quickly and helped encourage residents and businesses to return and rebuild (Abramson and Culp 2012). On its one-year anniversary, Joplin was praised for its significant progress in rebuilding (Gardner 2012).

Visionary Planning Outcomes

There are also examples of larger-scale and visionary approaches to recovery and reconstruction that can help to lead a community into a remarkably different future and manage to transcend the dissension, doubt, and uncertainty that can so easily undermine this level of aspiration, particularly post-disaster. That vision can come from a variety of sources: an elected official, community leader or advocacy group, the post-disaster recovery planning process, and pre-existing plans. When Hurricane Sandy devastated communities in the northeast region, U.S. HUD Secretary Shaun Donovan responded by launching a multistage design competition in June 2013 to develop innovative, implementable proposals that will help promote community resilience and long-term sustainability. From 148 international applicants, 10 interdisciplinary teams were selected to participate in the Rebuild by Design competition, each comprising architects, landscape architects, regional and transportation planners, engineers, and community organizers, among others. The competition was named one of CNN's 10 Best Ideas of 2013 and the six winners were announced in June 2014 along with plans for how these projects will be funded and implemented (Rebuilding by Design 2014). In a 2009 essay, former San Francisco mayor Art Agnos recalled the challenges and outcomes—both positive and negative, citywide and personal—of his leadership and vision to tear down, rather than repair, the 40-foot, double-decked Embarcadero freeway that traversed San Francisco's waterfront and was severely damaged in the 1989 earthquake (Agnos 2009).

The vision can also emerge as part of the post-disaster planning discourse. The Vision Santa Cruz planning effort undertaken in the city of Santa Cruz, California, following the 1989 Loma Prieta earthquake resulted in a new vision of the community's severely damaged central business district. Even though deliberations were time-consuming and often conflict-ridden, the Vision Santa Cruz process did succeed in engaging a broad spectrum of community organizations and

REFLECTIONS ON THE LOMA PRIETA EARTHQUAKE, 20 YEARS LATER

Art Agnos, former San Francisco mayor

I went to Washington to ask for federal funds allowing us to finally tear down the Embarcadero [double decker freeway], and challenged and re-challenged the estimates from California transportation officials comparing the cost of a retrofit with a teardown and a boulevard replacement. Finally the numbers came together.

At City Hall, getting the political numbers to come together was equally challenging. More than 22,000 citizens signed petitions to require a city vote to restore the double decker freeway…Finally, the Board of Supervisors voted to support my plan (for a tear down rather than a retrofit) on a razor thin 6-5 vote. There were those who never forgave me for that, and in 1991 when I ran for re-election,… I lost. Believe me, that hurt...but I'd do it again in a heartbeat because it was so worth it.

Twenty years later, there is no question that the biggest loss would have been to…keep a double-decker freeway from blocking the city to one of the great civic treasures…It made possible our waterfront baseball park, the world-renowned Ferry Building market, the historic streetcars running from the Castro to Fisherman's Wharf, …and new parks, housing, restaurants and businesses. It is nothing less than a showcase for one of the world's great cities. In short, that one decision emanating from an enormous disaster allowed this generation of San Franciscans to fulfill the ancient Athenian oath: I promise upon my honor to leave our city better than I found it. (Agnos 2009)

interest groups in recovery decision making and in developing a vision that successfully guided rebuilding an economically viable downtown (Sternberg and Tierney 1998). More recently, when flooding associated with 2011's Hurricane Irene indefinitely relocated 1,500 state employees who had previously served as the main economic base of the Town of Waterbury, Vermont, the town created a rebranding project as part of the post-disaster recovery plan to help market the community as a destination for food, recreation, and new business opportunities (Geratowski 2012; Waterbury 2012).

Pre-existing plans can be particularly helpful in accelerating the implementation and achievement of specific neighborhood- and project-level visions. After being hit by an EF-4 tornado on April 27, 2011, Tuscaloosa, Alabama, turned to its comprehensive plan, adopted in 2007, to help craft the city's reconstruction vision, which was supplemented with a post-disaster-specific planning process for the tornado-impacted areas. The plan emphasizes a village concept with a permanent greenway created along the tornado's path that connects neighborhoods, businesses, and open spaces in the community (Stromberg and Kuenzi 2011). Similarly, Los Angeles' Community Redevelopment Agency utilized the 1994 Northridge earthquake as an opportunity to direct post-disaster funding, in particular federal HUD-CDBG and U.S. Economic Development Administration funds, to implement the vision, programs,and projects identified in the pre-existing Hollywood Redevelopment Plan adopted in 1986 (Los Angeles 1986; Olshansky, Johnson, and Topping 2006).

Particularly when preparing recovery plans in the post-disaster environment, there are windows of opportunity where resilience, and potentially significant changes in land use and building construction, can be politically supported and achieved. The timing and characteristics of those windows of opportunity are still not well understood. Researchers warn, however, that the window of opportunity for accomplishing post-disaster improvements appears to be short, lasting at most for several months following the disaster (Olshansky 2006). As previously discussed, community consensus is a critical ingredient for visionary approaches to recovery. To help ensure success, that consensus should be built for both the establishment of recovery priorities and desired outcomes as well as the set of strategies adopted to achieve that vision (Sternberg and Tierney 1998). Without an appropriate set of implementation strategies, and without consensus on how those strategies should be carried out, the recovery process may stall and the damaged community may be left with a vision, but little else (Alesch, Arendt, and Holly 2009). Similarly, if the organizations, social and institutional networks,

and markets involved with the recovery process lack robustness and resilience, it is unlikely that they will be able to "tip in" and make the necessary contributions to realize visionary goals such as community betterment and enhanced disaster resistance (Sternberg and Tierney 1998).

Since recovery can take years to accomplish, it can be useful to actively involve the future stewards of the recovered city into the recovery planning process as well as implementation phase. For example, following the flooding of 2010 that destroyed their downtown, students in Olive Hill, Kentucky, organized to provide their input into the city's long-term recovery planning process and then elected to continue their involvement by forming HOPE—a volunteer organization with a mission of stabilizing Olive Hill through united youth and community involvement (Olive Hill 2011).

MAKING IT ALL WORK TOGETHER

Communities vulnerable to large-scale disasters have the potential to need recovery policies for the full spectrum of topics discussed in this chapter. Most communities already have some degree of plans for normal development or "blue skies" that may be able to be applied to recovery policy. For communities that are developing recovery plans pre-disaster, they will want to integrate recovery policy into their existing community plans as much as possible and ensure there are no conflicts between everyday policy and post-disaster policy.

The Standalone Recovery Plan

If beginning the recovery planning process after a disaster has already occurred, a community will almost certainly want to develop a standalone recovery plan where all goals and strategies can be summarized for public awareness of the coordinated vision of recovery. Developing recovery policy prior to a disaster, however, may have a community considering other options than a standalone plan. For instance, the community might find it more beneficial to include recovery policy in the comprehensive plan, if that plan holds the force of law within the community. A specific, standalone recovery plan could still be developed post-disaster in this instance. There are, however, benefits to developing a separate recovery plan pre-disaster. The State of Florida's post-disaster redevelopment pilot program found that a standalone plan was ideal, especially for multijurisdictional recovery planning, because it provided a unifying guide to policies relevant to recovery found in a multitude of jurisdictional, regional agency, and private-sector plans. The Palm Beach County, Florida, post-disaster redevelopment plan explains that its purpose is to be a reference source to guide decision making as well as a place to detail the actions that can be taken before a disaster in order to facilitate and speed up recovery. While the standalone plan is valuable in providing a central strategy for post-disaster recovery, it will most likely need to be supported by linkages to other plans and should complement "blue skies" goals and visions.

In addition to or instead of a standalone, strategy-oriented recovery plan, a community can adopt a recovery ordinance that contains components included in the model recovery ordinance in Appendix A. This will provide a legal framework for much of the necessary post-disaster recovery implementation. From a very pragmatic perspective, sometimes communities need to take what they can get. An excellent example is Hillsborough County, Florida, which adopted its Post-Disaster Redevelopment Ordinance (Ordinance 93-20), but it was not until 2010 that the county adopted a comprehensive plan (Hillsborough 2010).

Integrating Recovery Policy into Existing Plans

Many communities looking to begin the pre-disaster recovery planning process surely must consider plans that could encompass recovery planning rather than creating and maintaining new plans. There are several local plans that a community probably already has developed that could house recovery policy. The problem is that no one plan is ideally suited to housing both recovery policies and post-disaster implementation process as discussed in Chapter 7. If a community is doing recovery planning in advance of a disaster, it is going to want to incorporate recovery policies, projects, and implementation protocols into several of its plans to ensure all aspects of disaster recovery are institutionalized into legal and administrative frameworks in the community. The following section outlines how recovery planning fits in with major local plan types. There are also a number of topic-specific functional or area plans that may be considered for integrating recovery policy to a lesser degree: long-range transportation plans; community wildfire protection plans; water supply, sewage, or solid waste management plans; beach or sensitive areas management plans; economic development strategies; neighborhood plans; and sector or district master plans.

The Comprehensive Plan

Whether a community develops a standalone recovery plan or not, if the community has a comprehensive plan (particularly one with the force of law), it should have recovery policies integrated into it. This is the natural place to lay out

HAZARD MITIGATION VERSUS DISASTER RECOVERY PLANNING

While hazard mitigation should be included in recovery planning, the local hazard mitigation plan (LHMP) and the disaster recovery plan need not duplicate each other. The LHMP is focused on *reducing future risk* whether the hazard mitigation project is conducted before or after a disaster. The recovery plan is focused on addressing the impacts of a disaster in order to return the community to pre-disaster or improved conditions. Some actions of the recovery plan may be conducted pre-disaster in order to facilitate a more efficient post-disaster recovery process, but the focus is always on repairing the effects of the disaster while hazard mitigation focuses on preventing disaster damages.

Mitigation includes the capabilities necessary to reduce loss of life and property by lessening the impact of disasters. Mitigation capabilities include, but are not limited to, community-wide risk reduction projects; efforts to improve the resilience of critical infrastructure and key resource lifelines; risk reduction for specific vulnerabilities from natural hazards or acts of terrorism; and initiatives to reduce future risks after a disaster has occurred.

Recovery involves those capabilities necessary to assist communities affected by an incident to recover effectively, including, but not limited to, rebuilding infrastructure systems; providing adequate interim and long-term housing for survivors; restoring health, social, and community services; promoting economic development; and restoring natural and cultural resources (FEMA 2011b).

post-disaster land-use and reconstruction policy and the ways in which it differs from "blue skies" policy. In addition to the comprehensive plan, the community should also integrate some of these policies straight into the zoning, building, and land development codes. The policy areas included in this chapter may directly relate to some of the elements of the comprehensive plan, making policy integration fairly intuitive. Some states require or encourage an element of the local comprehensive plan to be focused on natural hazards or public safety and in these communities recovery policy may best be located within these elements. Studies have shown that states that mandate land-use plans that address hazards are more likely to have lower disaster losses than other states, controlling for other factors (Schwab 2010). A statistical study of the effect of seismic safety plan quality in mitigating damage to structures affected by the 1994 Northridge earthquake found that a comprehensive plan with a seismic safety element that includes high-quality factual bases, goals, and policies can reduce property damage from earthquakes (Nelson and French 2007). While similar studies have not been conducted on whether including recovery policies in comprehensive plans will result in more effective community recovery from disasters, it stands to reason that the same principles would apply. A thorough discussion of hazard-specific comprehensive planning is included in *Hazard Mitigation: Integrating Best Practices into Planning,* PAS Report 560 (Schwab 2010) and is recommended reading for planners intending to integrate recovery planning into their comprehensive plans.

The Local Hazard Mitigation Plan

Because one of the major hazard mitigation funding programs in the U.S.—FEMA's Hazard Mitigation Grant Program—is only eligible to local governments that have had a presidentially declared disaster, the local hazard mitigation plan (LHMP) has a direct practical connection with post-disaster planning and implementation. Another point in favor of integrating some recovery planning into the LHMP is that the plan has become ubiquitous in communities with high disaster risk due to the requirement of an adopted LHMP in order to receive nonemergency federal post-disaster assistance. The LMHP, however, may not be the ideal location for all recovery policy, such as post-disaster reconstruction standards, since it is often a multijurisdictional plan and is not required to be consistent with local comprehensive plans or development codes. The content of the LMHP is also prescribed by the Stafford Act and does not encompass recovery planning. While communities can include additional content that is not required in the LMHP, having a local hazard miti-

TABLE 6.1 POTENTIAL LOCAL PLAN LINKAGES BY RECOVERY POLICY AREA

Recovery Policy Area	Comprehensive Plan Elements	Emergency Management and Hazard Mitigation Plans	Other Local and Regional Plans
Land Use and Reconstruction Standards	Land-use, housing, and coastal/safety elements	Local hazard mitigation plan and community wildfire protection plan goals/projects for building retrofit and land acquisition; emergency operations plan damage assessment protocols and emergency support function for long-term community recovery	Zoning, building, subdivision, and land development codes; sector, master, or neighborhood plans; transfer of development rights ordinance; historic preservation; disaster recovery or temporary moratorium ordinance
Infrastructure and Transportation Restoration	Public facilities, water, sewer, stormwater, solid waste, and transportation elements	Local hazard mitigation plan goals/projects for mitigating infrastructure and building or improving stormwater systems and flood protection structures; continuity of operations plan for public or private infrastructure/utility providers; emergency operations plan for essential support functions for transportation, communications, public works, engineering, and energy	Local hazard mitigation plan; transportation improvements plan; capital improvement plan; utility/infrastructure company plans; debris management plan
Housing Recovery	Housing and land-use elements	Local hazard mitigation plan/community wildfire protection plan goals and projects for building retrofit; emergency operations plan for temporary housing and damage assessment protocols; emergency support function for housing	Zoning, building, subdivision, and land development codes; neighborhood plans; disaster housing plan
Economic Redevelopment	Economic development element	Emergency operations plan emergency support functions for business and industry, agriculture, and natural resources	Economic development plan; business district plans; tourism plan; business continuity plans
Environmental Restoration	Natural resource, coastal, parks, and recreation elements	Emergency operations plan for emergency support functions for hazardous materials response, agriculture, and natural resources; continuity of operations plan for hazardous materials and contamination protocols; local hazard mitigation plan goals/projects for land acquisition, erosion mitigation, and floodplain protection; community wildfire protection plan/local hazard mitigation plan goals/projects for wildland fuel maintenance	Management plans for conservation properties; green infrastructure plans
Health and Social Recovery	Health, social services, and public school elements	Emergency operations plan for emergency support functions for mass care, emergency assistance, human services, public health, medical services, and public safety and security	Neighborhood plans; hospital and assisted living continuity plans; private education continuity plans; transit plans; voluntary organizations active in disaster/nongovernmental organization

Table 6.1. Potential Local Plan Linkages by Recovery Policy Area (Allison Boyd)

gation team involved in the development of the recovery plan is one way to ensure compatibility between the LMHP and recovery plan and to enable the recovery plan to be flexible, dynamic, and quickly implemented in the event of a disaster.

The Local Emergency Operations Plan

Emergency management planning emphasizes process and protocols, making an emergency operations plan (EOP) an excellent location to include an annex on recovery implementation. Integration of recovery planning into the EOP may ease the transition from response through long-term recovery phases. The disadvantage to addressing recovery planning solely through the EOP is that it is primarily an operational plan, and the ability to address reconstruction policy and public input may be quite limited. However, this also might create a natural separation when defining short-term and long-term recovery needs. Involvement of the emergency staff in the development of the long-term recovery plan is vital to ensure that the plans are complementary

Recovery Policy Linkages with Other Plans

Just as recovery policy and implementation protocols should be integrated into other plans, the recovery plan needs to be consistent with and linked to local, regional, and state plans. Table 6.1 (p. 117) provides some common plan types and components that, if available, should be considered for consistency and cross-referenced whenever possible.

CONCLUSION

This chapter has looked closely at the process of recovery planning and the opportunities and challenges of undertaking a recovery planning process before or after disaster strikes. Ideally, a community will have a recovery plan in place before disasters happen, and it will also be consistent with policies embedded in up-to-date local comprehensive plans, zoning and development regulations, capital improvement plans, hazard mitigation plans, and other key documents. The importance of leadership and collaboration, public input, and vision in the recovery planning process have been given special attention since each is critical to ensuring buy-in and adoption of recovery plans to build the necessary capacity and support for its implementation.

As so aptly put by Vale and Campanella (2005, 353), "ultimately, the *resilient city* is a constructed phenomenon, not just in the literal sense that cities get reconstructed brick by brick, but in a broader cultural sense...'The cities rise again,' wrote Kipling—not due to a mysterious spontaneous force, but because people believe in them. Cities are not only places in which we live and work and play, but also a demonstration of our ultimate faith in the human project and in each other." Planning is about people and their hopes and aspirations for the communities in which they live and raise their families. When a disaster directly impacts people's lives and their sense of community, recovery plans and the collaborative process of planning can help restore that collective faith and build the necessary momentum to keep the community moving forward. However, holding onto the vision of the recovered city can be particularly challenging in the post-disaster environment. Flexibility and adaptation are characteristics often recommended for successful recovery implementation, and these issues will be explored further in Chapter 7.

CHAPTER 7

PLAN IMPLEMENTATION: THE LONG, HARD ROAD OF RECOVERY

This chapter concludes the long-term recovery planning series discussion by examining how recovery plans are implemented and what the implementation phase of post-disaster recovery can entail. Unfortunately, the collective understanding of the plan implementation phase of post-disaster recovery—what actually gets funded, how it is executed, and what does and does not succeed—is far more limited than the understanding of the planning processes. This, in part, reflects the reality that government programs rarely work in practice as envisioned. It also reflects some of the continued challenges in the collective understanding of the recovery process itself: the observed conflicts between speed and quality as measures of recovery success and the uncertainty about how and when recovery ends and normal community processes resume.

What is known is that the work of recovery, in many ways, looks much like normal urban life, governance, and development and renewal. But what is uniquely different after a disaster is that all these activities are now happening concurrently and a community, which previously took years and even generations to build, now wants to be restored within a matter of months to years. Also, the fast pace of all these activities varies considerably both spatially across the community and in time. This creates a sort of "warping." Post-disaster warping can cause processes—such as physical construction, the supply of financial resources, and restoration of neighborhood social and economic networks—to happen unevenly and unnaturally across the community (Olshansky, Hopkins, and Johnson 2012). As a result, certain urban activities become out of sync compared to normal times, things are rebuilt in the wrong order, and some apparently lower-priority recovery actions can get completed before higher priorities. For example, homeowners quite often have funds to repair and rebuild their houses well before local governments and utility operators have funds for infrastructure and road repairs and before neighborhoods services are restored.

Since disasters are likely to disrupt many normal community activities, the phenomena of time compression and warping will likely kick in post-disaster and significantly change the way that disaster-affected communities operate and function. Thus, there are some specific conditions that need to be considered in developing the implementation section of a disaster recovery plan and in implementing a recovery plan post-disaster (Olshansky, Hopkins, and Johnson 2012):

- Decisions made early in the disaster response period can impede or undermine long-term recovery priorities and policy implementation. These include permitting of building reoccupancy or demolitions; siting of temporary housing and business locations; debris management and disposal locations; and transportation and infrastructure restoration priorities, upgrades, and relocation decisions.
- There are simultaneous and competing demands for limited resources post-disaster that will exacerbate pre-disaster inequities. This is particularly the case for personal wealth but also organizational staffing and funding resources.
- There is a mismatch between the flow of money resources and the pace of recovery. Some funds will come before they are needed, while others come later.
- Bureaucracies often do not adapt well to the compressed, post-disaster decision environment and so new governmental and nongovernmental organizations both formal and informal emerge, particularly to fill the information gaps and provide more resources (e.g., money, labor, technical assistance, and communication channels).
- The rules keep changing as post-disaster challenges often require significant adaptations to disaster management systems and result in a host of legislative, policy, and program changes.

GEARING UP FOR IMPLEMENTATION

Implementation priorities of an advance recovery planning effort should focus on preparing for and reducing the possibilities for or the effects of these potential conditions.

Similarly, post-disaster recovery planning needs to face these challenges head-on and quickly in the planning process.

Implementation Needs before Disaster Strikes

Knowing when and how disaster will strike is still a highly uncertain science. Communities that have developed recovery plans in advance of a disaster can be well-positioned, whenever that inevitable time comes, to more quickly organize for recovery, engage knowledgeably with state and federal partners as well as citizens about the likely recovery needs and challenges, and ultimately achieve a more successful recovery for the entire community. However, to be most effective, there are several key recovery planning-related actions that should be completed in advance of a disaster: adopting necessary rebuilding policies and procedures, conducting additional studies on specific hazards and federal and state regulatory matters, developing advance contracts and mutual-aid agreements, training staff on elements of the plan, and regularly reviewing and maintaining the plan. Public outreach is also an important pre-disaster implementation action discussed in detail later in this chapter.

Once the plan development is complete, the local recovery planning task force and lead planning agency or official should begin transitioning into an implementation role, helping to guide the plan's formal adoption and overseeing the execution of critical implementation tasks. The task force might want to work with key city departments and other local agencies to set aside staff time for pre-disaster implementation activities, and it can also help obtain grants or other funding sources to hire temporary staff or consultants to assist with implementation. Otherwise, when local government budgets tighten, staff time, funding, or both get more limited. With other competing organizational and community concerns, pre-disaster implementation actions might be neglected and pre-disaster investment in planning can erode.

The National Disaster Recovery Framework recommends that local governments appoint a Local Disaster Recovery Manager with pre-disaster responsibilities to serve as the primary point of contact for local recovery preparedness with state and federal partners; coordinate development, training, and exercises of the recovery plan; and establish and maintain resource and support networks, such as mutual-aid agreements (FEMA 2011b). Two additional recommendations for increasing the plan's implementation accountability pre-disaster are (1) to include annual reporting procedures in the plan for elected officials and the public and (2) to secure grants for and link other funds to particular tasks that must be met by specific deadlines (Florida 2010a).

Adopting the necessary ordinances, plan and regulatory amendments, and policies and procedures. The recovery plan should be submitted for review and formal adoption by the appropriate elected bodies, such as the city planning commission and city council, and include a final round of public hearings. If possible, the formal plan submission should also contain the accompanying regulations and proposed amendments to existing plans and regulatory documents.

This presumes that the recovery plan is prepared as a standalone document, providing in one place the strategy and action plan to guide post-disaster decision making and actions. But, by itself, a standalone recovery plan is not adequate for successful post-disaster recovery. The recovery strategy—its goals, policies, and recommendations—must also be integrated into other local plans and regulations. The comprehensive plan, hazard mitigation plan, capital improvement plan, and emergency operations plan are four key documents that should be amended to reflect the recovery strategy.

Relevant data, analyses, and policies of the recovery plan should be integrated into the comprehensive plan to ensure that there is consistent post-disaster guidance for long-term recovery and reconstruction in areas such as land use, hazard mitigation, transportation, housing, economics, and natural and cultural resources. Not all issues, however, will be a good fit for integration into the comprehensive plan; operational aspects of the recovery plan are one such example. The recovery plan goals, analyses, and projects that work to improve the community's disaster resilience should be integrated into the hazard mitigation plan. Similarly, those elements of the recovery plan that address the resilience of infrastructure systems and public facilities should be integrated into the capital improvement plan. Long-term post-disaster recovery issues, in particular, should be integrated into the local emergency operations plan. This might be done by adding or expanding a recovery annex to the plan to look beyond short-term recovery procedures. Also, to help leverage a wider slate of planning and regulatory tools in implementing recovery, land-use regulations, subdivision and zoning controls, and building regulations, among others, may need to be amended to better reflect recovery plan recommendations.

A post-disaster recovery ordinance should also be proposed as part of the plan's implementation, and its formal adoption and integration into the local municipal code ideally should occur ahead of disaster. At a minimum, the ordinance should address temporary regulations, such as moratoria and temporary restrictions on repairs and reconstruction and expediting of the permit review process, and

define the recovery authorities and operational leadership and management structure. (Appendix A includes a sample pre-event recovery ordinance.)

Conducting additional studies. Information is like money in disaster recovery; they are both fuel for the process, and there never seems to be enough of either. While a wealth of information is collected in order to develop recovery strategies as part of the pre-disaster planning effort, inevitably there will be areas where more information would be helpful to collect, and perhaps continually monitor, to be better prepared when disaster strikes. A pre-disaster implementation program could be established to identify areas of study, how information will be collected and monitored for accuracy, and how staff will receive ongoing updates and training. Some priority recovery issue areas will always benefit from further scrutiny pre-disaster, including hazards and risk management, the economy and post-disaster financing, and federal and state regulatory matters.

Broadening the local institutional knowledge of disaster financing and cost recovery issues before disaster can save valuable time in recovery. Some recommended recovery financing-related projects to be implemented pre-disaster include (Alesch, Arendt, and Holly 2009):

- Develop and maintain an inventory of funding sources that already exist or can be quickly tapped once a disaster occurs.
- Assign staff the responsibility to develop and maintain proactive partnerships with key funding agencies with the goal of having a strong working knowledge of the agencies' different funding programs and details on project eligibility, restrictions, timelines, and other key conditions.
- Institute regular staff training on federal and state post-disaster funding procedures and eligibility requirements.
- Assess how the city's budget may be affected by different disaster scenarios (how top revenue sources may be affected by the disaster and for how long as well as what costs are likely to increase due to recovery and redevelopment needs) and identify strategies for better managing post-disaster cash flow, such as financial reserves, new revenue sources, and credit and bond capacity.
- Develop a means for more directly receiving and accessing cash donations post-disaster.

Establishing advance contracts and mutual-aid agreements. The pre-disaster recovery planning effort will provide a much deeper organizational understanding of the personnel and other resources that may be required to effectively manage critical recovery services. Just as emergency managers and utility operators routinely make mutual-aid agreements with other agencies to assist with emergency response and restoration, there is an opportunity pre-disaster to establish mutual-aid agreements with nearby local governments or a "sister city," for example, that is not likely to be affected by the same disaster events to help augment staffing post-disaster. Advance contracting is also another means of ensuring resources for recovery, including specific expertise for recovery management, data management and geographic information system (GIS) support, and claims and funding expertise. Other recovery-related resource and support networks might also be established with the business community, neighborhood and community-based organizations, and the nonprofit sector. The Federal Emergency Management Agency (FEMA), the U.S. Department of Agriculture through its cooperative extension network, and other federal and state agencies have helped to create mutual-aid and sharing networks for local communities post-disaster. Several professional and academic organizations have also helped facilitated these interchanges.

Conducting drills and simulation exercises. The emergency management field has long understood the value of regularly exercising response-related roles and responsibilities. With a pre-disaster recovery plan completed, there is an opportunity to regularly exercise the plan and train staff and local leaders about their respective recovery-related roles and responsibilities, which will help institutionalize the knowledge and skills necessary to execute recovery. This is particularly important with newly elected or appointed leaders and staff from agencies who may have recovery-related roles and responsibilities that are different from their everyday functions or who will likely require special knowledge of disaster recovery programs, funding sources, and agencies. Because recovery is a highly interconnected and collaborative undertaking, it is important to exercise institutional responsibilities that also involve other organizations and groups working together in implementation, such as housing and economic recovery tasks.

It is recommended that communities conduct exercises annually. They can conveniently coincide with annual budgeting processes and preparations for peak hazard periods of the year, such as hurricane, flooding, tornado, and wildfire seasons. Tabletop exercises are a form of emergency management drill that consider policy-level material and may be most appropriate for exercising the recovery plan. Tabletop exercises might be held in conjunction with functional exercises de-

signed to test short-term recovery-related tasks, such as debris removal and damage inspections. They might also test (and possibly develop) the procedures for transitioning the emergency operations center (EOC) and emergency management organization from response and short-term recovery-focused tasks to long-term recovery implementation. These exercises can help assess the adequacy and sequencing of tasks to determine whether resources can meet the anticipated demands. In addition, exercises can be held in conjunction with specific job training, such as training on the Stafford Act and FEMA funding programs. They might also be used to identify pre-disaster mitigation priorities and develop or update the hazard mitigation or capital improvements plans.

After-action reports from the exercises should identify gaps or additional needs that can inform future modifications of the recovery plan. A set of operational procedures can be developed as a result of the exercise efforts to document the recovery-related responsibilities and help provide important guidance for future staff as team members change. FEMA's Emergency Management Institute offers courses on the National Disaster Recovery Framework, community planning and capacity building in recovery, recovery coordination, and other specialty offerings (www.training.fema.gov/EMI/). Other national and state emergency management training centers may offer similar training on long-term recovery or have resources on designing and conducting recovery exercises.

Conducting ongoing (annual) maintenance and review. As exemplified by the 2011 release of the National Disaster Recovery Framework, disaster recovery is an evolving field of disaster management and probably will be for some time to come. Therefore, pre-disaster recovery plans should undergo regular review and maintenance to be effective when a disaster occurs.

Annual exercises and budgeting efforts provide concurrent opportunities for a community to review the plan and make recommended revisions to ensure consistency with local plans and to reflect any changes in circumstances such as community priorities; local roles, functions, and assignments for recovery; and state and federal recovery policies and programs. Specific provisions for plan maintenance might be included in the plan and provide a regular opportunity to assess progress on pre-disaster implementation tasks identified in the recovery plan and to report progress to the public and authorizing bodies. Recommendations for an annual monitoring checklist include the following (Florida 2010a):

- Review stakeholder group membership and update for personnel and organizational changes as needed.
- Document actions that have been completed and remove them from pre-disaster implementation task lists.
- Include new actions resulting from the review.
- Determine if priorities need readjusting and review the actions previously scheduled to be implemented over the next year. Adjust implementation timeframe of actions accordingly.
- Seek resources and funding for actions scheduled to be implemented in the next few years.
- Consider preparing a brief report on implementation accomplishments that can be presented to elected officials, the public, state and federal partners, and the media and that can be posted on the plan's website.

Major updates and reviews should be undertaken at least every five years and can coincide with reviews and updates to other major local plans, particularly the comprehensive plan, emergency operations plan, capital improvement plan, and hazard mitigation plan. Hazards and risk analyses, institutional capacity and plan assessments, issue priorities, recommended strategies and actions, and potential funding sources are all areas that communities should carefully consider to ensure consistency and implementation leverage among the plans. The collection of coordinated stakeholder and public input on priorities for the plan updates might also help create synergies between the plans and also save staff time. A thorough analysis of major legislative and state and federal recovery policy and program changes should also be done at least every five years, ensuring that key issues are not accidentally overlooked in the annual reviews. This review should also include research to indentify any new guidance on recovery planning or significant lessons learned from other communities dealing with recent disasters.

Implementation Needs after the Disaster

After a disaster strikes, the first major decision that the community will likely have to confront is whether to activate a pre-disaster recovery plan or, if one does not yet exist, then whether to initiate a post-disaster recovery planning effort. Guidance on initiating a planning process is provided in Chapter 6. The following sections discuss post-disaster activation, adoption, and deactivation of recovery plans. Following this, the remainder of the chapter explores some of the major issues and challenges of post-disaster recovery implementation: recovery management organizations and their roles; recovery financing, milestones, and timetables for recovery implementation; recovery as a community enterprise; managing post-disaster uncertainties and legal issues; and measuring recovery progress and outcomes.

Activating the plan. When disasters happen, someone must decide whether to activate the recovery plan and when and how its activation should begin. While it may take months for the long-term recovery activity to really kick in, an activation decision should come much earlier during the first days and weeks, as soon as critical response and life-saving efforts are winding down and the processes of damage assessment and needs analyses for restoration and recovery have begun. This will give responsible staff and other stakeholders an opportunity to prepare for activation and engage alongside the emergency management team. This will also ensure a smooth transition into recovery as response activities taper off and attention turns to short- and long-term recovery implementation tasks.

To clarify the activation process, it may be useful to have some recommended triggers as well as the decision authority defined in the recovery plan or the implementing ordinance. Activation decisions should be informed by the level of damage and anticipated recovery needs, financing, and implementation issues. As part of an incident command-based emergency operations plan, the planning chief of the EOC might also be charged with looking at this issue and making a recommendation to the incident management team. The emergency manager and planning director might also be designated to make the activation recommendation to the city council or another authorizing body. Some specific triggers could be tied to the preliminary damage assessments and the disaster declaration process. In implementing the Stafford Act, FEMA has developed formulas for assessing the level of disaster damages to guide the federal major disaster declaration process (see 44 CFR 206.48). Some state emergency management agencies may also provide specific guidance. Communities should consult the latest information from FEMA and the state emergency management agency in considering potential triggers.

Also, the activation process needs to include a process for reviewing and modifying pre-disaster recovery plans once the actual damage patterns, estimated local revenue impacts and recovery costs, and other implementation issues resulting from the disaster have been considered. The stakeholder group might be reconstituted or reconvened post-disaster to assist with this review and formulation of recommended modifications. Recovery strategies may need to be added or adjusted, some projects and program activities might not be needed while others may need to be added, and the timing and metrics for implementation may also need to be adjusted. A process for formally reviewing and making any necessary amendments will also need to be undertaken with the appropriate authorizing bodies.

Adopting the plan and appropriate authorizing ordinances, plan and regulatory amendments, and policies and procedures. If planning is undertaken post-disaster, there will need to be a final review and formal adoption process by the appropriate elected bodies, all of which is discussed further at various points in Chapter 6. The recovery planning strategy's goals, policies, and recommendations must also be integrated into other local plans and regulations—particularly the comprehensive plan, hazard mitigation plan, capital improvement plan, and emergency operations plan—as well as land use, subdivision and zoning controls, and building regulations. However, given the likely pressures to complete planning as soon as possible, the planning team may not be able to prepare all the accompanying regulations and proposed amendments to existing plans and regulatory documents that would normally be recommended to ensure consistency with the recovery plan. These additional regulations and amendments may need to be developed and considered in stages after the plan is formally adopted.

Even if time is limited, a post-disaster recovery ordinance should also be developed and submitted for consideration as part of the post-disaster plan adoption process. At a minimum, the ordinance should define the recovery authorities and operational leadership and management structure, and it should address temporary regulations, such as building moratoria and repair permitting. Chapter 2 contains a lengthier discussion of the merits and contents of a recovery ordinance and Appendix A provides a model pre-event recovery ordinance.

Once the plan is adopted, it is important to commemorate this important post-disaster milestone, which in many instances will have been accomplished under extraordinary conditions and with considerable sacrifice. This is a time to celebrate with the stakeholder group and the public and thank them for their participation in the process. It is also important to allow staff involved in the post-disaster planning process some time to attend to overdue tasks. There is a metaphor that post-disaster planning is a sprint, while long-term recovery is a marathon. Therefore, it is important to take breaks along the way.

Finally, there also needs to be a mechanism by which the plan is periodically reviewed and amended once implementation begins. The planning task force and the stakeholder group might convene periodically during the implementation phase to adjust priorities and identify new strategies and actions, recognizing that the recovery process will be dynamic, conditions will change, and new information will emerge as time progresses. The most effective post-disaster

recovery plans and implementation efforts contain a measure of flexibility and adaptability to deal with the complex recovery environment.

Deactivating and updating the plan. The point at which community recovery and recovery plan implementation ends and normal local management processes resume is never clear. If the disaster's damage is significant, recovery will likely take many years but, eventually, the recovery issues begin to look more like "planning as usual." The pace of new housing starts, repair and construction permitting, and funding flows will seem more normal, even if pockets of recovery-related projects persist. Older urban problems will also persist into recovery and newer ones brought on by the disaster will emerge as well. All these issues will also take a long time to address.

Deactivation considerations should include whether the implementation actions have been accomplished, the community has reached an acceptable level of normalcy, and oversight from the recovery management team is no longer needed. It should be the responsibility of the recovery leadership and management organization to make a deactivation recommendation and to update the plan based upon lessons learned during its implementation (FEMA 2011b). The stakeholder group might reconvene to evaluate the recovery progress and recommend plan deactivation or a return to pre-disaster implementation status. The final decision, however, should be formally made by the appropriate authorizing body, such as the city council.

After the plan has been deactivated and recovery implementation has come to a close or is winding down, the plan should be updated to incorporate lessons learned from the implementation experience. Deactivation should also include a formal process of administrative closure that includes documentation of the results of each recovery project, collection of records, and creation of a set of project archives for future reference and use by local officials. Similar to emergency management practice, the recovery management team should compile an "after-action" report and the stakeholder group may convene for review and recommendation purposes. Recovery timetables and measures of recovery progress and outcomes can also be useful tools in the deactivation decision as well as the evaluation and update process. Both are discussed further in later sections of this chapter.

Once the post-disaster update is complete, the recovery plan will move into pre-disaster implementation status, and periodic exercises and reviews should be reinstated and continued. Completion of the recovery effort is also a cause for celebration and an important way in which a local government can publicly signal that it is transitioning back to normal operations while also setting expectations about how it will handle lingering issues for those who are still affected.

MANAGING RECOVERY IMPLEMENTATION

Strong and effective local recovery management can help build a great deal of positive momentum for a community's recovery trajectory, especially when communities can decide quickly on their recovery priorities and their organizational and decision framework. Studies have shown that personal leadership, the ability to act, and knowledge of disaster management and available resources are three of the most influential factors in community recovery and should be carefully considered in any recovery organizational design (Rubin 1985). The National Disaster Recovery Framework also provides the following set of criteria focused more on governance, primarily local governments, that have been shown to help ensure a successful recovery (FEMA 2011b):

- Effective decision making and coordination among local government leaders, stakeholders, and the community
- Integration of community recovery planning processes into the implementation efforts
- Well-managed recovery
- Proactive community engagement, public participation, and public awareness in the recovery planning and implementation efforts
- Well-administered financial acquisition of all disaster assistance programs and funds
- Organizational flexibility to adapt to post-disaster complexity and change
- Resilient rebuilding

The following sections explore these criteria in greater detail by looking at recovery management authorities; organizational models and roles; staffing of the recovery management organization and specific roles of local agencies and departments; state and federal partnerships; and the leveraging of formal and informal community networks.

Post-Disaster Recovery Management Authority

When a local emergency is declared, local governments typically grant their administrators and emergency management staff special authorities and suspend many of the normal approval and decision-making processes for a specific period of time. In more significant disasters, that emergency declaration period may be reauthorized several times to extend

the necessary authorities and cover the time staff needed to complete response and short-term recovery-related actions. But emergency proclamations typically do not address the necessary authorities for long-term recovery decision making and actions, and they may require additional legislation and authorization. Especially after a major disaster, recovery implementation will involve activities that were not previously anticipated and approved and that require quick decisions and swift action. Taking time to go through traditional approval processes can cause significant delays. On the other hand, the long-term consequences and politically high stakes of recovery decision making and implementation deserve deliberation and a public dialogue.

As previously noted, pre-disaster recovery plans should recommend both the authorities and organizational structure for recovery management, and the submission package for the plan's formal adoption should include a recovery ordinance that can be integrated into the local municipal code ahead of disaster. Also, as discussed in Chapter 2, the recovery ordinance should specify the following: the officers and members of a recovery management organization; the emergency powers and authorities that a recovery management organization would have after a disaster, including the scope of potential recovery operations; and the temporary regulations and activities that the organization would have the authority to administer.

Recovery Management Organization Models and Roles

As of yet, no set standard exists for the design and authorities of a local recovery management organization. Local managers who have had responsibility for post-disaster recovery also caution that there may not be one systematic or rational approach to recovery management (Johnson 1999). Scholars have proposed a host of recovery organizational management approaches and strategies, most of which emphasize "flexibility, improvisation, collaborative decision-making, and organizational adaptability" as key organizational characteristics necessary to deal with the distinctive challenges that disasters present (Tierney 2007, 409). Alesch, Arendt, and Holly (2009, 135) recommend that local governments create a "high-level problem-solving team that cuts across specialties to see the big picture and to understand how the parts fit together" and that it comprise people who are "willing to tell top leaders when something doesn't appear to make sense, who have good ideas, who can work together, and who can handle responsibility." In researching post-disaster recovery in both the U.S. and abroad, the U.S. Government Accountability Office (2012a, 3) also found that "having clearly defined and well-understood roles and responsibilities is a critical first step in coordinating and implementing the responsibilities of the various parties involved in the long-term recovery process." A few example organizational models are presented here, followed by some generalized recommendations for recovery management organizational roles and responsibilities.

In designing the recovery management structure, it is important to pay close attention to the organizational coordination and transition issues—especially in moving from emergency response to recovery but also in the transition from recovery back to normal governance structures. There will inevitably be some overlap between implementation of the emergency operations and the recovery plans. Emergency response and many short-term recovery operations will likely be organized through the Incident Command System (ICS) and led by the emergency management organization and the EOC, while some of the short-term recovery operations, as well as most all of the long-term recovery operations, will be organized through the recovery plan and its recommended organizational structure. In making any organizational transition, there needs to be a clear division of resources, especially staffing, and a way to ensure that the smooth continuity of operations started under one management structure continues to the next.

The National Disaster Recovery Framework does specify that local government has "the primary role of planning and managing all aspects of the community's recovery" (FEMA 2011b, 22). However, it does not specify the organizational structure. The framework also recommends appointing a Local Disaster Recovery Manager with post-disaster responsibilities to lead the creation of a local recovery organization and initiatives; to coordinate these activities, including any post-disaster recovery planning efforts; and to work with state and federal recovery partners on damage and impact assessments, prioritization of recovery issues and needs, identification of recovery funding sources, measurement of recovery progress, and effective and consistent communication with stakeholders and the public (FEMA 2011b).

The National Incident Management System (NIMS) has set a standard for emergency operations organizations and planning with which all jurisdictions must comply. The emphasis of these standards, however, has been on emergency response and short-term recovery operations that are designed to save lives, reduce suffering, protect property and the environment, stabilize the situation, and set the stage for reentry and recovery (U.S. Department of Homeland Security

2008). While not required by NIMS, some communities have structured their recovery plans as annexes to their emergency operations plans and developed a series of recovery support functions—both short- and long-term recovery actions—that complement and work in tandem with emergency support functions and the NIMS, ICS-based organizational structure of their emergency operations centers.

The ICS—first developed for use by firefighters and now serving as the foundation of NIMS—standardizes the emergency management organizational structure across jurisdictions to enable effective, efficient, and collaborative incident management and to allow for integration of other resources from various partners through mutual-aid agreements and assistance agreements (FEMA 2008). The ICS-based organization structure could be extended beyond the emergency response period to cover short-term recovery actions and help local governments transition into recovery. It might also be used for the entire post-disaster implementation of the recovery plan to provide a more standardized structure for local recovery management and intergovernmental collaboration and interaction in recovery. In 2012 Fairfax County, Virginia, adopted a pre-disaster recovery plan that incorporates the recovery support functions of the National Disaster Recovery Framework into an ICS-based organization structure (Fairfax County 2012).

If the recovery management organization also follows an ICS-based organizational structure, then staff from agencies and departments with key recovery responsibilities, such as city planning and redevelopment, could replace emergency responders within the former emergency management-focused organizational structure as the transition from response to recovery occurs. Hourly and daily planning sessions could evolve into weekly or biweekly sessions as recovery progresses. Following the 1997 flood, the City of Grand Forks, North Dakota, structured its short-term, six-month-focused recovery plan according to the ICS organizational structure and facilitated ICS-styled weekly recovery planning sessions with city departments as well as state and federal partners to set priorities, identify and resolve issues, and track progress on the plan (Johnson 2014). Figure 7.1 illustrates an ICS-based recovery management organizational model.

Florida's *Post-Disaster Redevelopment Planning* guide recommends that the post-disaster redevelopment organization responsible for recovery plan implementation be similar to the stakeholder planning body that was formed to draft the plan or the local government's typical department organization (Florida 2010a). Many of the communities involved in Florida's pilot planning projects chose to establish an executive committee or task force to serve as an advisory body to the board of county commissioners or municipal councils, leaving ultimate approval of implementation actions up to the official elected body. In some communities, the executive

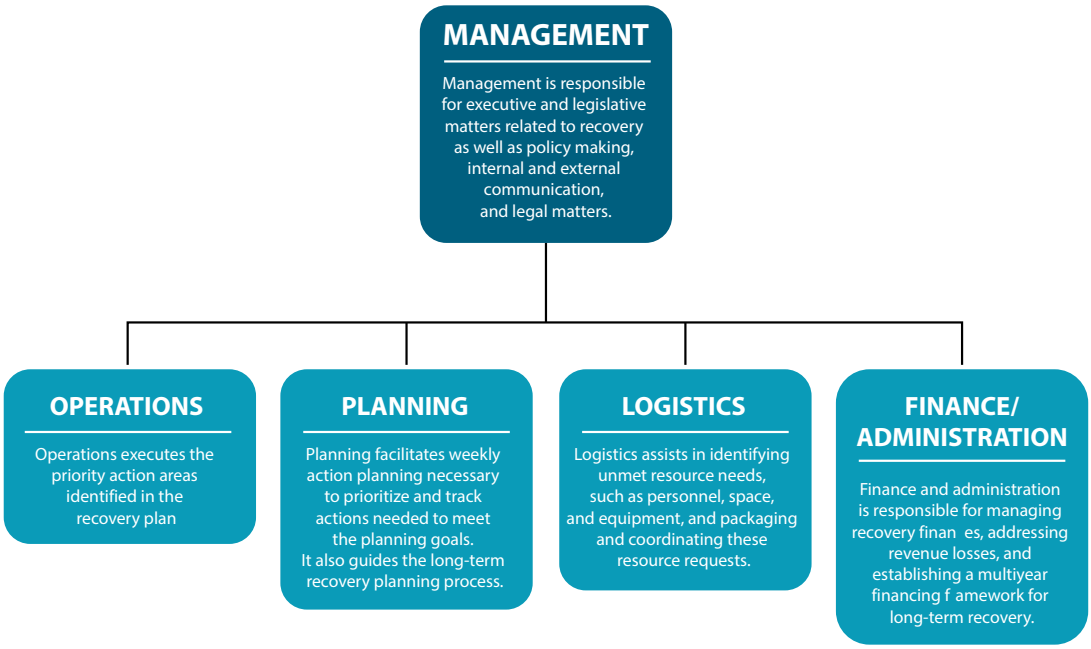

Figure 7. 1. An Incident Command System-based recovery management model (Johnson 2014)

THE RECOVERY IMPLEMENTATION STRUCTURE OF WATERBURY, VERMONT

After severe flooding from Hurricane Irene in late August 2011 affected the the town of Waterbury, Vermont (population 5,000), it received recovery planning technical assistance from the Long-Term Community Recovery (LTCR) team of the Federal Emergency Management Agency and completed a long-term community recovery plan in May 2012 (Waterbury 2012). Soon after, Waterbury town officials, recovery project champions, and other community leaders worked with the LTCR team to design a community recovery steering committee and a transition and implementation plan to ensure Waterbury's recovery projects would move forward with the community in control (Waterbury Long-Term Community Recovery Steering Committee 2013). The transition and implementation plan details the structure and membership of the steering committee; a project tracking process; contact information for state, local, and federal partners along with assigned roles and responsibilities; and some specific project champion and steering committee roles and responsibilities to keep various projects moving forward.

A recovery steering committee was established to guide the recovery implementation process, and it reported to the town select board and village trustees, who maintained overall responsibility for recovery activities and their integration into other town and village initiatives. Guidelines defined the composition of the committee to be a mix of town government and community representatives, with up to two town select board members, up to two village trustees, one library commissioner, and up to three members of the public. The steering committee held weekly meetings, and Waterbury's municipal manager and community planner provided administrative support as needed. One meeting a month also included the project champions in order to keep them engaged and motivated, and the meeting also provided additional support for these projects when applicable. In 2013 the steering committee reduced its meeting frequency to bimonthly and then eventually to once a month as recovery projects were either completed or well on their way, or took on lives of their own with clear leadership. Minutes from all steering committee and project champions meetings are posted on the municipal website (www.waterburyvt.com/about/recovery/).

committee or task force was also supported by subcommittees whose structure aligned with the major topics of the recovery plan. Each is responsible for providing subject matter expertise and coordinating the implementation of individual post-disaster actions.

Cities that do not regularly use redevelopment authorities or have established redevelopment agencies often create recovery management processes that replicate many of the features of redevelopment (Spangle Associates 2002). The general process of reconstruction, in many ways, mirrors the detailed process of redevelopment. "Redevelopment agency staffs usually have the skills needed for reconstruction" (Spangle Associates 2002, 41), and the legal procedures and requirements for redevelopment could also provide an organizational framework for reconstruction.

Irrespective of its structure, the recovery management organization should be authorized to work on behalf of the elected bodies to oversee post-disaster recovery of the entire community. This includes repairing and restoring public facilities and infrastructure as well as potentially providing short-term assistance to individuals and families in need and helping residents and businesses find needed resources to rebuild. The following are some recommended management activities (Florida 2010a):

- Ensuring that recovery decisions align with the community's "vision," found in the local comprehensive plan and recovery plan
- Ensuring accountability, transparency, and equity in the recovery process
- Monitoring progress toward meeting long-term recovery goals and objectives as specified in the recovery plan, setting a timetable for reaching milestones, and ensuring that the progress is clearly communicated to the public and stakeholders
- Reviewing damage and economic loss assessments for the entire community and evaluating the need to modify or augment post-disaster actions
- Reviewing priorities for implementation on a regular basis during post-disaster phases to adjust as conditions warrant
- Initiating recommendations for enactment, extension, or repeal of emergency ordinances and procedures that affect long-term redevelopment, such as moratoria

- Overseeing coordination between different levels of government as it relates to implementing recovery actions
- Assigning or reassigning implementation responsibility for new and adopted actions as needed
- Formulating or modifying committees or other aspects of the recovery organizational structure as needed to implement recovery
- Ensuring resources and staffing are provided in a timely manner to accomplish recovery actions
- Recommending budget requests and approval of grant agreements to implement recovery actions

Roles of Local Leaders, Departments, and Agencies in Recovery and Recovery Management Staffing

Overall leadership for local recovery implementation needs to come from the top of city management. In a typical city-manager form of local government, this will likely be the city manager's office. In a strong-mayor form of local government, the responsibility may fall to the mayor or city administrator's office. Strong and engaged executive leadership is a key determinant of both the quantity and quality of human, physical, and financial resources devoted to community recovery. Exerting this leadership does not necessarily mean that the top executive must fulfill the recovery manager position; however, it does mean that this person should assume responsibility for determining who does.

As previously noted, the National Disaster Recovery Framework recommends appointing a Local Disaster Recovery Manager with post-disaster responsibilities to lead a local recovery organization (FEMA 2011b). Other recommended responsibilities for the recovery manager position include serving as the key point of contact with state and federal recovery partners, keeping local political bodies and the public appropriately involved in decision making, and ensuring effective and consistent communication with key stakeholders, especially business and community leaders and the public. This person should have the ability to manage, motivate, and collaborate with an array of personalities and constituencies; decide upon and execute priorities; and possesss the capacity to handle uncertainty and dynamic and challenging conditions.

Local elected bodies and officials are responsible for ensuring that there is transparency and open discourse about local government decisions and actions, monitoring community sentiment closely, and helping to evaluate options and opportunities as they emerge. Elected officials are ultimately responsible for the key decisions and actions taken by local governments in recovery and their choices can define the success or failure of recovery. Some decisions will be extremely difficult to make—decisions that defy the experts' opinions or that are unpopular with community members. There can be significant turmoil and turnover in local elections post-disaster, and "local leaders are encouraged to use their best judgment to make the best decision because upheaval will occur regardless of how much a community tries to avoid it" (Grand Forks 2006).

Besides leadership, recovery implementation will require years of dedicated hard work by local government staff. Sufficient staffing is needed to design, manage, implement, and monitor the recovery-related projects and programs, many of which can be larger or significantly different from any prior ones. At the same time, the staff needs to continue all routine local government functions, while also handling the increased workloads brought on by the time-compressed, simultaneous demands—such as processing many more permits for housing and business repairs, designing and implementing a broad array of public facilities and infrastructure repairs, completing the necessary paperwork required for state and federal assistance, and conducting all the follow-up inspections. Figure 7.2 outlines the recovery-related roles and responsibilities of local government departments and agencies. Staff will also need backup to not become exhausted by the stressful environment and the balancing of work demands with their own personal and family recovery. Backup resources can be provided through contract services, mutual-aid agreements, other local departments, and part-time staff.

The following are some additional management practices that researchers have recommended after studying many disaster-affected communities (Alesch, Arendt, and Holly 2009; Inam 2005; Olshansky et al. 2008; Spangle Associates 1997; Steele and Verma 2006):

- Employ systems thinking, recognizing that recovery tasks are interconnected and that a systems approach to institutional management can enhance adaptability and add capacity.
- Focus on enhancing "horizontal organizational integration," ensuring that key departments are well linked through the flow of information, communication, shared resources, and similarity of practices.
- Decentralize implementation by granting considerable decision-making authority to departments to carry out recovery operations but also ensuring transparency and accountability in decision making.
- Leverage existing agencies and familiar routines and programs to accomplish much of the work of recovery. Especially in major disasters, it may be time consuming and

Emergency Management

- Manage the emergency operations center and oversee the implementation of the emergency operations plan, both of which involve other departments, to execute short-term recovery tasks, such as damage inspections, demolitions, access control, debris removal, interim housing, and business locations.
- Act as primary interface with state and federal response agencies, both of which have recovery related operations. This may include resource requests and allocations, grant applications for disaster assistance, and cost recovery for response and short-term recovery related activities.
- Coordinate the preparation of local hazard mitigation plans and post-disaster hazard mitigation grant applications.

Planning

- Identify specific rebuilding and hazard mitigation opportunities.
- Expedite review of temporary housing, rehabilitation, and land-use applications as part of rebuilding, including environmental review.
- Enforce or recommend exceptions to planning-related regulations, such as architectural and design guidelines, nonconforming uses, and historic preservation.
- Recommend sites for interim housing or businesses, changes in land uses, and any new standards for rebuilding.
- Participate in the preparation of local hazard mitigation plans and post-disaster hazard mitigation grant applications.

Redevelopment

- Designate redevelopment project areas and prepare redevelopment plans for those areas.
- Oversee land-use, rebuilding, and redevelopment activities in pre-existing or post-disaster designated redevelopment project areas, including developing property and imposing land-use and redevelopment controls and environmental reviews.
- Use powers of eminent domain/voluntary acquisition to acquire and assemble heavily damaged or blighted properties.
- Relocate households or businesses in property acquired by the agency.
- Finance operations in the project areas through incremental increases in property tax revenues, borrowing of funds, seeking of funds, developing and administering of grant and loan programs, and selling of bonds.

Finance

- Manage cash flow and arrange for bridge/gap financing.
- Oversee grant applications, damage claims, and determinations of eligible and ineligible expenditure reimbursements from state and federal disaster assistance providers, insurers, and others.
- Establish and oversee record-keeping and accounting procedures.
- Manage post-disaster audits.

Legal

- Ensure proper authorities for recovery, redevelopment, and other key recovery activities.
- Review decisions and actions to ensure legal authority and consistency.
- Oversee the preparation and adoption of any necessary ordinances and other regulatory actions.

Building

- Inspect the habitability and structural safety of buildings damaged by disaster and placard hazardous buildings.
- Secure damaged buildings to prevent collapse or other threats to public safety.
- Inspect and certify buildings for reoccupancy.
- Coordinate with local utilities on service restoration to damaged buildings.
- Enforce building moratoria.
- Institute contractor certification.
- Expedite permitting for business.
- Permit repairs and reconstruction.
- Enforce building codes or recommend exemptions or enhancement to building regulations, such as rebuilding to newer seismic or wind-related standards and National Flood Insurance Program compliance.

Public Works

- Manage debris removal and street clean-up and reopening.
- Inspect publicly owned buildings and infrastructure damaged by the disaster, and close and secure damaged structures to prevent collapse or other threats to public safety and FEMA assessments for public assistance.
- Provide temporary infrastructure solutions as needed, such as potable water and sewage disposal and treatment.
- Design, implement, and manage repairs and reconstruction of damaged public buildings and infrastructure, including obtaining funding and preparing grant and loan applications.

Transit/Transportation

- Reroute traffic around heavily damaged areas.
- Provide alternative means of transportation/transit.
- Manage repairs and reconstruction of damaged road, bridges, and other transportation/transit facilities, including obtaining funding and preparing grant and loan applications.

Housing

- Identify short-term and long-term housing needs of all community residents.
- Seek funds and develop and administer grant and loan programs for alternative housing, housing repairs and reconstruction, and affordable housing construction.
- Manage repairs to damaged public housing units and develop necessary assistance programs for residents.

Public Health

- Enforce habitability and other public health standards or recommend exemptions and enhancements (e.g., for mold, safe drinking water, and waste disposal).
- Assist in interim housing design and location.
- Provide mental health counseling services, which may be needed well into recovery.

Figure 7.2. Key Recovery-Related Roles and Responsibilities of Local Government Departments and Agencies (Information adapted from Florida 2010a, 2010b; Schwab 1998)

difficult to innovate and implement new programs and schemes, and the outcomes are likely to be more uncertain.
- Employ personnel management techniques for high-pressure and high-demand situations, which can include redeploying ordinary "non-disaster" resources in innovative ways for recovery, adding temporary staff, and seeking specialized technical assistance to ensure that the requisite skills and sheer numbers of staff are available to deal with the added demands of post-disaster recovery.

While adding costs, local governments rarely, if ever, regret the decision to augment staff (Alesch, Arendt, and Holly 2009). Finding funds, however, for these new positions is always a challenge. FEMA Public Assistance has many restrictions on reimbursing costs for added staff. Many communities have been able to secure technical assistance or grant funding from state and federal agencies, notably the U.S. Economic Development Administration (EDA) and Community Development Block Grant (CDBG) programs. Philanthropic organizations have also underwritten the supplemental staffing needs for disaster recovery in affected communities. Instead of hiring additional staff, some communities have turned to academics and volunteers, especially in helping to assess damage, design and facilitate post-disaster recovery planning, and promote community interaction. More often than not, these individuals self-select the neighborhoods and recovery-related tasks in which they they want to be involved, and it is important for local governments to reach out and integrate them into the recovery organization.

Technical assistance can be especially helpful when local government staff have little prior experience with disasters and disaster regulatory compliance. In their multicity study, Alesch, Arendt, and Holly (2009, 133) found that "local governments typically augment their capacity to help systematically evaluate and assess government and community consequences of the disaster, devise and evaluate recovery strategies and programs, manage programs that involve and cut across several agencies and departments, and work with granting agencies to maximize the help available to the community while minimizing the hassles, and to track expenditures." They also documented some significant advantages. For example, they found that local governments hiring staff or consultants to help understand the regulations and eligibility requirements of state and federal disaster assistance programs were "usually successful in obtaining grants and with less difficulty than communities that chose to rely on an already overburdened staff" (134). They describe good consultants as "those who have been through disasters before, have a solid track record of being helpful in other communities, are easy to work with, and will be there when they're needed" (134). They also strongly recommended checking with other local governments for references and prior experience.

Some other staffing-related recommendations from Alesch, Arendt, and Holly (2009) include:

- Understand state and federal disaster assistance guidelines for reimbursing staff-related costs. The costs of temporary staffing working exclusively on disaster recovery are more likely to be eligible for reimbursement than the costs of permanent staff performing a mix of normal government functions and disaster-related work.
- Decisions to acquire supplement staffing will be needed at different points in the recovery process. Decisions should be made quickly after the disaster to ensure adequate support for short-term recovery activities, such as building damage inspection and debris removal, while it may be more appropriate to allow some time to elapse before technical assistance to support the longer-term recovery of the community is engaged.
- Begin planning for the end of technical assistance as soon as the scope of the technical assistance is established. Where possible, the end date should coincide with completion of a phase of recovery, and the technical assistance team should provide the community with products that support the transition to the next phase of recovery.

State and Federal Partnerships in Recovery

Disaster recovery, in particular recovery from major disasters, requires strong coordination among multiple levels of government as well as voluntary and nongovernmental organizations. In many cases, the partnership is critical to community recovery success, since local governments are typically much less experienced with disasters than the personnel of state and federal response and recovery organizations.

There are many federal departments and agencies responsible for administering dozens of recovery-related programs, some of which require active participation by state agency counterparts and local governments. When major disasters affect multiple cities and states at once, federal and state government administrations have sometimes appointed interagency task forces and recovery coordinators to help manage the collaboration and partnering necessary to administer recovery programs. The most recent of these is the Hurricane Sandy Rebuilding Task Force, established by President Obama in December 2012 and chaired by former U.S. Department of Housing and Urban Development

(HUD) Secretary Shaun Donovan. The task force included senior representatives from over 20 federal agencies. In tandem with the elements of the National Disaster Recovery Framework, the task force was charged with identifying and working to remove obstacles to resilient rebuilding, while taking into account existing and future risks and promoting the long-term sustainability of communities and ecosystems in the Sandy-affected region (Hurricane Sandy Rebuilding Task Force 2013). Federal interagency task forces were established after the 1997 upper Midwest floods in North Dakota and Minnesota and Hurricane Georges in 1998 in Puerto Rico. After Hurricane Katrina and Hurricane Rita in 2005, Louisiana's governor established the Louisiana Recovery Authority (2009) to advise on recovery policy and funding priorities. Similarly, Mississippi's governor established an Office of Recovery and Renewal to help identify disaster recovery resources; advise on disaster recovery policies; and conduct education, training, and outreach efforts aimed at building local capacity for recovery (Smith 2011). In 2008 Iowa's governor established a Rebuild Iowa Office to facilitate recovery after destructive floods in Cedar Rapids and other communities along the Missouri River (FEMA 2011a).

A major purpose of the National Disaster Recovery Framework is to clearly define roles and create a coordinating and partnering structure to align and unify the recovery efforts of multiple levels of government, the private sector, and nongovernmental and community organizations (FEMA 2011b). The framework defines the position of Federal Disaster Recovery Coordinator (FDRC) to be a focal point for incorporating recovery and mitigation considerations into the early post-disaster decision-making processes following large-scale disasters and catastrophic incidents. The FDRC is to be a deputy to the Federal Coordinating Officer for all matters concerning disaster recovery. Specific post-disaster responsibilities of the FDRC are as follows (FEMA 2011b):

- Develop a strategic approach for coordinating federal assistance and policies and facilitate federal funding streams.
- Coordinate federal assistance to support community recovery planning and work with affected communities to incorporate mitigation and resilience-building measures into recovery plans and implementation.
- Coordinate the recovery-support function operations and activities and work with affected communities to establish recovery measures, track progress, and provide support for their goals.
- Facilitate the development of a unified communications and outreach strategy among all stakeholders and promote inclusiveness to increase participation and innovation of stakeholders in the recovery process and outcomes.
- Reinforce the importance of compliance with federal civil rights laws when using federal funds.

The National Disaster Recovery Framework also calls for the appointment of State Disaster Recovery Coordinators (SDRCs) after large-scale disasters or catastrophic incidents to ensure that recovery activities are well managed, especially while extended response and short-term recovery activities are ongoing (FEMA 2011b). The post-disaster responsibilities of the SDRCs are similar to those in the framework but with a state-level focus for establishing and managing a state structure for recovery; coordinating and collaborating with federal and local counterparts; and supporting planning, communications, and resilience and mitigation measures in the recovery process.

Case study research has also found that local government relationships with state and federal officials have varied considerably from community to community post-disaster (Alesch, Arendt, and Holly 2009; Olshansky, Johnson, and Topping 2006; Rubin 1985). Multigovernmental interaction has historically been greater when larger amounts of federal assistance are being provided to local governments, and these interactions have had a major influence on the efficiency of local recovery.

Sternberg and Tierney's (1998) study of governmental responses following the 1994 Northridge earthquake found that there was a fairly smooth-functioning intergovernmental system, where agencies within the three principal levels of government—local, state, and federal—carried out their tasks within a shared system of authority, status, powers, and regulations that was mostly well understood. They attributed the positive coordination to long-standing experience with planning for and responding to earthquakes and major disasters at the local and state levels; more than a decade of targeted investment by state and federal agencies for earthquake planning in Southern California; multilevel use of ICS for emergency response; formalized and well-understood responsibilities and authorities at the federal level; and use of informal mechanisms for intergovernmental problem-solving, such as frequent teleconference calls.

Multitier governmental coordination should be a clearly defined function of a local recovery management organization. Its responsibilities should include working collaboratively with state and federal partners to reduce common recovery obstacles associated with funding, reimbursements, application review, and regulatory compliance. It should

also bring additional expertise from state and federal agencies to enhance local capacity and effectiveness in recovery. In addition, some recommended interagency coordination mechanisms include streamlined paths of communication and duties and the use of information technology to optimize inter-organizational communication and the flow of new and updated information between or within organizations.

There are some cautionary notes, however, that all partners should be vigilant about recognizing and addressing. Intergovernmental partnerships can often be little more than loose federations, leading to distrust and conflict. Organizations and staff at different levels of government may also have different ideologies and seek autonomy, and they may have concerns about loss of organizational identity, scarce resources, and control.

Implementation as a Community Enterprise

Public employees are never the only source of human, physical, and financial resources for recovery implementation. In the post-disaster environment, there are hundreds, even thousands, of actors and decision makers, and only some of these are public employees and policy makers. What happens in recovery is to a considerable extent the outcome of many individual choices and decisions. Thus, recovery essentially happens as individuals, businesses, and institutions directly and indirectly affected by a disaster make these choices and decisions and take action. It can be thought of as an "ecosystem of builders" involving government agencies, including neighboring jurisdictions; community, faith-based, and nongovernmental organizations; residents, businesses, their associations, and other private-sector investors and organizations; and the public-at-large.

Local governments, with the primary responsibility for recovery, also have the greatest stake in recovery, and they are ultimately accountable for the physical, social, and economic outcomes of the recovery process. By the nature of their daily, direct contact with communities and provision of services, local governments also have the greatest ability to positively and directly influence the decision making and action-taking that encompasses the recovery process. Yet, local governments—and all levels of government—need to resist the urge to overly control or interfere with the ecosystem of recovery rebuilders. Instead they need to work collaboratively to positively influence the multitude of decisions and actions so that the whole community of residents, businesses, and other stakeholders "tip in" to the recovery effort. For example, the restoration of infrastructure is critically important to local recovery and a good portion of local-serving infrastructure is managed by the private sector or nonlocal entities. Engaging with them to understand mutual priorities and coordinate restoration work can enhance the overall recovery process.

Key recovery decision-action influences are leadership and resources—most importantly money but also human and information resources. It is possible to essentially "seed" community recovery with projects and investments that can influence recovery decisions of individuals and organizations and indirectly influence the recovery outcomes. This "seeding" might be for a very specific project, such as public funding in Santa Cruz, California, of a downtown parking garage to incentivize commercial building owners and businesses to return to the area largely destroyed in the 1989 Loma Prieta earthquake (Arnold 1999). It could also take the form of more limited interventions, such as offering low-income housing tax credits that enable market forces to act quickly, equitably, and sustainably. But to be effective at this high grade of influence, the recovery process must be managed as a "collective action problem" with strong coordination and communication across multiple levels of government and with individual actors as well as the private and nonprofit sectors (Birch and Wachter 2006).

A strong foundation for collective action can be developed through an inclusive recovery planning process, and implementation will be more collaborative and well-coordinated if there is active engagement between government agencies and the public in decision making, policymaking, and project and program design. For instance, economic recovery is interdependent on housing and infrastructure restoration, and implementation of the different actions cannot be successfully accomplished without coordination between all the individuals and groups involved. Unanticipated disaster impacts and situations that require additional decisions and input will also emerge. Community leaders can attest to a "decision paradox" in recovery, with some decisions taking painfully long to make and others needing to happen very quickly (Grand Forks 2006). Some recommended strategies for strengthening inclusiveness, collaboration, and coordination in recovery implementation are discussed briefly here.

Understand that nongovernmental organizations, both formal and informal, will emerge in post-disaster recovery, and the implementation process should embrace them. There always will be new players and outside agencies that emerge after a disaster. Their major purposes are to fill the information gaps and provide more resources—primarily in the form of labor, technical assistance, and communication channels. The business community and neighborhood groups are emblematic of the invaluable alliances that devel-

op post-disaster. A community's social capital—preexisting social networks, interconnectedness, and ties—can serve as a form of "informal insurance," helping disaster-affected residents to stay, access resources, and engage in recovery planning and implementation. Volunteers, community-based organizations, and other nongovernmental organizations also can be instrumental in leading community transformation following disaster; in particular, they can assist vulnerable populations whose needs are not met by more conventional disaster-assistance programs.

In New Orleans after Hurricane Katrina, the Neighborhoods Planning Network emerged to promote inclusion and empower neighborhood groups during the city's recovery planning process (Olshansky et al. 2008). The group endured beyond the formal planning period in 2006 and 2007 and renamed itself the Neighborhoods Partnership Network. It worked to support its neighborhood association members in their own development and to address larger citywide issues (Neighborhoods Partnership Network 2012).

In Florida many communities have formalized their networks of community agencies into long-term recovery organizations to assist disaster-affected residents in meeting needs over the long term that cannot be met through the standard assistance process. They also have helped to coordinate and organize volunteer efforts and obtain additional donations and volunteer assistance to address long-term needs (Florida 2010a).

Formalize multigovernmental partnerships for recovery. These partnerships can help in resource sharing and interagency communication—both horizontally among agencies and organizations and vertically among different levels of government—to break down institutional barriers and collectively solve problems. They can be especially useful in disasters involving multiple jurisdictions to coordinate policy and funding flows as well as foster consistency in policy development, interpretation, and negotiations with state and federal partners.

Regional associations of governments and agencies offer these functions in normal times and could also serve these purposes for their region post-disaster. Major disasters rarely affect just one jurisdiction, especially in metropolitan regions, so pre-existing regional governance structures can be helpful in encouraging communication, cooperation, and even collaboration in recovery planning and implementation. In Vermont the state's regional planning commissions participated in a FEMA training workshop to learn about the long-term recovery planning and implementation process and toolkit, and then offered their assistance to communities affected by flooding from Hurricane Irene in 2011 (Geratowski 2012).

Peer-to-peer partnerships with other communities that have experienced disasters can also provide valuable opportunities for mentorship of local staff, elected officials, and even community leaders. For example, after Hurricane Katrina in 2005, local government and community leaders involved in recovery in Grand Forks, North Dakota, following the 1997 Red River flood developed a briefing book and also participated in exchanges with Gulf Coast community leaders (Grand Forks 2006). In 2008 FEMA helped arrange a video conference between local officials from Texas communities affected by Hurricane Gustav and Hurricane Ike and state and local government leaders from Colorado, Florida, Iowa, and Mississippi to learn about those states' experiences with recovery plan implementation, multigovernmental coordination and collaboration, and project development and funding (FEMA 2011a).

Formalize public-private partnerships for recovery. The purposes of these partnerships can vary. Some can be advisory only—a stakeholder group or recovery task force that can raise issues; publicly vet proposed policies, projects, and programs; and design more effective strategies and solutions. Some partnerships include more direct involvement in the recovery, such as business improvement districts and community development corporations actively involved in design, funding, construction and even long-term management of recovery-related projects. The purpose of some partnerships can also evolve over time.

After the Red River flooded the entire downtown of Grand Forks in 1997, the business community quickly organized into an officially recognized group called the Mayor's Task Force on Business Redevelopment. The task force led both the city's overall economic recovery and recovery of the downtown area (Grand Forks 1997). The task force was very active in developing the objectives, projects, and milestones for the business redevelopment component of the city's six-month recovery action plan. In September 1997, the city council formed a development commission for downtown to establish and implement a downtown revitalization plan (Spangle Associates 2002). The commission included many members of the task force, and it fulfilled the essential functions of a redevelopment agency. The city council appropriated $13 million of HUD-CDBG funds for downtown recovery programs, development commissions projects, and several other key projects in the city.

Build, staff, and maintain a robust information and communication infrastructure for recovery. Stakeholders have an almost insatiable need for information about post-disaster conditions, programs, and plans—both from

government agencies as well as from other stakeholders. Information-intensive recovery tasks include documenting damage assessments and the claims application process, tracking payouts and reimbursements, ensuring that planned actions are consistent with legal requirements and regulations, monitoring the process of newly proposed programs and legislation, and recording the recovery progress.

Information management is not only concerned with disseminating information but also with gathering information from authorities and disaster management agencies and from the affected communities. An effective recovery information management strategy has as its central premise a belief that the disaster-affected community has a right to all information relevant to the recovery. The capacity of the community to "tip in" to recovery is directly dependent upon the quality and communication of information.

Disaster-affected communities should develop and maintain disaster-related information management systems, including shared and integrated databases, interdepartmental networking, multi-organizational data standards, and GIS and other mapping technologies to aid local recovery planning, management, and decision making. Ideally a disaster information management strategy would be developed in advance of disaster. Strategies also should consider how to leverage advancing technologies, including remote sensing and social media.

Authentic communication must also happen post-disaster, and it needs to occur at much faster rates than during normal times. Suspicion, rumors, antagonism, and mistrust are more likely to emerge without it. Communities should develop a post-disaster communication strategy that centralizes communication efforts and targets the full range of constituencies in the community and beyond, including elected officials, department heads and employees, community residents, homeowners, business owners, state and federal partners, and the media. It should also be closely linked with an information management strategy—collection, integration, and dissemination of recovery information—that includes recovery milestones and progress as well as any adjustments made to the recovery plan or implementation strategies. Social media tools can be a very effective way of providing both information and opportunities for monitoring and feedback.

Skilled and sustained staffing and other resources are critical to the effectiveness of all post-disaster communications and information management efforts. Most federal, state, and local agencies have dedicated information technology teams as well as emergency-related communications personnel, often called public information officers; the responsibilities of these positions should be extended to include disaster recovery. The City of Grand Forks, North Dakota, appointed a post-disaster communications team to prepare daily reports, pamphlets, newsletters, and articles to educate the public and media about the recovery progress. The team also closely monitored and addressed the numerous rumors and speculation that continued long into the recovery (Grand Forks 2006).

Local governments can use a variety of "push" communications methods: automated telephone calling systems, posters and billboards, dedicated websites for local government recovery news, and communications through social and mass media. But there must also be "two-way" communications approaches and activities, such as individual meetings to gather targeted input on proposed policies and programs; assistance centers where citizens and government representative can communicate about funding applications, permitting, and other recovery activities; the creation of community leadership teams to advise recovery policy makers; forums and charrettes to obtain vision and direction from the public and to build community support for plans and actions; and meetings to more systematically involve citizens in recovery decision making.

Planners' Roles in Post-Disaster Recovery Management

However the recovery management is structured and organized, post-disaster recovery clearly demands the skills of planners because "recovery is a microcosm of all the challenges of urban planning—developing land use and economic development strategies to improve lives, acting in the absence of sufficient information, making trade-offs between deliberation and expediency, navigating local politics, engaging the public, and identifying funding sources to supplement inadequate local resources" (Olshansky and Chang 2009, 201). Planners can be quite adept at leading interdisciplinary work teams during plan development and implementation. Planners are also commonly involved in policy design, and they can take on a similar role in recovery implementation. Planners are acutely aware of the opportunities that post-disaster environments create to improve communities; conversely, they also understand the difficult challenges and pre-existing problems that disasters can often exacerbate.

Planners are also skilled at involving the public in planning and decision making, and so they can be indispensable contributors to recovery-related communications and information management efforts. Just as in normal times, public participation in post-disaster planning and decision making can sometimes result in an assortment of narrow, local,

and self-serving actions that can undermine or overpower community-wide views. Experienced local planners are veterans at balancing professional and neighborhood values, the concerns of one group of citizens and those of others, and citywide and neighborhood needs. Planners are often also active in regional planning efforts, such as the allocation of transportation funds, and thus may have valuable experience in and relationships for building cooperation and coordination across the region.

But planners are not usually well versed in disaster programs and tend to be more strategic than operational in nature. Therefore, they may be at risk of being marginalized by other decision makers in the time-pressured environment of post-disaster recovery situations where the focus is on getting organized and up and running. However, the important long-term perspective of local planners can be invaluable to local recovery decision making, especially as it may affect the community for generations to come.

FINANCING RECOVERY

Recovery implementation can seem like an endless search for money followed by the need to justify the use of funding. There never seems to be enough money and seldom is it available when it is needed. A driving force in a community's recovery process will be money, and large amounts of it, as this can help speed up the actual rate of rebuilding and the overall timeframe for community recovery. But it is also possible that the money comes too fast or the amount is too much. A major challenge of recovery implementation is managing the flow of money.

Managing Post-Disaster Recovery Finances

Before discussing the various kinds of funding typically used in post-disaster recovery, it is important to first think about organizing to manage the enormous task of local recovery financing.

Understand the overall fiscal and economic impact of the disaster. Anticipating the consequences of disaster means understanding the direct damage and impacts both by geography and specific sectors—which take time to discover—as well as the indirect, fiscal, and economic impacts. The goal of this exercise is to develop the best estimate of the total costs of the disaster on the entire community, including local government, residents, businesses, utilities, and key service providers. If potential funding sources are known, these should be tracked as well; however a cost should not be ignored or omitted because it will likely be covered by some outside funding source. Developing a comprehensive view of the costs takes time, but it will ultimately help a community to chart a more informed and proactive—rather than reactive—course in articulating and obtaining funds to meet the necessary needs.

Gathering and integrating information related to direct costs for response and repair requires a clearinghouse approach. Some of the information will come from the damage investigations, but some will not. There can be many sources of the same type of information, including local government, FEMA and other federal agencies, state agencies, and insurance inspectors and claims adjustors. There will also be immediate costs for emergency response and temporary repairs to be considered. Hazus is a loss estimation, GIS-based software that is publicly available from FEMA and has been used by agencies post-disaster to estimate likely damage levels to buildings, lifelines, and other components of the built environment as well as social and economic losses resulting from selected scenario earthquakes, hurricanes, or floods that most closely represent the actual event. However, even the most accurate estimates need to be ground truthed through onsite damage assessments and impact analyses.

An analysis of the indirect costs of the disaster and its damage—or the ripple effects—may be most efficiently done by gathering data on the pre-disaster economy for comparison and might include identifying primary industries and employers; trends in wages, employment, and industrial output; and the local and regional economic outlook. The post-disaster analysis should look at businesses affected (e.g., annual revenues lost, employee changes, property damage, equipment and inventory damage, and business interruption losses), utility-related losses, business recovery assessments (e.g., reopenings, rebuilding, and relocations), and the categories and values of broader economic losses. These analyses should include characterizations of the short- and long-term impacts on businesses, different economic sectors, and the overall economic outlook of the community.

Next, the disaster impacts on local government revenue should be evaluated. The damage assessment and other applicable information can be used to estimate how revenue sources have been affected by the disaster—both directly and indirectly—and also to project how they might continue to be affected and for how long. The costs of essential local government services that must be maintained throughout the recovery should also be assessed along with the anticipated additional costs necessary to support other response and recovery-related costs.

RECOGNIZING THE INDIRECT ECONOMIC IMPACTS THAT DISASTER CAN HAVE ON A COMMUNITY

In *Managing for Long-Term Community Recovery in the Aftermath of Disaster*, Alesch, Arendt, and Holly (2009) found that the local economy unraveled to a greater or lesser extent following disaster in nearly every community they studied. Their first recommended task for communities undertaking long-term recovery is an assessment of post-disaster damage, including an estimation of the direct physical damage, costs and challenges involved to address the physical damage, community components and ripple effects, and resources needed and obstacles to fixing long-standing problems.

After a disaster, it is important for local governments "to gather the massive amounts of disjointed information and work to interpret what it all means. What goods and services are not yet available? What is the housing situation, and where are people living? How have the large employers fared? What specific needs do they have?" (139). Alesch, Arendt, and Holly recommend that, almost immediately after a disaster, local governments inventory the direct effects and the consequences that follow. Then, local governments should continue to identify, catalog, analyze, and address the additional social, economic, and political outcomes that unfold over time in response to the initial impacts and consequences as these consequences "dramatically complicate efforts aimed at recovery and, in [their] experience, are the biggest obstacles to community recovery." These sorts of consequences are "numerous, pervasive, and extremely important," and "rarely predictable" (26). Examples include business closings and consequent unemployment following a disaster.

Develop a comprehensive recovery implementation financing strategy. Creating a robust and comprehensive financing strategy should be part of the recovery planning process, and it is almost as important as the planning itself. For those communities that undertake an advance planning effort, the draft strategy will be a good starting point for post-disaster analyses. The strategy can also serve as a comprehensive guide long into recovery, but this will require skilled sustained staffing and political commitment to apply, evaluate, and adapt the strategy as new information, resources, and needs emerge.

The recovery implementation financing strategy should first integrate three categories of information about the community's recovery: (1) the community's needs, including total damage and economic impacts, (2) the known recovery resources such as federal and state assistance, insurance, local reserves, and other resources, and (3) the potential gaps in funding. This includes looking at the costs that have already been incurred responding to the disaster and the many resources that are already committed to address those immediate needs. Any unfunded gaps need to be accounted for as part of the analysis. This is also a time to explore nonessential, cost-cutting actions so that the local budget is better aligned with funding recovery activities and the maintenance of staff and essential services.

Once this macro-analysis is done, it is time to consider the proposed recovery programs and projects resulting from the planning process and to begin matching resources to each. Managing recovery financing can seem like a great deal of "knitting" and "shredding," as some recovery programs and projects will require assembling financial resources for implementation while, at the same time, parsing programmatic funds across many programs and projects. This requires significant knowledge about the different sources of funding—which sources to use for particular projects and needs; when and how each source becomes available; and what eligibility requirements, project conditions, and matches are required. For example, the process of financing the repair of infrastructure and public facilities may start with an assessment of damages and determination of whether the repairs will be covered by insurance or are eligible for federal reimbursement through the Public Assistance program administered by FEMA (www.fema.gov/public-assistance-local-state-tribal-and-non-profit). Some level of local match may also be needed to cover the insurance deductible or the required local match for Public Assistance.

Assembling all this information is no small task and the stakes are high. The sources and terms of different recovery

funds will definitely affect the overall timeframe and outcomes of a community's recovery. Financing strategies need to address both short-term and long-term needs and revenue gaps, and they should also aim to leverage outside resources with local resources for long-term investments in community resilience, not just a return to pre-disaster conditions. However, strategies focused on maximizing outside resources to fund the recovery can be fiscally attractive, but they can also lessen local control over recovery. Having a recovery plan and accompanying implementation financing strategy will help maintain local leadership over the entire recovery process by providing a road map of the community's vision and plans as well as a clear understanding of the unique local conditions and needs, an invaluable "business case" for outside investors to use.

Ensure transparent, inclusive, and accountable approaches to local recovery financing. A comprehensive and sustainable community recovery will require a mix of public and private financing sources. It will require a proactive, collective, and sustained effort to pursue both traditional recovery funding sources and alternative and innovative funding sources. Some disaster assistance programs have extensive application and approval processes that take time. Therefore, some of the application work needs to begin as soon as possible duirng the recovery, even as estimates of damages and projects costs are being refined.

Local governments are encouraged to create a recovery financing "clearinghouse" for the entire community—possibly with physical offices as well as a web presence—to centralize information on disaster assistance programs that might be available from federal, state, and private sources and to help ensure that every person and every organization in the community understands what programs exist; their eligibility requirements, basic rules, and regulations; and how to maximize the probability of achieving success. Similarly, funding conferences are a great way to leverage and engage state and federal partners in recovery implementation. For example, the Spirit Lake Tribal Nation in North Dakota hosted a Recovery Partners Conference in 2010, bringing together 150 representatives from federal and state agencies and nonprofit organizations to help match programs with the communities' proposed projects and plans to address ongoing flooding from the rising Devil's Lake (FEMA 2011a).

Accountability and transparency are necessary in building and maintaining trust between those who provide recovery funds, those who manage the funds, and those who use the funds in rebuilding. Local governments are encouraged to establish robust and transparent accounting systems that meet the standards of key disaster funding agencies, such as FEMA, to carefully track all expenditures from project to project. This will provide critical information when audits are eventually performed by these agencies.

Many disaster-affected local governments have also benefited from having a chief financial officer on staff to help manage cash flows and arrange for bridge financing. Alesch, Arendt, and Holly (2009, 131) state that a diverse set of organizational skills are needed: "Maintaining an overall view of local government finances and keeping the jurisdiction within safe financial limits requires more than accounting skills; it requires someone who understands finance, management, intergovernmental relations, and, in general, how things work in a political system." They also found that those local governments that fared best in receiving financial grants from federal agencies like FEMA, HUD, and the EDA, shared several important characteristics (Alesch, Arendt, and Holly 2009):

- They hired or contracted staff to help ensure that they were well-versed in federal programs, eligibility requirements, and regulations.
- They also had staff designated to do little other than work on grant applications and administration.
- They were adept at quickly drawing up sensible, readable project proposals to the various granting agencies.
- They did not blame the federal government or federal officials for their problems or seemingly bureaucratic "red tape" but rather worked with federal agencies to provide the required information quickly and accurately.
- They had sophisticated accounting systems in place that enabled them to monitor projects, track every dollar spent, and show all the documentation needed by the federal government to ensure reimbursement and to accommodate federal auditors who always come—but sometimes years later.

KEY SOURCES OF DISASTER RECOVERY FUNDS

In the U.S., the modern system of financial assistance for disaster recovery is a shared system of private and public resources. The major public resources are defined namely by the federal Stafford Act and delivered through its related programs. The primary private resource is insurance coverage for different disaster types. The system loosely follows a free-market philosophy that individuals, businesses and corporations, and other nongovernmental organizations are generally responsible for their own financial well-being first, with

the government primarily responsible for disaster-related costs for governmental entities as well as those most in need.

While this is the philosophy behind how the system should work, in reality the disaster assistance framework in the U.S. often operates much differently. Even though insurance and private resources are intended to be the primary financing tools for the private sector's recovery, the insurance penetrations and disaster-specific coverages have been decreasing in many of the most disaster-prone regions of the U.S., such as Florida and California (Doherty et al. 2008). Still, insurance payouts have reached record levels in recent years (Guy Carpenter 2012). The public resources, namely those available through the Stafford Act, are designed to be triggered by presidential disaster declarations and disaster impacts; these too are rising. The number of presidential disaster declarations has increased significantly over time from an average of 18 declarations per year between 1960 and 1969 to an average of 56 declarations per year between 2000 and 2009. In 2011 there was a record 99 declarations (Lindsay and McCarthy 2012). Also, the proportion of federal resources that make up post-disaster recovery costs is also increasing—from about 23 percent of the total losses for Hurricane Hugo in 1989 to an average of 69 percent for Hurricane Katrina and disasters through 2008 (Michel-Kerjan 2012).

Evidence is now growing to suggest that the large proportion of governmental funding is having some perverse effects: state and local governments have less incentive to pre-finance their disaster losses through insurance and other mechanisms, and private property owners living in areas that received governmental disaster relief also show less demand for insurance in the following years (Michel-Kerjan 2012). Congress, FEMA, and others are scrutinizing federal disaster relief determinations and expenditures, and future reforms may affect whether and how much aid a community receives if a major disaster strikes (Lindsay and McCarthy 2012; U.S. Government Accountability Office 2012b). During fiscal years 2004 to 2011, the president received governors' requests for 629 disaster declarations and approved 539, or 86 percent (U.S. Government Accountability Office 2012b). Still, the vast number of local disasters do not require substantial state assistance or result in state or federal disaster declarations.

Also, since 1992, following Hurricane Andrew, Congress has been working outside the Stafford Act provisions and has appropriated disaster recovery (DR) grants through the CDBG program as well (McCarty, Perl, and Foote 2005). With time, CDBG-DR grants have played a much larger role in the overall federal relief process. As of March 2014, HUD was managing nearly $41 billion in CDBG-DR funds for disasters dating back to the 2001 World Trade Center disaster (U.S. Department of Housing and Urban Development 2014). The breadth and depth of financing strategies that local governments undertake in long-term community recovery depends, in great part, upon the resources available to them as well as the creativity and resourcefulness of local governments to pursue funding resources beyond what the traditional programs offer and what the local tax base generates. Some priority recovery projects may not fit the funding requirements of the more traditional programs, but communities should take the time necessary to see whether waivers of certain criteria or creative financing solutions might be allowed. It is important both to understand the major disaster financing resources and to plan to use a diverse set of financing tools, both derived locally and from outside sources, rather than just relying on a few sources.

The following sections briefly describe the major disaster recovery resources for local communities, residents, and businesses; how they are typically applied; and some cautions and constraints on their application. Additional information on some of the key federal laws and disaster assistance programs is provided in Chapter 4.

Federal Disaster Grants and Loans

The following funding resources are available from various federal agencies, including FEMA, the U.S Department of Housing and Urban Development, the U.S. Small Business Administration, the U.S. Economic Development Administration, and the U.S. Department of Transportation.

Federal Emergency Management Agency

When a presidential declaration is made, four federal programs—all administered by FEMA—are authorized: the Public Assistance Program, the Hazard Mitigation Grant Program, the Community Disaster Loan Program, and the Individual and Household Assistance Program. State emergency management agencies typically play a key intermediary role in managing the application and distribution processes of Stafford Act-related programs on behalf of and in collaboration with FEMA.

- **Public Assistance (PA)** is the major federal assistance program for disaster-affected local governments. The PA program provides grants to state and local government agencies, private nonprofit organizations, and federally recognized tribal organizations for the following activities: debris removal; emergency protective measures; and repair, replacement, or restoration of disaster-damaged

facilities and infrastructure. These funds are typically granted after extensive documentation of the damage, proposed scope of work, and cost estimations are deemed eligible for reimbursement. The federal share of assistance is at least 75 percent of the eligible costs, and state and local governments can have up to a 25 percent cost-share. So, at a minimum, local governments must be prepared to finance their portion of the local cost-share, unless a waiver is granted to raise the federal or state shares. Also, the PA program has extensive conditions on the types of repairs, replacement, and restoration of buildings and infrastructure that are eligible for reimbursement. This includes proof that the disaster in question generated the loss. Generally, the guidelines specify that any improved or alternate projects—other than what existed prior to the disaster—must be approved prior to construction and may receive an even lower federal proportion of eligible costs (FEMA 2014c). Even after FEMA has signed off on a repair, replacement, improved, or alternate project, the agency retains the discretion to modify the definition of the project eligibility for the life of the project. Unless waived by congressional legislation, FEMA can only reimburse 75 percent of the approved federal share of the estimated eligible costs for improved or alternate projects. Section 406 of the PA program does fund some hazard mitigation measures for damaged facilities during the recovery process. However, the cost-effectiveness of these measures is reviewed on a case-by-case basis and requires that applicants conduct a benefit-cost analysis to demonstrate project eligibility (FEMA 2010b).

- **Hazard Mitigation Grant Program (HMGP)** funding is authorized by Section 404 of the Stafford Act, and it is directed to states and tribal organizations for hazard mitigation planning and projects amounting to up to 15 percent of federal disaster costs if a FEMA-approved state or tribal hazard mitigation plan has been developed and up to 20 percent if a FEMA-approved state or tribal enhanced hazard mitigation plan has been developed (FEMA 2010a). Similar to the PA program, HMGP projects are funded on a cost-share basis, and the funding is often not available until much later in the recovery process. Local governments are awarded subgrants from their states after they develop and submit HMPG applications approved by both the respective state-administering agency and FEMA.
- **The Community Disaster Loan Program (CDL)**, passed by Congress in October 2005, authorizes FEMA to provide loans to assist local governments in providing essential services (FEMA 2005a). CDL loans (not to exceed 25 percent of the local government's annual operating budget for the fiscal year in which the major disaster occurs, up to a maximum of $5 million) are made to eligible jurisdictions that have suffered a substantial loss of tax and other revenue. The jurisdiction must demonstrate a need for financial assistance to perform its governmental functions.
- **Individual and Households Program (IHP)** funding provides grants directly to renters and displaced homeowners that register with FEMA for assistance and reside within the boundaries of a disaster declaration region. These funds come relatively quickly after a disaster and are intended to provide short-term assistance, but they are usually not large enough to completely finance individual and household recovery needs. In the fiscal year 2014, the maximum allowable IHP amount was $32,400 (FEMA 2014a).

U.S. Department of Housing and Urban Development

The U.S. Department of Housing and Urban Development (HUD) administers the federal Disaster Housing Assistance Program, which provides housing vouchers to those displaced by disaster and funds to repair disaster-damaged public housing. It can also provide funds for mortgage assistance and expedite the annual awards made through the CDBG program and the HOME Investment Partnerships Program (HOME) to metropolitan cities, urban counties, and states for activities in a disaster area. None of these programs is authorized by the Stafford Act, and they can be applied at the discretion of HUD or by authorization from Congress after a disaster. Once allocated, they come to cities through the state. Following a disaster, HUD has the authority to waive many regulatory requirements governing the use of CDBG and HOME funds and to permit its grantees (i.e., state or local governments) to redirect their non-disaster CDBG and HOME funds to meet disaster recovery needs, both short and long-term, if the projects meet a national objective and are included in the state action plan (McCarty, Perl, and Foote 2005). However, since 2005 because of mishandling of funds in previous disasters, duplication of benefits review has made the administration and application of these funds more complex and restricted their distribution.

Congress can also appropriate supplemental emergency funds to many federal agencies, including HUD. Following Hurricane Andrew in 1992, Congress has been appropriating funds to HUD for CDBG-DR grants and, to a smaller extent, HOME to help rebuild areas affected by major presidentially declared disasters (McCarty, Perl, and Foote 2005). CDBG-DR grants are noncompetitive, nonrecurring grants generally intended to assist state and local governments in ad-

dressing disaster recovery needs unmet by other FEMA, U.S. Small Business Administration (SBA), and U.S. Army Corps of Engineers (USACE) disaster assistance programs (HUD 2014). The CDBG-DR funds are relatively flexible compared to other federal disaster assistance programs.

Grant recipients, typically states and larger local governments, must develop and submit an action plan for disaster recovery before receiving the funds. The action plan must describe the needs, strategies, and projected uses of the disaster recovery funds. Recipients must also report program progress quarterly. CDBG grantees are not generally required to provide a match for the federal funds received (McCarty, Perl, and Foote 2005). In addition, the CDBG funds can be used as the nonfederal match for federal Public Assistance and Hazard Mitigation Grant Program funding.

There are other federal rules that must be met. In general, CDBG funding approved by Congress since 2005 has included provisions that limit the amount a state can use for administrative expenses to five percent; allow a state to seek waivers of program requirements, except those related to fair housing, nondiscrimination, labor standards, and environmental review; prohibit the use of funds for activities that are reimbursable by or made available by FEMA or the U.S. Army Corps of Engineers; and require each state to develop state recovery plans that HUD must approve (Boyd 2010).

U.S. Small Business Administration

The U.S. Small Business Administration (SBA) provides disaster assistance programs, typically in the form of loans, for businesses of all sizes and for homeowners and renters for damage restoration. They are automatically activated when a presidential disaster declaration is made; the SBA can also independently activate its disaster recovery programs in areas with certain damage levels but which did not get a presidential declaration (U.S. Small Business Administration 2014). All homeowners and individuals must register first with FEMA in order to qualify for SBA assistance. Business owners can apply directly to the SBA. Loans are only made for losses uncompensated by insurance or other disaster programs.

U.S. Economic Development Administration

The U.S. Economic Development Administration (EDA) administers disaster program funds through targeted grants to disaster-affected communities to help them shift their focus when appropriate from short-term emergency response to long-term economic impacts and to enable the development of an economic recovery programs that reflect local priorities (U.S. Economic Development Administration 2014). The EDA can also perform economic impact evaluations and carry out other specific tasks through special "mission assignments" created by FEMA. The EDA provides grants to small businesses in addition to local governments.

U.S. Department of Transportation

The Federal Highway Administration (FHWA) of the U.S. Department of Transportation provides post-disaster funds for freeway and highway repair and restoration (Federal Highway Administration 2014). This program is commonly referred to as the Emergency Relief (ER) program. By law, the FHWA can provide up to $100 million in ER funding to a state for each natural disaster or catastrophic failure that is eligible for funding. The ER program, however, is also limited to $20 million in any fiscal year. Therefore, for a large disaster that exceeds the $100 million per state cap, Congress must pass special legislation lifting the cap for that disaster. ER funds are provided on a pro rata share basis. For interstate highways, the federal share is 90 percent; for all other highways, the federal share is 80 percent. Also, 100 percent of the federal share may be provided for "emergency repair work to restore essential travel, minimize the extent of damage, or protect the remaining facilities, accomplished in the first 180 days after the disaster occurs" (Federal Highway Administration 2014). States must request ER funds, and these requests are usually filed by the state transportation departments.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) provides disaster preparedness services and advanced planning measures designed to reduce the amount of damage caused by an impending disaster. Under the Stafford Act, the USACE coordinates public works and engineering activities in the National Response Plan (U.S. Army Corps of Engineers 2014). Most USACE-constructed flood damage reduction projects are owned by sponsoring cities, towns, and agricultural districts, but the USACE maintains and operates many of the larger facilities, such as dams and reservoirs. Following a disaster, the USACE will undertake flood protection repairs and reconstruction. In addition to building projects, the USACE also advises communities, industries, and property owners on protection measures they can take themselves, such as zoning regulations, warning systems, and flood proofing. Congress also authorizes USACE flood protection studies and projects that are part of a Water Resources Development Act (WRDA) before appropriating funds to them. It has been almost eight years since the last WRDA.

U.S. Department of Agriculture

Under the Stafford Act, the U.S. Department of Agriculture (USDA) provides food assistance after a presidentially declared disaster. For rural communities, the USDA provides Emergency Community Water Assistance Grants and emergency watershed protection programs to help protect life and property threatened by excessive erosion and flooding and purchase floodplain easements as an emergency measure (Farm Services Agency 2014). It also offers many disaster assistance programs to landowners, farmers, and agricultural producers. No presidential declarations are required for most of this assistance. Through the land-grant universities and its cooperative extension services, the USDA also provides pre- and post-disaster education and technical assistance to rural communities, local leadership, and residents and businesses.

Other Federal-Level Grants and Loans

A major purpose of the National Disaster Recovery Framework and the Emergency Support Function #14—Long-Term Community Recovery has been to help match local recovery priorities and projects with an array of federal partners and programs besides the more traditional disaster assistance programs (FEMA 2011b). Many more programs are available from other federal agencies, including the U.S. Department of Energy, the U.S. Department of Health and Human Services, the U.S. Department of the Interior, and the U.S. Department of Labor. FEMA has developed a guidebook, *Disaster Assistance: A Guide to Recovery Programs,* as a resource on federal programs that may be able to provide disaster recovery assistance to eligible applicants (FEMA 2005b). The Catalog of Federal Domestic Assistance also provides a more comprehensive list of federal financial and nonfinancial programs (www.cfda.gov/).

Also, following major disasters, Congress or the president may authorize tax credits and other forms of temporary relief or incentives to help stimulate rebuilding. For example, the federal New York Liberty Zone Act of 2001 and Gulf Opportunity Zone Act of 2005 provided tax incentives for business and housing development as well as tax credit bonds and advance refunding provisions for state and local governments in the designated regions (U.S. Government Accountability Office 2008b). The tax credit bonds and advance refunding provisions were used by state and local governments to provide debt relief—to repay principal and interest—on existing obligations. It is important that communities work closely with federal recovery agency partners to ensure that they understand the full range of programs available.

State Disaster Grants and Loans

State emergency management agencies typically administer the Stafford Act programs, including Individual and Household Assistance, Public Assistance, and the Hazard Mitigation Grant Program. Other agencies, such as state transportation and housing agencies, are also involved in recovery and liaise with their counterparts at both the national and local levels. For example, state housing agencies may manage the distribution of HUD-CDBG federal funding to disaster-affected local governments and residents. States may also have to provide a share of matching funds to the federal programs, and they can authorize tax credits and other forms of temporary relief or incentives to help stimulate rebuilding. They also are likely to have disaster-related assistance programs so it is also important for communities to develop good working relationships with state recovery partners in order to understand the full range of state-level programs available.

Insurance

Insurance has been a major financing source for post-disaster recovery in the U.S., and there are both public and private instruments.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) provides federal backing of flood insurance coverage to homeowners, renters, and business owners residing in communities that adopt and enforce floodplain management measures (FEMA 2014a). FEMA authorizes private insurance companies to sell flood insurance in the community up to the program limits; additional coverage beyond these limits is available from the private insurers. Those communities designated as flood-prone which do not apply for participation in the NFIP within one year of notification are ineligible for federal or federally related financial assistance for acquisition, construction, or reconstruction of insurable buildings in the federally designated "special flood hazard areas" (FEMA 2008).

Flood-damaged public facilities located in a known special flood hazard area for more than one year yet still not covered by flood insurance will also not be eligible for full levels of post-disaster assistance. Similarly, any person who previously received flood disaster assistance for repair, replacement, or restoration for damage to any personal, residential, or commercial property and subsequently failed to obtain and maintain flood insurance will not be eligible for federal disaster relief assistance if the property is damaged again by flooding.

To help encourage hazard mitigation, the NFIP also provides a voluntary Community Rating System (CRS) that

communities can join and which recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. For participating communities, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reducing flood damage to insurable property, (2) strengthening and supporting the insurance aspects of the NFIP, and (3) encouraging a comprehensive approach to floodplain management. Depending upon the level of participation, flood insurance premium rates for policyholders can be reduced up to 45 percent. Technical assistance for designing and implementing some activities is available from FEMA at no charge. Also, implementing some CRS activities can help projects qualify for certain other federal assistance programs (FEMA 2014b).

State-Backed Insurance

Several states have created state-backed insurance programs for specific disaster types. These are most common in hurricane-prone states of U.S.—for example, the Citizens Property Insurance Corporation in Florida. California also has a state-backed residential earthquake insurance program. These programs mostly focus on providing peril-specific coverage to homeowners and, in some cases, to renters and small businesses. Additional coverage beyond the limits available under these programs are available from private insurers.

Private Insurance

Private insurance is one of the most significant disaster recovery resources with payments going directly to policyholders in a disaster-affected community. In 2011 private insurers paid out $35.9 billion for disaster-related losses, well above the 2000 to 2010 average of $23.8 billion (in 2011 dollars) (Insurance Information Institute 2014). Thunderstorms, including tornadoes, were the costliest type of natural disaster in 2011, with over $25 billion in insurance losses—more than double the previous record. Hurricanes were the second most costly disaster category with $5.5 billion in insured losses in 2011, and winter storms were the third most costly with $2 billion in insured losses in 2011.

Policies generally cover structures, contents, and the costs of additional living expenses (residential) or business interruption (commercial and public sector). This allows policyholders to prepare to pay for disaster-related costs without having to keep high levels of cash and reserves on hand to cover these uncertain costs. A typical property policy covers direct losses due to fire, lightning, tornadoes, wind storms, hail, explosions, smoke, vandalism, and theft. Some of these perils, such as windstorms/hurricanes and hail, may have more specific restrictions than other perils, such as higher deductibles or lower policy limits. Also, some perils are typically excluded—such as terrorism, earthquakes, or ground failure—and may only be offered as an added cover underwritten separately by the insurer.

Some state and local governments do not have disaster-related private insurance, electing to "self-insure" instead and rely on federal programs like FEMA's Public Assistance to repair damaged public property after a disaster. In some cases, local governments pool disaster policies and contribute to the pool to buy coverage; they then draw from the pool when they have losses.

For most facilities, a Public Assistance applicant is not required to have insurance on a facility the first time a disaster damages it, unless the facility is located in a FEMA-designated Special Flood Hazard Area—in which case the facility must have flood insurance in order to obtain disaster assistance. The Stafford Act also requires that Public Assistance applicants must obtain and maintain insurance after receiving assistance to repair, restore, or replace a damaged facility. Thereafter, an applicant must insure that facility against future losses up to at least the amount of assistance it received. The insurance purchase requirement applies no matter what type of disaster damaged the facility.

Besides covering direct damages to facilities, some local governments have also looked to private insurers to cover potential losses in revenue streams. Two months prior to Hurricane Katrina, the City of Biloxi, Mississippi, spent $92,000 on $10 million worth of business interruption coverage to protect it against potential revenue losses to its casino-based economy. The city was able to collect $7.5 million from its insurer when Biloxi's casinos were damaged and closed for some time following the storm (Alesch, Arendt, and Holly 2009). The city was then able to use these funds for other storm-related costs incurred recovering from Katrina.

City-Led Financing Tools

Disasters can damage local government facilities, displace the government work force, and disrupt income streams, making it difficult to sustain local government operations. Large-scale disruptions to the local economy can also reduce local resources for recovery over the long term. In addition to federal and state disaster assistance, most communities find that they need to modify or create new revenue streams or better leverage existing programs to make up for their post-disaster funding shortfalls and to facilitate recovery. While the more traditional federal and state disaster assistance

applications are going through the review processes, local government can investigate alternative sources of funding. However, as a cautionary note, it may be time-consuming and more difficult to develop ad hoc programs and implement creative new schemes; plus, the outcomes can be more uncertain (Olshansky et al. 2008). This section focuses first primarily on tools and techniques that are common to normal local operations and which have been successfully applied to recovery.

Capital Improvement Programs

Infrastructure and public facilities repairs and reconstruction projects associated with disaster recovery should be integrated into a community's ongoing, multiyear schedule and financing plan. Even if these projects qualify for state and federal disaster assistance programs, such as FEMA's Public Assistance, capital improvement programming and any associated bonds and revolving funds can be particularly effective in helping to finance a local match that may be required. It can also help to fund improvements or alternative projects that do not qualify for state and federal programs. Integrated programming of both disaster and nondisaster capital improvement programming can also provide a more comprehensive view of locally led activities which can be valuable in communicating with citizens, rating agencies, and investors.

Redevelopment

Redevelopment is nearly always part of local reconstruction following major disasters; it has been used after virtually every damaging earthquake in the U.S. since 1906 (Spangle Associates 2002, vii). Most states also have adopted some form of redevelopment-enabling legislation that empowers local governments to undertake redevelopment planning and regulation functions. In many states, local agencies must demonstrate that an area is blighted in order to establish redevelopment districts.

Once a redevelopment district is established, tax increment financing (TIF) can be used to offset redevelopment costs and earmark a portion of the new tax revenues generated by the new development. This method sets aside revenue generated by the value that all taxable properties within the project area accrue with redevelopment, starting from the time of district formation. As the value of these properties increases over time as a result of redevelopment investments, the additional increments of property taxes accrue entirely to the redevelopment project. Such revenues can be set aside to pay exclusively for land acquisition and new development in project areas, rather than being used for general government or education services. TIF is the primary method of funding public redevelopment projects in most states.

The Los Angeles Community Redevelopment Agency created four redevelopment projects after the 1994 Northridge earthquake and also infused post-disaster funds, particularly CDBG and EDA funds, into the pre-existing Hollywood redevelopment project (Olshansky, Johnson, and Topping 2006). The New Orleans Redevelopment Authority also has had a major role in post-disaster recovery following Hurricane Katrina, leading a comprehensive blight reduction strategy for the city and working with the state's recovery authority to receive, manage, package, and resell properties sold to the state as part of the state's "Road Home" housing repair program (Road Home 2014).

Public-Private Partnerships

Public-private partnerships are being used increasingly by state and local governments to fund infrastructure projects, such as road and bridge construction. These projects typically involve up-front private investment that helps leverage the public funding component and a construction and operation management structure to reduce the risks of cost overrun and schedule delays as well as maintenance throughout the concession period. It can also provide private capital and operational resources to the recovery process.

The City of Joplin, Missouri, created a redevelopment district and hired a master developer to help rebuild its convention center complex, performing arts complex, clusters of affordable housing, and other portions of the city destroyed by the May 22, 2011, F-5 tornado (Associated Press 2012). The implementation involves over a dozen potential projects valued at nearly $800 million, and it is being financed through a mix of federal and state disaster programs, tax increment financing and other government tax credits, private investment, and long-term debt (Wallace Bajjali Development Partners, L.P. 2012).

Special Taxing and Assessment Districts

Many states allow local governments to create special service and benefit districts and collect taxes, fees, or other assessments from property owners located in the designated area. Similar districts can be established, or existing districts can possibly be repurposed or expanded, to help fund recovery programs and projects. In California, communities can form local assessment districts, called geologic hazard abatement districts (GHADs), for the purpose of prevention, mitigation, abatement, or control of geologic hazards (Public Resources Code, §§ 26500–26654). GHADs may be proposed by (1) a

petition signed by owners of at least 10 percent of the real property in the proposed district or (2) by resolution of a local legislative body. The owners of at least 50 percent of the assessed valuation of the proposed district must agree to the formation. GHADs also have a variety of financing tools and regulatory powers, including landowner assessments, issuance of bonds, the purchase and disposal of property, the acquisition of property through eminent domain, and construction and maintenance improvements. Improvements undertaken by GHADs are exempt from state environmental review, and the state has also granted GHADs a good degree of immunity from liability to encourage communities to reduce their geologic risks.

Business improvement districts (BIDs) are a form of special benefit district that can be created either by local governments or voluntarily through associations of business and property owners who agree to pay fees or be assessed a tax. These associations of business owners and property owners are typically created to make basic improvements or provide services not otherwise being provided by the municipality. BIDs have also been used post-disaster to help delineate areas needing special recovery attention and leverage a small public investment with a larger private-sector involvement and investment. After the 1994 Northridge earthquake, the City of Los Angeles helped finance the establishment of at least four BIDs in earthquake-affected commercial areas of the city to foster communication with neighborhood businesses and combat blight through promotions and maintenance programs (Los Angeles 1995).

Impact Fees

Impact fees are typically tied to new development projects to pay for the costs of infrastructure and other services for the area. These fees are generally used to underwrite the expansion of or addition to water and wastewater services, roads, and necessary public facilities, such as schools and fire and police stations. The scope and conditions on local governments to use this tool varies widely from state to state, and local governments should seek legal guidance in applying it to post-disaster recovery. Such fees could be used in recovery for post-disaster hazard mitigation projects or for restoration of infrastructure and services in hazard-prone areas, for example.

Special Bonds, Loans, and Taxes

State and local governments have also sought to raise revenue to fund disaster recovery through special bonds, loans, and taxes. One challenge for local communities is the additional debt burden that new revenue or general obligation bonds or loans can place on disaster-stressed budgets. After all, disaster-related fiscal and economic impacts can endure for many years. Another challenge is getting electorate support, particularly for additional bonds or special taxes. Nonetheless, many disaster-impacted communities have been able to overcome these obstacles. For example, following the 1989 Loma Prieta earthquake, the voters of Santa Cruz County, California, and the county's cities approved a one-half of one percent transaction and use tax to help finance capital improvements and public projects related to earthquake recovery (Santa Cruz Public Libraries 2014).

Philanthropic and Private Investment

Donations are a significant component of post-disaster financial assistance, particularly early on after a disaster when media attention is high. Nongovernmental organizations, private nonprofit entities, faith-based organizations, foundations, and businesses provide both material and financial assistance to individuals, families, community organizations, and local governments. Much of this assistance is focused on the immediate needs created by the disaster, but some organizations do provide resources for recovery, ranging from immediate repairs to homes to funding for long-term investments in housing, schools, infrastructure, and other critical elements of the community's well-being.

Communities are often challenged to manage the early donations effectively and often do not take advantage of the opportunity to leverage this early interest into long-term community recovery investments. The volume of donations, particularly immediately after the disaster, can overwhelm the community's systems for processing donations and channeling them to meet needs appropriately. In some cases, local governments and other community organizations may not have the authority or means to accept and use donations, depending on the form of the donation and the conditions under which it can be used. Some communities have worked with local community foundations that act as the fiscal agents receiving monetary donations, which are then disbursed to qualified service providers in the locality. Local governments have also invested in systems that manage material donations and connect them with donors, such as Aidmatrix (www.aidmatrix.org), or established agreements with foundations that already have similar tools.

Ultimately, community recovery requires considerable private investment; residents, property owners, retailers, and businesses must decide that it is worth the risk to invest in rebuilding. Plans are critically valuable documents in helping all these investors make their recovery decisions. Aside from their own resources, they must be able to secure financing for their

plans. Thus financial institutions must also decide that investments in the community are worth the risk. Oftentimes, private investment will wait until public investment occurs—that is, homeowners and others will not take steps to rebuild until repairs to infrastructure and public facilities, such as neighborhood schools, are visibly underway. This may be particularly true in situations where recovery plans propose projects to improve or rebuild differently. Private entities may be reluctant to support or engage in redevelopment if it does not appear that it will be adequately funded or proceed without lengthy delays. Government incentives can help stimulate private investment, especially in the commercial and industrial sectors, by offering development tax credits, payroll tax relief, and targeted jobs programs and funds, for example. Also, professional organizations and organizations like Vista and AmeriCorps are very active in providing, in many cases, pro bono services, technical assistance, and other personnel to help local governments, small businesses, and residents deal with their recovery challenges. All these efforts are important contributions to community recovery, and local governments can help attract and direct these resources to the recipients who need them.

Other Special Considerations in Financing Disaster Recovery

In addition to funding, there are other ways that local governments can incentivize recovery and reconstruction. Many of these are tools that are very familiar to planners. There are other special issues that should be considered in ensuring that funds are used as wisely and efficiently as possible. A few of the more common tools and concerns are discussed here, but others will likely crop up post-disaster. It is important for communities to be both proactive and sensitive in recognizing and addressing issues as they arise in post-disaster recovery implementation.

Transfer of Development Rights

A transfer of development rights ordinance allows property owners to sell or transfer some or all of their future development rights. This tool has become a common means of reducing development density in order to preserve open space, agricultural and forest lands, and habitats. They can also be used to reduce development density on hazard-prone land or to help property owners redevelop outside heavily damaged areas, such as flood plains; coast lines; and landslide, liquefaction, and other ground failure areas.

Differential Taxation

Similarly, differential taxation is a long-term measure aimed at discouraging development in certain areas. It also requires state enabling legislation. It has been used extensively by states as a technique for lowering the effective cost of retaining forest or farmland by taxing such lands at their current use value, rather than the value at which the market might appraise them for other uses, such as residential development (Schwab et al. 1998). Participation in a differential tax program is usually voluntary. The differential rates often expire within finite intervals and penalties can be assessed when a conversion to another use occurs. This is not a permanent method of land preservation comparable to conservation easements or purchase of development rights, and it is recommended that local governments couple the differential taxation with "existing use" zoning to avoid problems of takings in relation to a property owner's development expectations. In disaster recovery, this combination of differential taxation and existing-use zoning could be used to retain undeveloped land in flood plains, coast lines, and ground failure areas such as landslide and liquefaction areas.

Temporary Uses

Recovery is a long-term proposition and funding for various projects can also take a long time to materialize. Additional assistance may be needed for interim and temporary uses. Likewise, local governments can permit some temporary uses before permanent repairs or rebuilding decisions are made. For example, businesses can be allowed to construct temporary facilities on properties scheduled for buyout and before they have found alternative, permanent commercial space. All of these actions can provide time-critical help to residents and businesses struggling to assemble their recovery finances.

Density Bonuses

Many states and local governments provide density bonuses to development projects that agree to include additional public amenities. A common application in residential development projects is to allow construction of a greater number of market-rate housing units than otherwise would be allowed, in exchange for including some below-market-rate housing units. Density bonuses can vary from project to project and are usually not allowed to exceed a particular threshold, such as 20 to 25 percent of normal density. These bonuses can be provided at virtually no cost to local governments. In post-disaster recovery, density bonuses could be provided for offsetting the costs of repairing or reconstructing to higher levels of safety, for setting back from hazard-prone lands, or for being an early reinvestor in heavily damaged areas of the community.

Public Mortgage Lending Subsidies and Policies

Many local governments and states have programs to subsidize interest rates or provide other fiscal incentives for low-income or first-time home buyers or to encourage redevelopment in blighted areas. Similar programs could be created or modified post-disaster to help low- to moderate-income home and business owners with repairs or to purchase, refinance, and rehabilitate damaged properties.

Other Financing Concerns

Local governments and other public agencies are held to high standards of fiscal accountability and transparency. Few fiscal errors and oversights are tolerated in normal times, and federal and state disaster assistance program providers as well as the public and other investors will require audits and other forms of fiscal oversight. But, unfortunately, the phenomenon of time compression in disaster recovery will almost certainly increase the intensity of such mistakes, both in number and cost. Sometimes it may be necessary to undo previous actions, which can be costly both in terms of dollars and time.

FEMA and other federal and state assistance program providers have strict guidelines aimed at preventing the duplication of benefits between its own programs, insurance benefits, and other forms of disaster assistance. Program auditors will demand complete records of expenditures. It is im-

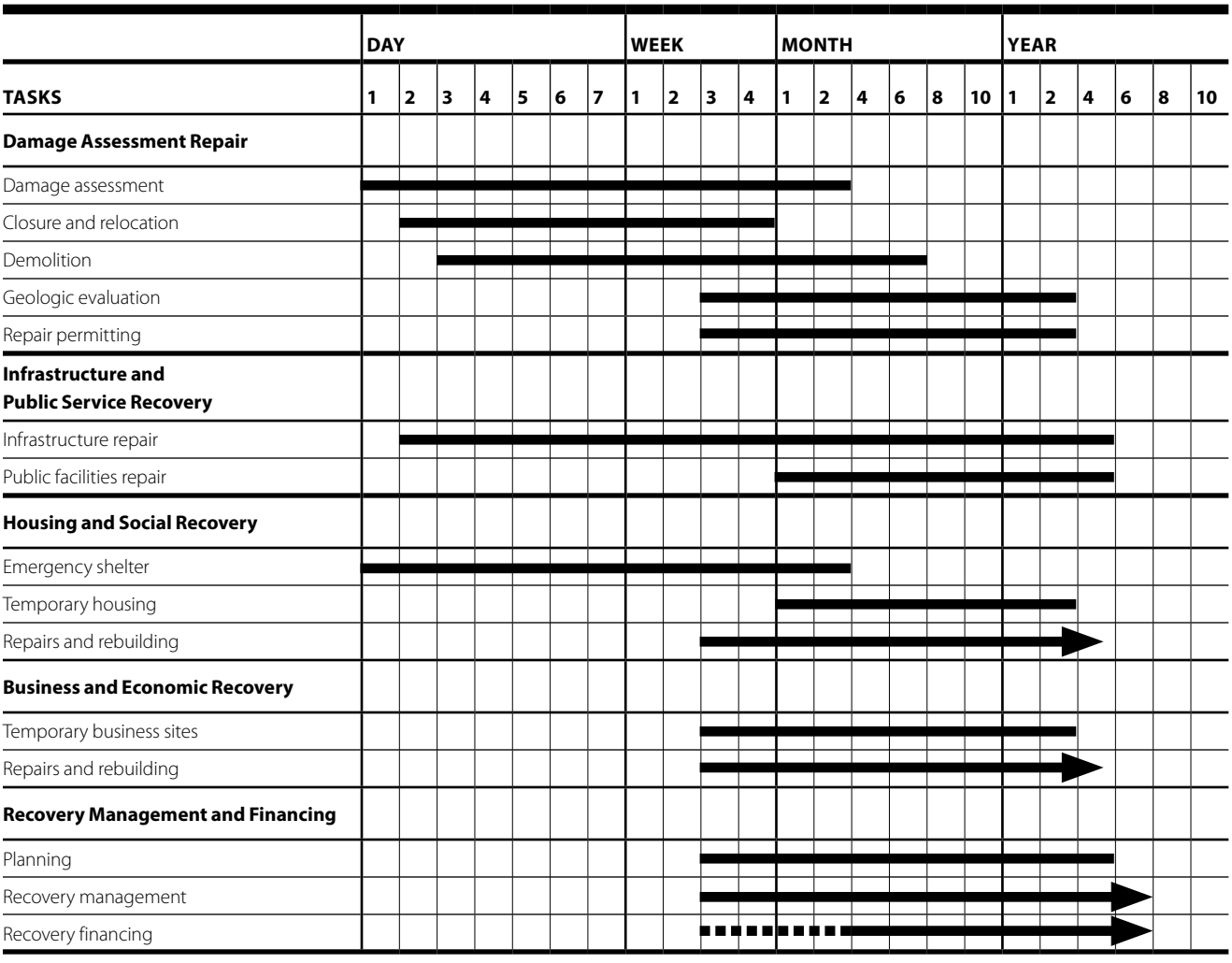

Figure 7.3. Generalized post-earthquake recovery timeline for local governments (EMA 1994; Spangle Associates 1991)

portant for communities to have good financial systems and documentation procedures in place from the very start and to also plan ahead for the mistakes and audit reimbursement requirements that are almost certain to come.

IMPLEMENTATION STRATEGIES, MILESTONES, AND TIMETABLES

While recovery involves many of the normal city-building and renewal processes, by no means is it a rational or orderly process. The compressed nature of post-disaster recovery requires a surge of activities and actions at various points in the process. Some activities, like debris removal and clean-up, start almost immediately after disaster strikes, while others do not begin until months and years later. Some happen quickly while others take years to complete.

For most communities, recovery and reconstruction typically takes two to ten years to complete. Basic repairs to damaged housing, businesses, and infrastructure can usually be completed by the second year of recovery, leaving the most difficult challenges and problematic areas that sometimes can take a decade or more to complete, including repairing damaged city centers, rebuilding affordable housing, remediating areas with geologic problems, and handling controversial areas.

Figure 7.3 is a generalized timeline for local post-earthquake recovery activities derived from analyzing the rebuilding experiences of nearly a dozen cities that rebuilt after earthquakes (FEMA 1994; Spangle Associates 1991). It shows that there are clusters of recovery-related activity in the first weeks, months, and years, with rebuilding continuing for many years beyond. Completion of these clusters could also be useful in establishing milestone points on a long-term recovery timetable. For example, Florida's post-disaster recovery planning guide recommends the following milestones to mark the end of the short-term recovery period: (1) any temporary moratoria on repairs or construction are lifted, at least for most areas; (2) power and water are restored to all but the destroyed structures; (3) schools are reopened or temporarily relocated; and (4) most of the road network and traffic signalization is operational (Florida 2010a).

The time needed for a full recovery depends on a number of factors. Some are physical, including the nature and extent of the disaster and its impacts on the urban environment. Also, disasters tend to accelerate ongoing urban trends, such as declining use of older or outdated commercial districts and neighborhood blight. The leadership capacity, vision, and commitment of local leaders and recovery managers also count as do the timing and availability of resources, particularly financial and labor, and the social capital available to "tip in" to community recovery.

It is also important to reemphasize the point that getting back to pre-disaster conditions may never be possible and should not be the goal of a community's recovery timeline. Instead, there will be a "new normal" which is important for understanding and defining milestones and a timetable for recovery. Two categories of "new normal" need to be considered. The first is that the recovered community may be physically, socially, or economically different from the pre-disaster community due to the disaster's impacts or the policy choices and actions taken during the recovery, including community risk reduction and other improvements. Also, a focus on pre-disaster conditions does not account for the changes that would have happened anyway over time in the community even if the disaster did not happen. Macroeconomic and external conditions—like recessions, local conditions, and pre-disaster plans for a downtown makeover or new housing—all should be considered when setting the bar for the recovered state of the community. A more detailed discussion of recovery measures comes later in this chapter.

Realistic timeframes and desired outcomes should be established for every recovery program and project and then closely monitored throughout recovery. Likewise, a realistic timetable and desired outcomes for the entire recovery implementation strategy should also be set along with milestones to help assess progress along the way. Timelines provide the recovery "roadmap," and they are valuable information and communication devices that help set the expectations for federal and state partners, elected officials, affected residents and businesses, insurers and investors, and members of the "ecosystem of builders" contributing to recovery.

The flood recovery and reinvestment plan for Cedar Rapids, Iowa, established an overall timetable of 12 to 15 years for full implementation of the recovery plan developed after the 2008 floods (Cedar Rapids 2009). It also sets milestones for completing more detailed planning and for initiating and completing projects in economic recovery, flood protection and management, public facilities replacement and rehabilitation, and health and human services. To track and report the flood recovery progress, the City of Cedar Rapids' GIS division also maintains a web-based interactive map of the city that reports on repairs to city facilities and residential and other demolitions and acquisitions (http://crgis.cedar-rapids.org/CR-Progress/FlexViewer/index.html).

Developing plans and timelines and acquiring and distributing resources—financial and labor—to undertake an array of recovery programs and projects will definitely help fuel the recovery process. But the long, hard work of recovery and reconstruction must also be constantly managed and monitored and strategies adjusted as new problems surface and new information and resources emerge.

Recovery Implementation Strategies

Knowingly or not, a robust recovery implementation approach generally works to balance priorities and actions across three separate but interdependent tactics: timeline strategies, spatial strategies, and systematic strategies (Murosaki 2007).

Timeline Strategies

These approaches to implementation integrate in the time-serial or sequential nature of the recovery process—short-term versus long-term—and specific recovery programs and projects. While recovery can seem chaotic at times, many aspects of recovery follow the logical order of normal development and construction. For example, housing reconstruction does not usually begin until debris from the damaged structure is removed, funding is secured, and preparations for reconstruction are completed.

Timeline strategies also can be used to parse problems and manage uncertainties, from the general to the particular. Iterative approaches to planning are examples of timeline strategies where the initial rounds of planning might provide the overall, communitywide framework for recovery. These are then followed by increasingly specific levels of planning by neighborhood, sector, or program and plan as more information is gathered and analyzed and stakeholder deliberations can occur. The City of Santa Cruz, California, took this approach in its reconstruction planning and implementation after the 1989 Loma Prieta earthquake severely damaged the downtown (Arnold 1999). The Vision Santa Cruz planning process focused first on developing an overall vision and basic approach to reconstruction. More time was then taken to deliberate on issues such as land-use changes, which directly involved the interests of landowners, building owners, occupants, and the public.

Spatial Strategies

These approaches to recovery implementation have a more geographic focus. The disaster almost naturally initiates this strategy when certain areas—such as coastal and riverfront properties and ground failure areas—are more heavily damaged than others. Communities often adopt temporary moratoria to limit repairs and reconstruction activities in the most heavily damaged areas, which is also a spatial approach to implementation. However, as recovery progresses, the spatial prioritization of recovery programs and projects might need to continue as a means of dealing with resource constraints. Funding delays and limitations in construction labor and materials may make it difficult to allow simultaneous reconstruction of all damaged areas. Spatial strategies can also be used to incentivize and direct reconstruction. For example, communities might prioritize infrastructure restoration and expedited permitting for areas that are less vulnerable to future disasters.

Spatial strategies can also be used to specifically target or "seed" recovery reinvestment in certain neighborhoods. This approach is most akin to place-based urban policies and programs that target resources for specific locations for poverty alleviation and neighborhood and economic revitalization. The City of New Orleans' post-Katrina target area plan identified 17 recovery zones in business corridors around the city where public recovery funds would be used to fund repair and reconstruction of key public facilities and infrastructure in an effort to spur redevelopment and private investments and also enhance quality of life.

Systematic Strategies

This approach is often taken by agencies with a system or set of similar or integrated facilities, infrastructure, and other physical assets damaged by disaster. Utility and school districts, public housing, and social service providers are some examples. Initial focus is often given to identifying and staging repairs to those assets with less damage or in areas with easier access. More detailed planning, project design, and execution then happens as detailed inspections are completed and future demands and resources for recovery are better understood.

However, a more systematic approach to recovery might also be applied on a sector level, such as in housing recovery. In thinking systematically about housing recovery, all housing programs would be managed collectively. This would include individual and household assistance; the siting and design of temporary housing to keep communities and services intact; and neighborhood-level recovery of housing, infrastructure, and community services. To some extent, the National Disaster Housing Strategy, developed by FEMA at Congress' direction following Hurricane Katrina, is such a systematic approach aiming to help better integrate various federal programs targeting households and housing recov-

ery (FEMA 2009). At the community level, an even broader systematic approach to housing recovery might link housing programs together with employment and K–12 school restoration, recognizing that household recovery for many families in the community will depend upon having all three elements—homes, jobs, and schools—restored.

Managing Post-Disaster Uncertainties

Inevitably, the post-disaster period will be fraught with uncertainty caused by the complexity of the situation, the lack of information to help with decision making, and the dynamics of the changing urban landscape. Too much uncertainty can slow recovery and even lead to wasteful duplication of efforts and squandering of resources. After disasters, some common and difficult post-disaster uncertainties occur first with situational awareness—understanding the recovery landscape and developing a vision and strategic approach to the recovery process. A second round of uncertainty tends to emerge around characterizing future hazards and the safety of future land and occupancy uses as well as determining available funds for reconstruction. Taking a longer view, there may also be questions of population return, if a significant number of residents had to relocate shortly after the disaster, as well as the business and future economic viability of the community.

Post-disaster recovery planning can be quite helpful in reducing uncertainty and managing future risks as data on post-disaster conditions and needs are collected and analyzed. Iterative and incremental approaches to funding and refining recovery policies and program for recovery are constructive ways of coping with uncertainty. Such approaches start with initial actions and decisions that can move ahead quickly, followed by others over time as more information is available and time for deliberation, both internally and with the public, is possible. Decision makers are encouraged to develop policies that can serve as criteria for helping to evaluate the alternatives and to avoid making decisions before they are needed. As Alesch, Arendt, and Holly (2009, 165) point out, "it isn't necessary to decide on a location for the new library in town while the city is still under water. But it is important to define some criteria or policies that will be used to evaluate sites for the library—perhaps on a main bus line or near the center of town—when the time comes to make that decision."

To some extent "all planning projects are policy experiments" and incremental approaches to their planning, deliberation, execution, feedback, and adaptation can help ensure that "courses of action are shaped from lessons of past experience as well as from a more realistic understanding of current and emerging conditions" (Inam 2005, 180). It is possible to seed the community with projects and investments that help stimulate the desired recovery actions. An essential condition, however, for iterative and incremental implementation approaches is having flexible and adaptable funding programs. Local recovery is most successful when disaster assistance programs are flexible "with a capacity for embracing error, learning with people, and building new knowledge and institutional capacity with action" (Berke, Kartez, and Wenger 1993, 97).

LEGAL CONSIDERATIONS IN RECOVERY IMPLEMENTATION

There is always tension between public and private interests, and these conflicts can be especially heightened post-disaster. Politics and rivalries might be temporarily suspended in the early days following disaster, but they can return and sometimes even stronger than before. This is due to the simultaneous and competing demands for limited resources that the time-compressed post-disaster environment creates.

This section reviews the critical legal issues that local leaders are likely to confront in recovery implementation. All these issues can cause substantial staff burdens post-disaster, require special expertise to address, and delay the recovery process. Ideally, communities should develop guidance on these matters ahead of disaster. They can also be incorporated into a community's recovery ordinance adopted before or soon after disaster strikes. In addition to the guidance offered here, it is critical that all local and state legal authorities and restrictions be understood before engaging in these or any other significant legal matters.

Moratoria and Temporary Restrictions

Adopting and enforcing moratoria or other temporary restrictions on building and development permitting actions is always a political minefield. So why do it, and especially why should a community consider taking such action after disaster strikes? Local governments often take such actions post-disaster simply because they are overwhelmed and "business as usual" no longer makes sense. Disasters often expose land-use and structural vulnerabilities, and it takes time to conduct technical investigations, assess future risks, and determine appropriate rebuilding standards.

Conditions for moratoria and temporary restrictions on repairs and rebuilding should be based upon clear distinc-

tions in levels of damage to individual structures—by building type or by geographic area. They also should be clear about their application to repair and rebuilding permits for existing uses versus new development. Temporary modifications to the local permitting process can help accelerate rapid post-disaster repairs for those buildings and areas of the community with moderate to light damage as well as new construction in safe areas, while maintaining a reasonable amount of time for local building and planning officials and property owners to assess the situation in more severely damaged buildings and areas.

These tools can also provide some additional time to clear debris, stabilize hazardous buildings and other life safety risks, repair damaged infrastructure, and explore mitigation options and funding to rebuild to different standards or to potentially relocate certain uses. For example, one week after an EF-4 tornado cut a nearly six-mile path through Tuscaloosa, Alabama, the city's mayor issued an executive order restricting rebuilding within the tornado's path to allow city leaders a chance to monitor proposed construction within the area while a master plan was developed (Morton 2012). Similarly, after the 1989 Loma Prieta earthquake, Santa Cruz County, California, enacted temporary restrictions on repairs and rebuilding in some unincorporated areas of the Santa Cruz Mountains until ground failure issues could be properly investigated and rebuilding standards defined (Spangle Associates 1991).

The public, especially property owners who might be directly affected, should be involved in the decision making. It is also important to recognize that there are some inherent delays in rebuilding that occur—especially in major disasters—in debris removal, insurance claims processing, and demand surge for construction materials and labor. So, oftentimes, the post-disaster environment and market conditions will create de facto restrictions even without formal action.

Nonetheless, communities should consider developing and adopting procedures in advance of disaster so that there is adequate time for meaningful deliberation on the criteria and procedures for moratoria or temporary restrictions to be enacted post-disaster. This can help residents and businesses get more comfortable with staffing and capacity issues that local governments face post-disaster and this can ensure that the quality of repairs and rebuilding not be compromised because of post-disaster pressures to rebuild.

"A phased or 'triaged' moratorium that is specific to the type of permit will be easier to sell to the public than a generic policy that leaves details to be determined after the disaster" (Florida 2010a, 46), and similarly temporary restrictions that differentiate between the types of permit applications and when they will be processed will ensure that, at a minimum, critical permits that need to be processed quickly to enable recovery can do so with fewer delays. For example, Hillsborough County, Florida, adopted an ordinance that "provides for an initial moratorium of 72 hours in the case of a disaster declaration, which is then followed by moratoria for destroyed structures (30 days), major damaged structures (10 days), minor damaged structures (4 days), and new development (30 days)" (Florida 2010a, 46).

Nonconforming Uses

Many communities have policies in place that set conditions on nonconforming land uses and structures. Most allow nonconforming uses to remain but restrict their expansion, conversion to another nonconforming use, or restoration in the event of their discontinuance or destruction. Such policies respect the vested rights of owners of nonconforming uses while also working to gradually eliminate such uses. Disasters can provide a substantial opportunity to eliminate many nonconforming uses at approximately the same time. But this can also slow recovery by adding complexity to the permitting process, and it may also create financial hardships that can hamper residential and business recovery efforts.

Communities are encouraged to inventory all plans, policies, codes, and other regulations ahead of time to identify the host of nonconforming uses requirements, ensure that there are no conflicting standards, and make sure that code requirements and other standards governing reconstruction are up-to-date and meet best practices. Consideration should also be given to which nonconforming use standards will be applied and which might be relaxed or ignored when there are substantial disaster-related damages. For example, when certain damage thresholds are met or exceeded, or a certain percentage of the floor area is to be affected by the proposed repairs or reconstruction, structures are often required to be rebuilt to current adopted building codes and other standards. The NFIP requires that participating communities adopt floodplain management regulations so that substantially flooded buildings will be rebuilt to current flood-related building codes and other land-use regulations (FEMA 2014b).

While still likely to be publicly contested, health- and safety-related standards are much more politically defensible post-disaster than other upgrade requirements, particularly those related to architecture, aesthetics, and other nonessential requirements. Local governments should aim to provide clear guidelines as to what nonconforming use standards

will be enforced and which will be relaxed or waived post-disaster. The waiving or modifying of nonconforming use requirements is, in fact, a regulatory incentive that can be used strategically post-disaster to help stimulate rebuilding in certain areas or for certain uses. For example, waiving the parking area requirements but still enforcing the current building code standards for nonconforming uses in an older, flood-damaged downtown can help building owners build back quickly and safely.

Emergency Demolitions

Disasters can substantially damage structures to the point that they are only partially collapsed and pose an imminent threat to public health and safety. It is important to ensure that local emergency powers are in place, ahead of disaster, so that these dangers can be handled quickly. Issues of due process and procedures for demolition, environmental review, and handling of historic resources should be explicitly addressed in demolition procedures.

Environmental Review

Many building and development activities require environmental review. Some states have their own environmental review regulations in addition to those of the National Environmental Policy Act (NEPA). Generally, for a project to be subject to NEPA, the agency that carries out or approves the project must be a federal agency. This means that any federal funds administrated by a community, such as FEMA or CDBG funds, are subject to this process. NEPA may also apply to nonfederal actions where a permit, a regulatory decision, funding, or other assistance from a federal agency is required (U.S. Environmental Protection Agency 2014). A nonfederal action is "federalized" depending on the extent of federal involvement, and the typical legal test is whether the overall project could be implemented without federal agency approval.

NEPA and state regulations also may contain certain types of protections and emergency exemptions that local governments can utilize. For example, in California, projects to repair, restore, demolish, or replace property or facilities damaged or destroyed as a result of a disaster are exempt from state-level environmental review requirements if a state of emergency has been declared by the governor under the Emergency Services Act (California Natural Resources Agency 2014). NEPA does not include a specific exemption for emergency situations, but the Council of Environmental Quality is authorized to allow for alternatives to the normal environmental impact statement procedures in the case of emergencies. Many federal agencies have included emergency situations in their own NEPA regulations as categorical exclusions, but there are still many exceptions to the exemption rule. Local governments should consult with key state and federal disaster-related funding agencies, such as HUD, FEMA, and the USACE, should always be consulted as to their specific standards.

Historic Preservation

Disasters tend to seek out the most vulnerable targets, and quite often older, historical buildings and districts in a community are hit hardest. Some of the most commonly affected sites include historic riverfront districts; coastal properties; and brick, masonry, and other older, seismically vulnerable structures, particularly historic churches and civic buildings. Many properties that are not officially designated as historic resources but add to a community's cultural character will also likely be damaged. The potential loss of these resources can have a traumatic impact on a community already burdened by the significant social and economic losses caused by a disaster.

Sometimes, the loss of some historic resources is unavoidable as a result of disaster-related forces. Others can be damaged or destroyed accidently, such as by earthquake aftershocks or during debris removal operations, if procedures are not in place to help manage these issues. This can include shoring up vulnerable facades, salvaging building and architectural elements before demolition or debris removal begins, and ensuring that archaeological resources are not disturbed by heavy equipment.

In the post-disaster period, historic resources that were damaged during the disaster but are still standing can result in some of the most politically contentious local debates. It will be difficult to sort out which buildings are critical to preserve, even if they have sustained substantial damage. It will also take time to develop the appropriate standards for repair and reconstruction. Without clear regulations, property owners may make quick decisions and inappropriate repairs.

A list of historic resources, both officially designated and those that meet historic preservation criteria, should be developed in advance of disaster, especially for those that are located in hazardous areas or have not had any structural mitigation. If not, a target list of potentially affected historic resources should be developed quickly post-disaster and distributed to damage inspection teams. Damage inspections of historic resources should be carried out by qualified personnel. Repair standards for damaged historic structures also need to incorporate any state or national requirements to maintain their character and historic designation.

All states have historic preservation officers who can provide guidance on inspections, permitting, and repair and reconstruction considerations for historic resources. It is also important to engage local historic preservation organizations in the recovery planning and implementation process to help ensure that the unique considerations involved with preserving and restoring historic structures and archeological sites are considered. Private foundations have also been important partners in funding necessary repairs and reconstructions of historic structures in many disasters.

Property Acquisitions and Relocations

Disasters can create opportunities for land-use change, particularly in precluding rebuilding in hazardous areas and relocating those uses elsewhere. Nonetheless, major land use changes rarely happen even after a disaster. The main reason is that disasters do not usually destroy all the buildings and infrastructure in a particular area. Therefore, some property value and ownership rights and patterns remain; pressures to rebuild what existed before are incentivized through many insurance schemes. The potential infringement on private property can also be very contentious, and the legal issues should be carefully considered before any post-disaster changes to land-use or development regulations are proposed.

All post-disaster expropriations of private property for a public use after disasters must comply with the due process and just compensation clauses in the U.S. Constitution and constitutional case law. States also can have additional property protection provisions that must be upheld. The most common forms of post-disaster expropriations are associated with large-scale hazard mitigation and infrastructure projects, like acquiring land to construct levees for flood protection. These projects often involve federal and state agencies, such as the USACE, which has its own extensive compliance and public input processes

There are many examples of successful programs undertaken by communities for voluntary land acquisitions and relocations of vulnerable or damaged properties in high-hazard areas. In some cases, property owners may lack the funds to properly mitigate the buildings or land-related hazards and thus may seek to be "bought out" so they can relocate elsewhere. In addition to the potential hazard reduction benefits, these programs can also have environmental, social, cultural, and economic benefits—such as environmental restoration and tourism and recreation opportunities—that may help justify the costs and increase public support as well. FEMA hazard mitigation grants have been a major source of post-disaster funding for such programs. A key issue that many communities must contend with is valuation and the high costs of compensation for acquisitions. Often the most valuable real estate—for example, along riverfronts and on barrier islands—is also the most hazardous.

Implementation of post-disaster buyout or relocation programs needs to be sensitive to the inhabitants of these properties—homeowners, renters, or business tenants. Post-disaster surges in construction labor and materials and increased demand for undamaged housing or commercial space may require some additional intervention and assistance by local government or other recovery partners to help ensure that relocations can happen as smoothly as possible. These might include, as examples, fast-tracking subdivision and development reviews or infrastructure construction in less hazardous areas and providing some property tax relief on new home purchases in these areas.

Low-income homeowners, manufactured housing occupants, the elderly, and minorities are among those with special relocation issues. Social and environmental justice issues can quickly emerge if these are not handled sensitively. Some communities have offered additional assistance to help move residents as well as undamaged homes outside buyout areas. This can be particularly helpful in preserving historic properties. The City of Grand Forks used CDBG funds to acquire a parcel of land to provide interim housing for residents participating in the voluntary residential buyout of areas heavily damaged in the 1997 floods and to purchase and remodel a building to serve as a community center for the interim housing residents. It also used CDBG funds to acquire land and construct the infrastructure (e.g., sanitary sewer, storm sewer, paving, and street lighting) for a new residential subdivision in an area proposed for future residential development in the city's comprehensive plan (Grand Forks 1997).

If a community wants to consider post-disaster land-use acquisitions or restrictions on construction in vulnerable locations, it may be useful to identify potential acquisition areas ahead of a disaster and to enact moratoria or temporary restrictions on rebuilding quickly post-disaster. Moratoria and temporary restrictions will help preserve the option to evaluate vulnerability and work with property owners to determine if rebuilding restrictions are feasible. If not, these actions may help identify other mitigation options that can be applied to help reduce future risks from rebuilding in these areas.

Legal Considerations with Other Hazard Mitigation and Resilience Measures

There will definitely be "windows of opportunity" post-disaster when the community will be much more open to consid-

ering ways to mitigate hazards and reduce future community vulnerability. Before embarking on any mitigation project designs, it is important to understand whether there are any statutory limitations on the local government's authority to undertake hazard mitigation work. Most states grant certain classes of municipalities the home-rule powers to undertake legal and constitutional actions not otherwise prohibited by state law. Also, any mitigation project will likely have public as well as private benefits, so it is also important to understand if there are any limitations on spending public funds to mitigate hazards on private property. Most courts do not hold governments liable for actions taken to enhance public safety; nevertheless legal guidance can help ensure that there are no potential liability issues if the project fails to prevent damage in a future disaster.

Besides land-use acquisitions, other potential regulatory approaches include reducing the intensity or density of permitted uses; increasing setbacks from hazard sources, such as earthquake faults, beaches, or waterways; instituting other hazard-specific site design requirements; and increasing structural mitigation requirements (State of Florida 2010a). These methods could be implemented through policies that specify damage thresholds for certain areas or throughout the community, requiring nonconforming uses and buildings to meet current standards. Zoning overlay districts, post-disaster specific land development codes, and/or special assessment districts to fund mitigation projects that benefit more than one property might also be applied. GHADs are one example of such a special assessment district that California allows local governments to create to finance mitigation and ongoing maintenance required for geologic hazards, and they are discussed further in the financing section of this chapter.

Various forms of incentives can also help reduce structural vulnerability and hazards. For example, FEMA post-disaster hazard mitigation grants have been used throughout Louisiana to help offset the costs of elevating structures to new base flood elevations established following Hurricane Katrina (Louisiana Recovery Authority 2009). To be successful, incentives also need a good public education strategy to encourage property owners to voluntarily rebuild to higher standards so that there is a discernible reduction in community vulnerability overall (Florida 2010a).

Controlling Blight

Particularly after large-scale disasters, some residents and tenants may temporarily relocate and choose not to return, or property owners may lack the necessary funds to repair damaged homes and businesses. Neighborhood blight can result from these decisions and emerge at varying points in the recovery process—early on when damaged buildings need to be cleaned up and debris removed as well as months and years later as tenants and owners decide not to "tip in" to the recovery. Blight can propagate as adjacent properties lose value, investors lose confidence, and vandalism and squatting ensue. This is what happened in parts of Los Angeles after the 1994 Northridge earthquake damaged many garden-style apartment complexes, residents moved out, and owners could not finance repairs (Comerio 1998).

Post-disaster blight abatement could exceed the capability of traditional local code-enforcement procedures (Florida 2010a). Issues that need to be considered include notification and decision processes to demolish destroyed structures that remain in neighborhoods for unacceptable timeframes; alternative means of financing demolition costs when the typical method of property liens is inadequate in dealing with widespread problems or after federal reimbursement program timeframes have run out; provisions for adjudicating blighted and abandoned properties; and acquiring, packaging, and reselling properties post-disaster. Since Hurricane Katrina struck in 2005, the City of New Orleans has adopted several innovative programs and strategies to deal with its significant load of blighted and abandoned properties. They include a "Lot Next Door" program to help owner-occupied residents purchase adjacent abandoned properties, streamlined administrative hearing procedures, and strengthened code enforcement and code lien foreclosure and sales procedures (New Orleans 2014a, 2014b).

METRICS OF RECOVERY: MEASURING SUCCESS

Until now, the implementation focus of this chapter has looked at how things happen, or how to make things happen. This final section considers what actually happens and how to assess the progress and outcomes of the recovery process.

Determining what constitutes implementation success and how to measure it is riddled with questions that need to be thoughtfully considered in designing a recovery tracking and assessment process. While difficult, the "how to" questions are fairly straightforward:

- At what scale will the recovery success be measured—at the individual or household level; by census tract, neighborhood, or other community subset; citywide; or something broader or more regionally?

- Over what length of time, and in what increments of time, will the recovery be measured—days, months, years, or beyond?
- Who will be the evaluator? Will the evaluations consider the perspective of the disaster-affected or recipients of assistance, the entire community, program and project staff and funding agencies, or independently?

The "what" issue—exactly what constitutes a successful recovery—is a much more complicated question to answer and unfortunately there is not, as of yet, clear theory or consistent policy guidance. Fortunately, disasters occur relatively infrequently in both space and time, but this creates some significant problems for systematic study of an array of recovery efforts. There is not a centralized repository or system for collecting and archiving recovery indicators. And, more problematic yet, there are not comprehensive models of the recovery process or clear definitions of the process itself, the endpoint of recovery, and what has been achieved with recovery.

A clear definition and description of recovery across multiple dimensions must first be established before it can be measured. These dimensions include environmental restoration, physical reconstruction of damaged or destroyed buildings and infrastructure, rebuilding of the economy, and reestablishment of social and institutional well-being. This work should not be done without community and stakeholder input, but that input needs to be structured and guided. For many disaster-affected residents and businesses, a return to pre-disaster conditions is a clear and desirable measure of recovery success. But restoring pre-disaster conditions is seldom possible across all recovery sectors and should be used sparingly, if ever, in defining recovery success or its measures.

Instead, the "new normal" needs to be defined and holistically described. Consideration should be given to how the recovered community may be physically, socially, or economically different from the pre-disaster community due to the disaster's impacts or policy choices and actions taken during the recovery, including community risk reduction and other improvements. Also, some retroactive visioning may be required to seriously consider what changes would have happened anyway over time, even if the disaster had not happened. For example, it may be unrealistic to expect retail sales to return to their pre-disaster levels if those levels were already in decline due to an economic downturn, or conversely if they were at a seasonal high due to holiday shopping. Researchers call this a counterfactual state of recovery and recommend finding comparable regions unaffected by disaster to use in developing such a definition (Ganapati, Cheng, and Ganapati 2012).

The National Disaster Recovery Framework places responsibility for defining successful recovery on disaster-affected communities and acknowledges that one community "may characterize success as the return of its economy to pre-disaster conditions while another may see success as the opening of new economic opportunities" (FEMA 2011b, 12). Recognizing that no single definition fits all situations, the framework does describe some conditions that successfully recovered communities share (FEMA 2011b, 12):

- The community successfully overcomes the physical, emotional, and environmental impacts of the disaster.
- It reestablishes an economic and social base that instills confidence in the community members and businesses regarding community viability.
- It rebuilds by integrating the functional needs of all residents and reducing its vulnerability to all hazards facing it.
- The entire community demonstrates a capability to be prepared, responsive, and resilient in dealing with the consequences of disasters.

Once the desired outcomes of the recovered community are more clearly described, the actual measures also need to be defined. How can the goals and objectives of the recovery plan best be represented and tracked? Will the measures emphasize speed or quality of recovery, and how will both of these standards be balanced? Also, will they be qualitative descriptors or opinions of the outcomes or more specific, fact-based, and quantitative measures? For qualitative indicators, survey instruments might need to be developed and administered at periodic intervals in the recovery process. For quantitative indicators, a series of data sets may need to be defined and regularly collected or constructed.These indicators may include population counts, demolition and repair permits, household consumption and retail sales, new housing and job starts, bankruptcies, school enrollment, and public transit ridership. Sometimes, data proxies may be needed, such as household reconnections of electric power service as an indicator of repopulation rates. Both in the U.S. and internationally, remote sensing data, such as measures of night-time light dispersion, have been applied to measure recovery progress.

The Florida *Post-Disaster Redevelopment Planning* guide proposes that successful completion of the long-term redevelopment period will be evidenced by the following milestones (2010a):

- Replacement of housing stock is adequate for the post-disaster population such that interim housing can be removed
- Economic indicators show unemployment has stabilized at a rate near pre-disaster levels or comparative to other similar locations
- Seventy percent or more of businesses have reopened and remained in business for at least 3 months or have been replaced
- The percent of population dependent upon disaster assistance and social assistance programs has decreased to near pre-disaster levels

After the 1995 earthquake in Kobe, Japan, the governor of Hyogo Prefecture identified specific recovery targets: to rebuild all damaged housing units in 3 years, remove all temporary housing within 5 years, and achieve complete physical recovery in 10 years (U.S. Government Accountability Office 2008a). Each month, the City of Kobe and the prefecture published information on the web and provided it to the media, charting its recovery progress towards these and other recovery goals. Both the city and prefecture also convened panels of international and domestic experts and community members to assess the progress made on these targets and other recovery issues and to recommend any needed changes to existing policies. These goals were critical in helping inform the national government's recovery-funding decisions and in coordinating the wide range of participants involved in the recovery.

Measuring recovery progress and outcomes requires that a set of baseline conditions be defined and a system established to collect, track, and provide documentation of progress against these baseline measures. Such an information management system should be designed to leverage GIS mapping, social media, and other technology, and it should also be linked with a communications strategy that helps promote and ensure accessibility, accountability, and transparency. Both local government and the public can use the system to monitor recovery progress and evaluate whether strategies and programs are achieving the desired results. Periodic briefings with the media and the public can also be valuable in keeping the community, state and federal partners, and philanthropic and private investors actively engaged in the recovery implementation and committed to the community's recovery success.

CONCLUSION

Having an actionable recovery plan is a critical first step in the long road of disaster recovery. This chapter has looked at some of the key issues in recovery implementation, a process that can last years following a major disaster. As noted, strong and effective local recovery management can help build a great deal of positive momentum into a community's recovery trajectory, especially when communities can decide quickly on their recovery priorities and their organizational and decision frameworks. Planners, in particular, can bring some unique and valuable skills to recovery because of their long-term strategic perspectives and also because the work of recovery, in many ways, looks a lot like normal urban life, governance, development, and renewal.

As noted at the start of this chapter, the collective understanding of the implementation phase of post-disaster recovery is far more limited than the understanding of the process of recovery planning. This, in part, reflects the reality that implementation programs rarely work in practice as envisioned and require continued monitoring, flexibility, and adaptation. It also reflects some of the continued challenges in the collective understanding of the recovery process itself: the observed conflicts between speed and quality as measures of recovery success and the uncertainty about how and when recovery ends and normal community processes resume. At some point, the work of recovery will be subsumed by the work of normal community development and renewal. By that time, the careful action taken by planners and other community leaders to plan and implement a well-envisioned and strongly supported recovery ideally will help heal the loss that communities inevitably face in disaster and ensure a positive trajectory for long-term community resilience.

CHAPTER 8

NEXT STEPS IN CREATING RESILIENT COMMUNITIES

The question that dominates planning for post-disaster recovery is what a positive outcome should look like. There is no single answer because of the variety of circumstances that face communities in such situations, but there are some general principles that seem to make sense in any case—and they form the core of the concept of resilience. One is that the community should emerge from the process of recovery safer and stronger, better able to withstand future assault from the forces of nature. Yet posing the issue in those terms can suggest armoring against nature when, in fact, the real answer may lie in relying, to the extent possible, on natural systems to mitigate the impact of those forces against the built environment.

Where possible and necessary, it also may involve removing the built environment from harm's way in order to minimize that impact. Another principle is that the community should restore and, ideally, improve its economic situation, a transformation that can take many forms but should include some measure of equity and increased opportunity for disadvantaged segments of the population. They will deserve such attention because small businesses have often suffered the highest failure rate with a consequent loss of lower-wage jobs (Alesch, Arendt, and Holly 2009).

Little of this happens, however, without some sort of strategic public or private initiative. That is the ultimate point of this concluding section of the report—the paramount importance for planners and public officials of seizing opportunities during long-term recovery to move their communities forward. Seizing opportunities is not a role for the timid or the unprepared. It requires leadership, and leadership depends on champions of ideas, whether these champions be elected or appointed officials or emergent leaders of new or existing civic organizations. The leadership must come from somewhere.

But the results of such leadership are undeniable:

- Although observers have pointed out many shortcomings in the response to Hurricane Katrina, it is important to note that state officials in Louisiana seized at least two major opportunities that have reshaped the context of planning there. One is that the state legislature approved the consolidation of the previously balkanized constellation of levee districts into just two, one on either side of the Mississippi River, in order to improve coordination of levee planning and maintenance. The other was the approval of the state's first mandatory building code.
- In Greensburg, Kansas, the mayor and others seized the opportunity in rebuilding after an EF-5 tornado in order to reposition the town both environmentally and economically to become a nationally recognized example of green post-disaster redevelopment.
- In Cedar Rapids, Iowa, among numerous testaments to the value of bold thinking, the city retained and gained population after the 2008 floods, in defiance of the usual trends, by ensuring that residents whose homes were lost to the flood or bought out afterwards were able to relocate to new housing within the city limits.
- In New York City, city planners after Hurricane Sandy undertook studies of how to accommodate coastal flood mitigation while retaining the vitality of densely built urban neighborhoods where relocation is not always a viable option (New York 2013a, 2013b; Schwab 2013). The city has been implementing many of those ideas. It is important to know, however, that the city planners had already been thinking about these issues before Hurricane Sandy struck.

The American Planning Association (APA) has stressed throughout its hazard-related publications and policy guides the need to identify and act upon the silver lining in disasters, which provide unique opportunities to reshape for the public good the context and content of planning that follows. Disasters seldom if ever produce the proverbial blank slate for

planning, but they do provide the chance to start anew. While no one in their right mind would wish for such events to occur in order to achieve such outcomes, a sober assessment of reality indicates that natural disasters will occur and that communities should be prepared to make something positive happen as a result. A crisis, as it has famously been said, is a terrible thing to waste.

But as this report emphasizes more than any other APA has produced, it is not enough merely to wait until the disaster has occurred to begin to contemplate what those opportunities might be. It is critical to begin to evaluate those possibilities beforehand, in order to expedite and maximize the chances of success when they arise. Savvy planners have long known that there are better and worse times to move certain agendas for public improvements. Especially in view of the impending impact of climate change in coming decades, it is time to apply that insight to planning for post-disaster recovery.

ADAPTIVE THINKING

Post-disaster recovery is in some ways such a demanding intellectual and emotional exercise that it behooves planners to dig more deeply and think more creatively than they often do. In that context, it does not hurt to turn to some of the increasingly profuse literature about how people's minds work without trying to make the subject more complicated than it needs to be. It may be useful to reprise a relatively straightforward summary of six ways of thinking, as offered by Robert Goldman (1999), a Chicago physician and surgeon who has written on brain health, borrowing from British educator Edward de Bono:

- **Objectively**: focusing mainly on facts, statistics, and hard information
- **Critically**: analyzing a situation for possible drawbacks, asking, "What's the downside?"
- **Positively**: finding the benefits, solutions, and new possibilities in a situation, asking, "What's the upside?"
- **Creatively**: generating new ideas, applying novel or unusual remedies to a problem
- **Intuitively**: reacting on the basis of emotions or instinct
- **Self-monitoring**: examining how one thinks to find any biases or flawed assumptions in the analysis of a problem; in other words, thinking about how one thinks

The point here is not that any one way of thinking is better than the others. All people use all of these methods some of the time, and personalities are in part a reflection of the penchant for one way of thinking more than another.

Planners and allied professionals in the community are called upon to think critically about the problems that can arise with natural hazards. This is not a comfortable exercise for everyone, and some people may in fact think of critical thinking as negative thinking, or "reasons why they cannot do something." Many people do not like to think about undesired events, much as they do not like to think about death, but not facing those possibilities does not make them go away. It only makes them more traumatic, when they happen, than they needed to be. Moreover, critical thinking allows individuals to understand the consequences of a contemplated set of actions, such as permitting development in a floodplain or in the wildland-urban interface. Thus, planners and public officials who do not consider such scenarios and contemplate effective ways to address them are doing their community a disservice. There is great value in considering the downside of placing new development in hazardous locations and articulating what that might be. There is great value in considering the downside of a lack of preparation for a plausible disaster. There is great value in recognizing that there is a downside to not having prepared for the recovery needs that would follow such a disaster. Conversely, one measure of success in recovery may very well be the degree to which the community avoids these projected downsides.

Disasters have been famously touted at times as learning opportunities. Planners and public officials who want to inspire their communities can think even more broadly about the greatest examples of inspiring humanity more generally. The late Nelson Mandela changed the thinking of an entire nation, and much of the world, by converting the highly negative experience of 27 years of harsh imprisonment into an opportunity for reconciliation.

People's better instincts gravitate naturally to examples of people overcoming adversity to find the silver lining that allows life to move forward. At its best, that is precisely what planning for post-disaster recovery should become, and it should be approached with the same combination of equanimity and enthusiasm that such examples provide. This is precisely why Greensburg, Kansas, has become an icon of green post-disaster redevelopment (see "Green Recovery in Greensburg, Kansas," p. 164). Mayor Bob Dixson, in particular, has been able to articulate why an EF-5 tornado with enormous destructive power has been converted into something positive, an opportunity to rethink the future direction of a dying town. In doing so, he has noted that the wind that destroyed the community has now become its ally, as the

town has shifted to a total reliance on renewable energy. This thinking has accomplished a noteworthy bit of conceptual jujitsu. In that martial art, the key lies in using an adversary's strength to one's own advantage. If there is a more emotionally powerful upside in life than converting tragedy into opportunity, it is hard to imagine what it might be. How many potential upsides lie dormant in communities' futures for lack of such positive thinking?

Such positive thinking, however, is fueled by ideas, or creative thinking. Planners are, or should be, quite used to the brainstorming and creative thinking that is inherent in community visioning and goal-setting exercises. There are numerous studies by now from psychologists on the subject of creativity, one of the most famous being *Flow: The Psychology of Optimal Experience* (Csikszentmihalyi 2008). Most of these works deal with individual creativity, but what puts an entire community, or audience of citizen participants, in the creative "zone"? People can not only be creative individually, but collectively, feeding on each other's ideas and learning from each other. Again, it is apparent that, in the small town of Greensburg, something like this has happened with institutions like the nonprofit organization Greensburg GreenTown. This is also the logic of artists' collectives and similar organizations. In the context of confronting the needs of post-disaster recovery with creative solutions, the question is how people accent the creative side of the community. One international example comes from Christchurch, New Zealand, where the city conducted an online "Share an Idea" forum that generated more than 106,000 ideas that city staff then consolidated into a much smaller number of related concepts (Christchurch 2012; Hoskin 2011). This collective creativity becomes an effective way of engaging citizens and earning public "buy-in" for the ideas that are ultimately adopted, in part because such collective creativity generates a sense of empowerment.

Empowered or not, survivors of a disaster will have a variety of emotional reactions to their experience. They will have to process these before they can move on to more analytical thoughts about recovery. Planners and others have discovered to their dismay that not allowing time and space for these emotional reactions only invites delays by suppressing a perfectly natural response to tragedy. People who have lost lives, homes, and personal belongings should be expected to grieve. Planners and public officials who can think intuitively and learn to respond positively and empathetically to people in need will help, not hinder, the recovery process. In some circles, this ability is now known as "emotional intelligence" (Goleman 2005), a term that makes the point that understanding the emotions of others is a learnable skill and important form of wisdom in its own right. In Cedar Rapids, Iowa, Christine Butterfield, community development director, thought it important enough that she contracted for the services of the Chicago-based Institute for Cultural Affairs to train facilitators among city staff to help conduct the neighborhood flood recovery planning meetings that took place in 2008 and 2009 (Butterfield 2012).

It is important in this context to understand that the attachment many people will have to a sense of place that preceded the disaster, no matter how fraught with hazards or other problems, such as poverty or social inequality, that place may have been, may continue to inhibit people's ability to re-envision the future of their community. Empathy alone may not always resolve these obstacles to restoring a public imagination that may not have been particularly robust beforehand.

Finally, self-monitoring is important to recovery planning because it provides a means to review biases and assumptions and how they may be affecting the way planners view the problem. Self-monitoring is not merely a way of thinking important to individuals. Specific sets of biases and flawed assumptions can affect the collective thinking of whole communities, neighborhoods, ethnic groups, and even professions. The self-selecting biases that influence how people join particular professions is perhaps of special significance because various forms of professional tribalism can and often do influence the ways in which various professions interact with each other. This sometimes pervasive problem is one of the most powerful reasons for bringing those different sets of professionals together on a regular basis to assess not only their use of common terminology but the ways in which they attack problems, in order to enlighten each other on better ways in which to pursue solutions together. In a more positive sense, these collective traits are sometimes referred to as cultures, but cultures are not static. Cultures of all types—whether civic, national, ethnic, or professional—are constantly affected by outside influences and evolve, sometimes rapidly, in response to changing circumstances. What is most important to know about recovery planning in this context is that the pressure for such change may be intense in the time-compressed atmosphere of recovery. It may even be excruciating under the most dire conditions. Far better, it would seem, to start the dialogue early, before disaster strikes, when the relationships can evolve under measured conditions.

No one individual, and no group, contains all the above thinking skills in equal measure. People all bring preferences and tendencies, and professional affiliations tend to lead peo-

GREEN RECOVERY IN GREENSBURG, KANSAS

Kirstin Kuenzi

Although situated in a region often referred to as "Tornado Alley," Greensburg, Kansas, had never sufficiently planned for its hazards. The Disaster Mitigation Act of 2000 set forth national guidelines requiring an approved Local Hazard Mitigation Plan in order for a jurisdiction to be eligible for federal mitigation grants. But Greensburg GreenTown founder Daniel Wallach said that the city did not have a comprehensive plan in place, let alone a working mitigation or recovery initiative.

On May 4, 2007, at 9:45 p.m., an EF-5 tornado ripped through the heart of the city; although the majority of residents were able to seek safety in time, 11 were killed and more than 60 injured. Ninety percent of Greensburg's building stock was destroyed and close to half of its residents evacuated, never to return. This still left the town with a golden opportunity—though the population of the rural community had dropped from 1,500 to less than 800 within the past ten years, Greensburg is flourishing more than it ever has before.

Less than a week after the storm, residents began the recovery process by forming the organization Greensburg GreenTown. Kathleen Sebelius, former governor of Kansas, also called upon BNIM Architects, a consulting firm in Kansas City, Missouri. Encouraging in-depth collaboration, BNIM worked alongside residents, Emergency Support Function #14 team of the Federal Emergency Management Agency (FEMA), and Greensburg GreenTown on brainstorming a new vision for the city. Since the entire community had been damaged, residents discussed the idea of a green rebuild, the basis of this plan being rooted in the belief that a better "new normal" was achievable. FEMA, BNIM, and GreenTown (present at each town meeting) described their main goal as making sustainability the corner piece of the rebuilding process, giving the town a distinct new identity and showcasing it as a green revival of America's heartland.

Greensburg still conjures up important memories for BNIM principal Bob Berkebile and former associate Stephen Hardy. Although BNIM had been working on comprehensive plans for nearly 40 years, the process involved in Greensburg's plan altered the firm's viewpoints on the future of community integration. Greensburg still stands as the first example in which Berkebile and Hardy saw an entire community involved in comprehensive planning, including many women, children, and elderly residents.

With FEMA and BNIM's assistance, residents were committed to the idea of placemaking and wanted to see a rededication for the future generations of Greensburg. As Mayor Bob Dixson (2012) said, "You are either growing or dying, and we needed the attitude that this has to be a better place for us to live and work." In August 2007, after four large-scale community meetings and 43 resident interviews, FEMA released a long-term community recovery (LTCR) plan for Kiowa County and Greensburg. Projects that were considered most vital to the reconstruction of this community included rebuilding city and county buildings, developing affordable housing opportunities, creating a business incubator, and building a Kiowa County Museum and Tourism Center.

BNIM studied the recovery issues laid out in FEMA's LTCR plan and released in early 2008 a separate master plan for the city, titled the *Greensburg Sustainable Comprehensive Plan*. This plan discussed new additional growth concepts including LEED-Platinum certified buildings and a local wind farm, as well as multiple side projects such as eco-lodging and new home construction. A partnership with renowned brands, including SunChips and Ben & Jerry's, greatly benefitted the municipality's projects growth, and Greensburg now draws 100 percent of its energy from renewable sources. The town continues to work with the National Renewable Energy Laboratory, a division of the U.S. Department of Energy, on its energy credits while also looking to secure funding resources for the final aspects of BNIM's plan. With the aid of federal, state, and private grants in addition to corporate donations, a large percentage of the plan has been completed. Most recently in Greensburg, the Big Well Museum and Gift Shop, dedicated to the world's largest hand-dug well, located here, had its grand opening in May 2012.

One cannot commend the success of Greensburg without acknowledging the city's difficulties. Stress weighed heavily on both residents and the mayor in office at the time, who resigned and handed his duties off to the subsequent mayor, John Janssen. Financing recovery was increasingly complex, community-building exercises saw arguments between residents, and the timeline for redevelopment at times looked bleak.

But the city was rewarded for its perseverance. Greensburg, now seen by many as the paragon of green sustainability, is thriving as planned. Other communities, such as Joplin, Missouri (p. 169), also discussed in this chapter, have consulted with Greensburg after the devastating tornadoes that occurred in the spring of 2011. Dixson states that he

felt it was his duty to bring back a strong community to endure lifetimes, and now his town is more than willing to pay it forward.

For more information, visit "Greensburg GreenTown" at www.greensburggreentown.org/.

Long-Term Community Recovery Plan for Kiowa County and Greensburg
Available at www.greensburgks.org/residents/recovery-planning/long-term-community-recovery-plan.

Greensburg Sustainable Comprehensive Master Plan
Available at www.greensburgks.org/residents/recovery-planning/sustainable-comprehensive-master-plan/view.

Watch Greensburg's recovery process, "Greensburg, Kansas: Thriving in the Wake of Disaster," on the Mother Nature Network at http://planetgreen.discovery.com/tv/greensburg/.

ple to emphasize one skill set over another. The point of this review, however, is to show that, because of its sheer complexity, all are relevant to some aspect of post-disaster recovery. If we adopt a conscious recognition of that fact in approaching the overall problem, the ability to gain a holistic grasp of the challenges that lie ahead is likely to increase significantly.

SUSTAINABILITY: THE FUTURE OF PLANNING FOR RESILIENCE

Resilience, by its very nature with its emphasis on being able to rebound from a setback or disaster, involves a relatively short-term capability based on more long-term traits that enable that capability. Put another way, it is a capacity deliberately cultivated that cannot simply be developed when the need arises, but which must precede the event that triggers a demonstration of that civic or communal quality.

Sustainability, on the other hand, is a quality that deliberately seeks to preserve opportunities for generations well removed from the present by reducing or eliminating current reliance on technologies or activities that consciously (or otherwise) deplete resources for current use and thus deprive future generations of the ability to use those same resources. The burning of fossil fuel is an obvious example but hardly the only one. The diametrical opposite is the Greensburg, Kansas, vision since the May 4, 2007, tornado of becoming totally reliant on renewable fuel sources.

Over time, sustainability has been robbed of some of its conceptual vitality by its appeal as a branding device for corporations, many of which now have sustainability officers, and for many other organizations that wish to present a positive environmental appearance. In the process, an increasing vagueness has crept into many of the popular discussions concerning just what sustainability actually is. At the same time, sustainable development advocates, like those for smart growth and new urbanism, often have had a tendency not to think too hard about issues like natural hazards, perhaps because they represent a disruptive force that can upset many assumptions. Yet it is hard to think of anything less green and more wasteful, or less sustainable, than the kinds of destruction wrought upon the built environment by events like Hurricane Katrina or Superstorm Sandy. Thus, the concept of "safe growth" emerged, and APA later offered the concept of a safe growth audit as a means to put it into productive use (Godschalk 2009; Schwab 2010).

When it first emerged as a concept, sustainable development relied on a definition provided by a United Nations

commission chaired by former Norwegian Prime Minister Gro Harlem Bruntland. The "Bruntland Commission" report defined sustainable development as meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations 1987). That is a tall order and a bit ambiguous in its meaning, but it has at least some elements of measurability. Depending on how needs are defined, the ability to meet them in a given environment can conceivably be measured, if not without some difficulty. Complex concepts, however, often pose operational challenges.

Despite the general devaluation of the concept in common parlance, the United Nations commission definition of sustainability retains its basic validity. It is a concept rooted in the simple notion that there is a long-term future beyond the lives of all of people for which they remain responsible not to foreclose options and opportunities available today. Now, however, the concept of resilience is gaining traction, and it too has the kind of broad parameters that contain the potential for the sort of abuse that sustainable development has suffered at the hands of politics and commerce. A significant part of this report has been devoted to operationalizing the most useful definitions of resilience, which for the most part revolve around the idea of being able to rebound effectively from setbacks, among which are counted various kinds of natural and human-caused disasters. Yet already there is conceptual confusion about the differences between sustainability and resilience, and even a willingness in some circles to use the two terms interchangeably. They are not the same. Particularly when these two terms are used within the planning community, or for planning purposes, it is important that they be distinguished carefully, and their relationship to each other made clear.

Simply put, it is suggested here that planners and their communities should strive for *both* resilience and sustainability. They should also understand that in truly thinking about the welfare of future generations, whose abilities to meet their own needs should not be impaired, they should go about the business of developing the culture of sustainability that contains within it the seeds of a culture of preparedness, to ensure that potential current disasters do not foreclose those future opportunities. Infrastructure built to withstand foreseeable disasters within the current generation or even the next will consume fewer resources, and borrow less environmental capacity from future generations, by not needing to be rebuilt (or at least by being rebuilt less extensively) every time a disaster occurs. Moreover, long-term sustainability that builds serious resilience in the face of increasing natural hazard threats as a result of climate change may actually increase sustainability for future generations. Civic and institutional capacity to understand and confront these issues may perhaps be the most significant heritage to bequeath to those who come later.

ENVIRONMENTAL CHANGE

The studies documenting climate change have accumulated rapidly in recent decades. Planners seeking the details of the accumulated evidence of human impacts on climate have numerous sources to which they can turn, including the National Climate Assessment reports and those of the United Nations Intergovernmental Panel on Climate Change. A brief summary of those findings here may provide planners with a sobering view of the future many of their communities face with regard to expected impacts. For the most part, those impacts exacerbate existing hazards rather than create new ones. Within the United States, the most recent National Climate Assessment (Melillo, Richmond, and Yohe 2014) projects the following overall trends, among others:

- Significant increases in heavy precipitation events in the Northeast, Midwest, and Great Plains states, with degrees of magnitude in that order
- Sea-level rise (ranging from one to four feet in the coming century) that puts at risk extensive areas of low-lying coastal real estate and infrastructure, particularly in the East and Gulf Coast
- Decreased water availability in areas such as California and the Southeast, as well as Hawaii and the Pacific islands
- Potential for increases in prolonged droughts in areas like the Midwest and Great Plains, as well as the possibility of drought and high heat fostering increased and more intense wildfires

Both the spatial and the temporal scales of climate change are well beyond the short-term climatic conditions that most people perceive on a daily basis. If communities are to remain resilient and sustainable into an extended future, surely climate change must become a consideration with regard to both hazard mitigation planning and pre-disaster and post-disaster recovery planning. In some communities, marshaling public awareness of the issue is clearly easier than in others. The issue has become polarized, and that very polarization itself has become an obstacle to public discussions

of the potential local and global impacts of climate change. One primary reason is that the scale of such change is far beyond the immediate perceptual capabilities of individuals.

The growing focus on climate adaptation may create some opportunities to alleviate these polarities, to the degree that it offers "no regrets" solutions that may also provide economic opportunities in the bargain, particularly in more disadvantaged communities where the impacts of climate change could, in certain instances, be greatest. For instance, improving energy efficiency in housing, expanding the urban forest to reduce urban heat island impacts through increased tree canopy, and applying water-conserving building technologies may all both create jobs and increase the long-term resilience and sustainability of the communities that adopt such approaches, whether or not climate change impacts are used as the primary rationale for these strategies. Nonetheless, there are also times when it is possible to expand public awareness of climate change as a result of extreme events that bring renewed attention to the subject, such as Superstorm Sandy, which combined elements that at least created openings for public discussion of the long-term causative dynamics behind such events and their immediate impacts. In this sense, it is worth noting that the existing planning work in New York on the potential impacts of sea-level rise laid noteworthy groundwork for discussion of the issue after Sandy validated those concerns in the minds of many citizens (see New York City Panel on Climate Change 2013).

Howe and Leiserowitz (2013) posit two hypotheses in their study of perceptions of climate change: first, that "the spatial distribution of perceptions of local climate conditions—the conditions to which individuals are exposed in the immediate area of their household—will broadly coincide with patterns of recorded temperature and precipitation anomalies" (4). In other words, people's perceptions of climate will vary with the climate that affects them. The second, based on the concept of motivated reasoning, posited that "respondents with different sets of beliefs about global warming will exhibit different perceptions of local climate conditions, even after controlling for the conditions experienced by each respondent" (3). Their study involved a nationwide online survey, underwritten by the National Science Foundation, involving a randomly selected panel but matching actual localized weather records against their stated perceptions of recent weather.

Before discussing their results, it may be useful to note the spectrum of opinion they identify within the U.S. public on global warming because it has direct relevance to efforts to develop public consensus for action on climate-related issues. Understanding this spectrum may allow for more finely grained efforts at communication on such issues and better understanding both of the message itself and the potential impact on its recipients. This spectrum informs the differentiation they examine in the results of the survey. It consists of six distinct reactions to climate change:

- **Alarmed:** Firmly believe climate change is a threat and support mitigation of that threat.
- **Concerned:** Also believe climate change is happening but not personally engaged.
- **Cautious:** Uncertain whether it is occurring.
- **Disengaged:** Know little or nothing about the subject.
- **Doubtful:** Skeptical about whether global change is real or, if it is, whether it poses a threat.
- **Dismissive:** Do not believe it is happening, do not see a threat, do not support mitigation.

The survey results "suggest that motivated reasoning may bias individual recollections of seasonal climate, but the effect is asymmetric and more pronounced among those who most strongly believe that global warming is not happening" (11). They also note that motivated reasoning seems to have less of an effect on more recent memories, which are easier to recall more precisely.

The point of discussing this study is that it notes the challenges involved in climate change communication. It may be too much to expect any major changes in perception by the "dismissive" contingent, but there may well be considerable room for influence among those with less well-formed opinions, although success in this regard at the local level may require that planners and others involved in message development also be clear about their own perceptions and how those influence communication. In short, influencing public perceptions of long-term trends in climate variability is tricky business that requires some understanding of how all individuals experience and perceive climate change. Nonetheless, when the long-term horizons for the impact of most hazard mitigation projects are considered, it is imperative that communities find ways to motivate public support based on reasonably accurate understandings of probable impacts.

APA has developed a resource for planners on this issue in its *Policy Guide on Planning & Climate Change* (American Planning Association 2011). It makes clear why planning should address both the anthropogenic causes of climate change by mitigating greenhouse gases, and the symptoms, such as drought and sea-level rise, through adaptation measures, which include many elements of hazard mitigation. Most importantly, it stresses that many of the measures,

which can form the backbone of the communication effort as well, involve a "no regrets" approach because of the ancillary benefits of much climate change work, such as increased energy efficiency or enhanced public safety.

COMMUNITY VITALITY

The case study of Greensburg, Kansas, makes clear that, despite significant challenges and obstacles, a small town of fewer than 1,000 people in western Kansas has succeeded in transforming itself into an icon of green post-disaster redevelopment. The high level of public support behind this achievement relates well to the point about the benefits of the "no regrets" approach that APA advocates in its policy guide. The shift to a renewable energy economy in Greensburg has given the community a dynamic new image that is attracting visitors from around the world, drastically reducing the town's reliance on fossil fuels, creating new businesses and jobs, and allowing the community to "pay it forward" by providing a model for others. In June 2011, nearly two dozen citizens, mayors, and other public officials from the various communities that had suffered devastation from tornadoes that spring, such as Joplin, Missouri, came to Greensburg for a day to learn about the town's approach. Greensburg had caught on.

Yet it was not the first, and surely will not be the last, community to attempt this sort of "greening." The idea of rebuilding sustainably dates as far back as 1979, when Soldiers Grove, Wisconsin, relocated its business district uphill and out of the floodplain of the Kickapoo River, while also installing energy-efficient and solar building designs. That idea resurfaced after the 1993 Midwest floods in towns such as Valmeyer, Illinois, which also relocated uphill and used solar design extensively at its new site. The idea is gaining attention and traction. The question now for planners is how to mainstream such ideas in order to create more sustainable communities through deliberate planning. While communities need not wait for disasters to take such initiatives, the idea gains a certain added emotional appeal when people can bring something so positive out of an otherwise tragic event.

One interesting feature of such redevelopment is that it does not depend on opinions about climate change for its appeal. For Greensburg, the idea simply makes sense on its face because of the inherent economic and environmental advantages already noted. However, it should be noted that there are relatively few hazard mitigation features of Greensburg's approach. Another EF-5 tornado, if the town were unlucky enough to suffer a second such hit, would probably destroy or damage most of the buildings and windmills yet again. The remote odds of such a second occurrence are greatly outweighed by the positive benefits of the strategy; after all, even if Greensburg had rebuilt more traditionally, it would face the same problem.

The relocated river towns demonstrate a strategy that combines aggressive hazard mitigation with green energy development that, coincidentally, now also serves in some small way to mitigate global warming. This double-barreled opportunity is actually the more likely scenario in most instances of post-disaster redevelopment. But even this is not the full complement of opportunities that now face planners, as the Hurricane Sandy Rebuilding Task Force made clear. The task force report encouraged the use and development of green infrastructure as both a mitigation and investment strategy for the Northeast: "Federal partners should collaborate to enhance their ability to adequately capture the entire value of green infrastructure and environmental factors when selecting infrastructure investments, including the compounding value of linked or proximate projects" (Hurricane Sandy Rebuilding Task Force 2013, 52). In light of such emerging priorities in post-disaster federal assistance, it would seem wise for community planners to begin to identify the opportunities for such investments that can be exploited to the community's long-term benefit as part of both mitigation and pre-disaster recovery planning.

Many of those opportunities should already be apparent. For instance, this report's predecessor (Schwab et al. 1998) contained a case study of Arnold, Missouri, that documented how a floodplain management plan (Arnold 1991) developed by a citizen task force for gradually buying out properties in the Meramec and Mississippi River floodplains for greenbelts allowed that city to marshal Hazard Mitigation Grant Program funds after the 1993 floods to accelerate implementation of that plan by about 20 years. The plan, in effect, became a post-disaster recovery plan that had not specifically contemplated a disaster, although it certainly was developed with awareness of a chronic problem with flooding.

Urban forestry is another example of an opportunity to combine documented beneficial impacts of green infrastructure, such as reduced stormwater runoff and better soil retention, with economic, social, and other benefits (Schwab 2009). Urban reforestation after a disaster is simply one manifestation of such planning, but clearly one that became important in Joplin, Missouri (see "Post-Disaster Reforestation in Joplin, Missouri"), with noteworthy assistance from the state's natural resources department.

POST-DISASTER REFORESTATION IN JOPLIN, MISSOURI

Kirstin Kuenzi

Although Joplin, Missouri, experienced its deadliest tornado within 50 years on the evening of May 22, 2011, unique approaches to recovery have strengthened the tightly knit community of 50,000. Along with partnerships for downtown redevelopment and a substantial Federal Emergency Management Agency (FEMA)-assisted plan for long-term recovery, Joplin residents have begun a comprehensive urban forestry initiative led by the Missouri Department of Conservation. Along with planting 161 trees in memoriam to those killed by the storm, nonprofit organizations and city employees have worked alongside government entities to restore many of Joplin's public and private properties. These properties include a new growth of trees, flowers, and shrubbery, which were all donated and are now maintained by volunteers.

One of the largest groups involved in the re-greening of Joplin is the Citizen's Advisory Recovery Team (CART). Days after the tornado, residents established CART as Joplin's collective voice. They created task forces during the first post-tornado meeting, focusing their mission on the quick restoration of facilities and services. FEMA's Emergency Support Function #14 team worked alongside CART to expedite the construction of new infrastructure; in the first month alone housing units, two fire stations, and nine facilities (including a mobile hospital) were constructed. The city's civic structures including parks and school facilities were also rebuilt, opening in August 2011 to give residents their first signs of normalcy.

FEMA's long-term community recovery plan for Joplin went to community leaders for review on January 19, 2012, and the city council quickly adopted it. In late 2011, the city had released a request for proposals concerned with the downtown district's redevelopment. After two months, the city had received six proposals. In March 2012, city officials completed a contract agreement with Wallace Bajjali Development Partners of Sugar Land, Texas. By contacting and visiting Joplin less than a week after the tornado, partner David Wallace maintained interest in upholding a theme of community resilience, working to create a plan that would make the city safe, fun, and economically sustainable. Believing in an overall higher quality of life for city residents, he is especially dedicated to boosting economic vitality by supporting Joplin's extracurricular and family-friendly activities, such as libraries and hiking/biking trails.

The city's reforestation projects constituted another unique approach to Joplin's reconstruction. Nick Kuhn, the head of community forestry and communications for the Missouri Department of Conservation, noticed Joplin's steadfast drive to replant trees and other shrubbery after the tornado. Although resident intentions were good, thousands of people reached out to re-green the city. It was obvious the city needed staff who could coordinate both donations and volunteers.

In February 2012, Kuhn hired certified arborist Ric Mayer, long-time resident of Springfield, Missouri, for the position of community forestry recovery coordinator. In his first months of duty, Mayer helped put all of the city's small-scale projects in motion and worked to repair three leveled public parks. Mayer also has kept track of every new tree that has been planted (close to a thousand) and has coordinated a schedule for each tree's watering hours. The dedication to beautifying Joplin again is comforting for residents there who have noticed an aesthetic change in the city.

Individuals from AmeriCorps, the TKF Foundation at Cornell University, nonprofit MoreLeaf, and various others give over 340 hours of community service each week to reforestation initiatives. Other partners involved in Joplin's relief include Greensburg, Kansas, locals from Greensburg GreenTown, who worked with CART to create Joplin GreenTown. Desiring to rebuild in a more sustainable manner, Joplin GreenTown has utilized tree planting and visualized new mixed use development with LEED-certified buildings. In total, 130,000 registered volunteers from around the world have given 810,000 hours of community service to Joplin—which equal 82 years and $17 million of service. Residents of Joplin including Andy Martin, vice chairman of CART, are deeply thankful for this support. Martin says he is no longer worried about the town's future, but believes that that the city has an unmatched and special resiliency.

For more information, visit the Joplin Citizens Advisory Recovery Team at http://joplinareacart.com/.

Joplin Moving Forward: 2012 Comprehensive Plan
Available at http://joplinmo.org/index.aspx?NID=495.

After the Storm: Missouri's Commitment to Joplin
Available at http://sema.dps.mo.gov/newspubs/publications/AfterTheStormMissouriCommitmentToJoplin.pdf.

BRINGING IT ALL TOGETHER

In the end, the opportunity to combine aspects of community economic revitalization with environmental restoration and serious considerations of social equity, particularly in the context of adapting communities for a future of greater climate resilience and adaptation, draws upon some of the most powerful, creative, and visionary skill sets that planners can offer to a community. It is incumbent upon the planning profession to rise to this opportunity while realizing that disasters, with all the human, economic, and environmental loss they represent, are sobering reminders of all that society may not have gotten quite right, or right at all, in the way it has chosen to build in the past. When communities push the "reset" button after a disaster, they need to do so thoughtfully but creatively, with an eye on the high price already paid for placing too much of the built environment in harm's way. It is not enough—not nearly enough—merely to repeat the mistakes of the past.

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APPENDIX A: MODEL PRE-EVENT RECOVERY ORDINANCE

One action a community can take to move toward better management of disaster mitigation, preparedness, response, and recovery is the adoption of an ordinance before or after a damaging event to serve as either a forerunner or supplement to a full-blown recovery plan. The Model Recovery Ordinance below outlines a foundation on which a community can organize to efficiently manage short- and long-term recovery, preferably in advance of a declared disaster, as well as after.

Purposes. The Model Recovery Ordinance focuses on actions found necessary to facilitate recovery, provides a structured format for capturing essential recovery requirements, and offers prototypical language adaptable to unique local circumstances. The concept reflects some essential elements. Among other things, the recovery ordinance should do the following:

1. Be adopted by local governing body action, if possible, before a disaster happens, as well as periodically updated and amended, as needed.
2. Authorize establishment and maintenance of a local recovery management organization, coordinated closely with the local emergency management organization.
3. Direct the preparation of a pre-event short- and long-term recovery plan in concert with the local emergency management organization and community stakeholder organizations.
4. Establish emergency powers by which the local government staff can take extraordinary action to protect public health, safety, and welfare during post-disaster recovery.
5. Identify methods for local government to take cooperative action with other entities to assure full access to all external financing resources as well as to facilitate recovery.
6. Specify the means for consulting with and assisting citizens, businesses, and community stakeholder organizations during recovery planning and implementation.

Form of Government. For ease of use, the Model Recovery Ordinance is written to reflect a council-manager form of government used by many cities and counties. In this form, executive as well as policy-making authority resides with an elected governing body, such as a city council or county board of supervisors, and administrative powers are delegated to staff through a city manager or county administrative officer. Also in use is the mayor-council form of local government, characterized by a separately elected executive, such as a mayor or county executive. In this form, policy-making authority is shared by the elected executive and other governing body members in highly differentiated ways, depending upon location, with administrative powers delegated to staff through the executive. Although reflecting the mayor-council form, the Model Recovery Ordinance can be tailored to the mayor-council form through appropriate substitution of terms.

Recovery Management Emphasis. The Model Recovery Ordinance emphasizes a recovery management process operated in conjunction with administrative powers of local government under the policy-making and/or executive powers of the governing body. It acknowledges the distinction between the vast bulk of more routine administrative actions reflected in short-term recovery provisions and the policy process more common to long-term recovery, directed through formal action by the governing body, and often marked by public hearings and controversy.

MODEL RECOVERY ORDINANCE LANGUAGE

An ordinance establishing a recovery organization, authorizing preparation of a recovery plan, and granting emergency powers for staff actions which can ensure timely and expeditious post-disaster recovery for the City (or equivalent), and amending Section(s) __ of the Municipal Code (or equivalent).

CHAPTER __. DISASTER RECOVERY

[Insert here: listing of all section and subsection titles]

WHEREAS, the City is vulnerable to various natural hazards such as earthquakes, flooding, landslides, wildfires, and severe storms causing substantial loss of life and property resulting in declared local, state, or federal level disasters;

WHEREAS, the city is authorized under state law to declare a state of local emergency and take actions necessary to ensure the public safety and well-being of its residents, visitors, business community, and property during and after such disasters;

WHEREAS, it is essential to the well-being of the City after disasters to expedite recovery, mitigate hazardous conditions threatening public safety, and improve the community;

WHEREAS, disaster recovery can be facilitated by establishment of an ongoing Recovery Management Organization within the city government to plan, coordinate, and expedite recovery activities;

WHEREAS, preparation of a pre-event Recovery Plan can help the city organize to expedite recovery in advance of a declared disaster and to mitigate hazardous conditions before and after such a disaster;

WHEREAS, post-disaster recovery can be facilitated by adoption of a pre-event ordinance authorizing certain extraordinary staff actions to be taken to expedite implementation of recovery;

WHEREAS, it is mutually beneficial to identify in advance of a declared disaster the necessity to establish and maintain cooperative relationships with other local, regional, state, and federal governmental agencies in order to facilitate post-disaster recovery;

WHEREAS, it is informative, productive, and necessary to consult with representatives of business, industry, citizens, and community stakeholder organizations regarding the most suitable and helpful means to facilitate post-disaster recovery;

The City Council [or equivalent] does hereby ordain:

Section

1. **Authority.** This ordinance is adopted by the City Council [or equivalent] acting under authority of the [authorizing legislation], [State Emergency Management Act or equivalent], and all applicable federal laws and regulations.
2. **Purposes.** It is the intent of the City Council [or equivalent] under this chapter to:
   a. Authorize, in advance of a disaster, the establishment and maintenance of an ongoing Recovery Management Organization within the City [or equivalent] to plan, prepare for, direct, and coordinate orderly and expeditious post-disaster recovery;
   b. Direct, in advance of a declared disaster, the preparation of a pre-event Recovery Plan for short-term and long-term post-disaster recovery, to be adopted by the City Council [or equivalent] and amended periodically, as necessary;
   c. Establish, in advance of a disaster, powers to be implemented upon declaration of a local emergency by which staff of building, planning, public works, and other departments can take extraordinary action to reasonably assure safe and healthy post-disaster recovery;
   d. Identify methods by which the City [or equivalent] may take cooperative action with other governmental entities to facilitate recovery;
   e. Specify means by which the City [or equivalent] may consult with and assist citizens, businesses and community organizations during the planning and implementation of recovery procedures.
3. **Definitions.** As used in this ordinance, the following definitions shall apply:

   3.1 **Development Moratorium** shall mean a temporary hold, for a defined period of time, on the issuance of building permits, approval of land-use applications or other permits and entitlements related to the use, development, and occupancy of private property in the interests of protection of life and property.

   3.2 **Director** shall mean the Director of the Recovery Management Organization or an authorized representative.

   3.3 **Disaster** shall mean a locally declared emergency also proclaimed as a state of emergency by the Governor of the State and declared a disaster by the President of the United States.

   3.4 **Emergency** shall mean a local emergency, as defined by the Municipal Code, which has been declared by the City Council for a specific disaster and has not been terminated.

   3.5 **Flood Insurance Rate Map (FIRM)** shall mean an official map of a community on which the Fed-

eral Insurance Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a Digital Flood Insurance Rate Map (DFIRM).

3.6 **Hazard Mitigation Grant Program**. A program for assistance to federal, state, and local agencies whereby a grant is provided by FEMA as an incentive for implementing mutually desired mitigation programs, as authorized by the Stafford Act and related federal regulations, plans, and policies.

3.7 **Historic Building or Structure** shall mean any building or structure included on the national, state, or municipal register of historic places, and structures having historic significance within a recognized historic district.

3.8 **Individual Assistance Program**. A program for providing small grants to individuals and households affected by a disaster to offset loss of equipment, damage to homes, or the cost of relocation to another home, as authorized under the Stafford Act and related federal regulations.

3.9 **In-Kind** shall mean the same as the prior building or structure in size, height and shape, type of construction, number of units, general location, and appearance.

3.10 **Interim Recovery Strategy** shall mean a post-disaster strategic program identifying major recovery initiatives and critical action priorities either in the Recovery Plan or necessitated by specific post-disaster conditions.

3.11 **Local Hazard Mitigation Plan.** A plan prepared for governing board adoption and FEMA approval, which, among other things, assesses the type, location, and extent of natural hazards affecting the City; describes vulnerability of people, structures, and infrastructure facilities to such hazards and estimates potential losses, and includes a mitigation strategy that provides the City's blueprint for reducing potential losses identified.

3.12 **Multi-Agency Hazard Mitigation Team.** A team of representatives from FEMA, other federal agencies, state emergency management agencies, and related state and local agencies, formed to identify, evaluate, and report on post-disaster mitigation needs.

3.13 **Natural Hazards/ Safety Element [or equivalent]** shall mean an element of the comprehensive plan that addresses protection of the community from unreasonable risks associated with earthquakes, landslides, flooding, wildland fires, wind, coastal erosion, and other natural, technological, and human-caused hazards.

3.14 **Public Assistance Program**. A program for providing reimbursement to federal, state, and local agencies and non-profit organizations for repair and replacement of facilities lost or damaged in a disaster, as authorized under the Stafford Act and related federal regulations, plans, and policies.

3.15 **Redevelopment** shall mean the rebuilding or replacement of permanent residential, commercial, or industrial facilities damaged or destroyed in a major disaster, as well as construction of large-scale public or private infrastructure, addition of community improvements, and/or restoration of a healthy economy.

3.16 **Recovery** shall mean the restoration of housing, transportation, public services, and/or economic activity to levels equal to or better than their pre-disaster states through a series of short-term, intermediate, and long-term strategies and actions.

3.17 **Recovery Management Organization** shall mean an interdepartmental organization that coordinates city staff actions in planning and implementing disaster recovery and reconstruction functions.

3.18 **Recovery Plan** shall mean a pre- or post-disaster plan for recovery, comprising policies, plans, implementation actions, and designated responsibilities related to expeditious and orderly post-disaster recovery and redevelopment, as well as long-term mitigation.

3.19 **"Stafford Act"** shall mean the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288, as amended).

Commentary: *The preceding definitions are based on terms frequently used in this Model Recovery Ordinance. As other language is added or substituted within specific sections of a local ordinance customized along the lines of this model ordinance, other definitions will need to be added. For example, the term "disaster" is defined to reflect the Stafford Act interpretation in which a local emergency leads to a state-proclaimed emergency and a federally declared disaster. However, in a customized local ordinance, the term might be applied to any level, including local or state-proclaimed emergency. In such cases, the application of the term in a local or-*

dinance would need to be modified, as necessary, to reflect the differing meaning. Additionally, definitions are for the most part written in general terms to allow flexibility of local adaptation and interpretation. More specific definitions, however, can be found in a variety of existing sources. To avoid confusion, in this Model Recovery Ordinance the definition of Flood Insurance Rate Map reflects the specific definition found in 44 CFR 59.1. However, under Model Recovery Ordinance Section 3.7 the term Historic Building or Structure is defined in general language, although a more specific definition can be found in the previously mentioned federal code reference.

4. Recovery Management Organization. There is hereby created the Recovery Management Organization [or equivalent] for the purpose of planning, organizing, coordinating, and implementing pre-event and post-disaster disaster recovery actions.

Commentary: *This ordinance is written with a council-manager form of city government in mind for a small to medium-sized community. The overall concept here is for the City Manager to run the recovery management organization on behalf of the City Council, reserving the presence of a Mayor for critical junctures following a disaster or for times when policy matters come up needing City Council involvement. In actuality, the City Manager inevitably becomes the pivotal party for informing and advising the City Council on recovery matters, interpreting Council policy and coordinating staff functions. In a big-city environment, presence and availability of the Mayor or a Deputy Mayor may be important from a leadership standpoint, even though recovery in many instances is largely a staff-driven process with the City Manager as the primary coordinator. Either way, the intent of the following language is to assure an ongoing communications connection between staff and the City Council.*

4.1 Powers and Duties. The Recovery Management Organization shall have such powers as needed to carry out the purposes, provisions, and procedures of this chapter.

4.2 Officers and Members. The Recovery Management Organization shall be comprised of the following officers and members:

a. The City Manager [or equivalent)] who shall be Director;
b. The Assistant City Manager [or equivalent] who shall be Deputy Director in the absence of the City Manager;
c. The City Attorney [or equivalent] who shall be Legal Adviser;
d. Other members include [list titles or functions, such as chief building official, city engineer, director of community development or planning, fire chief, emergency management or disaster preparedness coordinator, general services director, historic preservation director, police chief, director of public works, director of utilities, floodplain manager, hazard mitigation specialist], and representatives from such other departments as deemed necessary by the Director for effective operations;

Commentary: *The formal structure of a recovery organization will vary from community to community. Department manager and officer titles used locally vary widely. The important thing is inclusion of the widest array of functions having a direct or indirect role in recovery.*

4.3 Relation to Emergency Management Organization. The Recovery Management Organization shall include all members of the Emergency Management Organization [or equivalent] as follows: [list titles, such as emergency management coordinator, fire chief, police chief, etc.]

Commentary: *A Recovery Management Organization should encompass all members of the Emergency Management Organization because of inherent interrelationships between hazard mitigation, emergency preparedness, response, and recovery functions. A close formal relationship should be maintained before, during, and after the state of emergency. When the emergency formally ends, recovery management should continue under the umbrella of the Recovery Management Organization to coordinate short-term recovery operations. At this juncture, the Recovery Management Organization should continue as an important source of coordination of staff inputs on complex long-term recovery planning and redevelopment issues, community workshops that may involve controversy, and City Council hearings to determine preferred policy outcomes.*

4.4 Operations and Meetings. The Director shall be responsible for overseeing Recovery Management Organization operations and for calling meetings, as needed. After a declaration of an emergency, and for the duration of the emergency period, the Recovery Management Organization shall meet daily, or as frequently as determined by the Director.

4.5 Succession. In the absence of the Director, the Deputy Director shall serve as Acting Director and shall be empowered to carry out the duties and responsibilities of the Director. The Director shall name a succession of department managers to carry on the duties of the Director and Deputy Director, and to serve as Acting Director in the event of the unavailability of the Director and Deputy Director.

4.6 Organization. The Recovery Management Organization may create such standing or ad hoc committees as determined necessary by the Director.

5. Recovery Plan. The Recovery Management Organization shall prepare a Recovery Plan addressing pre-event and post-disaster recovery policies, strategies, and actions; if possible, the Recovery Plan shall be adopted by the City Council [or equivalent] before a disaster, and amended after a disaster, as needed.

5.1 Plan Content. The Pre-Disaster Recovery Plan shall be composed of pre- and post-event policies, strategies, and actions needed to facilitate post-disaster recovery. The Recovery Plan will designate lead and back-up departmental action responsibilities to facilitate expeditious post-disaster recovery as well as hazard mitigation actions. The Recovery Plan shall address short-term and long-term recovery subjects, including but not limited to: business resumption, damage assessment, demolitions, debris removal, expedited repair permitting, hazards evaluation and mitigation, historical buildings, moratorium procedures, nonconforming buildings and uses, rebuilding plans, restoration of infrastructure, temporary and replacement housing, and such other subjects as may be appropriate to expeditious and wise recovery. To the extent possible, the Pre-Disaster Recovery Plan should reflect a holistic approach (where everyone in the Recovery Management Organization team is working toward common objectives, and roles are defined within a general consensus regarding those roles); include language about constructing a mutually agreed-upon vision of community resilience; and also include language regarding local perspectives on sustainability and climate adaptation.

5.2 Coordination with Other Organizations. The Recovery Plan shall identify relationships of planned recovery actions with those of local, regional, state, federal, mutual aid, and nonprofit organizations involved with disaster recovery, including but not limited to: the Federal Emergency Management Agency (FEMA), the American Red Cross, the Department of Housing and Urban Development (HUD), the Small Business Administration (SBA), the Environmental Protection Agency (EPA), the Department of Transportation (DOT), the State Emergency Management Agency [or equivalent] and other organizations that may provide disaster assistance. Prior to adoption or amendment of the Recovery Plan by the City Council [or equivalent], such organizations shall be notified of its proposed content, and comments shall be solicited in a timely manner.

Commentary: *In contrast to most local emergency management organizations, FEMA has substantial recovery and reconstruction responsibilities. To provide direction for handling of emergency response, relief, and recovery in relation to major disasters, Congress enacted in 1988 the Robert T. Stafford Disaster Relief and Emergency Assistance Act (a.k.a. the Stafford Act), Public Law 93-288, as amended. For most communities, this is an important source of external funding to compensate for certain disaster losses. Since FEMA is an important source of post-disaster infrastructure and other funding, it is important to solicit advice from that agency before the disaster on the Recovery Plan.*

5.3 Consultation with Citizens. During the initial and intermediate stages of Recovery Plan formulation as well as prior to its adoption or amendment by the City Council [or equivalent], the Recovery Management Organization shall conduct outreach to community stakeholder groups, organize and distribute public announcements, schedule and conduct community workshops and meetings, and/or convene advisory committees composed of representatives of homeowner, busi-

ness, and community organizations, or implement other means to provide information and consult with members of the public regarding preparation, adoption, or amendment of the Recovery Plan. Public comments shall be solicited in a timely manner during Recovery Plan formulation, adoption, and amendment processes.

Commentary: *Direct outreach to the community should be established in advance of a major disaster with the assistance of neighborhood safety or similar programs, such as local Community Emergency Response Team (CERT) organizations. Such outreach should ideally be conducted in conjunction with preparation of the Recovery Plan. Following a major disaster, proactive outreach is critical to establishing a two-way flow of information, without which controversy inherent in post-disaster settings can become severe. A critically important mechanism in establishing a successful post-disaster relationship between local government, victims, and other community stakeholders has been conduct of weekly meetings between city staff and disaster victims in disaster- impacted areas. As an example of such outreach, regular meetings were sponsored by the City of Oakland following the 1991 Oakland Hills Firestorm with beneficial results.*

5.4 Adoption. Following preparation, update, or revision, the Recovery Plan shall be transmitted to the City Council [or equivalent] for review and approval. The City Council shall hold at least one legally noticed public hearing to receive comments from the public on the Recovery Plan. Following public hearing(s), the City Council may adopt or amend the Recovery Plan by resolution, or transmit the plan back to the Recovery Management Organization for further modification prior to final action.

Commentary: *City Council adoption of this ordinance in conjunction with a pre-event recovery plan is extremely important for successful post-disaster recovery. The Council needs to become comfortable with the concept of a pre-event plan and ordinance adoption in order to feel confident in staff during post-disaster recovery operations. If Council adoption is not possible immediately because of the press of other business, then timely opportunities should be sought for bringing the recovery plan and ordinance forward, such as when a catastrophic disaster has struck in another jurisdiction.*

5.5 Amendments. The Recovery Management Organization shall address key issues, strategies, and information bearing on the orderly maintenance and periodic amendment of the plan. In preparing amendments, the Recovery Management Organization shall consult in a timely manner with the City Council [or equivalent], City departments, businesses and community organizations, and other government entities to obtain information pertinent to possible Recovery Plan amendments.

5.6 Implementation. Under policy direction from the [Mayor and/or] City Council [or equivalent] the Recovery Management Organization shall be responsible for Recovery Plan implementation. Before a declaration of emergency, the Director shall prepare and submit reports at least annually to fully advise the City Council [or equivalent] on the progress of preparation, update, or implementation of the Recovery Plan. After a declaration of emergency, the Director shall report to the City Council [or equivalent] as often as necessary on actions taken to implement the plan in the post-disaster setting, identify policy issues needing City Council [or equivalent] direction, and receive authorization to proceed with interim plan modifications necessitated by specific circumstances.

5.7 Training and Exercises. The Recovery Management Organization shall organize and conduct periodic training and exercises annually, or more often as necessary, in order to develop, communicate, and update the contents of the Recovery Plan. Such training and exercises will be conducted in coordination with similar training and exercises related to the Emergency Operations Plan.

Commentary: *Recovery training and exercises should happen on a joint, ongoing basis between the Recovery Management Organization and the Emergency Management Organization, as well as with community stakeholder groups such as Community Emergency Response Team (CERT) organizations. For greatest value, recovery training and exercises should include careful attention to critical relationships between early post-disaster emergency response and recovery actions that condition long-term reconstruction, such as street closings and re-openings, demolitions, debris removal, damage assessment, and hazards evaluation.*

5.8 Coordination with Related Plans. The Recovery Plan shall be coordinated with the Comprehensive General Plan, the Emergency Operations Plan, the Local Hazard Mitigation Plan, and such other related plans as may be pertinent, to avoid inconsistencies between plans. Such related plans shall be periodically amended by the City Council to be consistent with key provisions of the Recovery Plan, and vice versa.

6. Interim Recovery Strategy. At the earliest possible time following a declaration of local emergency, the Recovery Management Organization shall prepare an Interim Recovery Strategy.

6.1 Content. The Interim Recovery Strategy shall identify and describe recovery initiatives and action priorities anticipated or underway that are necessitated by specific post-disaster circumstances.

6.2 Critical Action Priorities. The Interim Recovery Strategy shall identify critical action priorities, including but not limited to those actions identified under Section 9.0 Temporary Regulations of this chapter, describing for each action its objective, urgency, affected individuals and organizations, funding sources, department responsible, and likely duration. The Interim Recovery Strategy shall separately identify those recovery initiatives and action priorities that are not covered or insufficiently covered by the adopted Recovery Plan, but which in the judgment of the Director are essential to expeditious fulfillment of victims' needs, hazard mitigation imperatives, critical infrastructure restoration, and rebuilding needs, and without which public health, safety, and welfare might otherwise be impeded.

6.3 Short-Term Hazard Mitigation Program. The Interim Recovery Strategy shall include a short-term hazard mitigation program comprised of high-priority actions. Such measures may include urgency ordinances dealing with mitigation and abatement priorities identified under Section 9. Temporary Regulations, or requiring special land-use and development restrictions or structural measures in areas affected by flooding, urban/wildland fire, wind, seismic, or other natural hazards, or remediation of known human-induced or technological hazards such as toxic contamination.

6.4 Review and Consultation. The Interim Recovery Strategy shall be forwarded to the City Council [or equivalent] for review and approval following consultation with FEMA, other governmental agencies, businesses, infrastructure operators, and other citizen and stakeholder representatives. The Director shall periodically report to the City Council regarding Interim Recovery Strategy implementation, and any adjustments that may be required by changing circumstances.

6.5 Coordination with Pre-Disaster Recovery Plan and Other Plans. The Interim Recovery Strategy shall form the basis for periodic amendments to the Recovery Plan, and such other related plans as may be pertinent. It shall identify needed post-disaster amendments to the Pre-Disaster Recovery, Comprehensive Plan, Emergency Operations Plan, or other plans, codes, or ordinances.

Commentary: *The purpose of the Interim Recovery Strategy is to structure the flow of local post-disaster short- and long-term recovery actions around a unifying concept that: 1) acknowledges real damage and loss conditions experienced, 2) modifies scenarios underlying the Pre-Disaster Recovery Plan, and 3) translates the new reality into short-term actions pending revision of the Recovery Plan. This may be essential because damage conditions are often likely to be different from those anticipated in the Pre-Disaster Recovery Plan. Preparation of such an interim strategy in the early days of recovery has the benefit of incorporating a positive, proactive emphasis to counter what can be an overwhelmingly reactive and negative context. The Interim Recovery Strategy can be updated as recovery experience is gained and new issues emerge. It also provides a source from which the Pre-Disaster Recovery Plan and related plans can be updated.*

7. Hazard Mitigation Program. Prior to a major disaster, the Recovery Management Organization, with City Council concurrence, shall establish a hazard mitigation program by which natural hazards, risks, and vulnerability are addressed for prioritized short-term and long-term mitigation actions leading to reduced disaster losses. The hazard mitigation program shall include preparation and adoption of a Local Hazard Mitigation Plan, amendment of the Comprehensive Plan to include a Natural Hazard/Safety Element [or equivalent], to-

gether with emergency actions dealing with immediate hazards abatement, including hazardous materials management.

7.1 Local Hazard Mitigation Plan. The Recovery Management Organization shall prepare for City Council adoption and FEMA approval a Local Hazard Mitigation Plan qualifying the City for receipt of federal Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM), and Severe Repetitive Loss (SRL) grants, under the provisions of the Stafford Act, National Flood Insurance Act, and Disaster Mitigation Act of 2000, as amended. The Local Hazard Mitigation Plan shall include, among other items specified in federal regulations (44 CFR 201.6): a risk assessment describing the type, location, and extent of all natural hazards that can affect the City, vulnerability to such hazards, the types and numbers of existing and future buildings, infrastructure, and critical facilities located in identified hazard areas, and an estimate of the potential dollar losses to vulnerable structures; and a mitigation strategy that provides the City's blueprint for reducing the potential losses identified in the risk assessment. The Local Hazard Mitigation Plan, or its mitigation strategy and other contents, shall be adopted as part of the Natural Hazard/Safety Element [or equivalent] of the Comprehensive Plan.

7.2 Natural Hazard/Safety Element [or equivalent]. The Recovery Management Organization shall prepare for City Council adoption an amendment to the Comprehensive Plan known as the Natural Hazards/Safety Element [or equivalent] including proposed long- and short-term hazard mitigation goals, policies, and actions enhancing long-term safety against future disasters. The Natural Hazard/Safety Element [or equivalent} shall determine and assess the community's vulnerability to known hazards, including climate change impacts, such as: severe flooding; wildland fires; seismic hazards, such as ground shaking and deformation, fault rupture, liquefaction, and tsunamis; dam failure; slope instability, mudslides, landslides, and subsidence; sea level rise, coastal surge and erosion; hurricanes, tornadoes, and other high winds; and human-induced or technological hazards, such as oil spills, natural gas leakage and fires, hazardous and toxic materials contamination, and nuclear power plant and radiological accidents.

Commentary: *About a dozen states require inclusion of natural hazards as a mandated subject within their comprehensive plans. For example, a Natural Hazards Element is a required or suggested part of comprehensive plans of Colorado, Idaho, Illinois, and Iowa, and a Safety Element is a required part of comprehensive plans in Arizona, California, and Nevada. Such requirements may have encouraged disaster loss reduction. For example, per capita flood losses were found in one study to be lower for those states which required natural hazards as a subject of the comprehensive plan than for those without such a requirement. Moreover, such comprehensive plan elements provide a context into which communities can fit their Local Hazard Mitigation Plan (LHMP) required under the Disaster Mitigation Act of 2000 as a precondition for eligibility for federal hazard mitigation grants. California provides financial incentives to local jurisdictions that adopt their LHMP as part of the safety element. To the extent that hazard mitigation reduces disaster losses and facilitates recovery, communities stand to benefit from integrating such plans with the Pre-Disaster Recovery Plan.*

7.3 New Information. As new information is obtained regarding the presence, location, extent, location, and severity of natural and human-induced or technological hazards, or regarding new mitigation techniques, such information shall be made available to the public, and shall be incorporated as soon as possible as amendments to the Local Hazard Mitigation Plan and the Comprehensive Plan through City Council action.

8. General Provisions. The following general provisions shall be applicable to implementation of this chapter:

8.1 Emergency Powers and Procedures. Following a declaration of local emergency and while such declaration is in force, the Recovery Management Organization shall have authority to exercise powers and procedures authorized by this chapter, including temporary regulations identified below, subject to extension, modification or re-

placement of all or portions of these provisions by separate ordinances adopted by the City Council [or equivalent].

8.2 Post-Disaster Operations. The Recovery Management Organization shall coordinate post-disaster recovery operations, including but not limited to: business resumption, damage assessment, demolitions, debris removal, expedited repair permitting, hazards evaluation and mitigation, historical buildings, moratorium procedures, nonconforming buildings and uses, rebuilding plans, restoration of infrastructure, temporary and replacement housing, and such other subjects as may be appropriate, as further specified below.

8.3 Coordination with FEMA and Other Agencies. The Recovery Management Organization shall coordinate recovery actions identified under this and following sections with those of state, federal, local, or other mutual organizations involved in disaster recovery, including but not limited to the Federal Emergency Management Agency (FEMA), the American Red Cross, the Department of Housing and Urban Development (HUD), the Small Business Administration (SBA), the State Emergency Management Agency [or equivalent], and other organizations that provide disaster assistance. Intergovernmental coordination tasks include but are not limited to the following: local compliance with all applicable federal and state laws and regulations; provision of information and logistical support; participation in the Multi-Agency Hazard Mitigation Team; cooperation in joint establishment of one-stop service centers for victim support and assistance; and such other coordination tasks as may be required under the specific circumstances of the disaster.

Commentary: *A substantial portion of the Stafford Act is devoted to the means by which federal funds are distributed to persons, businesses, local governments, and state governments for disaster relief and recovery. For most communities, this is an important external source from which certain disaster losses can be compensated. Although insurance may be instrumental in personal, household, or business recovery, it has little value for compensating losses incurred from disasters for which insurance is too costly or difficult to obtain, such as earthquake insurance. In addition, some federal assistance is in the form of grants and loans, involving other federal agencies such as HUD and SBA. The federal government has become increasingly interested in coordinating post-disaster victim services and mitigating hazards affecting land use and building construction. Consequently, federal assistance to localities in many instances is contingent upon the adjustment of local recovery and hazard mitigation policies and practices to conform to federal standards, such as elevation of rebuilt structures in floodplain areas.*

9. Temporary Regulations. The Recovery Management Organization shall have the authority to administer the provisions of this section temporarily modifying provisions of the Municipal Code [or equivalent] dealing with building permits, demolition permits, and restrictions on the use, development, or occupancy of private property, provided that such action, in the opinion of the Director, is reasonably justifiable for protection of life and property, mitigation of hazardous conditions, avoidance of undue displacement of households or businesses, or prompt restoration of public infrastructure.

Commentary: *The following temporary regulations are at the heart of the recovery process. Although state law or city ordinances may authorize some of these functions, it is preferable to have a source of locally adopted regulation which provides direct authority for staff actions taken on behalf of the City Council in line with the Recovery Plan, and provides a rationale for intervention in matters dealing with private property. Among these temporary regulations are provisions dealing with their duration, environmental clearances, debris clearance and hazard abatement, damage assessment and placarding, development moratoria, temporary use permits, temporary repair permits, deferral of fees for repair and rebuilding permits, nonconforming buildings and uses, one-stop service centers, and demolition of damaged historic buildings. Each of these topics needs careful adaptation to local conditions. It is not possible to fully anticipate in advance the magnitude and distribution of disaster damages, but these pre-adopted temporary regulations provide a basis for more efficient action substantially less subject to uncertainties found in cities which have not prepared in this manner. Also, it is important to remember that although temporary regulatory modifications outlined here are associated with the municipal code, disaster assistance from federal agencies will*

be contingent upon compliance with requirements of federal laws and programs, such as the National Flood Insurance Program (NFIP); the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), Endangered Species Act (ESA), and others as applicable. Changes in local ordinance/municipal code, though temporary, will not change these federal requirements.

9.1 Duration. The provisions of this section shall be in effect subject to review by the City Council for a period of 90 days from the date of a local emergency declaration leading to a state-proclaimed emergency and federally declared disaster, or until such time as the local emergency is extended, modified, replaced, or terminated in whole or in part by action of the City Council through separate ordinance.

Commentary: *This provision allows for flexibility in the duration of application of the temporary regulations, so that any portion can be terminated, modified, or extended depending upon local circumstances. It also reflects a recognition that "temporary" regulations may be in effect for an extended period of time beyond either termination of the local state of emergency or the 90-day period. Depending upon the severity of disaster damage, it may be necessary for temporary provisions to remain in effect for several years after the disaster.*

9.2 Environmental Clearances. The provisions of this section enable actions that in the judgment of the Director are justifiable for protection of public health and safety and, therefore, can be reasonably declared to qualify under statutory exemptions of environmental regulations contained in other chapters of the Municipal Code, and within state and federal law. The Director shall provide ongoing monitoring reports to the City Council on environmental issues arising in relation to the Interim Recovery Strategy, the Recovery Plan, and the statutory exemptions.

9.3 Debris Clearance and Hazard Abatement. The Director shall have the emergency authority to undertake the following actions:

a. Debris Removal—Remove from public rights-of-way and/or private property adjoining such rights-of-way any debris, rubble, trees, damaged or destroyed cars, trailers, equipment, or other items of private property, posing a threat to public health or safety;

b. Hazardous Materials—Remove and/or abate hazardous and toxic substances threatening public health and safety;

c. Setbacks of Temporary Buildings—Create and maintain such additional setbacks for temporary buildings as to assure emergency and through movement of vehicles and pedestrians essential for recovery management;

d. Prohibition of Access—Prohibit public access to areas damaged and/or hazardous to public health;

e. Other—Take such other actions, which, in the judgment of the Director, are reasonably justified for protection of public health and safety, provision of emergency ingress and egress, assurance of firefighting or ambulance access, restoration of infrastructure, and mitigation of hazardous conditions.

Commentary: *Although clearance of privately owned debris is routinely considered a function of local government, it can become very controversial where owners take the position that such property is salvageable and has value (e.g., used brick after an earthquake). Pre-event adoption of such a provision reinforces the expectation that debris clearance functions will be carried out decisively, thus minimizing a problem otherwise compounded by hesitation or ambiguity of intention on the part of the city.*

9.4 Damage Assessment and Placarding. The Director shall direct damage assessment teams having authority to conduct field surveys of damaged structures and post placards designating the condition and permitted occupancy of such structures as follows:

Commentary: *Damage assessment and the placement of placards identifying whether buildings are safe or unsafe to occupy are two functions having perhaps more profound effects on life, property, and recovery than any other within the post-disaster decision sequence towards which provisions of these temporary regulations are directed.*

Damage assessment is undertaken by various entities following a major disaster, usually the city

and FEMA. There is at least a twofold purpose for these inspections. One purpose is to determine the degree of structural damage of each building and notify the public about the relative safety of entry and occupancy. This has been a long-standing duty under local government health and safety responsibilities with which building departments are familiar. The other purpose is to quickly estimate the approximate replacement costs of damaged buildings and other property in order to inform the state and federal governments of dollar amounts needed for emergency legislative authorizations. The latter purpose is fraught with difficulty to the extent that hurriedly conducted damage assessments can miss substantial elements of damage and corresponding costs. Moreover, local expertise tends to be limited in the area of deploying common standards and procedures for determining structural damage in order to assess damage in a truly comparable manner.

The most important element of all these concerns is the establishment of standard identification of structural damage both in gross general terms reflected in the red, yellow, and green tag placard systems. The placard language below is adapted from Model Ordinances for Post-Disaster Recovery and Reconstruction initially published by the California Governor's Office of Emergency Services. The procedures used to make these basic safety distinctions in the California model ordinance are based on detailed post-disaster inspection methods described by the Applied Technology Council in ATC-20, Procedures for Postearthquake Safety Evaluation of Buildings and ATC-20-2 Addendum:

a. **Inspected—Lawful Occupancy Permitted** is to be posted on any building in which no apparent structural hazard has been found. This does not mean other forms of damage that may not temporarily affect occupancy.

Commentary: *This is commonly known as the "green tag" placard.*

b. **Restricted Use** is to be posted on any building in which damage has resulted in some form of restriction to continued occupancy. The individual posting this placard shall note in general terms the type of damage encountered and shall clearly and concisely note the restrictions on continued occupancy.

Commentary: *This is commonly known as the "yellow tag" placard.*

c. **Unsafe—Do Not Enter or Occupy** is to be posted on any building that has been damaged to the extent that continued occupancy poses a threat to life safety. Buildings posted with this placard shall not be entered under any circumstances except as authorized in writing by the department that posted the building or by authorized members of damage assessment teams. The individual posting this placard shall note in general terms the type of damage encountered. This placard is not to be considered a demolition order. This chapter and section number, the name of the department, its address, and phone number shall be permanently affixed to each placard. Once a placard has been attached to a building, it shall not be removed, altered, or covered until done so by an authorized representative of the department or upon written notification from the department. Failure to comply with this prohibition will be considered a misdemeanor punishable by a $500 fine.

Commentary: *This is commonly known as the "red tag" placard (www.atcouncil.org/vmchk/Post-earthquake-Damage-and-Safety-Evaluation-of-Buildings/Procedures-for-Postearthquake-Safety-Evaluation-of-Buildings-Addendum/flypage.tpl.html).*

9.5 Development Moratorium. The Director shall have the authority to establish a moratorium on the issuance of building permits, approval of land use applications or other permits and entitlements related to the use, development, and occupancy of private property authorized under other chapters and sections of the Municipal Code and related ordinances, provided that, in the opinion of the Director, such action is reasonably justifiable for protection of life and property and subject to the following:

a. **Posting**—Notice of the moratorium shall be posted in a public place and on the Internet, and shall clearly identify the boundaries of the area(s) in which moratorium provisions are in effect, and shall specify the exact nature of the development permits or

entitlements that are temporarily held in abeyance;

b. Duration—The moratorium shall be in effect subject to review by the City Council at the earliest possible time, but no later than 90 days, at which time the Council shall take action to extend, modify, replace, or terminate such moratorium through separate ordinance.

Commentary: *After disasters, a prevailing sentiment may often be to act quickly to replicate pre-disaster building patterns in an effort to "restore normalcy." In many instances, this sentiment prevails as public policy despite the presence of a severe natural hazard condition, thereby reinforcing the chances of repetitive losses. Many examples exist of communities which have allowed rebuilding in a manner that ignored known hazardous conditions, whereas intervention was needed to create greater safety.*

To prevent or reduce repetitive losses, a city may choose to interrupt and forestall rebuilding long enough to assess options for avoiding placing buildings and people back in harm's way. This can be done by establishing an emergency moratorium on issuance of repair and rebuilding permits or on land-use approvals in areas where severely hazardous conditions are identified. The hazard may be newly detected, as in a post-earthquake circumstance where the pattern of structural damage, recent flooding, fresh landslides, or ground subsidence may indicate the need for engineering studies to clearly identify hazards and determine proper solutions.

A moratorium on development may be important for a city to undertake from the standpoint of informed public policy. However, such actions tend to be controversial and unpopular, so it is important to lay the groundwork with the community in advance, if possible. This subsection provides prior authorization through adoption of this ordinance before a major disaster, enabling city staff to act expeditiously in a post-disaster setting to forestall premature issuance of permits in areas shown to be hazardous. Such action is necessarily subject to Council review, ratification, modification, or termination.

9.6 Temporary Use Permits. The Director shall have the authority to issue permits in any zone for the temporary use of property that will aid in the immediate restoration of an area adversely impacted by a major disaster, subject to the following provisions:

a. Critical Facilities--Any police, fire, emergency medical, or emergency communications facility that will aid in the immediate restoration of the area may be permitted in any zone for the duration of the declared emergency.

b. Other Temporary Uses--Temporary use permits may be issued in any zone, with conditions, as necessary, provided written findings are made establishing a factual basis that the proposed temporary use: 1) will not be detrimental to the immediate neighborhood; 2) will not adversely affect the Comprehensive General Plan or any applicable specific plan; and 3) will contribute in a positive fashion to the reconstruction and recovery of areas adversely impacted by the disaster. Temporary use permits may be issued for a period of one year following the declaration of local emergency and may be extended for an additional year, to a maximum of two years from the declaration of emergency, provided such findings are determined to be still applicable by the end of the first year. If, during the first or the second year, substantial evidence contradicting one or more of the required findings comes to the attention of the Director, then the temporary use permit shall be revoked.

Commentary: *Most zoning ordinances have no provisions for temporary use of property following a disaster. A few allow temporary placement of mobile homes on residentially zoned sites pending reconstruction of a residence. Time limits vary, but are usually for a two-year period. After a disaster, special latitude may be needed, however, to support various recovery needs. Care must be taken not to set precedents that will erode or destroy a pre-existing pattern of zoning that the city*

may wish to protect. The language within this section is modeled after provisions of the Los Angeles recovery ordinance adopted after the Northridge earthquake, titled Temporary Regulations Relating to Land Use Approvals for Properties Damaged in a Local Emergency. *That ordinance was geared toward the needs of a large and diverse city. Smaller communities may wish to restrict temporary uses to those already allowed by existing zoning, limiting the provision to temporary structures such as tents, domes, or mobile units.*

9.7 Temporary Waiver of Repair Permit Requirements for Emergency Repairs. Following a disaster, temporary emergency repairs to secure structures and property damaged in the disaster against further damage or to protect adjoining structures or property may be made without fee or permit where such repairs are not already exempt under other chapters of the Municipal Code. The building official must be notified of such repairs within 10 working days, and regular permits with fees may then be required.

Commentary: *This provision is specifically written for repairs which may not be exempt under standard building code permit exemptions but which are justifiable from a public health and safety standpoint to avoid further damage to property after a disaster. It is modeled after a provision of a post-disaster rebuilding ordinance adopted in 1992 by the County of San Bernardino shortly after the Landers-Big Bear earthquake. Written before the earthquake, the ordinance was based on a pre-event study titled* **Post-Disaster Rebuilding Ordinance and Procedures**, *which included a survey of top managers and elected officials regarding various post-disaster rebuilding provisions, such as for nonconforming buildings and uses. Because of the pre-event involvement of top managers and elected officials, it was adopted after the earthquake with no controversy.*

9.8 Deferral of Fees for Repair and Rebuilding Permits. Except for temporary repairs issued under provisions of this chapter, all other repairs, restoration, and reconstruction of buildings damaged or destroyed in the disaster shall be approved through permit under the provisions of other chapters of this Code. Fees for such repair and reconstruction permits may be deferred until issuance of certificates of occupancy.

Commentary: *Pressure to waive processing fees frequently arises after a disaster when victims are unsure of their sources of financing for rebuilding. It may be inadvisable to succumb to pressures to waive fees due to the ongoing need for cost recovery for disaster-related services at a time revenue flows are uncertain. As an alternative, local governments can buy time by deferring fees to determine the degree to which funds will be found at a later time to help offset victims' fee costs. For example, sometimes the cost of processing fees may be covered by insurance or by federal funds. Deferral of fees until occupancy permit issuance buys time during which to ascertain possible alternate sources without injuring necessary revenue flows to the city treasury. This provision is modeled after similar language in the Los Angeles temporary regulations.*

9.9 Nonconforming Buildings and Uses. Buildings damaged or destroyed in the disaster that are legally nonconforming as to use, yards, height, number of stories, lot area, floor area, residential density, parking, or other provisions of the Municipal Code specified herein may be repaired and reconstructed in-kind, provided that:

a. The building is damaged in such a manner that the structural strength or stability of the building is appreciably lessened by the disaster and is less than the minimum requirements of the Municipal Code for a new building;
b. The cost of repair is greater than 50 percent of the replacement cost of the building;
c. All structural, plumbing, electrical, and related requirements of the Municipal Code, as well as any rebuilding requirements imposed by a higher level of government, such as building elevation or basement removal if required under NFIP, are met at current standards;
d. All natural hazard mitigation requirements of the Municipal Code are met;
e. Reestablishment of the use or building is in conformance with the National Flood Insurance Program requirements and procedures, or higher community standards;

f. The building is reconstructed to the same configuration, floor area, height, and occupancy as the original building or structure;
g. No portion of the building or structure encroaches into an area planned for widening or extension of existing or future streets as determined by the comprehensive general plan or applicable specific plan;
h. Repair or reconstruction shall commence within two years of the date of the declaration of local emergency in a major disaster and shall be completed within two years of the date on which permits are issued; damaged structures must be secured in accordance with the community's provisions for abandoned structures in order to ensure the health and safety of the public;
i. Nothing herein shall be interpreted as authorizing the continuation of a nonconforming use beyond the time limits set forth under other sections of the Municipal Code that were applicable to the site prior to the disaster.

Commentary: *No recovery issue can be more vexing to planners than whether or not to encourage reestablishment of nonconforming uses and buildings after a disaster. Planners have sought for decades to write strict provisions in zoning ordinances designed to gradually eliminate nonconforming uses or buildings as they were abandoned, changed owners, or were damaged by fire, wind, or water. Such provisions normally prohibit reestablishment of nonconforming uses and buildings where damage exceeds a certain percentage of replacement cost, most often 50 percent. This approach is logical, orderly, and normally equitable when weighing community interests balanced with those of the property owner. However, the thinking behind such provisions has been geared to incremental adjustments or termination of such uses over time, not to sudden circumstances forcing disposition of such uses as a class at a single point in time.*

In theory, disasters are seen as an opportunity to eliminate uses that conflict with the prevailing pattern in a neighborhood but that remain because of legal nonconforming status--for example, scattered industrial uses in a residentially zoned neighborhood. In reality, local governments are beset after a disaster by pressures from property owners and other interests to reestablish the previous development pattern, including nonconforming buildings and uses. Such pressures extend beyond the demand to reestablish nonconforming buildings or uses to include waiver of current building, plumbing, and electrical code provisions to the standards in place at the time of construction.

From a risk management, liability exposure, or public safety standpoint, acquiescence to the reduction of such basic health and safety standards in the face of a known hazard can be seen as unacceptable. However, zoning provisions hindering reestablishment of nonconforming buildings or uses tend to be more arguable and are more likely to be modified by city councils under pressures of the moment to restore the status quo. In recognition of such pressures, this model ordinance language offers a straightforward tradeoff approach allowing reestablishment of a nonconforming use or building in return for strict adherence to current structural, plumbing, and electrical code and hazard mitigation requirements. The language assumes existence of a provision commonly found in the Municipal Code authorizing repair or reestablishment of a nonconforming use or building where damage is less than 50% of the replacement cost. It also assumes the building was substantially weakened by the disaster and is below code requirements. This compromise approach recognizes that its application may require the unwelcome decision to accept continuation of disorderly land-use patterns, unless a solution can be found through redevelopment or rezoning. Instead, it places a high value on life safety.

It is important to note, however, that the language of these provisions includes the following important limitations on the economic incentive to reestablish the nonconforming use or building.

i. It does not extend any previously stipulated life of the nonconforming

use—this is an important disincentive if the costs of replacement cannot be offset by insurance, FEMA assistance, SBA loans or other sources of financial support.

ii. *It does not allow the extent of nonconformance to be increased over that which existed prior to the disaster, thwarting another common pressure.*

iii. *It requires strict adherence to current structural, plumbing, electrical, and other requirements of the Municipal Code, any street setbacks stipulated within the comprehensive plan circulation element and related ordinances, as well as any rebuilding requirements imposed by a higher level of government, such as building elevations or basement removals where required by FEMA under the National Flood Insurance Program (NFIP). Note: within NFIP there is no grandfathering for substantially damaged structures (i.e., those damaged in excess of 50% of their pre-event value). Such local, state or federal requirements, though potentially costly, are necessary from a public safety standpoint.*

iv. *It recognizes that compliance with more stringent hazard mitigation requirements may be needed, for example, moving a structure to a less hazardous area on the lot, especially in cases involving increased on-site hazards because of fault rupture, landsliding, coastal erosion, or severe flooding where upgrading to current structural, plumbing, and electrical code requirements may not assure safe occupancy. Compliance with such provisions may reduce or eliminate the possibility of rebuilding, or be sufficiently costly to discourage reestablishment of the use or other nonconforming feature.*

The relative importance of post-disaster reestablishment of nonconforming uses and buildings may vary from one jurisdiction to another. Therefore, the most useful time to assess this aspect of post-disaster recovery is before a major disaster, in the course of pre-event planning. Education of the city council in advance can help lessen post-disaster tendencies to compromise critical hazard mitigation and public safety requirements, notwithstanding the outcome on nonconforming use and building requirements.

10. **One-Stop Service Center for Permit, Economic, and Housing Assistance**. The Recovery Management Organization shall coordinate the establishment of a one-stop center, staffed by representatives of pertinent City departments, and staff of cooperating organizations, for the purpose of providing coordinated services and assistance to disaster victims for purposes including but not limited to: permit processing to expedite repair of buildings, provision of housing assistance, and encouragement of business resumption and industrial recovery. The Director shall establish such center and procedures in coordination with other governmental entities that may provide services and support, such as FEMA, SBA, HUD, or the State Emergency Management Agency (or equivalent).

Commentary: *One-stop service centers have become more common with recent disasters, often combining the presence of multiple agencies to provide better coordination of information needed by disaster victims to obtain essential public and insurance services and to rebuild. A prime example was the Community Restoration and Development Center established by the City of Oakland shortly after the 1991 Oakland Hills Firestorm and operated until mid-1994 with financial support from FEMA. Benefits to be gained for establishing a special one-stop center include accelerated information, integration of services, and expedited permitting. Setting up a specialist team working exclusively on repair and rebuilding permit issues has the added advantage of insulating normal development review from disruption by the recovery process and vice versa.*

11. **Emergency Contractor and Volunteer Certification.** The Recovery Management Organization shall have authority to establish a standard certification process for all contractors and volunteers seeking to provide clean-up, repair, or construction services within areas that have

experienced disaster damage. In order to be eligible, contractors and volunteers must obtain the proper certification using the following process.

11.1 Application for Contractor Certification. Contractors must apply for Contractor Certification at a one-stop center with the location and hours identified by the City. An application processing fee of $25.00 is required for each contractor firm and may be paid in cash or by check made payable to the City.

11.2 Application Requirements. Contractors seeking certification must meet the following minimum insurance and background check requirements.

a. Staff will verify that contractors are properly registered and/or licensed with the state contractors' licensing agency of the state within which their business is headquartered.

b. The Police Department will conduct a criminal background check on each worker that will be performing services for the contractor's firm.

c. Contractors must be licensed for their respective trades through the state contractors' licensing agency within which their business is headquartered and meet minimum insurance required by that state. All other contractor firms seeking to perform projects with a scope of work that exceeds a cost of $2,000 must provide proof of a general liability insurance policy for an amount lot less than $1,000,000.

11.3 Certification Enforcement. Contractors are subject to the following certification enforcement requirements.

a. Proof of certification will be a City-issued photo identification badge for each worker performing clean-up, repair, or construction services within disaster-damaged areas. This must be displayed by each worker at all times within the designated area. Replacement badges will be issued at a cost of $10.00.

b. Individuals without an identification badge will not be permitted to perform clean-up, repair, or construction services.

c. Contractors failing to register will be subject to a fine of $100.00 per day or be subject to imprisonment for not more than 30 days. Each day a violation occurs will constitute a separate offense.

d. The City retains the right to suspend or revoke the Contractor Certification.

11.4 Volunteer Certification. Persons volunteering their efforts without compensation for disaster clean-up repair, or construction services must also apply for emergency certification as a volunteer at a one-stop center and receive a photo identification badge. No application processing fee is required for a Volunteer Certification. However, volunteers certified to assist with clean-up, repair, or construction services must be affiliated with a charitable, non-profit organization meeting all preceding Contractor Certification insurance and enforcement requirements.

Commentary: *The phenomenon of unscrupulous actions by contractors or persons posing as contractors after a disaster by which advantage is taken of helpless disaster victims is a widely recognized and repetitive problem for which there is little guidance in the professional recovery management literature. The preceding emergency contractor certification provisions have been adapted from a program established by the City of Cedar Rapids, Iowa, following a severe flood in 2008. Through implementation of this program, the City of Cedar Rapids turned down over 200 applications for emergency contractor certifications, and made over 30 arrests for program violations. Through notification of over 10,000 contractors, the program also had a substantial preventive effect, discouraging otherwise unscrupulous persons from attempting to take advantage of the post-flood recovery situation.*

Although volunteers were certified and issued badges without charge by the City of Cedar Rapids, their program did not explicitly address volunteer certification. Therefore, language is included that addresses this need. Since many cities do not wish to discourage volunteer assistance by the imposition of a seemingly unnecessary requirement, it is a sensitive provision and should be thought through carefully as to how it might work without posing needless barriers to volunteer efforts before inclusion in a local ordinance.

12. Temporary and Permanent Housing. The Director shall assign staff to work with FEMA, SBA, HUD, the State Emergency Management Agency (or equivalent), and oth-

er appropriate governmental and private entities to identify special programs by which provisions can be made for temporary or permanent replacement housing which will help avoid undue displacement of people and businesses. Such programs may include deployment of mobile homes and mobile home parks under the temporary use permit procedures provided in Section 9.6 of this chapter, use of SBA loans and available Section 8 and Community Development Block Grant funds to offset repair and replacement housing costs, and other initiatives appropriate to the conditions found after a major disaster.

Commentary: *The issue of post-disaster temporary and permanent replacement housing has grown to one of critical dimensions since Hurricane Katrina. After that event, thousands of households were temporarily housed in trailers for periods far longer than anticipated, under unhealthy conditions due to faulty mobile home design. Relatively little progress has been made since then in finding effective ways by which to handle this issue on a broad scale. This section is essentially a placeholder for language that preferably should be made more specific on the basis of a pre-event plan that anticipates the local levels of housing vulnerability and identifies potential solutions. A great deal more research is needed to find satisfactory solutions for prompt, efficient provision of both interim and replacement housing. With possible downsizing of federal budgets in future years, this issue will become more critical. Also needed is research on feasible incentives for retrofitting a substantial portion of the existing housing stock to reduce vulnerability and risk. This is true in western states susceptible to heightened earthquake risk and for Midwestern and southeastern states under continuing threats of hurricane, tornado, and severe storm damage.*

13. Demolition of Damaged Historic Buildings. The Director shall have authority to order the condemnation and demolition of buildings and structures damaged in the disaster under the standard provisions of the Municipal Code, except as otherwise indicated below:

13.1 Condemnation and Demolition. Within _ days after the disaster, the building official [or equivalent] shall notify the State Historic Preservation Officer that one of the following actions will be taken with respect to any building or structure determined by the building official to represent an imminent hazard to public health and safety, or to pose an imminent threat to the public right of way:

a. Where possible, within reasonable limits as determined by the building official, the building or structure shall be braced or shored in such a manner as to mitigate the hazard to public health and safety or the hazard to the public right-of-way;

b. Whenever bracing or shoring is determined not to be reasonable, the building official shall cause the building or structure to be condemned and immediately demolished. Such condemnation and demolition shall be performed in the interest of public health and safety without a condemnation hearing as otherwise required by the Municipal Code. Prior to commencing demolition, the building official shall photographically record the entire building or structure.

13.2 Notice of Condemnation. If, after the specified time frame noted in Subsection 8.1 of this chapter and less than 30 days after the disaster, a historic building or structure is determined by the building official to represent a hazard to the health and safety of the public or to pose a threat to the public right of way, the building official shall duly notify the building owner of the intent to proceed with a condemnation hearing within __ business days of the notice in accordance with Municipal Code Section ___; the building official shall also notify FEMA, in accordance with the National Historic Preservation Act of 1966, as amended, of the intent to hold a condemnation hearing.

13.3 Request to FEMA to Demolish. Within 30 days after the disaster, for any historic building or structure that the building official and the owner have agreed to demolish, the building official shall submit to FEMA, in accordance with the National Historic Preservation Act of 1966, as amended, a request to demolish. Such request shall include all substantiating data.

13.4 Historic Building Demolition Review. If after 30 days from the event, the building official and the owner of a historic building or structure agree that the building or structure should be demolished, such action will be subject to the review process established by the National Historic Preservation Act of 1966, as amended.

Commentary: *A difficult aspect of recovery in older communities is dealing with damaged historic struc-*

tures. Since these can be very old, measures needed to make them structurally sound may be more difficult and costly than normal. Because of the controversy frequently associated with this issue, vocal opposition may emerge when a badly damaged historical structure is considered for demolition. Therefore, it is wise to have language already in place to guide planning and building officials who may be involved. The National Historic Preservation Act of 1966, as amended, identifies steps that must be taken by a jurisdiction or owner to mitigate public health and safety hazards resulting from disaster-caused damage. The intent is to establish predictable rules by which proposed demolitions, except in extreme cases of danger to the public, can be reviewed by state and federal officials in order to provide time to identify preservation options. The review process is intended to discourage hasty demolition action by local officials when such action may not be justified.

The preceding language is adapted from provisions of the Uniform Code for the Abatement of Dangerous Buildings. It provides specific time frames and actions for abatement of hazards created by damage to historic buildings. The important element of judgment here is the establishment of a specific time frame for declaring a structure an imminent hazard to public health and safety justifying immediate demolition without a condemnation hearing. Such time frames are generally from three to five days, though sometimes stretched to ten. After the established time frame, the threat may no longer be justified as imminent and, therefore, the remaining procedures kick in.

14. **Severability.** If any provision of this chapter is found to be unconstitutional or otherwise invalid by any court of competent jurisdiction, such invalidity shall not affect the remaining provisions, which can be implemented without the invalid provision, and, to this end, the provisions of this ordinance are declared to be severable.

APPENDIX B: DISASTER LAWS, EMERGENCY PROVISIONS, AND FEDERAL DISASTER MANAGEMENT ADMINISTRATIVE DIRECTIVES

DISASTER LAWS ADMINISTERED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY

Disaster Relief Act, 1950
(Public Law 93-288, 42 U.S.C.A. §5121 et seq.)

National Flood Insurance Act of 1968
(Public Law 90-448 42)

Disaster Relief Act of 1970
(84 Stat. 1744 [42 U.S.C.A. §4401 et seq.])

Flood Disaster Protection Act of 1973
(Public Law 90-448 42 U.S.C. 4001)

Disaster Relief Act of 1974
(Public Law 93-288)

Robert T. Stafford Disaster Relief and Emergency Assistance Act, 1988
(Public Law 93-288, 42 U.S.C.A. §5122 et seq.)

National Flood Insurance Reform Act of 1994
(Public Law 103-325 Sec. 511)

Disaster Mitigation Act of 2000
(Public Law 106-390)

Mitigation Planning
(44 CFR Part 201 – Section 201.4-201.7)

Homeland Security Act of 2002
(Public Law 107–296, 116 Stat. 2135; created 6 U.S.C. Ch. 1 §101)

Flood Insurance Reform Act of 2004
(Public Law 108-264)

Post-Katrina Emergency Management Reform Act of 2006
(Public Law 109–295, 120 Stat. 1355; S. 3721; H.R. 5351)

Biggert-Waters Flood Insurance Reform Act of 2012
(Public Law 112-141)

Homeowner Flood Insurance Affordability Act of 2014
(Public Law 113-89)

EMERGENCY PROVISIONS ADMINISTERED BY OTHER AGENCIES

Small Business Act, 1953, as amended
(15 U.S.C. Ch. 14A)

Flood Control and Coastal Emergency Act, 1955
(Public Law 84-99)

Federal-Aid Highway Act of 1956
(Section 125, U.S. Code, Title 23: Emergency Repairs)

Housing and Community Development Act of 1974
(Public Law 93-383; 42 U.S.C. Ch. 69 § 5301)

Water Resources Development Act, 1974
(Public Law 93–251)

Public Works Employment Act, 1976
(Public Law 94-369)

Emergency Planning and Community Right-to-Know Act, 1986
(Amended Superfund; Public Law 99-499)

Water Resources Development Act, 1996
(Public Law 104–303)

National Dam Safety Program (or Act), 2006
(Reauthorized as Public Law 109-460; 44 CFR §1724.55)

FEDERAL DISASTER MANAGEMENT ADMINISTRATIVE DIRECTIVES

Federal Response Plan, 1992
(42 U.S. Code § 5121, Basis for Emergency Support Functions)

National Incident Management System, 2004
(Homeland Security Presidential Directive 5; see Homeland Security Act of 2002)

National Response Plan, 2004
(Homeland Security Presidential Directive 5; see Homeland Security Act of 2002)

National Response Framework, 2008
(Part of the National Preparedness System; developed through PPD-8; superseded National Response Plan)

National Disaster Recovery Framework, 2011
(Developed through PPD-8)

National Preparedness Goal, 2011
(Presidential Preparedness Policy Directive 8/PPD-8)

Threat and Hazard Identification and Risk Assessment, 2012
(Developed through PPD-8)

National Mitigation Framework, 2013
(Developed through PPD-8)

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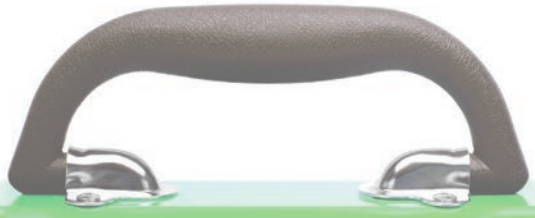

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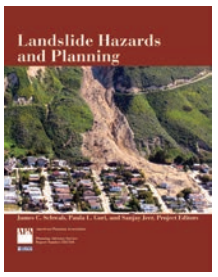

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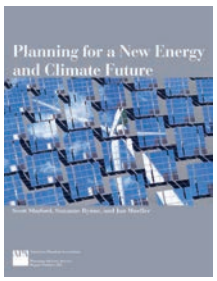

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