Integrating Hazard Mitigation Into Local Planning

Case Studies and Tools for Community Officials

March 1, 2013

FEMA

Table of Contents

List of Figures

List of Tables

List of Examples

Chapter 1: Introduction

Nearly every community in the United States is susceptible to natural hazards. However, we can control our vulnerability to these hazards. As a community planner or local decision maker, you help manage risk through the manner in which you choose to plan, design, and build communities. You have the ability to keep natural hazards from becoming natural disasters.

> **Hazard mitigation** is sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.[1]

The purpose of this document is to provide succinct and practical information to local government officials on how to best integrate hazard mitigation into the full range of community planning activities. It is intended for those who are engaged in any type of local planning, but primarily community planners and emergency managers that bear responsibility for hazard mitigation planning. This document does not impose legally enforceable rights or obligations, although references to laws, regulations, standard operating procedures, or agency practices are included. A more extensive report titled *Hazard Mitigation: Integrating Best Practices into Planning*, published by the American Planning Association (APA) in partnership with FEMA, complements the material presented in this document.[2]

Defining Integration

The definition of integration is specific to your community. It depends on the known hazards, coupled with the range of planning processes and tools that influence how the built environment is exposed to those hazards. It can generally be described as the routine consideration and management of hazard risks in your community's existing planning framework—that is, the collection of plans, policies, codes, and programs that guide development in your community, how those are maintained and implemented, and the roles of people, agencies, and departments in evaluating and updating them. Effective integration of hazard mitigation occurs when your community's planning framework leads to development patterns that do not increase risks from known hazards or leads to redevelopment that reduces risk from known hazards.

Planning for Resilience

The term "resilience" resonates with local planners, particularly where adverse factors threaten the stability of local communities, including economic recession, climate change, and the increasing frequency of disaster events. However, achieving resilience and "sustainability" has long been ingrained in community planning. Pioneer planners such as Ian McHarg, author of *Design with Nature* in 1969, advocated for the development of communities in a manner that is compatible with the location, climate, and surrounding natural environment.[3] In more recent years, "safe growth" has been promoted by FEMA and APA, beginning with the launching of APA's *Safe Growth America* initiative in 2004 and continuing today through the work of the APA's Hazards Planning Research Center.[4] The concepts of resilience, sustainability, and safe growth are embraced and actively promoted by FEMA through its implementation of Federal regulations for hazard mitigation planning.[5]

1 Title 44 Code of Federal Regulations (CFR) §201.2, *Definitions*
2 American Planning Association, "Hazard Mitigation: Integrating Best Practices into Planning," *Planning Advisory Service Report*, No. 560, Chicago, American Planning Association, 2010. Available at: http://www.fema.gov/library/viewRecord.do?id=4267
3 Ian L. McHarg, *Design with Nature*, New York, Natural History Press, 1969.
4 APA Hazards Planning Research Center: https://www.planning.org/nationalcenters/hazards/index.htm
5 Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended, 42 U.S.C. 5165, and Title 44 Code of Federal Regulations (CFR) §201, Mitigation Planning. Also see FEMA Multi-Hazard Mitigation Planning at: http://www.fema.gov/multi-hazard-mitigation-planning

Resilience is the ability to adapt to changing conditions and prepare for, withstand, and rapidly recover from disruption.[6]

Sustainability is the capability to equitably meet the vital human needs of the present without compromising the ability of future generations to meet their own needs.[7]

The goal of **Safe Growth** is to build environments that are safe for current and future generations and to protect buildings, transportation, utilities, and the natural environment from damage.[8]

Between the years 2000 and 2012, more than 25,000 local governments of all types and sizes participated in the development of hazard mitigation plans for their communities that include an assessment of hazard risks and strategies for reducing or eliminating those risks. However, as further described in Chapter 2, a missed opportunity in many of those communities is the connection between hazard mitigation planning and other types of community planning. The focus of this document is on bridging this gap and firmly linking the resulting public policies, which ideally, achieve greater resilience.

Organization

This document is primarily written for community planners, but also is helpful in communicating with other local leaders and public officials who have an important role to play in supporting the integration of hazard mitigation with other local planning. It consists of the following chapters:

- Chapter 2 describes the importance of integrating hazard mitigation into local planning, including the opportunities and benefits of integration. This chapter also describes how to communicate with key policymakers and stakeholders in your community.
- Chapter 3 offers guidance on how to integrate hazard mitigation goals and strategies with other local plans, policies, regulations, and programs.
- Chapter 4 presents potential solutions for overcoming common barriers and obstacles to successful integration.
- Chapter 5 includes a series of case studies that illustrate the principles of integration in real-world situations.
- Chapter 6 contains a series of fact sheets that provide specific information related to the guidance presented in this document.

6 U.S. Department of Homeland Security, *DHS Risk Lexicon*, Washington, U.S. Department of Homeland Security, 2010. p. 26. Available at: http://www.dhs.gov/xlibrary/assets/dhs-risk-lexicon-2010.pdf

7 American Planning Association, *Policy Guide on Planning for Sustainability*, New York, American Planning Association, 2000. Available at: http://www.planning.org/policy/guides/adopted/sustainability.htm

8 2004 AICP Symposium, *Safe Growth*, American Planning Association, 2004. http://www.planning.org/aicp/symposium/2004/

Chapter 2: The Importance of Integrating Hazard Mitigation Into Local Planning

Community planners develop plans and policies that balance physical, social, economic, and environmental issues of concern. The relationships between each of these issues have increased the demand for more fully integrated solutions to community planning.

> *"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 after 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, David R., et.al. 2009. "Estimating the Value of Foresight: Aggregate Analysis of Natural Hazard Mitigation Benefits and Costs." Journal of Environmental Planning and Management 52(6):739-56.

What has not changed is the fundamental goal of local planning: to improve the welfare of people and their communities by creating more convenient, equitable, healthful, efficient, and attractive places for present and future generations.[1] Inherent to this goal is the principle of community resilience—that is, the ability to adapt to changing conditions and prepare for, withstand, and rapidly recover from disruption caused by adverse events.[2]

The purpose of Chapter 2 is to describe the importance of integrating hazard mitigation into local planning and to provide some information that can assist you in effectively communicating this message to community leaders, elected officials, and others.

Making the Business Case

The business case for integrating hazard mitigation into local planning should not be a difficult one to make. Community leaders and policymakers should already know that nothing is more essential to the role of local government than its responsibility to protect the public health, safety, and welfare of its citizens, and hazard mitigation is clearly within those functions. Community leaders should also understand that the economics make sense—the benefits of avoiding or minimizing risk through safe development practices from the start greatly outweigh the costs of damage and disruption later. It is important to recognize these two underlying principles as you consider the best approach to communicate the importance of integration with the key leaders and decision makers in your community.

In order to be successful in making the business case, tailor specific messages or "selling points" to various individuals. For example, in gaining support from senior executives you may want to demonstrate the more immediate administrative benefits of integrating hazard mitigation into local planning such as more streamlined governmental processes (in other words, integration increases efficiency and avoids conflicting outcomes). You may focus on the expected damage or losses avoided for individual property owners and businesses throughout the community, or describe the potential cost savings to first responders or emergency management functions of the community to your local finance director. Last but not least, your message underscores the fact that mitigation measures save lives.

> *"Given the amount of good information available to building designers, public policymakers and developers, there is no excuse for failing to minimize risk from natural hazards by considering and incorporating protective actions into decisions about where and how communities are planned and built."*
>
> - Julie Rochman, President & CEO
> Insurance Institute for Business & Home Safety

1 American Planning Association, *What is Planning?*, Washington, American Planning Association, 2012. Available at: http://www.planning.org/aboutplanning/whatisplanning.htm

2 U.S. Department of Homeland Security, *DHS Risk Lexicon*, Washington, U.S. Department of Homeland Security, 2010. p. 26. Available at: http://www.dhs.gov/xlibrary/assets/dhs-risk-lexicon-2010.pdf

It is also important to consider that local leaders may respond more favorably to the promotion of concepts or ideas that align with other community values or ideals. For example, a persuasive argument can be made that a community is not truly prepared, sustainable, or resilient without considering the potential hazard risks it faces. It is therefore critical for local leaders to fully understand not only the factors that drive and sustain their community, but also the hazards that threaten to disrupt or damage their community and how that risk is being managed.

It is critical for local leaders to fully understand the concerns of their citizens and the factors that drive and sustain their community, the hazards that threaten to disrupt or damage their community, and how that risk is being managed. FEMA/Jocelyn Augustino

The key benefits listed in Table 2-1 at the end of this chapter can be considered as selling points to use in making the business case to those who can support your integration efforts. More guidance on specifically how to inform, engage, and build support from your community leaders and decision makers in this process is provided in Chapter 3 (see *Step 2: Inform and Engage Local Leadership, Staff, and Stakeholders*).

Challenges

The Disaster Mitigation Act of 2000 amended Federal law to require State, Tribal, and local governments to develop hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation projects.[3] In response, more than 25,000 communities have adopted FEMA-approved hazard mitigation plans—a significant step forward in the completion of local risk assessment and mitigation planning initiatives nationwide. However, several notable challenges and missed opportunities have been observed, including:

- Hazard mitigation plans are often developed or updated without the active participation or leadership of local planning and community development staff;[4]
- Local land use planners are less willing to embrace hazard mitigation planning as falling within their professional purview;[5]
- Hazard mitigation plans often include mitigation strategies or actions that are focused on a disconnected series of emergency services, structure or infrastructure protection projects, and public outreach initiatives, with less emphasis on non-structural measures available through local land use planning or policy alternatives;[6] and
- Hazard mitigation plans are typically completed as stand-alone documents that cover multiple jurisdictions, and it is relatively uncommon for them to be directly linked or integrated with other community-specific planning tools such as comprehensive land use plans and development regulations.

Federal regulations require that local hazard mitigation plans describe a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans.[7] This encourages communities to capitalize on all available hazard mitigation and risk reduction opportunities. The guidance below describes the opportunities that exist for integration and the benefits that can be derived if implemented.

3 Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended by the Disaster Mitigation Act of 2000: http://www.fema.gov/library/viewRecord.do?id=3564

4 American Planning Association, "Hazard Mitigation: Integrating Best Practices into Planning," *Planning Advisory Service Report*, No. 560, Chicago, American Planning Association, 2010. Available at: http://www.fema.gov/library/viewRecord.do?id=4267

5 Philip Berke and Gavin Smith, "Hazard Mitigation, Planning, and Disaster Resiliency: Challenges and Strategic Choices for the 21st Century," *Sustainable Development and Disaster Resiliency*, Ed. Urban Fra: Amsterdam, The Netherlands: IOS Press, 2009. Available at: http://www.ie.unc.edu/cscd/pdf/Berke_Smith_chapter_Fra_editor.pdf

6 Philip Berke, Ward Lyles, and Gavin Smith. Impacts of Federal and State Hazard Mitigation Policies on Local Land Use Policy, Chapel Hill, University of North Carolina at Chapel Hill, 2012. Available at: http://www.ie.unc.edu/cscd/projects/pdf/Berke.Lyles.Smith_CRSDMA_ResearchSummary.pdf

7 Title 44 Code of Federal Regulations (CFR) §201.6(c)(4)(ii), *Local Mitigation Plans*

Opportunities and Benefits

Through effective communication of the opportunities and benefits that exist in your community, local leaders and elected officials can achieve agreement on efforts to integrate hazard mitigation into local planning. As planners know, gaining such agreement and support takes you one giant step toward successful implementation.

Through effective communication of the opportunities and benefits that exist in your community, local leaders and elected officials can achieve agreement on efforts to integrate hazard mitigation into local planning. FEMA/Norman Lenburg

Table 2-1 describes the opportunities for integration and describes benefits that may be used in your messaging to local leaders and elected officials. More specific techniques for how to integrate hazard mitigation into local planning are discussed in Chapter 3.

Table 2-1. Opportunities and Benefits of Integrating Hazard Mitigation into Local Planning

Opportunity	Key Benefits
Comprehensive or General Plan	▪ Promotes consistency within and concurrency between plans ▪ Increases the visibility and may elevate the legal standing of mitigation goals, objectives, and policies ▪ Promotes mitigation as a policy priority across multiple elements (e.g., land use, infrastructure, economic development, environment) ▪ Increases the likelihood of successful hazard mitigation plan implementation ▪ Encourages multi-objective management and planning ▪ Guides future land use and development ▪ Leverages available resources and potential funding opportunities ▪ Improves coordination between planners and emergency managers ▪ Avoids conflicting outcomes resulting from uncoordinated planning ▪ Facilitates more holistic solutions to community problems ▪ Synchronizes geospatial hazard analysis/mapping and policy recommendations ▪ Eliminates redundancies in planning for known hazards ▪ Enhances decision making for post-disaster redevelopment ▪ Provides opportunities for public and stakeholder participation in pre-disaster planning
Zoning Ordinances and Municipal Codes	▪ Promotes development and redevelopment patterns (location, type, density) that are at less risk from known hazards ▪ Reduces potential for damages caused by negligent or imprudent permitting or land use decisions
Building Codes and Standards	▪ Requires design standards for new construction and the repair of existing buildings to be more resistant to hazards ▪ Promotes adoption of building codes with hazard resistant provisions that may exceed minimum standards of existing model codes or design guidelines
Subdivision Regulations	▪ Regulates the division of land parcels in ways that can help avoid or minimize the effects of known hazards ▪ Encourages or requires development applicants to submit plans or complete performance measures that identify the extent of known hazards, and mitigate their potential effects ▪ Ensures that new developments avoid land clearing or construction practices that may exacerbate known hazards ▪ Creates incentives for creative designs that avoid or minimize hazards
Capital Improvement Programs and Other Funding Mechanisms	▪ Leverages funding to implement hazard mitigation measures ▪ Helps ensure that public expenditures for capital improvements are consistent with hazard mitigation goals, objectives, and policies ▪ Provides the opportunity to review and consider the impact of proposed improvements on hazard vulnerability, either directly or indirectly, through supporting private investment in land development ▪ Can help guide new growth to safer areas

Opportunity	Key Benefits
Functional Plans (such as parks and recreation or water quality plans)	▪ Identifies hazard risks specific to a function ▪ Implements best planning practices that reduce or avoid hazard risks
Environmental Resource Management Plans	▪ Considers hazard impacts to natural or cultural resources ▪ Recognizes the value of natural resources as buffers against natural hazards
Area Plans	▪ Targets mitigation measures to a specific area such as a central business district, transportation corridor, or particular neighborhood, and usually in combination with other development or design elements such as land use, transportation, housing, etc.
Site Plan Review (including permitting)	▪ Allows community planners to review relationships between proposed developments and known hazards, as well as consistency with the local hazard mitigation plan ▪ Provides the opportunity to enforce hazard mitigation requirements as a condition for permitting the development, if necessary
Economic Development Strategies	▪ Guides private investment to areas that are safe and in ways that are more resilient to known hazards ▪ Encourages more coordinated planning to achieve mutual objectives focused on protecting, sustaining, and enhancing the community's economic base ▪ Promotes a diverse economic base that has reduced its exposure to hazard risks ▪ Promotes strategies that encourage a more resilient economic base that is able to quickly recover from disasters
Special Programs (e.g., Transfer of Development Rights, Tax Increment Financing, Impact Fees, etc.)	▪ Applies innovative planning or funding techniques to hazard mitigation programs ▪ Promotes safer development patterns without curtailing development or decreasing tax revenues
Safe Growth Evaluation or Assessment (e.g., a safe growth audit or safe growth integration tool as described further in Chapter 3)	▪ Provides an important connection between community development, public safety, and risk management ▪ Reveals the extent to which hazard mitigation principles or practices are successfully integrated into local plans, policies, ordinances, and related government actions that influence the long-term risk to people and property from hazards ▪ Promotes internal consistency, while identifying gaps or conflicts with regard to community development and future hazard vulnerability ▪ Informs decision makers on needed changes or amendments in local planning or policy instruments before unwise development takes place ▪ Identifies opportunities for further integration

Chapter 3: How to Plan Resilient Communities Through Integration

This chapter provides you with an approach to planning more resilient communities through integration, recognizing that each community is unique in size, resources, form, culture, and planning context. The process supports improved integration of mitigation policies, codes, and programs into the existing planning framework, as well as identifying new initiatives that reduce risks from natural hazards, and potentially manmade hazards or threats as well.

Planning framework is the collection of plans, policies, codes, and programs that guide development in your community, how those are maintained and implemented, and the roles of people, agencies, and departments in evaluating and updating them.

The process includes these basic steps:

Step 1: Assess Your Community's Planning Framework with a Lens for Resilience
Become familiar with the risks facing your community and assess your community's capacity to plan and implement mitigation activities. Review your existing hazard mitigation plan and local planning policies, regulations, and programs to identify the areas of overlap or gaps where integration is needed.

Step 2: Inform and Engage Local Leadership, Staff, and Stakeholders
Identify key players, build support for hazard mitigation integration, collaborate with stakeholders, and establish regular channels for interdepartmental or interagency communication and cooperation.

Step 3: Establish an Integration Agenda of Resilient Community Principles and Actions
With leadership and stakeholder input, establish informed and practical objectives for integrating policies and hazard mitigation actions throughout your community planning framework.

Step 4: Be Opportunistic!
Look for ways to use current projects, future initiatives, or potential funding opportunities as vehicles for implementing aspects of your hazard mitigation plan or other resilient community principles.

Step 5: Monitor, Measure, Report, Repeat
Establish metrics and benchmarks to determine whether and to what extent your efforts reduce losses and increase resilience. Keep the channels of communication open with regular reporting to decision makers. Continue the cycle.

The steps above can be completed at any time. However, if developing or updating your community's mitigation plan, these steps can assist you in meeting the requirement to describe the community's process to integrate mitigation plan goals, actions, or other information into other planning mechanisms.[1] The following describes each step in detail and identifies supporting resources for further information.

Step 1: Assess Your Community's Planning Framework with a Lens for Resilience

Each community's approach to preventing or minimizing disaster losses through local planning may vary depending on several factors, including:

- Types of risks associated with hazards present in your community;
- Your leadership and the public's knowledge of risks and how to mitigate them;
- The existing planning and regulatory framework; and
- The resources available to planning staff and stakeholders to act.

1 Title 44 Code of Federal Regulations (CFR) §201.6(c)(4)(ii), *Local Mitigation Plans*

For example, a smaller community with a limited set of plans and ordinances and limited staff dealing primarily with localized flooding may select from a narrower set of possible mitigation approaches than a much larger community with a more complex planning framework or a planning area that covers multiple jurisdictions facing multiple hazards.

Therefore, the first step toward planning a more resilient community is to understand your community's current situation. You can begin by reviewing your community's hazard mitigation plan to gain an understanding of the types of risks facing your community and your existing hazard mitigation strategies.

The first step toward planning a more resilient community is to understand your community's current situation. FEMA/Hans Pennink

Next, identify what your community is already doing to address resiliency in terms of natural hazards. Inventory and document your community's local planning framework. What plans, policies, regulations, and programs does your community have? What tools are available to you? As you conduct this inventory, be sure to include the local plans, policies, regulations, and programs that may already address hazards and community resiliency. Some of these are likely already captured in your local hazard mitigation plan as part of a review of community capabilities, authorities, and other resources available to accomplish mitigation (commonly referred to as a capability assessment.)

You can then begin to identify the gaps and overlaps between your current hazard mitigation plan and the larger planning framework, and find those existing tools that may provide opportunities for integration. This chapter presents two evaluation tools to assist you in identifying gaps and overlaps: the Safe Growth Audit described on page 3-11 and a Safe Growth Integration Tool described on page 3-17.

One important component is to consider the ability or capacity of your community to act. A community with limited staff and resources may need a very targeted mitigation strategy and may need to take smaller steps using existing resources. Conversely, a community with a large and sophisticated planning department may have more resources available, but the challenge may lie in focusing those resources in an efficient way.

Example 3-1. A Strong Foundation: Augusta-Richmond County's Framework for Continued Integration

Augusta-Richmond County, Georgia, set a precedent for integration with their 2012-16 Multi-Jurisdictional Hazard Mitigation Plan. The plan incorporates elements of existing plans and requires that new or updated planning documents of individual jurisdictions be consistent with the goals and strategies of the plan. Refer to Chapter 5 for an in-depth case study.

Review Existing Hazard Mitigation Strategies

One of the reasons that gaps exist between hazard mitigation planning and the broader planning framework is because community planners are generally not directly involved in hazard mitigation planning or well-versed in hazard mitigation plan requirements. Federal regulations and FEMA's planning requirements have required elements that all hazard mitigation plans must contain.

The primary required elements for a local hazard mitigation plan include:[2]

- **Planning Process**
  - Public participation
  - Review existing plans, studies, reports, and technical information
  - Documentation of planning process
  - Adoption by local governing bodies of jurisdictions covered under the plan

2 Title 44 Code of Federal Regulations (CFR) §201.6, *Local Mitigation Plans*

- **Hazard Identification and Risk Assessment**
  - Identify and profile local hazards, including descriptions of the type, location and extent of hazards, as well as information on previous occurrences and the probability of future hazard events
  - Assess vulnerability and potential consequences of hazards, including identifying vulnerable community assets, analyzing development trends, and determining potential impacts or losses
- **Mitigation Strategy**
  - Establish local hazard mitigation goals
  - Identify and analyze mitigation actions, including an assessment of existing plans and programs and the jurisdiction's capability to implement mitigation
  - Define an implementation plan for mitigation actions
  - Incorporate into existing planning mechanisms
- **Plan Review, Evaluation, and Implementation**
  - Monitor, evaluate, and update plan
  - Revise the plan to reflect changes in development and progress in mitigation efforts

From this outline alone, you may begin to see where your broader community planning framework could incorporate some of these features into existing plans, policies, capital improvement programs, or budgets. In addition to understanding how a hazard mitigation plan works, you should have an understanding of the general types of mitigation measures that are implemented to reduce risk. Generally, mitigation actions can be organized into the following categories:[3]

- **Local Plans and Regulations**

  These include government authorities, policies, or codes that influence the way land and buildings are developed and built. Examples include comprehensive plans, land use ordinances, building codes and enforcement, subdivision regulations, development review, National Flood Insurance Program (NFIP) floodplain management ordinances, capital improvement programs, open space preservation, and stormwater management regulations and master plans.

- **Structure and Infrastructure Projects**

  These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. Examples are acquisitions, elevation, utility undergrounding, and structural retrofits. This type of action also involves construction of manmade structures that reduce the impact of hazards, such as floodwalls, retaining walls, detention and retention structures, culverts, and safe rooms. Many of these types of projects are eligible for funding through the FEMA Hazard Mitigation Assistance programs.[4]

- **Natural Systems Protection**

  These are actions that minimize damage and losses and preserve or restore the functions of natural systems. Examples include sediment and erosion control, stream corridor restoration, forest management, conservation easements, and wetland restoration and preservation.

- **Education and Awareness Programs**

  These are actions that inform and educate citizens, elected officials, and property owners about hazards and ways to mitigate them. Such actions include radio or television spots, websites with maps and information, real estate disclosure, presentations to school groups or neighborhood organizations, and mailings to residents in hazard-prone areas. These actions may also include participation in national programs, such as StormReady[5] or Firewise[6] Communities. Although this type of mitigation is more indirect than structural projects that directly reduce risk, it is an important foundation. A greater understanding and awareness of hazards and risk is more likely to lead to direct action.

Opportunities for Integration Into Your Community Planning Framework

How you integrate existing or develop new hazard mitigation strategies can depend on the planning tools that are at your disposal. The following are some of the places you may check to see if your community has assessed or planned for hazards:

3 Federal Emergency Management Agency, *Local Mitigation Planning Handbook*, Washington, Federal Emergency Management Agency, 2013. Available at: http://www.fema.gov/hazard-mitigation-planning-resources

4 For more information on the Hazard Mitigation Assistance (HMA) Grant Programs, go to: http://www.fema.gov/hazard-mitigation-assistance

5 For more information on the National Weather Service StormReady program, go to: http://www.stormready.noaa.gov/

6 For more information on Firewise Communities, go to: http://www.firewise.org/

Comprehensive or General Plans

A comprehensive or general plan sets the overall policy direction for a community's future development. Depending on State planning enabling legislation, local land use policy and related development regulations may be required to conform to comprehensive plan policies. However, even in situations where such a legal requirement does not exist, a comprehensive plan can give additional credibility for implementing mitigation actions. Integrating hazard mitigation goals into comprehensive plans can elevate the importance of hazard mitigation throughout the planning framework.

The content of comprehensive plans varies depending on State or local requirements, as well as the unique needs of a community, but generally may include some or all of the following elements:

- Community vision and overall goals;
- Existing conditions;
- Land use;
- Transportation;
- Housing;
- Environmental and natural resources conservation;
- Recreation and open space;
- Cultural resources;
- Historic preservation;
- Economic development;
- Public facilities and services;
- Capital improvements;
- Implementation;
- Goals, policies, and objectives relating to each plan element; and
- Mapping of existing and future land uses, infrastructure, public facilities, and environmental features.

Consider including hazard identification, risk assessment information, and hazard mitigation goals in the comprehensive plan. Language on hazard mitigation strategies or actions may be integrated across all elements of the plan. Additionally, a separate public safety or hazard element could be added to the comprehensive plan, or a "checklist" or matrix of sorts might be considered for inclusion as an appendix to the plan to track where and how hazard mitigation is integrated throughout each element. Comprehensive plans frequently include future land use maps that guide zoning and other development regulations. The future land use map can be used to guide development away from high hazard areas.

Example 3-2. Integrating Hazard Mitigation Into a Local Comprehensive Plan: City of Berkeley, California

The City of Berkeley, California, successfully integrated hazard mitigation content throughout nearly all elements of its General Plan, which is also formally linked to the City's local hazard mitigation plan. Refer to Chapter 5 for an in-depth case study, as well as a more generic example of how hazard mitigation may be integrated into the various elements of a local comprehensive plan. Both examples highlight the relationship between each element and federal requirements for local hazard mitigation plans (Title 44 Code of Federal Regulations §201.6).

Example 3-3. California Climate Change

California has enacted a series of laws, regulations, and executive orders intended to prevent and adapt to climate change impacts using integrated planning. The California Global Warming Solutions Act (AB32) sets greenhouse gas emission reduction goals, and the California Environmental Quality Act (CEQA) requires local governments to analyze how future climate change may affect development under their general (comprehensive) plan. For example, general plan policies should reflect any increased risks and minimize the hazards for current and future development. A substantial number of California communities are addressing climate change in their general plan updates through both mitigation and adaptation policies. These measures are not limited to one element of the plan (i.e., a separate element on climate change or the required "mitigation element") but are rather woven throughout all elements, including but not limited to land use, housing, capital improvements, community design, conservation, and open-space.[7]

The land use element of a comprehensive plan is not the only element pertinent to hazard mitigation. High hazard areas can be identified as opportunities for acquisition or preservation within the recreation, open space, or environmental plan elements or maps. Such areas often provide natural and beneficial functions, and can serve as buffers between

7 For more information on California Climate Change, go to: http://www.climatechange.ca.gov/

hazards and developed areas to help mitigate the effects of some hazards. For example, wetlands and stream buffers can provide additional flood storage, potentially reducing flood damage to developed areas, as well as improving water quality.

Example 3-4. Integrating a Health and Safety Element in a General Plan: Kings County, California

The 2035 Kings County General Plan guides the physical growth, land use, and development of the county through 2035. The plan incorporates a health and safety element intended to reduce or eliminate long-term risk to people and property from natural or manmade hazards. The element describes and maps known hazards, hazardous land uses, and evacuation routes. In addition to the mitigation of natural hazards, the element identifies goals, objectives, and policies related to land use and patterns of development that affect the health, well-being, and property protection of county residents.[8]

Zoning Ordinances and Municipal Codes

Zoning ordinances are among the most common tools available to community planners. Zoning controls the location, type, and intensity of land uses and may contain provisions to regulate height, bulk, dimension, setbacks, stormwater management, and other physical characteristics of development. Other development regulations may include subdivision ordinances, design standards, site development standards such as landscaping standards, overlay zoning, and critical areas regulations. Floodplain development regulations, which are required of communities that participate in the NFIP, would be included in this category as well.

These types of regulations provide many effective ways to address resiliency to known hazards. Zoning, including overlay zones, can be used to guide development away from hazard areas, such as by prohibiting development in a landslide hazard area, or limiting specific uses, such as prohibiting the placement of hospitals or other essential community facilities in a floodplain. Subdivision, site development, and critical areas ordinances can affect the location of development as well, either through development restrictions such as prohibiting development immediately adjacent to the urban/wildland interface, or through flexible permitting provisions such as planned unit developments, cluster subdivisions, or density transfer that allow for intensive use of suitable land in exchange for the preservation of land more at risk from hazards.

Capital Improvement and Infrastructure Programs

Capital Improvement Programs (CIPs) and other infrastructure-related programs such as Transportation Improvement Programs (TIPs) establish spending priorities, typically over a five or six year period. CIPs and TIPs identify specific projects and target funds to complete the projects on the list. Such programs typically include important public improvements such as wastewater treatment plants, water and sewer lines, fire stations, or roadway expansions. Many of these improvements are critical facilities that are vital to the functioning of a community and warrant careful attention to hazard risks. The placement and design of such facilities should ensure their continued functioning in the event of a disaster.

CIPs often fund structural mitigation measures, including stormwater drainage improvements or retrofitting public facilities and infrastructure to better withstand the forces of nature. The CIP may be the main implementation vehicle for such projects. It is important; therefore, to ensure that major structural mitigation projects that are identified in your hazard mitigation plan become part of your CIP.

Capital improvements can also profoundly affect how and where a community grows. Constructing a major sewer trunk line or a highway interchange can open up previously undeveloped areas to growth. Communities should be strategic about such improvements and consider whether public investments may encourage growth in high risk areas.

Area Plans

Area, subarea, district, neighborhood, corridor, or similar plans that focus on a defined area within a community provide excellent opportunities to integrate hazard mitigation in a targeted way. For example, a waterfront district plan may be subject to flooding or wind and wave hazards associated with the water feature. Identifying and recognizing the hazard can help form the foundation for the district plan and guide its policies. Structural measures or wetland preservation may be proposed and possible locations mapped in the plan.

8 For more information on Integrating a Health and Safety Element in a General Plan, go to: http://www.countyofkings.com/planning/2035%20General%20Plan.html

Example 3-5. Waterfront Revitalization Program: New York City

The City of New York adopted an area plan called the Waterfront Revitalization Program (WRP) with the purpose of establishing guidelines and policies for redevelopment and new development along the coastline. The WRP covers a variety of issues, including hazard mitigation. The plan includes policies to minimize the loss of life, structures, and natural resources caused by flooding and erosion. Coastal floodplain management and structural security are identified as important issues for the revitalization and long-term sustainment of the New York City waterfront area.[9]

Functional Plans

Functional plans focus on functions or services such as stormwater management, public utilities, transportation, or open space planning. These plans may consider the entire area of a community, have a regional focus, or be related to the boundaries of a special district such as a water district service area. Functional plans can provide opportunities for hazard mitigation integration, specifically as it relates to the function. Examples include:

- **Stormwater Management Plans**
  A stormwater management plan identifies the contribution that stormwater infrastructure makes to a flood hazard and identifies policies or improvements that can be made to mitigate the hazard. Localized flooding may be created or exacerbated by channeling stormwater runoff. Implementing low-impact development stormwater management techniques may be proposed as a way to mitigate this impact.
- **Wastewater Management Plans**
  A sewer pump station located in a floodplain, for example, poses a significant threat to the sanitary sewer system in the event of a major flood event. The wastewater management plan may propose flood protection for the station or placing the pump station in a location not subject to the flood hazard.
- **Park, Recreation, and Open Space Plans**
  Most park, recreation, and open space plans address natural and open spaces throughout a jurisdiction's geographic boundaries, as well as the purpose and needs of parks and facilities. These plans provide significant opportunities to dovetail with larger hazard mitigation planning efforts. Open space is often an appropriate use of hazard areas and can be used to buffer developed areas from hazards.
- **Transportation Plans**
  Transportation plans establish priorities for major transportation improvements, including mass transit. Transportation plans may also contain standards, such as street cross sections. The transportation plan may consider hazards when identifying potential new transportation corridors, both to avoid hazards and to avoid inducing new development in high hazard areas.
- **Economic Development Plans**
  In this type of functional plan, methods and goals to guide private investment to areas that are less vulnerable to known hazards encourage mutual public and private objectives focused on protecting, sustaining, and enhancing the community's economic base. Such opportunities may also include structural or other protective measures of commercial areas, business continuity planning, or activities that promote a diverse economic base that is not overly reliant on businesses or industries that are particularly vulnerable to the impacts of disasters. Economic development plans can also highlight the rationale for infrastructure projects that prevent impacts or disruption to the business community and support long-term economic stability.
- **Emergency Operations Plans**
  Local emergency operations plans (EOPs) describe what the local government will do when conducting emergency operations. These functions focus on actions, such as direction and control, warning, public notification, and evacuation, that the local government will take during the initial phase of response operations. While mainly focused on delineating roles, responsibilities, and procedures as required, local EOPs also typically include an analysis of potential natural and manmade hazard threats to the community that may result in an emergency or disaster situation.

9 For more information on the Waterfront Revitalization Program, go to: http://www.nyc.gov/html/dcp/html/wrp/index.shtml

- **Post-Disaster Recovery and Reconstruction Plans** Though broader in scope than the other types of functional plans, a post-disaster recovery and reconstruction plan is a vital tool for any community facing hazard risks. The purpose of such a plan is to make advance planning decisions and formalize a process to guide long-term recovery and redevelopment after a disaster. This type of planning goes beyond the operations and disaster response procedures typically captured in an emergency management plan. Long-term recovery planning considers housing or business area reconstruction or economic redevelopment over a timeline of five or more years. It is important to consider long-term recovery prior to a disaster because the pressure to rebuild quickly after a disaster can often lead to short-term decisions with long-term effects that compromise the overall resilience of a community. A post-disaster recovery and reconstruction plan can identify roles and responsibilities of key people, departments, and agencies; address the need for temporary regulations such as post-disaster building moratoria; potential impacts to historic resources; potential impacts to non-conforming uses; and location and other provisions for temporary housing. The plan may also seek to integrate long-term hazard mitigation goals.[10]

Example 3-6. Hillsborough County Post-Disaster Redevelopment Plan (PDRP)

The Hillsborough County Post Disaster Redevelopment Plan (PDRP) was one of the pilot PDRPs prepared as a result of the State of Florida Post-Disaster Redevelopment Planning Initiative. It is a comprehensive approach for long-term holistic community recovery following a major disaster. The plan addresses a wide variety of redevelopment topics and is the first Florida PDRP to have a chapter dedicated to health and social services.[11]

Potential Funding Tools

A variety of special programs may provide opportunities to meet community goals for resiliency. Transfer of Development Rights (TDR) programs are used for farmland, natural area, or open space preservation. A TDR works by identifying a "sending area," which is the area targeted for preservation, and a "receiving area," which is an area appropriate for more intensive development. The development rights of the sending area can then be sold or transferred to properties in the receiving area. Such a program can provide an effective incentive to steer development away from high hazard areas. Other programs may include Tax Increment Financing (TIF) local improvement or business improvement districts. For example a local improvement district could levy a special tax on an area to generate funds to provide public hazard protection measures in that area, such as an impact fee. A TIF program could be used as an incentive for development in an area targeted for safe growth, potentially offsetting the pressure to develop in high hazard areas.

Site Plan (Project) Review

Site plan or project permit review and approval criteria may include specific standards for evaluating risks and requiring safe growth best practices. Such criteria can be codified using the zoning and municipal code controls discussed above. The effectiveness of such criteria can be reinforced by providing guidance to project applicants, such as checklists or handouts. Subdivision or site plan reviews provide excellent opportunities to proactively address hazard mitigation in new construction.

Neighborhood design and site planning in your community may be built around smart growth principles. Smart growth and hazard mitigation are not mutually exclusive and thoughtful planning can incorporate both. For example, among the basic Smart Growth Principles,[12] taking advantage of compact building design and preserving open space, farmland, natural beauty, and critical environmental areas are effective methods to protect new development or redeveloped areas from the impacts of natural hazards.

10 For more information, see "Planning for Post-Disaster Recovery and Reconstruction," *Planning Advisory Service Report*, No. 483/484, Chicago, American Planning Association, 1998. Excerpts available at: http://www.fema.gov/library/viewRecord.do?id=1558

11 For more information on the Hillsborough County Post-Disaster Redevelopment Plan, go to: http://www.hillsboroughcounty.org/index.aspx?NID=1793

12 For more information on Smart Growth, go to: http://www.epa.gov/smartgrowth/index.htm

Building Codes

Codes provide minimum safeguards for people with regard to building safety and fire prevention. Codes protect health, safety, and welfare as they relate to the residential and commercial built environment. Standard building codes, such as the one developed by the International Code Council (ICC),[13] typically serve as the recommended or state adopted model for what a community adopts as its own local codes. These codes are only a minimum and higher standard codes would greatly improve the resilience of a community. When a hazard profile is done in the mitigation plan, the building codes can be reviewed to see if they sufficiently meet the standards needed to adequately protect lives and property from the forces of known hazards.

Example 3-7. Improved Building Code: Broward County

Starting in the 1950s when several devastating hurricanes made it obvious that strong Building Code provisions were needed in South Florida, a panel of experts, including architects, engineers, builders, and industry representatives began a search for a code relevant to South Florida needs. The panel working on designing a code reflecting local conditions started with the Uniform Building Code as a model. From there, they worked with the American Society of Civil Engineers (ASCE) and other research groups to devise wind-loading design to be incorporated into the new South Florida Building Code (SFBC). The SFBC was designed as a model that could be flexible enough to be adopted by any municipality or by the unincorporated section of a county. Broward County, Florida adopted a slightly modified version of the SFBC, applicable to the unincorporated portions of the county, on March 9, 1976. It was also made a mandatory standard for all municipalities within Broward County.[14] Following the devastation wrought by Hurricane Andrew in 1992, the State of Florida began developing improved building codes, based off of the SFBC. In 2001, the State adopted the Florida Building Code (FBC)[15] which contained the test protocols for high velocity hurricane zones. Since then, the State has made revisions to the code every few years to keep it up to date and encourages local communities to adopt even more stringent code requirements tailored to their jurisdictions, if appropriate.

13 For more information on the International Code Council (ICC), go to: http://www.iccsafe.org

14 For more information on the history of the SFBC in Broward County, go to: http://www.broward.org/CODEAPPEALS/Pages/HistorySouthFloridaBuildingCode.aspx

15 For more information on the FBC, go to: http://www.floridabuilding.org/c/default.aspx

Safe Growth Audit

Performing a Safe Growth Audit[16] is a way to assess how well your existing planning tools address hazard risks and community resiliency. Figure 3-1 presents a set of Safe Growth Audit questions intended to provide a systematic way to review local planning tools and identify the presence of, or need for, hazard-related actions.

A more detailed description of how to use this Safe Growth Audit can be found in the Hazard Mitigation: Integrating Best Practices into Planning[17] report published by the American Planning Association. As contributing author David Godschalk summarizes in a related article:

> *"Conducting a Safe Growth Audit can help to prevent future growth conflicts. If the community and its elected officials understand how their zoning and subdivision ordinances allow growth in hazardous areas, they can revise these ordinances before property owners embark on risky projects. If they understand how their comprehensive plans fail to guide growth to safe locations, they can amend the plans. If they understand how their capital improvement programs encourage unsafe growth, they can change their utility provision policies."*[18]

This statement raises the important point that leadership, staff, and stakeholders be engaged in your Safe Growth Audit and in integrating hazard mitigation into the community planning framework—which leads us into Step 2 of your integration effort.

16 David R. Godschalk, "Safe Growth Audits," *Zoning Practice*, No. 10, Chicago, American Planning Association, 2009. p. 2-7. Available at: http://www.planning.org/zoningpractice/open/pdf/oct09.pdf

17 American Planning Association, "Hazard Mitigation: Integrating Best Practices into Planning," *Planning Advisory Service Report*, No. 560, Chicago, American Planning Association, 2010. p. 74-86. Available at: http://www.fema.gov/library/viewRecord.do?id=4267

18 David R. Godschalk, "Safe Growth Audits," *Zoning Practice*, No. 10, Chicago, American Planning Association, 2009. p. 2-7. Reprinted with permission from the American Planning Association (APA). Available at: http://www.planning.org/zoningpractice/open/pdf/oct09.pdf

Figure 3-1. Basic Safe Growth Audit Questions

BASIC SAFE GROWTH AUDIT QUESTIONS

COMPREHENSIVE PLAN

Land Use

- Does the future land-use map clearly identify natural-hazard areas?
- Do the land-use policies discourage development or redevelopment within natural-hazard areas?
- Does the plan provide adequate space for expected future growth in areas located outside of natural-hazard areas?

Transportation

- Does the transportation plan limit access to hazard areas?
- Is transportation policy used to guide growth to safe locations?
- Are movement systems designed to function under disaster conditions (e.g., evacuation)?

Environmental Management

- Are environmental systems that protect development from hazards identified and mapped?
- Do environmental policies maintain and restore protective ecosystems?
- Do environmental policies provide incentives to development that is located outside of protective ecosystems?

Public Safety

- Are the goals and policies of the comprehensive plan related to those of the FEMA Hazard Mitigation Plan?
- Is safety explicitly included in the plan's growth and development policies?
- Does the monitoring and implementation section of the plan cover safe-growth objectives?

ZONING ORDINANCE

- Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?
- Does the ordinance contain natural-hazard overlay zones that set conditions for land use within such zones?
- Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?
- Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?

SUBDIVISION REGULATIONS

- Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?
- Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?
- Do the regulations allow density transfers where hazard areas exist?

CAPITAL IMPROVEMENT PROGRAM AND INFRASTRUCTURE POLICIES

- Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?
- Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?
- Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?

OTHER

- Do small area or corridor plans recognize the need to avoid or mitigate natural hazards?
- Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?
- Do economic development or redevelopment strategies include provisions for mitigating natural hazards?
- Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?

Source: Godschalk 2009

Source: "Safe Growth Audits," Zoning Practice, *2-7. October 2009. Reprinted with permission from the American Planning Association http://www.planning.org/zoningpractice/open/pdf/oct09.pdf.*

Step 2: Inform and Engage Local Leadership, Staff, and Stakeholders

The importance of identifying, informing, and engaging multiple stakeholders should not be lost on community planners. One of your key roles is to act as a bridge between different constituencies and mobilize the expertise of multiple technical disciplines. The value of this role with regard to community resilience cannot be overstated. By their nature, disasters affect the whole community and require integrated solutions. However integration is not just a matter of plans, policies, regulations, and programs, it is also one of communication and cooperation among people, departments, and agencies.

Identify Key Contributors

Key people, departments, and agencies generally include:

- **Decision Makers and Leaders**
  Engage as much as possible with local elected officials and other leaders, such as the mayor, city council members, county commissioners, planning commission members, city managers, and department directors through both formal and if capable, informal environments. Be sure to identify financial and legal risk managers within the community, including the finance director, city attorney, and others. In some cases with appropriate approval, you may need to engage leaders from outside the community, such as State or U.S. legislators.

- **Other Departments**
  Hazard mitigation is multi-disciplinary and involves active communication and cooperation among local departments, including planning, emergency management, public works, transportation, natural resources, economic development, public utilities, fire, police, and others.

- **Partner Agencies and Communities**
  Hazards do not follow jurisdictional boundaries and often warrant cooperative approaches with neighboring communities, regional agencies, special districts such as water districts or transit agencies, and State or Federal agencies with missions relating to planning, environmental resources, economic development, transportation, and others.

- **Stakeholders**
  Implementing hazard mitigation through land use planning affects a variety of stakeholders, such as individuals and non-governmental organizations (NGOs), including builders, consultants, environmental groups, neighborhood organizations, business associations, or chambers of commerce. Identify and involve your targeted stakeholders early and often.

- **Technical Experts**
  Effective hazard mitigation planning requires the assistance of technical experts in a range of fields including emergency managers, engineers, environmental professionals, geographic information systems (GIS) specialists, and others. Engage both local staff and outside experts as advisors.

- **General Public**
  As with any planning effort, the public must be engaged to bring the greatest range of perspectives, which increases long-term effectiveness through citizen awareness, participation, and buy-in.

Example 3-8. Stakeholder Engagement: Charlotte-Mecklenburg

After dealing with severe floods in the mid-1990s that caused significant damage to areas outside the Special Flood Hazard Area, the rapidly growing Charlotte-Mecklenburg, North Carolina, metropolitan area undertook the Future Land Use Map and Future Floodplain Initiative to map the potential extent of future flood events based on projected build-out conditions. Because this initiative would lead to the regulation of new construction in a "Community Floodplain" that was larger than that previously mapped by FEMA, it had the potential to run into opposition from landowners. In recognition of this concern, community officials brought a broad range of stakeholders to the table, including developers, environmentalists, community organizations, planners, engineers, county commissioners, city officials, and staff to guide the development of the program. Hydrologic modeling used to generate the new maps was aided through data sharing and an online interactive floodplain map viewer made the results available to the public. The transparent way in which the modeling was conducted and inclusion of various stakeholders allowed the new maps and regulations to be produced with a high level of buy-in and without the kind of backlash that may have occurred in the absence of such a stakeholder involvement effort.[19]

19 American Planning Association, "Hazard Mitigation: Integrating Best Practices into Planning," *Planning Advisory Service Report*, No. 560, Chicago, American Planning Association, 2010. p. 74-86. Available at: http://www.fema.gov/library/viewRecord.do?id=4267

Inform and Engage Local Leadership

Consider a variety of approaches to advocate for the importance of hazard mitigation to overall community resilience. For example, be mindful of "making a case" to your leadership, the public, and other stakeholders of the policy decisions that have been made in the past, and why these may or may not be best planning practices today. This includes valuable background information about existing hazards and about the benefits and trade-offs of potential mitigation actions.

The message of your engagement effort should be crafted with the audience in mind. Consider what resonates with current senior leadership or how your resiliency goals link to other community objectives. For example, protecting the economy or tax base, addressing climate change, preserving natural resources or open space, or promoting economic development may be issues of particular importance within the community. If economic development is a significant issue facing your community, then discussing resilient policies that relate to the economic development plan may be fertile ground for progress.

Preserving natural resources or open space, protecting the economy or tax base, addressing climate change, or promoting economic development may be issues of particular importance within the community. FEMA/Marvin Nauman

Create Formal Channels of Communication

Communication with leadership might take the form of presentations or workshops during council sessions, special seminars, distribution of electronic materials, or one-on-one communication. When possible, consider "piggybacking" your outreach or engagement efforts with other opportunities to get in front of community leadership, such as annual reports, budget meetings, or other regular meetings. Likewise, it is beneficial to formally establish various channels of communication and cooperation among departments, agencies, stakeholders, and the public. Such channels may include establishing a technical advisory group focused on hazard mitigation, inter-local agreements, or memoranda of agreement between communities or agencies, mail or email distribution lists, websites, or social media.

Convening a formal advisory group may be an effective method to engage other stakeholders and find technical expertise that exists in your community. A public information campaign that uses local media and community assets, such as local government websites, to disseminate information and solicit comments can foster public awareness and involvement.

Example 3-9. Interagency Coordination: Pennsylvania Silver Jackets Team

The Pennsylvania Silver Jackets Team is an interagency team dedicated to working collaboratively with the Commonwealth and appropriate stakeholders in developing and implementing solutions to flood hazards by combining available agency resources, including funding, programs, and technical expertise. Partners include Federal, Commonwealth, and regional government agencies and non-governmental organizations, as well as professional associations focused on emergency management, natural resources, economic development, transportation, housing, and others. The program is integrated with the State Hazard Mitigation Plan and focuses on mitigating Severe Repetitive Loss (SRL/RL) properties, interagency program guidance, outreach, and education.[20]

Find Champions

A local advocate or "champion" is someone who takes it upon him or herself to promote safe growth. A local elected official may be a champion by working to craft and introduce legislation to further safe growth goals or by advocating for safe growth in public forums. A department director or staff member may be a champion by identifying and pursuing opportunities for hazard mitigation integration in current projects. Citizens may be champions by voicing their support, engaging their neighbors, and volunteering their time and skills. Finding champions can ensure that hazard mitigation integration is not just a planning exercise, but is an issue of importance that retains visibility and momentum.

20 For more information on the Pennsylvania Silver Jackets Team, go to: http://www.nfrmp.us/state/factPennsylvania.cfm

Step 3: Establish an Integration Agenda of Resilient Community Principles and Actions

As described under Step 1, the Safe Growth Audit challenges us with safe growth questions that can help you analyze the impacts of current policies, ordinances, and plans on community resiliency to hazards due to growth and development or redevelopment. This is also an opportune time to begin identifying gaps in your community planning framework related to risks. Identifying and understanding these gaps and opportunities is a critical step in establishing an agenda that encompasses resilient community principles and actions with the sustained integration of hazard mitigation in mind.

Identify Gaps and Integration Opportunities

This section introduces a recommended process through the assistance of a functional worksheet, referred to as the Safe Growth Integration Tool, which can be adapted to help you identify and graphically illustrate the gaps and potential areas of overlap between hazard mitigation and your local planning framework.

Safe Growth Integration Tool

The Safe Growth Integration Tool is a potential method to evaluate, assess, and prioritize integration opportunities. Figure 3-2 shows an example of a completed basic worksheet, assuming use by a hypothetical community. This tool is an example of how a Safe Growth Audit can be initiated and the tool can be modified and expanded to reflect your local situation. Along one axis, list the components of your existing hazard mitigation plan, including mitigation goals and objectives, categories of mitigation techniques, and specific mitigation actions. Along the other axis, list your existing planning tools. Then identify both existing and potential areas of overlap as well as gaps or identified weaknesses in terms of resiliency to hazards. You can use this matrix to help find "homes" for existing mitigation actions within your existing planning framework, and to identify local planning tools that do not currently address hazards as they should. Appendix A has detailed instructions and a blank worksheet you can use to build your own Safe Growth Integration Tool.

Figure 3-2. Example Safe Growth Integration Tool

✓ = Area of Existing Overlap ★ = Gap Between Mitigation Plan and Planning Framework				PLANNING FRAMEWORK							
				Comprehensive/ General Plan Elements			Zoning Ordinances and Development Regulations			Capital Improvement and Infrastructure Programs	
				Hazards	Land Use	Environment	Zoning	Subdivision	Critical Areas	CIP	TIP
HAZARD MITIGATION	Risk Assessment			✓	✓	✓					
	Mitigation Goals and Objectives			✓	✓	✓					
	Mitigation Actions	Local Plans and Regulations	Hazard Area Avoidance	✓	✓	✓	✓	✓	✓	✓	✓
			Parks and Open Space Planning		✓	✓	✓			★	
			Stormwater Regulations	★							
		Education and Awareness Programs	Hazard and Risk Awareness	✓							
			Mitigation Best Practices	✓						✓	✓
			Monitoring and Reporting	✓							
		Natural Systems Protection	Watershed Management			✓			✓		
			Wetland Preservation			✓	✓	★	✓		
			Erosion and Sedimentation								
		Structure and Infrastructure Projects	Levees							✓	
			Structural Retrofits							✓	★
			Acquisition							✓	
			Stormwater Structures							✓	

Figure 3-2. Example Safe Growth Integration Tool (Continued)

✓ = Area of Existing Overlap
★ = Gap Between Mitigation Plan and Planning Framework

				PLANNING FRAMEWORK									
				Area Plans			Functional Plans			Special Programs		Public and Stakeholder Engagement	
				Downtown	Highway Corridor	Waterfront	Stormwater	Economic Dev.	Open Space	TDR	TIF	Council	Advisory
HAZARD MITIGATION	Risk Assessment			✓	✓	✓							
	Mitigation Goals and Objectives			✓	✓	✓							
	Mitigation Actions	Local Plans and Regulations	Hazard Area Avoidance	✓	✓	✓		✓	✓	✓	✓		
			Parks and Open Space Planning	★	★	★			✓	✓			
			Stormwater Regulations				✓						
		Education and Awareness Programs	Hazard and Risk Awareness					★				✓	✓
			Mitigation Best Practices					✓				★	★
			Monitoring and Reporting									✓	✓
		Natural Systems Protection	Watershed Management							✓			
			Wetland Preservation						✓	✓			
			Erosion and Sedimentation				✓						
		Structure and Infrastructure Projects	Levees										
			Structural Retrofits										
			Acquisition						✓				
			Stormwater Structures										

Identify Gaps and Integration Opportunities

After you have identified gaps and integration opportunities, you can devise potential mitigation strategies, map out needed linkages among existing plans, policies, regulations, and programs, and prioritize those that address the greatest need or that can provide the most benefit to community resiliency. Table 3-1 presents some examples of opportunities that may be identified through this process.

Table 3-1. Integration Opportunities

Planning Framework Components	Integration Opportunities
Comprehensive or General Plan	▪ Map hazards ▪ Profile hazards and risks ▪ Establish safe growth goals, objectives, and policies ▪ Adopt and incorporate hazard mitigation plan goals ▪ Create hazards element chapter ▪ Discourage and/or prohibit development or redevelopment in high hazard areas ▪ Illustrate areas of shared interest in other element chapters ▪ Target growth for low hazard areas ▪ Implement urban containment (e.g., urban growth areas) where outward growth presents hazard risks ▪ Create safe growth implementation and monitoring objectives
Zoning Ordinances and Municipal Codes	▪ Ensure that zoning and other codes implement safe growth goals, objectives, and comprehensive plan policies ▪ Create hazard overlay zones ▪ Limit development in high hazard areas ▪ Identify high hazard areas for uses that are less susceptible to hazard impacts (e.g., open space) ▪ Preserve environmentally critical areas (e.g., wetlands, floodways, steep slopes), require buffers ▪ Enact higher regulatory standards for floodplain and wildfire protection; participate in NFIP CRS program and Firewise ▪ Use density and land use controls to limit potential impacts in high hazard areas ▪ Enact flexible development provisions (e.g., cluster subdivisions, density transfer, PUDs, mixed use, form-based zoning) ▪ Use subdivision controls to limit development in high hazard areas ▪ Establish design guidelines that incorporate mitigation measures (e.g., guidelines to fit elevated structures into local architectural context) ▪ Create zoning or permitting incentives to encourage growth in less hazard-prone areas ▪ Identify mitigation measures appropriate to support historic preservation goals

Planning Framework Components	Integration Opportunities
Building Codes	▪ Update the state or local building codes to the International Building Code (IBC) and the International Residential Code (IRC) ▪ Compare current code to identified hazards to see if it is sufficient to protect the public ▪ Incorporate disaster resilient building code into the update
Capital Improvement Plans and Infrastructure Programs	▪ Provide funding for projects identified in hazard mitigation plan ▪ Avoid or prohibit building critical facilities in high hazard areas ▪ Provide protection to existing buildings and infrastructure (e.g., flood proofing, seismic retrofitting) ▪ Construct structural protection measures (e.g., levees) ▪ Plan major infrastructure improvements in areas suitable for safe growth, and avoid or prohibit capital expenditures in hazard areas
Functional Plans	▪ Implement stormwater management methods, such as low impact development, to mitigate flood hazards ▪ Protect critical infrastructure from hazards ▪ Seek to acquire high hazard areas for public open space ▪ Address hazard risks, resilience goals in economic development plans ▪ Plan transportation infrastructure with evacuation routes in mind ▪ Use transportation planning to guide growth to safer areas
Area Plans	▪ Map hazards ▪ Establish Safe Growth Policies ▪ Identify specific hazard mitigation measures and locations (e.g., historic districts, revitalization corridors, neighborhood specific plans.) ▪ Enact targeted land use controls
Special Programs	▪ Implement TDR program to steer growth away from high hazard areas and to areas suitable ▪ Establish Tax Increment Financing or other funding mechanisms to implement mitigation measures in high hazard areas or to encourage growth in less hazard-prone areas
Project Review	▪ Establish permit review and approval criteria that addresses hazards (e.g., building near the floodplain, wildfire prone, seismic zones, etc.)
Public and Stakeholder Engagement	▪ Engage key decision makers, including local representatives and State and U.S. legislators ▪ Provide hazard planning information and updates to local leaders via workshops, council presentations, electronic materials, social media ▪ Create partnerships with other departments, communities, agencies, and Non-Government Organizations ▪ Engage technical experts including emergency managers, engineers, environmental professionals, GIS specialists ▪ Engage stakeholders ▪ Convene a resilient community advisory committee ▪ Identify champions ▪ Provide information about hazard risks and resilient community practices to the public and invite comments

Example 3-10. Planning for a Safer Tomorrow: New Orleans Links Planning, Zoning, and Hazard Mitigation

In 2010, the City of New Orleans, Louisiana, created a new master plan titled "21st Century: New Orleans 2030." The master plan was released concurrently with a comprehensive zoning ordinance, creating better conformity between the two documents. Refer to Chapter 5 for an in-depth case study.

Step 4: Be Opportunistic!

You have identified your community's gaps and prioritized needed linkages, informed and engaged local leadership and other key players, and identified champions to promote the endeavor. Now you need to implement your integration agenda. Complete overhauls to the comprehensive plan or a major code rewrite solely for the purpose of integrating hazard mitigation may not be feasible. Try to leverage current projects, periodic plan reviews, and potential funding sources. This requires a commitment to an incremental approach that is guided by an overarching, long-term vision of community resilience.

Being opportunistic allows the efficient use of resources by integrating hazard mitigation into efforts that are already occurring, thus achieving multiple goals. For example, an ongoing transportation master planning effort may not only achieve the objectives of increasing mobility and improving freight movement, but may also increase community resilience by protecting the transportation system from potential disaster impacts, encouraging development outside of known hazard areas, and identifying suitable evacuation routes. Take planning as a holistic endeavor, rather than treating hazard mitigation as something separate from transportation planning.

A good place to start is by looking at current or upcoming projects in the community and identifying resiliency needs and opportunities. There may be an upcoming subarea planning effort, a proposed stadium or other major public facility, or a public housing grant opportunity. The use of hazard maps in the modeling of the build-out and planning of these projects would be a great way to integrate mitigation practices into the public infrastructure. All of them could benefit from safe growth practices and provide opportunities to implement pieces of the overall integration efforts.

A good place to start is by looking at current or upcoming projects in the community and identifying resiliency needs and opportunities. FEMA/Dan Watson

Some additional examples of opportunities that may be available to your community, and how hazard mitigation might be integrated, are presented below.

- **Annual Plan Reviews**
  Many jurisdictions allow for certain comprehensive plan updates to occur on an annual basis, sometimes referred to as docketing. Generally, updates ranging from correcting typographical errors to changing land use designations for small areas are placed on the docket and reviewed for adoption at one time. This process can potentially allow for the integration of safe growth language. Hazard mapping, risk identification, and policy language could potentially be added to the comprehensive plan this way. Most comprehensive plans include a description of existing conditions and flood maps, earthquake hazard maps, steep slope maps, wildfire hazard zones, etc. could be integrated into this description.

- **Community Initiatives**
  Other community initiatives focused on important topics to the community, such as climate change, urban forestry, downtown planning, economic development, or healthy communities, all contain some element relating to safe growth. These provide excellent opportunities for integration and because such initiatives frequently have some built-in momentum. Identify the importance that such initiatives have to overall community resilience and the risks that hazards pose to such initiatives. Then, propose that appropriate hazard mitigation actions be incorporated in the overall initiative.

- **Major Plan Updates**
  Many jurisdictions require regular updates to the comprehensive plan. A major plan update can present an opportunity to make significant revisions to the comprehensive plan and to incorporate a robust safe growth program, touching all aspects of the plan.
- **New or Revised Ordinances**
  The adoption of new ordinances, including the adoption of new development standards or the creation of hazard-specific overlay zones tied to existing zoning regulations, present opportunities to discourage hazardous construction and manage the type and density of land uses in areas of known natural hazards. Adopting and enforcing higher regulatory standards for floodplain management (i.e., those that go beyond the minimum standards of the NFIP) is another effective method for minimizing future flood losses, particularly if your community is experiencing growth and development patterns that influence flood hazards in ways that are not accounted for on existing regulatory floodplain maps.
- **Code Revisions**
  Revisions to existing building codes also present the opportunity to address safe growth. Many state and local codes are based off national or industry standard codes which undergo routine evaluations and updates. The adoption of revised code requirements and optional hazard-specific standards may help increase community resilience.
- **Five-Year Hazard Mitigation Plan Update**
  Hazard mitigation plans are required to be updated every five years. This provides an opportunity for planners to participate in the process and identify specific integration approaches. Contacting the local emergency manager, or organizer, to express shared interest benefit of being involved, can lead to better integration.
- **Regional Planning**
  Regional planning efforts provide excellent safe growth opportunities. Metropolitan Planning Organizations (MPOs), Councils of Government, or other regional planning organizations can provide the organizational framework to address hazards at a larger scale. Most hazards do not neatly fit within any one jurisdictional boundary and require the cooperation of multiple communities. Regional organizations may not only provide a more appropriate geographic scale but may also have access to a greater range of resources, including sources of Federal funding. In some cases, mitigation actions may not be capable of being accomplished without the cooperation of such organizations. For example, actions focused on highway infrastructure may require funding and programming through the MPO.
- **Grant Opportunities**
  State and Federal agencies frequently fund planning efforts through grants or provide technical assistance. FEMA provides funding for mitigation planning activities through its Unified Hazard Mitigation Assistance (HMA) programs.[21] The Sustainable Communities Grants[22] offered through the US Department of Housing and Development provides regional planning grants for integrated, cross-cutting, regional sustainability planning and implementation initiatives. The Community Development Block Grant is also offered through HUD, and can be helpful with downtown revitalization and post-disaster mitigation projects.[23]

Example 3-11. Tying It All Together: New Hazard Mitigation Plan Ties Into Existing Community Plans in Metro Nashville

The Metropolitan Government of Nashville and Davidson County (Metro), Tennessee, integrated existing planning goals into the 2004 Metropolitan Nashville-Davidson County Multi-Hazard Mitigation Plan. Refer to Chapter 5 for an in-depth case study.

21 For more information on the Hazard Mitigation Assistance (HMA) programs, go to: http://www.fema.gov/hazard-mitigation-assistance
22 For more information on the Sustainable Communities Grants, go to: http://portal.hud.gov/hudportal/HUD?src=/program_offices/sustainable_housing_communities/
23 For more information on Community Development Block Grants, go to: http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs

Step 5: Monitor, Measure, Report, Repeat

As with most planning efforts, the integration of hazard mitigation into local planning is not a one-off exercise. It is continually referenced, implemented, evaluated, and revised. Successful integration of hazard mitigation is unlikely to be implementable all at once and can require sustained momentum over years. The community could grow or possibly shrink, new development could occur, infrastructure can age, the values and priorities of citizens or elected officials may change, and the nature, location, or extent of hazards may change. Finally, mitigation actions are evaluated to assess their effectiveness and adjusted as necessary.

The Federal regulation for mitigation plan updates includes a requirement for communities to identify opportunities for integration within the planning process, so this can provide the basis for documenting, monitoring, evaluation, and updating integration activities.[24] Comprehensive plans may have similar required revision schedules. Your integration process can include specific steps to monitor the progress made toward implementation. Benchmarks and metrics may be established and data collected to assess the effectiveness of specific techniques and to demonstrate implementation success over time. Findings derived from monitoring and measuring can be regularly reported to local leadership and the public.

24 Title 44 Code of Federal Regulations (CFR) §201.6, *Local Mitigation Plans*

Chapter 4: Overcoming Obstacles to Successful Integration

Planners integrating hazard mitigation into other local planning processes may face a number of challenges. This is normal and should not discourage you from the goal of successful integration. Instead, challenges should be viewed as opportunities, and victories over obstacles should be celebrated and used to reinforce that integration is achievable and can yield positive results.

This chapter explores the following common barriers and obstacles to successful integration:

- Lack of awareness of hazard risks and mitigation solutions;
- Hazard mitigation not seen as a community priority;
- Perception of competition with other priorities;
- Lack of political will to implement solutions;
- Lack of incentives for integrated planning;
- Lack of capacity or resources; and
- Insufficient framework for intergovernmental coordination.

One general approach to overcoming most of these barriers is promoting awareness and communication of resilient community principles and being flexible and creative in adapting to your unique local situation. (see Chapter 3, *Step 2: Inform and Engage Local Leadership, Staff, and Stakeholders.*)

Increasing Hazard Awareness and Understanding of Mitigation Solutions

Some segments of your community may lack a full awareness and understanding of the hazard risks present within the planning area. These segments may include local government staff, elected officials, or the general public. In some cases, "disaster amnesia" or complacency sets in where the infrequent nature of a disaster can minimize people's perception of potential hazard risk. However, even in areas that experience frequent disaster events, the nature of those hazards and the range of potential solutions may not be well understood. For example, high-cost structural solutions such as levees and floodwalls are often viewed as the first, if not only, options for flood protection. The idea of using more cost-effective land use planning practices to minimize hazard risks may not enter the discussion. It is important to promote awareness of hazard risks and the range of potential solutions, including a discussion of trade-offs among options. The target audience for such information may include local leaders, agency staff, and the general public. Local news media, social media, government websites, flyers, mailings, and a presence at public events are a few of the ways to get the message out.

Some segments of your community may lack a full awareness and understanding of the hazard risks present within the planning area. NOAA News Photo

Carefully Frame the Issue to Resonate with Your Community

Hazard mitigation can seem like an obscure concept to some, and may not be a primary community objective. This may be due to a lack of information, awareness, or communication regarding what hazard mitigation is and what it means to make hazard mitigation a priority in the community.

It is important to frame the discussion in terms that are understandable to the audience and to emphasize the role that hazard mitigation has in the overall resilience of the community. Spend time surveying your local leadership and general public, whether informally or formally, to identify the facets of resilience that best speak to your audience. You may think about framing safe growth from the point of view of efficiency and economic development, respecting the natural environment, or, at the most basic level, protecting human life. The success of your campaign can hinge on properly understanding your community's values and what resonates with those values.

It is also important to inform people of the range of solutions related to community resilience, so that the issue is not seen as highly specialized but rather as a core principle that touches on all facets of the community. Seen in this light, the community may be more likely to embrace resilience as a goal and understand the importance of hazard mitigation (see Example 4-1).

Balancing the Appearance of Competing Priorities

Local governments typically deal with competing priorities, as well as limited time and resources. Where possible, try to minimize or avoid the perception that hazard mitigation measures are implemented at the expense of other projects and activities. By integrating mitigation goals and objectives with other planning initiatives, efforts to reduce hazard risks need not compete directly with other priorities but rather can support and complement them. There is also value in positioning these efforts as shared priorities, achieving multiple community objectives and benefiting a range of stakeholders.

Where activities have the appearance of competing, it can actually present a positive situation. Such opportunities spark conversations that prompt various parties to hear other sides of problems and situations and can lead to a better understanding between and within departments and agencies. By recognizing shared priorities as stated above, "win-win" scenarios can be reached where the intent of the hazard mitigation priority can be met while avoiding direct conflicts.

Example 4-1. Integrating Healthy Food Access and Food Security in King County

Six cities in south King County, Washington, conducted food landscape assessments in 2011/2012 and proposed integrated policy recommendations to improve healthy food access. Assessments of the six cities revealed common trends. Large land areas were not within walking distance of a supermarket, while there was a high ratio of fast food restaurants to sources of healthy food. The six cities also had areas with high poverty rates. A number of factors affect food access including physical access and proximity, affordability, socioeconomic factors, and cultural appropriateness. The analyses looked at transit availability, availability of lands for community gardens or farmers markets, economic analyses of the food sector, inventories of existing community resources such as food banks, and research of existing policies found in comprehensive plans or municipal codes.

Policy recommendations included establishing food access and health goals in comprehensive or neighborhood plans; defining farmers markets, community gardens, urban agriculture, and neighborhood grocery stores as allowed land uses in most zones; streamlining the permitting process for small markets; encouraging food retail in or near multifamily housing and transit-oriented developments; identifying public lands that may be suitable for farmers markets or community gardens, such as through parks and recreation plans; and improving pedestrian and bicycle connectivity to grocery stores.

This important local issue presented a unique integration opportunity for King County. In addition to being a significant health and social equity issue, improving access to healthy food serves emergency relief purposes as well. In the aftermath of a disaster, if power is out or roads are blocked, residents still need to access food and essentials at locations within walking distance.[1]

1 For more information on Integrating Healthy Food Access and Food Security in King County and to access the food landscape assessments, go to: http://www.urbanfoodlink.com/?page_id=431

Building Political Will

A lack of political will to implement solutions can slow or even stop the most well-planned integration efforts. Consider ways to work with your leaders and general public to promote implementation. Creating awareness of the economic, social, and environmental risks from hazards and clearly mapping out potential solutions can help support prioritizing community resilience among the public and stakeholders. Providing decision makers with the information they need to promote and justify initiatives can be a successful approach to action. Seek to document and communicate examples of successfully implemented projects. Document and communicate losses avoided, using quantifiable measures whenever possible. Emphasize the efficiencies and potential cost savings to be achieved through integrated solutions. By making such data available to decision makers, the perceived political risks of action can decrease while the benefits of action can become more apparent. Selling the ability to achieve multiple community goals through multi-objective hazard mitigation strategies is also key.

Finding Incentives and Drivers for Integrated Planning

As with any significant planning effort, overcoming inertia can be a substantial barrier to successful integration. Finding the right incentives and drivers for integrated planning can help give you the necessary momentum to get things started. One potential incentive or driver for integrated planning could be the establishment of performance measures at the local level. Having measurable objectives related to hazard mitigation as part of local performance measures can help your community know when it has been "successful" in terms of integration activities. Some examples of local performance measures are number or percentage of completed mitigation projects, estimated value of losses avoided, and reduction in call volume from community residents reporting hazard-related problems such as stormwater drainage issues.

Financial incentives, possibly related to an explanation of potential cost savings, could prove to be a valuable tool as well. Institutionalizing the practice of regularly reviewing the progress of implementation is another potential driver.

Example 4-2. A Driving Factor for the City of Roseville

One of the principal objectives of the City of Roseville, California, multi-hazard mitigation plan was to create a plan that would also help the City achieve the highest possible rating under FEMA's Community Rating System (CRS) program. The highest possible rating is that of Class 1, which requires a minimum of 4,500 credit points and results in a flood insurance premium reduction of 45% for properties located in the Special Flood Hazard Area. When the initial plan was completed in 2005, the Insurance Services Office (ISO) determined that the plan met the criteria for Class 1, making Roseville the nation's first Class 1 community. The upfront decision to integrate two separate planning initiatives paid off in the end and was driven by the clear financial incentives and specific performance measures of FEMA's CRS program.[1]

Expanding Local Capacity to Support Local Resources

Communities face a wide range of challenges with limited resources. No two communities are identical in their technical or administrative capacity for planning, growth management, and development regulation. Limited resources or capacity need not "derail" efforts to promote community resilience to hazard risks as there are a variety of ways to expand local capacity. For example, if local staffing needs to be increased, and assuming you have fiscal resources to support this, your community could hire additional full or part-time staff, or hire a contractor that offers the needed technical skills or resources. Using more creative alliances, you may be able to partner with other communities or agencies to share staff or resources, especially if cooperative solutions better address the scope of a potential risk. Also, consider involving technical experts that live or work in your community in working group discussions to bring that existing knowledge and expertise to bear. For example, you may find climate change specialists at a local college, an insurance industry representative from the local business sector, or a retired planning professional who is willing to contribute and support your efforts. Finally, finding ways to integrate your solutions with ongoing projects or initiatives in your community allows you to achieve multiple objectives while making the most efficient use of staff time, funds, and other resources.

1 For more information on the City of Roseville Multi-Hazard Mitigation Plan, go to: http://www.roseville.ca.us/fire/emergency_preparedness/multi_hazard_mitigation_plan.asp

Building a Framework for Intergovernmental Coordination

Hazard risks often affect areas that do not correspond directly to jurisdictional boundaries, and that can affect all aspects of a planning area—from infrastructure to public services to the economy. Implementing integrated solutions to hazard risks can greatly benefit from a sufficient framework for sustained intergovernmental coordination on long-term community development issues. If making resilient community goals a priority within a single community is a challenge, then establishing this priority among multiple governments is potentially an even greater challenge. Seek to frame the discussion in terms of overall community resilience and inform and communicate with your partners, just as you would in your own community.

To overcome the challenge in creating the opportunity for regular discussion and information sharing, the first place to start is with existing forums for communication. Make use of regional planning organizations, councils of government, metropolitan planning organizations, or city or county associations as venues to present information and start conversations. Use personal contacts with other agencies and communities to create more champions of resilient community goals. Once you have a certain level of buy-in, you may consider forming a panel or advisory group focused on community resilience and having representation from multiple units of government. Also, consider making use of other flexible means of communication such as social media, email distribution lists, and sharing links on government websites as a way to connect individuals from different organizations with a common interest.

Chapter 5: Case Studies

Case Study 1. Planning for the Next Generation: Integrating Flood Mitigation Planning as a Long-Term Revitalization Tool in Cedar Rapids

Cedar Rapids, Iowa, experienced catastrophic flooding in June 2008 when the Cedar River rose over 31 feet and covered 10 square miles of the city. This extensive flooding impacted 1,126 city blocks, 7,189 parcels, and 5,390 houses, and is considered the sixth-largest disaster declaration in U.S. history, based on public assistance claims.[1] Of the nearly 20,000 people living in the flooded area, half were displaced. Additionally, 310 city facilities flooded, costing an estimated $500 million to repair and/or replace.[2]

Cedar Rapids, Iowa, following the Flood of 2008. City of Cedar Rapids

Before the flood, Cedar Rapids had developed a Downtown Vision Framework Plan aimed at revitalizing the downtown area into a signature community, and the City was in the process of creating a Riverfront Master Plan. However, four days after this extreme flood event, Cedar Rapids officials decided that a riverfront plan would not be enough to revitalize the community. Instead, they concluded that flood mitigation planning would be a key component of their post-disaster recovery and long-term community revitalization. This idea coalesced in the River Corridor Redevelopment Plan, a two-phase community planning effort focused on redevelopment and recovery.

The first planning phase, Framework for Reinvestment and Revitalization,[3] linked flood hazard mitigation planning to fulfill Cedar Rapids' community vision. This framework focused on creating a flood management strategy that correlated to sustainable neighborhoods. Future development intensities were evaluated with regard to flood risk, and redevelopment opportunities with an emphasis on creating a plan that balanced more resilient redevelopment with the need to rebuild after the flood. Understanding the vulnerability of some of the neighborhoods along the river, planners discouraged high-intensity development in heavily damaged areas. This framework also incorporated a significant public feedback component, allowing citizens to participate directly in the plan integration process.

The Framework for Reinvestment and Revitalization led to a second planning phase, the Neighborhood Planning Process.[4] Completed in 2009, this process brought the overall ideas in the Framework for Reinvestment down to the neighborhood level, ensuring that communities could mitigate flood hazards while also becoming stronger, more cohesive areas. One of the overall community goals in this plan focused on building long-term flexible infrastructure solutions that integrate hazard protection and other preventive measures.

1 City of Cedar Rapids, Flood Recovery Progress. Available at: http://www.cedar-rapids.org/city-news/flood-recovery-progress/Pages/default.aspx

2 For more information on the Flood of 2008, as well as information on flood recovery planning in the City of Cedar Rapids, go to: http://www.cedar-rapids.org/government/departments/community-development/floodrecoveryplanning/Pages/default.aspx

3 For more information on the City of Cedar Rapids Framework Plan for Reinvestment and Revitalization, go to: http://www.cedar-rapids.org/government/departments/community-development/floodrecoveryplanning/Documents/CR_Phase1-All%20v2.pdf

4 For more information on the City of Cedar Rapids Neighborhood Planning Process, go to: http://www.cedar-rapids.org/government/departments/community-development/floodrecoveryplanning/Documents/NPP%20Report%20-%20Full%20Report%28for%20website%29.pdf

Additionally, the City worked with the U.S. Environmental Protection Agency and FEMA under an Interagency Agreement to review Cedar Rapids' municipal codes and development patterns to help stabilize neighborhoods using smart growth principles that would reverse development patterns that contributed to flooding in certain neighborhoods.[5]

Flood Planning Initiatives At-A-Glance	
Plan	**Element of Incorporation**
River Corridor Redevelopment Plan Phase I: The Framework for Reinvestment	Used flood mitigation planning to guide urban design and revitalization in the hardest-hit neighborhoods.
River Corridor Redevelopment Plan Phase II: Neighborhood Planning Process	Set as a community priority building sustainable infrastructure that is sensitive to flood risk.

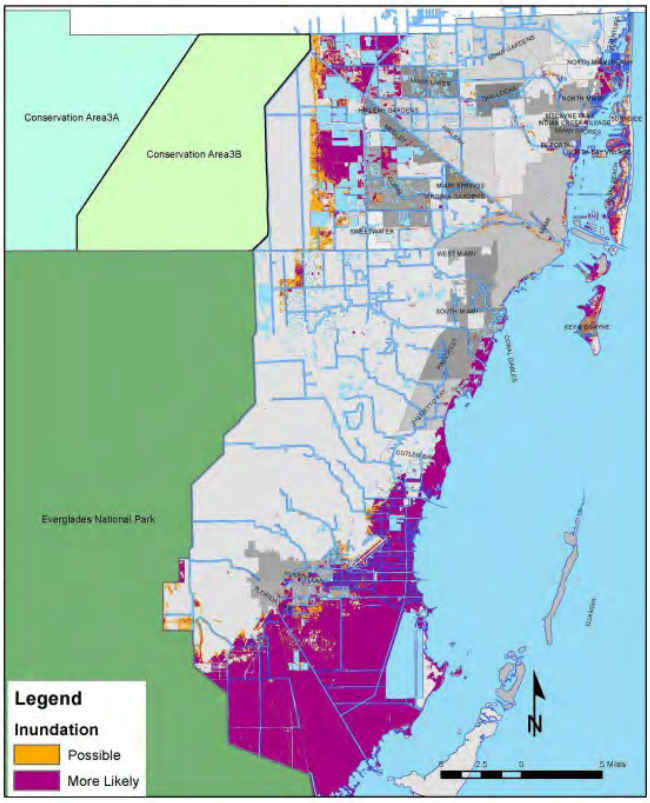
Integration Highlights

- Using the hazard risk geography to guide land use and redevelopment intensity.
- Incorporating watershed management into revitalization as a way to mitigate flooding.
- Emphasizing the importance of riverfront open space as a hazard mitigation opportunity as well as a sustainable community amenity and also a public safety feature.
- Incorporating flood reduction techniques into urban design guidelines.
- Strengthening public awareness of hazard mitigation through neighborhood-level planning.
- Coordinating with the State to bring hazard mitigation plans and planning processes in line with land development decisions, including both zoning and comprehensive land use planning.
- Auditing local codes and ordinances to identify enhancement opportunities for building a more sustainable community moving forward, including incentivizing natural resource protection to enhance flood control.

5 U.S. Environmental Protection Agency, Federal Emergency Management Agency, Embracing the River: Smart Growth Strategies for Assisting in Cedar Rapids' Recovery, 2010. Available at: http://epa.gov/dced/pdf/ia_cedar_rapids.pdf

Case Study 2. Planning for Hazards and Climate Change Impacts—Miami-Dade's Approach

Like many coastal areas, Miami-Dade County, Florida, is concerned about the potential impacts of climate change. With the unique topography of the county, computer models indicate that sea level rise may increase flooding on both the eastern and southwestern boundaries of the Everglades, causing the county and its infrastructure, people, and natural resources to be "squeezed" by the rising waters.[6] The county's major economic sectors—agriculture and tourism—would be severely impacted.



Map showing 3-foot sea level rise in Miami-Dade County. NOAA Coastal Services Center

Finding ways to focus on climate change at the same time as many other community issues was a challenge. Miami-Dade officials found the best approach was to put a "hazards and climate lens" on existing issues (such as water availability, stormwater management and runoff, and infrastructure maintenance and placement), which meant identifying how hazards and climate change can intensify these issues.

To address the issue, Miami-Dade focused all climate change-

6 For more information on sea level rise mapping in Southeast Florida, go to: http://www.csc.noaa.gov/digitalcoast/action/slr-seflorida

related efforts into the Office of Sustainability.[7] This office, created in 2009, helps the County evaluate potential hazard and climate impacts and examines existing response and planning efforts. Since all of the county is vulnerable to hazards and climate change, officials stress that the approaches must be countywide and include all stakeholders.

Central goals were needed for the office that link to existing County government priorities. Any action plan also needed to include knowledge and perspectives from across the various County departments. Taking these facts into consideration, the Office of Sustainability formalized two primary goals:

- Add climate adaptation to ongoing sustainability initiatives.
- Engage County and municipal decision makers in identifying hazards and climate change issues and make connections to existing planning and policy efforts.

The County began work on a sustainability plan, called *GreenPrint: Our Design for a Sustainable Future*.[8] The plan's focus is on preparing the county for future climate change impacts through existing County plans (land use, infrastructure, public safety, and others). Through *GreenPrint*, the Office of Sustainability worked to leverage present sustainability initiatives and develop new ones where needed.

To support this effort, the Office of Sustainability sought technical assistance from the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center. The two organizations customized a participatory workshop called "Roadmap for Adapting to Coastal Risk" for local stakeholders. The two offices worked closely with representatives from the County Department of Environmental Resources Management, Office of Emergency Management, Water and Sewer Department, and the GIS Division to plan the workshop.

During the workshop, participants were able to study the hazards that have the potential to impact their community in a new light. Several times during the workshop, participants commented that they had not thought about a particular concern, issue, or impact from the varying perspectives before. Hearing the issues in a different context enabled them to think more holistically about ways to address multiple issues, as opposed to concentrating on a single issue such as water treatment or conservation.

A countywide assessment of risk and vulnerability was also conducted which included input from County and municipal decision makers. It was important that these groups review the data and information and share their concerns, priorities, and ideas. This input and interaction provides a diverse perspective and is beneficial for implementation. To choose the appropriate data to use in the assessment, the NOAA Coastal Services Center worked with Miami-Dade County to determine:

- The decisions that spatial data could help to inform;
- The hazards and climate change impacts of most concern to the county;
- The local problems or management issues they were trying to address;
- The data and information that represent the county's populations, the built environment, and natural resources; and
- The inventory of data the GIS and planning departments deemed suitable for the assessment.

Integration Highlights

- Identifying vulnerabilities previously unknown to participants.
- Identifying new solutions (many innovative, simple, and inexpensive) to help resolve issues and increase the sustainability of the county.
- Promoting the value of the County GIS Division and the power of maps in decision-making.
- Sharing knowledge among participants about planning techniques, infrastructure development, and natural systems.
- Bringing various stakeholders/departments together to discuss issues in a more holistic fashion (intergovernmental coordination).

7 For more information on the Miami-Dade County Office of Sustainability, go to: http://www.miamidade.gov/oos/

8 For more information on GreenPrint, Our Design for a Sustainable Future, go to: http://www.miamidade.gov/greenprint/

Case Study 3. Planning for a Safer Tomorrow: Linking Planning, Zoning, and Hazard Mitigation in New Orleans

In 2010, the City of New Orleans created a new master plan titled *Plan for the 21st Century: New Orleans 2030*.[9] The master plan was released concurrently with the *New Orleans Comprehensive Zoning Ordinance*,[10] allowing for conformity between the two documents. The policies laid out in the master plan are reflected in the Comprehensive Zoning Ordinance, allowing for implementation of the master plan. The city council is prohibited from making zoning or land-use decisions that do not align with the structure outlined within the master plan. The simultaneous release of both documents also allowed for residents to voice concerns about new zoning policies during the master plan public meetings, streamlining public outreach. The master plan received the 2011 National Planning Excellence Award from the American Planning Association for its success in bringing together a diverse community in the face of adversity following the devastating impact of Hurricane Katrina.

The master plan was developed by integrating and building from all applicable past and present plans. The *Orleans Parish Hazard Mitigation Plan* (2005)[11] is listed among several plans that were referenced initially in order to develop a cohesive, well-integrated master plan and was included in the appendix section of the master plan. Including the parish hazard mitigation plan in the master plan communicates the importance of hazard mitigation in a city that has a demonstrated vulnerability to natural disasters. Other plans consulted in the creation of the master plan include:

- Pre-Hurricane Katrina Renaissance Plans
- Post-Hurricane Katrina Recovery Plans
- Independent District and Neighborhood Plans
- District, Sector, and Agency Plans.

In 2010, the New Orleans Office of Homeland Security and Emergency Preparedness, in conjunction with the City of New Orleans, prepared the *Orleans Parish 2010 Hazard Mitigation Plan Update*.[12] Following its adoption, the updated plan became part of the master plan replacing the earlier 2005 version. This plan update built upon the 2005 plan and consulted the *State of Louisiana Hazard Mitigation Plan* (2008). As a result, several new hazards were included in the 2010 update, and the dam and levee failure hazard was expanded to be consistent with the same section in the state plan. It is stated in the 2010 update that some of the mitigation actions identified within the plan will be implemented through the master plan, the *Comprehensive Zoning Ordinance*, or through existing city programs and building codes.

The *Comprehensive Emergency Management Plan* (CEMP) is also referenced within the *2010 Hazard Mitigation Plan Update*. The CEMP is described as the primary resource for emergency operations, whereas the Hazard Mitigation Plan Update is aimed at reducing the community's vulnerability to disasters and emergency situations. Plan integration helps clarify the difference between the CEMP and the hazard mitigation plan. The following plans were consulted for the development of the *2010 Hazard Mitigation Plan Update*:

- *City Assisted Evacuation Plan*
- City of New Orleans *Comprehensive Emergency Management Plan* (CEMP)
- City of New Orleans *Comprehensive Zoning Ordinance*
- City of New Orleans *Floodplain Management Ordinance*
- City of New Orleans Master Land Use Element

9 For more information on the Plan for the 21st Century: New Orleans 2030, go to: http://www.nola.gov/RESIDENTS/City-Planning/Master-Plan-Elements/

10 For more information on the New Orleans Comprehensive Zoning Ordinance, go to: http://www.nolamasterplan.org/

11 New Orleans Office of Homeland Security and Public Safety, Orleans Parish Hazard Mitigation Plan, 2005. Available at: http://www.hmgp.smartinc1.com/resources/OrleansParishHazardMitigationPlan.pdf

12 City of New Orleans Office of Homeland Security and Emergency Preparedness, Orleans Parish 2010 Hazard Mitigation Plan Update, 2010. Available at: http://new.nola.gov/getattachment/Hazard-Mitigation/Hazards-and-Planning/Orleans-Parish-2010-Hazard-Mitigation-Plan-Final-032311.pdf

- *Flood Risk in New Orleans, Implications for Future Management and Insurability*
- *Hurricane Katrina in the Gulf Coast, Mitigation Assessment Team Report, Building Performance Observations, Recommendations, and Technical Guidance*, FEMA 549
- Individual agency hazard mitigation plans within Orleans Parish
- *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast*
- *Louisiana Coastal Protection and Restoration* (LACPR) Final Technical Report
- New Orleans Louisiana Building Codes
- *Plan for the 21st Century: New Orleans 2030*
- *Polarize New Orleans*
- *State of Louisiana Hazard Mitigation Plan* (2008)
- *Unified Plan for New Orleans*

The extensive list above shows the integration and consistency sought by the City of New Orleans in recent planning efforts. Another example of integration is New Orleans' adoption of the 2006 Edition of the International Building Code. The new building code improves how builders address hazard mitigation.

Successful integration of hazard mitigation efforts have led to six out of every 10 residents in New Orleans reporting that they have seen progress to stormwater protection in their city, a common subject matter in many planning mechanisms.

Integration Highlights

- Releasing plans or ordinances at the same time to ensure consistency and implementation of new policy.
- Including past plans as annexes or appendices of new or updated plans.
- Reviewing and building upon past and present plans.
- Implementing actions listed in the hazard mitigation plan through other plans or programs.

Case Study 4. Systemic Plan Integration in Oregon: A Statewide Example of Reducing Risk Through Planning

Oregon has taken great care to integrate safer, more hazard-resilient growth into its overall planning framework. The State maintains a set of 19 Statewide Planning Goals[13] that articulate policies on land use, citizen involvement in planning processes, housing, and natural resources. While all of these goals holistically address land use and development at the local level, three directly integrate natural hazard mitigation planning into land use planning. These include statewide planning goals that require communities to develop a factual basis for their comprehensive plans, including the development of inventories of hazard risk areas, which may also be used during the hazard mitigation planning process.

Statewide Planning Goal 7 states that developments may not be planned in areas of known natural hazard risk without appropriate safeguards. The Goal also states that local governments must adopt comprehensive land use policies that reduce risk to floods, landslides, earthquakes, tsunamis, coastal erosion, and wildfires. Goal 7 also standardizes a procedure for the sharing of new information on hazard risk with local governments. Planning Goals 17 and 18 incorporate hazard mitigation planning activities that are specific to coastal areas. Goal 17 focuses on reducing hazards associated with coastal shorelands, and Goal 18 seeks to protect life and property through proper beach and dune conservation.

Oregon's land use planning and hazard mitigation efforts are well connected. Back-to-back winters with severe storms and flooding in 1996 and 1997 spurred the State to create the Governor's Interagency Hazard Mitigation Team, which guides state hazard mitigation planning efforts. This team of approximately 20 state agencies provides expertise, implementation support, and overall coordination for the *State of Oregon Natural Hazards Mitigation Plan*. The natural hazards identified in the state mitigation plan are consistent with those listed in Goal 7, which also builds in provisions for local communities to incorporate more localized hazard information into their comprehensive plans. Oregon's Department of Land Conservation and Development (DLCD) manages the State Natural Hazards Program, while working closely with emergency management staff to reduce losses.

13 For more information on the Oregon Statewide Planning Goals, go to: http://www.oregon.gov/LCD/goals.shtml

The Oregon DLCD encourages local governments to participate in both the National Flood Insurance Program (NFIP) and the Community Rating System (CRS). The requirements of the NFIP and CRS are considered intrinsic land use tools to both the State and local communities.

Oregon's building code also incorporates hazard mitigation principles, regulating building construction with respect to earthquake risk, wind loads, wildfire risk, and flood hazards, while working hand-in-hand with the State's NFIP model ordinance. The building design standards, while optional, include best practices for design and construction in flood hazard areas. Beyond everyday building requirements, Oregon law requires new critical facilities undergo hazard-specific site analysis to create resilient critical and essential facilities; it also prevents placing critical facilities in tsunami hazard zones.

In order to effectively protect from floods and other hazards, Oregon communities use three key local land controls: overlay zoning, subdivision regulations, and transfer of development rights (TDR) programs. Overlay zoning specifies more stringent requirements to protect identified hazard-prone areas. For example, the City of Talent uses a combination floodplain, parks, and greenway overlay to protect the floodplain and ensure it can properly convey flood waters. Subdivision regulations work to create safer future development, exemplified in Polk County, which prohibits subdivisions in the floodplain, and the State encourages other communities to use cluster development and performance bonds to encourage subdivisions in areas of the community that are deemed safe. TDR programs are used particularly for areas of known landslide hazard; TDRs transfer existing development rights from hazard-prone areas to safer areas. For example, Deschutes County requires developers to transfer the former right to development in landslide-prone areas to another parcel in a designated safe "receiving site."

Integration Highlights

- Setting a State or countywide planning agenda that clearly links local planning with preventing loss of life and property.
- Convening interagency experts to improve overall hazard mitigation integration.
- Standardizing risk information dissemination to empower local communities to make land use and development decisions based on the best possible information.
- Using overlay zoning and hazard-specific subdivision requirements to protect new and future development from hazards identified in hazard mitigation plans.
- Considering implementing TDR programs to move the right to development from unsafe to safe areas.
- Encouraging CRS participation at the statewide level to support local efforts.

Oregon Plan Integration At-A-Glance	
Planning Mechanism	**Role in Plan Integration**
Land Use Planning Goal 7	Natural hazards defined in Planning Goals are the same as those identified in the state hazard mitigation plan for a seamless connection across the planning and emergency management communities.
Interagency Hazard Mitigation Team	Recognizes the interdisciplinary nature of both land use and hazard mitigation, and strengthens connections and information sharing statewide.
Oregon State Building Code	Uses criteria specific to hazards identified in the state hazard mitigation plan and Goal 7 to promote safer building design and construction.
NFIP and CRS	Provides the framework for overlay zoning, subdivision regulations, and other land use controls to assist in hazard mitigation planning.

Case Study 5. Augusta-Richmond County, Georgia, Framework for Integration

The County has established a priority for integration with the *Augusta-Richmond County, Blythe and Hephzibah Multi-Jurisdictional Hazard Mitigation Plan* (2012-2016).[14] The plan outlines a process for integrating mitigation strategies through revision, updates, and implementation of action plans for individual jurisdictions. New or updated planning documents, including the *Augusta-Richmond County Comprehensive Plan* (2008),[15] *Emergency Operations Plan*, and other jurisdictional plans, are required to remain consistent with the goals and strategies of the hazard mitigation plan.

The plan also highlights various sections of existing plans that were incorporated into the hazard mitigation plan. For example, both the *Urban Area 2009 Master Plan for a Sustainable Future*[16] and the *Community Greenspace Plan* (2002)[17] stress the importance of protecting the Savannah River Basin. This was then included in the risk assessment for drought and in other applicable sections of the hazard mitigation plan. Aspects of the following plans were also incorporated into the hazard mitigation plan update:

Integration Highlights

- Incorporating appropriate policies from existing plans into the hazard mitigation plan.
- Engaging local planning organizations and jurisdictions to adopt the Hazard Mitigation Plan and incorporate mitigation strategies in their future planning efforts.
- Leveraging the ability of one project or planning goal to meet multiple purposes.

Plans Incorporated into the Hazard Mitigation Plan	
Plan	Element Incorporated into Hazard Mitigation Plan
Augusta-Richmond County Emergency Operations Plan	All-hazards approach to event response, evacuation, and recovery.
Augusta-Richmond County Comprehensive Plan	Demographic data, land use policies, development trends, short- and long-term work programs, and environmental policies.
Augusta-Richmond County and the Cities of Blythe and Hephzibah Capital Improvement Plans	Stormwater projects.
Building Code Requirements	Hazard area and critical facility construction.
Zoning Ordinances	Flooding hazards and land use.
Subdivision Regulations	Transportation corridors and location of subdivisions in sensitive areas.
Stormwater Management Plan	Public outreach and watershed education.

Case Study 6. Weaving Together Plans for the Future: Planning for Disaster, Development, and Improvement in Tulsa, Oklahoma

Located in the Great Plains, Tulsa's vulnerability to natural disasters, including tornadoes and thunderstorms, necessitates strategic planning to protect the city. The *City of Tulsa Multi-Hazard Mitigation Plan* (2009)[18] incorporated all pertinent existing plans during the update process. The mitigation strategies, expanded list of hazards, and goals of the State of Oklahoma's 2008 *Enhanced Natural Hazards Mitigation Plan* were also included in Tulsa's updated plan. One chapter of the Multi-Hazard Mitigation Plan focuses on all existing mitigation strategies in place and the corresponding plans that describe them. Action items from the *Hazard Mitigation Plan* have been integrated into the *City of Tulsa Capital Improvements Plan* in order to prioritize funding for hazard mitigation projects. Flood hazard areas, expansive soils, and future growth area information from the *Multi-Hazard*

14 Augusta-Richmond County, Augusta-Richmond County Multi-Jurisdictional Hazard Mitigation Plan, 2012. Available at: https://docs.google.com/file/d/0B44NiQQjw1DOWjByb2R0d3VTd0NrMTILbUhnY1FVQQ/edit?pli=1

15 Augusta-Richmond County Planning Commission, Augusta-Richmond County Comprehensive Plan, 2008. Available at: http://appweb.augustaga.gov/Planning_and_Zoning/docs/Comprehensive%20Plans/2008%20Comp%20Plan.pdf

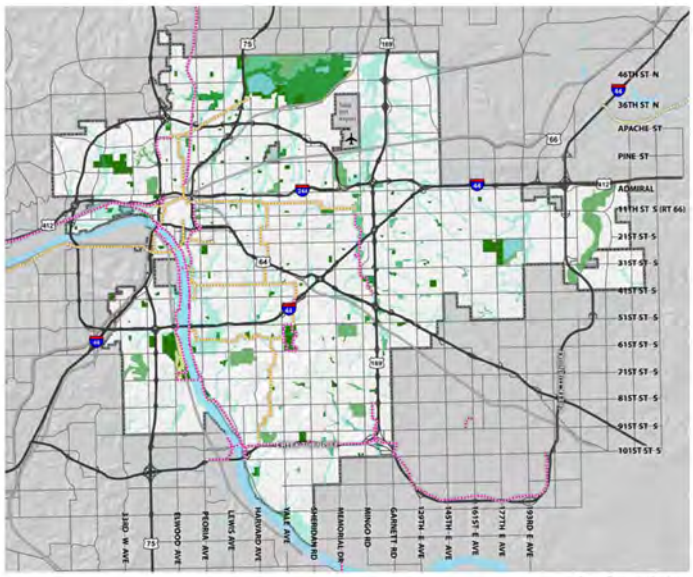
16 Augusta, Georgia and North Augusta, South Carolina, Urban Area 2009 Master Plan for a Sustainable Future, 2009. Available at: http://www.augustatomorrow.com/docs/2009-Master-Plan-Final-Report.pdf

17 Augusta-Richmond County Planning Commission, Community Greenspace Plan, 2002. Available at: http://www.augustaga.gov/DocumentCenter/Home/View/255

18 *City of Tulsa Multi-Hazard Mitigation Plan*, 2009. Available at: http://www.cityoftulsa.org/media/103341/tulsa2009approvedmultihazardmitigationplan.pdf

Mitigation Plan was also used to complete the 2010 update to the *Tulsa Comprehensive Plan*.[19] In addition, the *Multi-Hazard Mitigation Plan* has also been integrated with the following plans and codes:

- City of Tulsa Building Code
- *City of Tulsa Community Rating System Plan*
- *City-County Heat Emergency Action Plan*
- *City of Tulsa Technical Hazards Mitigation Plan*
- Drainage Master Plans
- *Non-Structural Mitigation Plan*
- *Pearl District Plan*
- *Repetitive Loss Plan*
- *Tulsa County Multi-Hazard Mitigation Plan*
- *Tulsa Emergency Operations Plan*
- *Tulsa Historic Preservation & Cultural Resources Annex to the Multi-Hazard Mitigation Plan*
- *Tulsa Metropolitan Area Major Street and Highway Plan*
- *Tulsa Public Schools Multi-Hazard Mitigation Plan*



Source: Fregonese Associates

Integration Highlights

- Ensuring consistency between the *Multi-Hazard Mitigation Plan* and existing plans.
- Updating mitigation strategy goals and objectives to incorporate ideas from the *Tulsa Comprehensive Plan* and *Capital Improvement Plans*.
- Coordinating the *Pearl District Plan* with the *Multi-Hazard Mitigation Plan* to address flooding problems in the area.
- Incorporating the *Multi-Hazard Mitigation Plan* and the *Citywide Master Drainage Plan* into specific drainage plans.

Case Study 7. Driving Mitigation: Kings County Steers Development Away From Disaster

Kings County has one of the fastest growing populations in California. The county is predominantly agricultural in nature, with more than 90 percent of its land area being used for farming. There is a need to accommodate the growing population of the county while simultaneously preserving farmland, which is essential to the county's economic success.

Kings County farmland. Kings County

The County took the first step towards integrating hazard mitigation into comprehensive planning in 2007 when it developed and finalized the *Kings County Multi-Jurisdictional Multi-Hazard Mitigation Plan* (2007).[20] Language within the plan stated that the mitigation plan was to be a primary source in the update of the 2035 *Kings County General Plan*,[21] which was also updated in 2007. An entire section of the general plan is dedicated to reducing and eliminating long-term vulnerability to hazards. The Health and Safety Element of the General Plan links land use and local safety planning and covers natural hazards, community health, and community safety. It contains policies for classifying acceptable risk imposed by designated land uses and mitigating risk.

19 *Tulsa Comprehensive Plan*, 2010. Available at: http://www.planitulsa.org/plan/download

20 Kings County, Kings County Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2007. Available at: http://www.countyofkings.com/planning/genplan/community%20plans/CompleteDoc_KCMJMHMP.pdf

21 Kings County Community Development Agency, 2035 Kings County General Plan, 2010. Available at: http://www.countyofkings.com/planning/2035%20General%20Plan.html

Integration Highlights

- Integrating appropriate hazard mitigation measures from the *Kings County Multi-Jurisdictional Multi-Hazard Mitigation Plan* into the Health and Safety Element policies.
- Implementing natural hazards review criteria for new development that is based on information provided in the Natural Hazards Section of the Health and Safety Element, to improve long-term loss prevention.
- Prohibiting new construction along known fault zones, and limit uses to nonstructural land uses.
- Requiring agriculture or open space land uses around areas identified as engaging in potentially hazardous activities to serve as a buffer that reduces possible personal or property damage resulting from an earthquake.
- Reserving FEMA designated flood hazard areas for agricultural and natural resource conservation uses along the floodway channels.
- Directing new urban growth to existing cities and community districts, or away from New Community Discouragement Areas, to avoid flood hazard areas and increased risk to people and property.
- Reviewing development proposals according to California Department of Forestry and Fire Protection "Fire Hazard Severity Zone Maps" to determine whether a site is located within a Very High Fire Hazard Severity Zone and subject to Wildland-Urban Interface Fire Area Building Standards and defensible space requirements.

Case Study 8. In the Wake of Disaster: Greensburg Rebuilds Through Sustainable Design That Includes Hazard Mitigation

On May 4, 2007, an EF-5 tornado struck the City of Greensburg, Kansas, destroying more than 90 percent of its building stock. In the wake of the disaster, the community set forth to rebuild and become a model sustainable rural community. The city adopted a *Long-Term Community Recovery Plan*[22] in 2007, prepared through FEMA's Long-Term Community Recovery (LTCR) program.

Greensburg, Kansas, May 7, 2007. FEMA/Michael Raphael

The LTCR program helped launch the preparation of a sustainable comprehensive plan to act as the blueprint for all new development in the city, providing direction and strategy for rebuilding. The *Greensburg Sustainable Comprehensive Master Plan*[23] devotes an entire section to hazard mitigation, focusing on tornado, thunderstorm, and other high windstorm hazards.

Integration Highlights

- Integrating hazard mitigation into the recovery plan or land development code by requiring that power lines be buried to reduce damage and decrease the frequency of power outages.
- Require back-up generators for critical facilities and test them regularly. This can be accomplished by integrating hazard mitigation into the local zoning ordinance and defining *critical facility*.
- Requiring or recommending the use of native species in the local land development code or tree ordinance. Using native plants and trees for ornamental plantings decreases vegetation damage, as they are typically more wind tolerant.
- Strengthening the local building code to reduce wind related damages.
- Building safe rooms using FEMA guidelines and seeking FEMA funding for such structures.
- Integrating hazard mitigation into the local emergency preparedness plan by committing to become a StormReady community.

22 City of Greensburg and Kiowa County, Kansas, Long-Term Community Recovery Plan, 2007. Available at: http://www.greensburgks.org/residents/recovery-planning/long-term-community-recovery-plan

23 City of Greensburg, Greensburg Sustainable Comprehensive Master Plan, 2008. Available at: http://www.greensburgks.org/residents/recovery-planning/sustainable-comprehensive-master-plan/view

Case Study 9. Integrating Hazard Mitigation Into a Local Comprehensive Plan: The American Planning Association's *Growing Smart Legislative Guidebook*

The table shown on the following pages is intended to illustrate how hazard mitigation may be integrated into a local comprehensive plan. It provides a description of the purposes of the various elements of a local comprehensive plan according to the American Planning Association's *Growing Smart Legislative Guidebook*.[24] A third column, "Potential Hazard Mitigation Elements," has been added to the table to highlight the relationship between existing federal requirements for local hazard mitigation plans (Title 44 Code of Federal Regulations §201.6) and each mandatory or optional element included in APA's model authorizing legislation for local planning. This includes the following elements:

- Mandatory
  - Issues and Opportunities
  - Land Use
  - Transportation
  - Community Facilities
  - Housing
  - Program of Implementation
- Mandatory with Opt-Out Alternative
  - Economic Development
  - Critical and Sensitive Areas
  - Natural Hazards
- Optional
  - Agriculture, Forest, and Scenic Preservation
  - Human Services
  - Community Design
  - Historic Preservation

24 American Planning Association, "Growing Smart Legislative Guidebook: Model Statutes for Planning and the Management of Change," Chicago, American Planning Association, 2002. Chapter 7, p. 7-61. Available at: http://www.planning.org/growingsmart/guidebook/print/

Element	Purposes of Element	Potential Hazard Mitigation Elements
Issues and Opportunities	(a) articulate the values of the citizens and others affected by the local comprehensive plan so that the local government may interpret and use those values as a basis and a foundation for its planning efforts; (b) identify the major trends and forces affecting the local government and its citizens; (c) state a vision or compilation of visions for the local government based on, among other factors, the values articulated in (a) above and the major trends and forces identified in (b) above, as well as the preferences of the legislative body; (d) serve as a series of guiding principles and priorities to implement the vision(s); and (e) link the vision statement with other applicable goals, policies, guidelines, and implementation measures of the local government.	**Element A4.** The planning process shall include the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information. **Element C3.** The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
Land Use	(a) translate the vision statement contained in the issues and opportunities element described above into physical terms, to the extent possible; (b) provide a general pattern for the location, distribution, and characteristics of the future land uses within the jurisdiction of the local government over a 20-year planning period; (c) serve as the element of the local comprehensive plan upon which all other elements, other than the issues and opportunities element, shall be based; and (d) integrate any urban growth areas and any existing or proposed areas of critical state concern, as identified in the regional comprehensive plan, with the location, distribution, and characteristics of future land uses within the jurisdiction of the local government.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Transportation	Provide and encourage a safe, convenient, efficient, and economical multimodal transportation system that is adequate to serve local transportation needs, that serves, supports, and reinforces the future land uses as shown on future land-use plan map or map series, and that is coordinated with state and regional transportation plans, including those required by federal law.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Element	Purposes of Element	Potential Hazard Mitigation Elements
Community Facilities	(a) provide for community facilities that are necessary or desirable to support the future land-use pattern proposed in the land-use element of the local comprehensive plan and to meet projected needs of the local government and its residents or over which the local government exerts control or authority in their location, character, extent, and timing; (b) establish levels of service for such community facilities so they will meet the needs and requirements of the local government and its residents; (c) ensure that such community facilities are provided in a timely, orderly, and cost-effective manner, including the optimization of the use of existing facilities as an alternative to expansion or new construction; and (d) coordinate with other local governments, special districts, school districts, and state and federal agencies on the provision of community facilities that have multijurisdictional impacts.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Housing	(a) document the present and future needs for housing within the jurisdiction of the local government, including affordable housing and special needs housing, and the extent to which private- and public-sector programs are meetings those needs; (b) take into account housing needs of the region in which the local government is located, including the need for affordable housing, especially as it relates to the location of such housing proximate to jobsites; (c) identify barriers to the production and rehabilitation of housing, including affordable housing; (d) assess the condition of the housing stock within the local government's jurisdiction and methods to maintain it, including rehabilitation and code enforcement; and (e) develop sound strategies, programs, and other actions to address needs for housing, including affordable housing.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Element	Purposes of Element	Potential Hazard Mitigation Elements
Program of Implementation	In order to achieve the goals, policies, and guidelines established in a local comprehensive plan, the plan shall contain a long-range program of implementation of specific public actions as well as actions proposed by non-profit and for-profit organizations to be taken in connection with required or optional elements, except for the issues and opportunities element. For each required or optional element, the program of implementation shall, as applicable, also include, but shall not be limited to, the following: (a) a time frame for identified actions (e.g., the sequence in which such actions should occur), which time frame shall cover a period not less than 5 and not more than 20 years, which time horizon may vary by required or optional element; (b) an allocation of responsibilities for actions among the various governmental agencies and, where applicable, not-for-profit and for-profit organizations operating in the planning area and having interests in carrying out the program; (c) a schedule of proposed capital improvements that includes a description of the proposed improvement, an identification of the governmental unit to be responsible for the improvement, the year(s) the improvement is proposed for construction or installation, an estimate of costs, and sources of public and private revenue available or potentially available for covering such costs. Such schedule shall form the basis for any local capital budget and local capital improvement program; (d) benchmarks; (e) a general description of any land development regulations or incentives that may be adopted by the local government within the period of the program of implementation in order to achieve the goals, policies, and guidelines set forth in the local comprehensive plan and that may be further detailed in the individual plan elements; and (f) a description of other procedures and programs that the local government may use in monitoring and evaluating the implementation of the plan, such as monitoring the supply, price, and demand for buildable land.	**Element C5.** The hazard mitigation strategy shall include an action plan, describing how the actions identified will be prioritized, implemented, and administered by each local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs. **Element C6.** The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvements, when appropriate. **Element A5.** The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process. **Element A6.** The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, evaluating, and updating the mitigation plan within a five-year cycle.

Element	Purposes of Element	Potential Hazard Mitigation Elements
Economic Development	(a) coordinate local economic development initiatives with those of the state through its state economic development plan and other state initiatives; (b) ensure that adequate economic development opportunities are available in order to provide a heightened quality of life and to enhance prosperity; (c) relate the local government's initiatives to the distinct competitive advantages of its surrounding region that make it attractive for business and industrial growth and retention, including its historic, cultural, and scenic resources; (d) assess the local government's strengths and weaknesses with respect to attracting and retaining business and industry; and (e) define the local government's role in encouraging job retention and growth and economic prosperity, particularly in relation to the availability of adequate housing for employees of existing and potential future businesses, industries, and institutions within its jurisdiction, transportation, broadening of job opportunities, stimulating private investment, and balancing regional economies.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Critical and Sensitive Areas	(a) further identify the characteristics of critical and sensitive areas within the jurisdiction of the local government as well as detail such areas that have been previously identified in the land-use element above; (b) assess the relative importance of these areas to the local government in terms of size, quality, and/or resource significance and relate them to relevant regional systems; (c) establish the thresholds at which the identified areas begin to decline in value as a resource; (e) identify mitigating measures that may need to be taken in such areas to offset or accommodate the impacts of development; (f) identify conflicts between other elements of the local comprehensive plan and land development regulations and critical and sensitive areas; (g) provide a factual basis for any land development regulations that the local government may enact that apply to and protect critical and sensitive areas; and (h) provide a factual basis on which to initiate the designation of an area of critical of state concern.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Element	Purposes of Element	Potential Hazard Mitigation Elements
Natural Hazards	(a) document the physical characteristics, magnitude, severity, frequency, causative factors, and geographic extent of all natural hazards, from whatever cause, within or potentially affecting the community, including, but not limited to, flooding, seismicity, wildfires, wind-related hazards such as tornadoes, coastal storms, winter storms, and hurricanes, and landslides or subsidence resulting from the instability of geological features. (b) identify those elements of the built and natural environment and, as a result, human lives, that are at risk from the identified natural hazards, as well as the extent of existing and future vulnerability that may result from current zoning and development policies; (c) determine the adequacy of existing transportation facilities and public buildings to accommodate disaster response and early recovery needs such as evacuation and emergency shelter; (d) develop technically feasible and cost-effective measures for mitigation of the identified hazards based on the public determination of the level of acceptable risk; (e) identify approaches and tools for post-disaster recovery and reconstruction that incorporate future risk reduction; and (f) identify the resources needed for effective ongoing hazard mitigation and for implementing the plan for post-disaster recovery and reconstruction.	**Element B1.** The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. **Element B2.** The risk assessment shall include information on previous occurrences of hazard events and on the probability of future hazard events. **Element B3.** The risk assessment shall include an overall summary of each hazard and its impact on the community, as well as a description of each jurisdiction's vulnerability to the identified hazards. **Element B4.** All plans must address NFIP insured structures that have been repetitively damaged by floods. **Element C1.** The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools. **Element C2.** The hazard mitigation strategy shall address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate. **Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Element	Purposes of Element	Potential Hazard Mitigation Elements
Agriculture, Forest, and Scenic Preservation	(a) inventory agricultural, forest, and scenic lands within the jurisdiction of the local government; (b) assess the relative importance of these lands in terms of size, quality, and/or resource significance as well as contribution to the economy of the local government and/or the surrounding region; (c) recognize that, in addition to their primary value as contributing to the economy of the local government and/or the surrounding region, agricultural and forest lands also have environmental value and may also have historic, cultural, open space, and scenic values; (d) prioritize such areas containing agricultural, forest, and scenic lands in order to take subsequent action to preserve them through acquisition or other means or protect them from incompatible forms of development; (e) promote and enhance the continuation of agriculture- and forest-based economies; and (f) reinforce any urban growth area.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Human Services	(a) integrate consideration of human services issues with other planning undertaken by the local government; (b) coordinate programs of human services providers, whether they are the local government, other government agencies, or nonprofit or for-profit organizations and determine roles, if any, in addition to coordination, that the local government may assume in relation to provision of human services; (c) identify deficiencies in existing human services programs; (d) establish benchmarks by which human services programs may be evaluated for funding by the local government as well as other entities; and (e) propose new human services programs or changes in or the elimination of existing human services programs, as appropriate.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Community Design	(a) assess the positive and negative factors that constitute the visual environment of the community as well as the appearance and character of community gateways, business districts, neighborhoods, and other areas; and (b) establish a basis for the local government to make decisions about community appearance and character by defining its goals and policies and by describing design principles or guidelines that will contribute to a desired overall image or series of images of the community.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Element	Purposes of Element	Potential Hazard Mitigation Elements
Historic Preservation	(a) identify, designate, protect, and preserve the local government's significant historic, archaeological, and cultural sites, landmarks, buildings, districts, and landscapes; (b) guide new development, as well as the rehabilitation or adaptative reuse of historic and cultural resources; (c) contribute to the economic development and vitality of the local government; (d) inform and educate the public about the local government's historic, archaeological, and cultural resources; and (e) integrate any relevant goals, policies, and guidelines in the state comprehensive plan, and any state historic preservation plan, and the regional comprehensive plan with local planning.	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Supporting Documentation *(Listed here as a possible addition or supplement)*	The local comprehensive plan may not be the appropriate place for certain documentation, however, separate supporting documents could easily be incorporated by reference or serve as a companion document including those necessary to meet applicable FEMA requirements.	**Element A1.** The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. **Element A2.** The planning process shall include an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process. **Element A3.** The planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval. **Element D1.** A local jurisdiction must review and revise its plan to reflect changes in development. **Element D2.** A local jurisdiction must review and revise its plan to reflect progress in local mitigation efforts. **Element D3.** A local jurisdiction must review and revise its plan to reflect changes in priorities. **Element E1.** The plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. (e.g., City Council, County commissioner, Tribal Council).

Case Study 10. Integrating Hazard Mitigation Into a Local Comprehensive Plan: City of Berkeley, California

The table shown on the following pages is intended to illustrate how hazard mitigation may be integrated into a local comprehensive plan. It provides relevant excerpts ("Hazard Mitigation Content") as taken from each element of the City of Berkeley's General Plan. This includes the following elements:

- Introduction
- Land Use
- Transportation
- Housing
- Disaster Preparedness and Safety
- Open Space and Recreation
- Environmental Management
- Economic Development and Employment
- Urban Design and Preservation
- Citizen Participation
- Implementation

A third column, "Potential Hazard Mitigation Elements," has been added to the table to highlight the relationship between the hazard mitigation content included in each element of the Berkeley General Plan (or perhaps where additional content could be included), and federal requirements for local hazard mitigation plans (Title 44 Code of Federal Regulations §201.6).

As can be seen in this example the City of Berkeley integrated hazard mitigation goals, policies and actions throughout nearly all elements of its General Plan. The City also maintains a separate Disaster Mitigation Plan as an appendix to the General Plan, which was prepared specifically to meet the federal requirements for local hazard mitigation plans. Most of the actions in the Disaster Mitigation Plan are directly taken from the General Plan's Disaster Preparedness and Safety Element, and the Disaster Mitigation Plan also includes an appendix with a matrix comparing Mitigation Plan Actions with General Plan Policies and Actions. More information on the linkage between Berkeley's General Plan and its Disaster Mitigation Plan is provided as a case study in the *Hazard Mitigation: Integrating Best Practices into Planning*[1] report published by the American Planning Association.

**This example does not convey approval or official guidance by FEMA to the City of Berkeley or any other local jurisdiction on the required content of a local comprehensive plan or hazard mitigation plan. This comparison is for illustrative purposes only, and any local community will need to work with their State Hazard Mitigation Officer or FEMA for official guidance or approval.*

1 American Planning Association, "Hazard Mitigation: Integrating Best Practices into Planning," *Planning Advisory Service Report*, No. 560, Chicago, American Planning Association, 2010. p. 97-110. Available at: http://www.fema.gov/library/viewRecord.do?id=4267

General Plan Element	Hazard Mitigation Content	Potential Hazard Mitigation Elements
Introduction	The Introduction describes the purpose and organization of the plan, and the process used its development. This includes the following excerpted language which could be updated as necessary to meet applicable FEMA requirements. ***Creating the General Plan:*** *Although a number of public workshops and several important publications were completed in the mid-1990s for the update of the General Plan, this General Plan document is the result of an intensive two-and-a-half-year effort by the Berkeley Planning Commission with help from the Berkeley community and City staff. In February 1999 the City Council authorized the Planning Commission and City staff to begin work on drafting a new General Plan for the City of Berkeley. City staff prepared the first draft in May 1999. After a series of five community workshops, staff prepared a second draft in October 1999 for Planning Commission consideration. Over the next 12 months, the Planning Commission held seven public workshops, which included over 20 hours of "roundtable" discussions. Hundreds of Berkeley citizens participated in the workshops or submitted written suggestions for the Planning Commission Draft General Plan. After an additional series of Planning Commission meetings dedicated to focused discussion of particular policies and policy alternatives, the Planning Commission published a Planning Commission Draft General Plan in October 2000. Following publication of the Planning Commission Draft Plan, the Commission initiated a series of public hearings on the Draft Plan and authorized work on a Draft Environmental Impact Report (EIR) evaluating the Draft Plan. During the spring of 2001, the Planning Commission dedicated another ten Planning Commission meetings to the consideration of additional public testimony and proposed amendments to the Planning Commission Draft Plan and held three public hearings for the public to comment on the Draft EIR and the Draft Plan. The goals, objectives, policies, and actions included in this General Plan are the result of four drafts, approximately 100 hours of public workshops, meetings, and hearings, close to 1,000 pages of policy suggestions submitted by Berkeley citizens, and the hard work and dedication of the Berkeley community and Berkeley Planning Commission. On July 11, 2001 the Planning Commission concluded its work on the update of the Berkeley General Plan and forwarded its recommended General Plan to the City Council for consideration and adoption.*	**Element A1.** The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. **Element A2.** The planning process shall include an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process. **Element A3.** The planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval. **Element A4.** The planning process shall include the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information. **Element D1.** A local jurisdiction must review and revise its plan to reflect changes in development. **Element D2.** A local jurisdiction must review and revise its plan to reflect progress in local mitigation efforts. **Element D3.** A local jurisdiction must review and revise its plan to reflect changes in priorities.
	The Introduction identifies seven major goals for the Plan, including the following goal statement that is focused on hazard mitigation: ***Goal #6:*** *Make Berkeley a disaster-resistant community that can survive, recover from, and thrive after a disaster.*	**Element C3.** The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

General Plan Element	Hazard Mitigation Content	Potential Hazard Mitigation Elements
Land Use	The Land Use Element integrates several policies and actions related to hazard mitigation: ***Policy LU-4**, Action A: When evaluating development proposals or changes to zoning consider General Plan and Area Plan policies, Zoning and Subdivision Ordinance standards, existing land uses, environmental impacts, safety and seismic concerns, social and economic consequences, and resident, merchant, and property owner concerns.* ***Policy LU-6:** Ensure that all residential areas are safe and attractive places to live.* ***Policy LU-7**, Action C: Carefully review and regulate proposals for additional residential development in the Hill Fire Hazard Area and the tsunami, seismic and landslide hazard areas.*	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Transportation	The Transportation Element integrates several policies and actions related to hazard mitigation: ***Policy T-9** (includes 5 Actions, not listed here): Continue to evaluate the possibility of working with the City of Albany, the racetrack owners, regional transportation agencies, and AC Transit to establish a ferry terminal and regular San Francisco ferry service from Berkeley at the foot of Gilman Street or at the foot of University Avenue as an alternative to the Bay Bridge and as an essential recovery element following a significant seismic event.* ***Policy T-23**, Action A: Restrict tank vehicles with potentially hazardous materials in residential and other areas such as the Hazardous Fire Area.* ***Policy T-28** (includes 5 Actions, not listed here): Provide for emergency access to all parts of the city and safe evacuation routes.* ** The Emergency Access and Evacuation Network map identifies the roadways in the city that must be maintained for emergency access and emergency evacuation in case of a major disaster, such as fires, earthquakes, floods, reservoir rupture, or hazardous materials release.*	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

General Plan Element	Hazard Mitigation Content	Potential Hazard Mitigation Elements
Housing	The Housing Element integrates an objective and several policies and actions related to hazard mitigation: ***Objective 2:*** *Existing housing should be maintained and improved. Improvements that will prepare buildings for a major seismic event should be encouraged.* ***Policy H-11*** *(includes 4 Actions, not listed here): Maintain housing supply and reduce the loss of life and property caused by earthquakes by requiring structural strengthening and hazard mitigation in Berkeley housing.* ***Policy H-13*** *(includes 2 Actions, not listed here): Encourage and facilitate addition of second and small "in-law" units on properties with single-family homes, but not in areas with limited parking and vehicular access or that are especially vulnerable to natural disaster.* ***Policy H-19****, Action A: As required by SB2, identify zoning districts where emergency shelters shall be allowed as of right, including a year-round emergency shelter.*	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Disaster Preparedness and Safety	The purpose of the Disaster Preparedness and Safety Element is *"to reduce the risk of death, injuries, property damage, and economic and social dislocation from natural and man-made hazards and disasters."* As such, hazard mitigation is integrated throughout the entire Element.	
	The Disaster Preparedness and Safety Element includes a section titled *"Hazards and Vulnerabilities"* with the purpose of identifying the major hazards confronting the community, and those aspects or areas that are most vulnerable to those hazards. This includes the following specific subsections which provide varying levels of information (including maps, tables, hyperlinks, etc.) on the nature of hazards and their risks to the community. These sections could be updated as necessary to meet applicable FEMA requirements. ▪ *Seismic and Geologic Hazards* ▪ *Seismic and Geological Vulnerabilities* ▪ *Fire Hazards and Vulnerabilities* ▪ *Landslide Hazards and Vulnerabilities* ▪ *Flood Hazards and Vulnerabilities*	**Element B1.** The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. **Element B2.** The risk assessment shall include information on previous occurrences of hazard events and on the probability of future hazard events. **Element B3.** The risk assessment shall include an overall summary of each hazard and its impact on the community, as well as a description of each jurisdiction's vulnerability to the identified hazards. **Element B4.** All plans must address NFIP insured structures that have been repetitively damaged by floods.

General Plan Element	Hazard Mitigation Content	Potential Hazard Mitigation Elements
Disaster Preparedness and Safety *(continued)*	The Disaster Preparedness and Safety Element includes six objectives: *1. Establish and maintain an effective emergency response program that anticipates the potential for disasters, maintains continuity of life-support functions during an emergency, and institutes community-based disaster response planning, involving businesses, non-governmental organizations, and neighborhoods.* *2. Improve and develop City mitigation programs to reduce risks to people and property from natural and man-made hazards to socially and economically acceptable levels.* *3. Plan for and regulate the uses of land to minimize exposure to hazards from either natural or human-related causes and to contribute to a "disaster-resistant" community.* *4. Reduce the potential for loss of life, injury, and economic damage resulting from earthquakes and associated hazards.* *5. Reduce the potential for loss of life, injury, and economic damage resulting from urban and wildland fire.* *6. Reduce the potential for loss of life and property damage in areas subject to flooding.*	**Element C3.** The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
	The Disaster Preparedness and Safety Element includes 28 policies and 73 specific actions related to hazard mitigation (not listed here). These policies and actions are organized under the following categories: ▪ *Emergency Preparedness and Response* ▪ *Mitigation* ▪ *Disaster-Resistant Land Use Planning* ▪ *Seismic Hazards* ▪ *Fire Hazards* ▪ *Flood Hazards*	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

General Plan Element	Hazard Mitigation Content	Potential Hazard Mitigation Elements
Open Space and Recreation	The Open Space and Recreation Element integrates a policy and several actions related to hazard mitigation: ***Policy OS-13*** *(includes 4 Actions): Implement the 1986 Waterfront Plan policies to establish the waterfront as an area primarily for recreational, open space, and environmental uses, with preservation and enhancement of beaches, marshes, and other natural habitats.*	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Environmental Management	The Environmental Management Element integrates several policies and actions related to hazard mitigation: ***Policy EM-16:*** *Work with owners of vulnerable structures with significant quantities of hazardous material to mitigate potential risks.* ***Policy EM-17:*** *Establish a way to warn residents of a release of toxic material or other health hazard, such as sirens and/or radio broadcasts.* ***Policy EM-24****, Action E: Ensure that new development pays its fair share of improvements to the storm sewerage system necessary to accommodate increased flows from the development.* ***Policy EM-31:*** *Encourage drought-resistant, rodent-resistant, and fire-resistant plants to reduce water use, prevent erosion of soils, improve habitat, lessen fire danger, and minimize degradation of resources.*	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
Economic Development and Employment	The Economic Development and Employment Element does not integrate any policies or actions related to hazard mitigation.	

General Plan Element	Hazard Mitigation Content	Potential Hazard Mitigation Elements
Urban Design and Preservation	The Urban Design and Preservation Element integrates several policies and actions related to hazard mitigation: ***Policy UD-7:*** *Encourage and support the long-term protection of historically or architecturally significant buildings to preserve neighborhood and community character.* *Action A: Encourage, and where appropriate require, owners of historically or architecturally valuable buildings to incorporate disaster-resistance measures to enable them to be feasibly repaired after a major earthquake or other disaster.* *Action B: Create incentives for owners of historic or architecturally significant structures to undertake mitigation to levels that will minimize the likelihood of demolition and maximize the ability to repair or avoid damage in the event of a natural disaster.* *Action C: In preparing for the period after the next big earthquake, firestorm, or other major disaster, establish preservation-sensitive measures including requirements for temporary shoring or stabilization where needed; arrangements for consulting with preservationists; expedited permit procedures for suitable repair or rebuilding of historically or architecturally valuable structures; and, where appropriate, provisions for replanting. Encourage use of FEMA funds for rehabilitation of such structures wherever possible.* ***Policy UD-14****, Action A: Consider providing new or expanded sources of financial assistance for unreinforced-masonry and other structures, including historically or culturally significant ones that need seismic retrofit.*	**Element C4.** The hazard mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

General Plan Element	Hazard Mitigation Content	Potential Hazard Mitigation Elements
Citizen Participation	The Citizen Participation Element describes the importance of continuously and significantly involving citizens in formulating, writing, and presenting the General Plan, area plans, and other planning documents. It describes the methods and processes for notifying, informing and facilitating citizen involvement, and includes several objectives, policies and actions for public participation in the General Plan and other planning tasks. This includes the following action: *The Planning Commission should establish clear procedures for maximum citizen participation in the General Plan amendment process, including providing procedures for citizens to recommend amendments to the General Plan and procedures for citizen input into the Commission's annual report to the City Council on the status of the General Plan and its implementation (Also see the Introduction chapter's section "Amending the General Plan," on pages 1-7 and I-8.)*	**Element A5.** The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

General Plan Element	Hazard Mitigation Content	Potential Hazard Mitigation Elements
Implementation	The Implementation Element includes the objectives, policies and actions relating to how the General Plan will be maintained and implemented to ensure that "the plan remains a dynamic, responsive document." This includes the following actions: *A. Annually, the Planning Commission will hold at least one public meeting to discuss the status of the General Plan and progress made toward implementation.* *B. Biennially, the City staff will prepare a status report for the Planning Commission on the General Plan that includes: 1) a summary or matrix evaluating the City's progress toward achieving the General Plan's objectives and implementing the policies and actions, 2) any recommended amendments to the General Plan or Area Plans, and 3) any staff recommendations regarding future year(s) funding for General Plan actions and programs. The report should be available to the Commission no later than December of the year prior to the adoption of the biennial City Budget. All relevant City departments should participate in the preparation of the report, and the report should be circulated to all relevant boards and commissions prior to the Planning Commission public meeting. After its meeting on the status of the General Plan, the Planning Commission should forward a report to the City Council on progress made in implementing the Plan and include any recommendations regarding the highest priority General Plan actions or programs that should be funded in the upcoming biennial budget.* *C. Prior to the adoption of the citywide Budget and Capital Improvement Program, the City Council shall review progress made in implementing the General Plan and associated Area Plans.* *D. When adopting the City Budget and Capital Improvement Program, the City Council shall include a finding of consistency with the General Plan and associated Area Plans.* *E. To help ensure adequate funds for capital improvements identified in the General Plan, the City should maintain capital reserve funds and whenever possible set funds aside each year for future capital projects. Expenditures from the committed reserves should be made in consultation with appropriate boards and commissions through the annual review and biennial budget process.*	**Element A6.** The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, evaluating, and updating the mitigation plan within a five-year cycle. **Element C5.** The hazard mitigation strategy shall include an action plan, describing how the actions identified will be prioritized, implemented, and administered by each local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs. **Element C6.** The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvements, when appropriate.

General Plan Element	Hazard Mitigation Content	Potential Hazard Mitigation Elements
Supporting Documentation *(Not included with Berkeley's General Plan, but listed here as a possible addition or supplement)*	The City of Berkeley General Plan may not be the appropriate place for certain documentation, however, separate supporting documents could easily be incorporated by reference or serve as a companion document including those necessary to meet applicable FEMA requirements.	**Element C1.** The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools. **Element C2.** The hazard mitigation strategy shall address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate. **Element E1.** The plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. (e.g., City Council, County commissioner, Tribal Council).

Chapter 6:
Fact Sheets

FEMA has prepared a series of Fact Sheets that present additional information on building community resilience by integrating hazard mitigation into local planning. To date, five Fact Sheets have been prepared and are included in this chapter:

- Integrating Hazard Mitigation Into the Local Comprehensive Plan
- The Role of Local Leadership
- Social and Economic Benefits
- Planning for Post-Disaster Redevelopment
- Protecting Community Infrastructure

These Fact Sheets are also available online at http://www.fema.gov/multi-hazard-mitigation-planning.

FEMA

Building Community Resilience by Integrating Hazard Mitigation

Integrating Hazard Mitigation Into the Local Comprehensive Plan

FEMA/Jocelyn Augustino

FEMA/Charles Powell

Local comprehensive plans, also referred to as master plans or general plans, provide a framework for the physical design and development of a community over a long-term planning horizon. They address social, economic, and environmental issues by the manner in which they guide overall growth and development. The vision, goals, and policies of the comprehensive plan are routinely implemented through other local planning instruments such as zoning ordinances, subdivision regulations, and capital improvement programs. Integrating hazard mitigation into the local comprehensive plan thereby establishes resilience as an overarching value of a community and provides the opportunity to continuously manage development in a way that does not lead to increased hazard vulnerability.

Land Use and Future Development

Strong land use policies are the foundation of successful comprehensive planning efforts—they establish the general pattern for the location, distribution, density, and type of future development throughout all areas of the community. The land use element of a comprehensive plan is based on an analysis of present and future conditions, including physical setting and natural surroundings. This creates opportunities to guide future growth and development away from areas with known hazards, or to ensure design standards for new or improved construction take potential hazards into account. Land use policies can build community resilience by taking information on the location, frequency, and severity of hazards into consideration and setting forth recommendations that influence development in a way that does not increase risks to life and property.

Transportation

Transportation and land use are intricately linked; therefore, the transportation element can reflect land use principles that reduce the community's vulnerability to hazards. Building community resilience through transportation planning can be accomplished by adopting policies that direct growth away from known hazard areas. Another opportunity to be seized is ensuring that transportation systems and other critical infrastructure are designed to withstand the effects of known hazards so that they still function in the event of an emergency or disaster.

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

American Planning Association, Planning for Post-Disaster Recovery and Reconstruction
http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=1558

Housing

Housing policies focus on the provision of safe and sanitary housing to meet existing and future needs of the community. The housing element can help strengthen community resilience by ensuring that the location and design of new or improved housing complies not only with existing building codes, but with potential hazards in mind. Opportunities to strengthen or replace structures identified as vulnerable to hazards can be promoted through existing maintenance or rehabilitation programs, and particularly through policies regarding non-conforming, substantially damaged, or substantially improved properties.

Economic Development

The relationship between economic development and resilience is rooted in the shared objective to sustain and enhance community sustainability. Hazard mitigation can be integrated with economic development policies by promoting commercial or industrial expansion in areas that are not vulnerable to damage or disruption from hazards, and by making community resilience a key feature in attracting, expanding, and retaining businesses and industry.

Public Facilities and Infrastructure

Similar to the transportation element, a community's facilities and infrastructure policies are directly linked to land use patterns and community development. These linkages provide opportunities to build community resilience by establishing policies that limit the extension of public facilities or services and the provision of other capital expenditures in areas that are vulnerable to hazards. Policies may be adopted to ensure critical facilities such as police and fire stations, as well as key infrastructure such as water and wastewater treatment plants, are protected from the effects of hazards. This element also provides opportunities to establish goals and policies in support of mitigation projects such as stormwater drainage improvements or the public acquisition of hazard areas for open space.

Natural Resource Protection

There are an abundance of opportunities to achieve multiple objectives when it comes to hazard mitigation and natural resource protection. Policies designed to preserve or enhance environmental areas of concern, such as wetlands, riparian corridors, and floodplains, often include the added benefit of avoiding or minimizing development in hazard areas. These policies build community resilience by not only protecting lives and property from hazards, but also maintaining natural and beneficial functions of systems that often act as buffers against those hazard effects.

Historic Properties and Cultural Resources

Policies designed to protect and preserve historic and cultural sites, buildings, and other resources may be linked with existing mitigation strategies to prevent damage or losses from hazards—particularly due to the fact that such resources are irreplaceable. The policies aimed at protecting these unique resources, by their very nature, can be tailored in a manner consistent with the location, design, or material to be preserved.

FEMA/Andrea Booher

FEMA/Jennifer Smits

"In the end, it is important both to focus on hazards in a specific element devoted to identifying and assessing the hazards a community faces and to integrate those concerns more broadly into other elements, since hazards do not operate in isolation from the built environment."

American Planning Association, Hazard Mitigation: Integrating Best Practices into Local Planning
http://www.fema.gov/library/viewRecord.do?id=4267

FEMA

Building Community Resilience by Integrating Hazard Mitigation

The Role of Local Leadership

How Can Local Leaders Promote the Integration of Hazard Mitigation into Local Planning?

Local community leaders and decision makers play an important role in setting priorities, providing overarching policy direction, and bringing stakeholders together. Their visibility can be used to spearhead initiatives that promote the importance of integrating hazard mitigation to achieve overall community safety and resilience. In addition, they have the ability to communicate with a broad base of constituents and partners. These qualities are invaluable for the success of an integrated, interdepartmental, multi-jurisdictional hazard mitigation strategy. Here are some ways to promote integrated hazard mitigation solutions:

- **Frame the issue.** On its own, integrating hazard mitigation and safe growth policies can seem like an obscure topic to decision makers and the general public. Frame the issue in terms that resonate with the community, such as economic development, environmental protection, or providing essential public services. Use these issues to highlight the importance of hazard mitigation in supporting these community values.
- **Make safety and resilience a priority.** Ensure that public safety and community resilience are considered in all decisions. When deliberating or voting on an issue, providing policy direction, or setting budgets, ask how that decision affects safety and resilience, and ask which hazard mitigation practices may strengthen the decision.
- **Build partnerships.** Bring stakeholders to the planning table by fostering partnerships among local departments, between agencies, and between communities. Include representatives of interest groups such as environmental organizations, business associations, or professional associations. Make use of technical experts—this helps to provide a more robust knowledge pool for developing ways to integrate hazard mitigation. Invite civic organizations and the general public to participate and provide input.
- **Get the message out.** Use the visibility of a local leader as a platform to champion, or raise awareness on, the importance of hazard mitigation and community resilience. Quickly highlight successful actions and return on investment to promote other actions. Be repetitive and consistent with the message through multiple channels of communication.

FEMA/Norman Lenburg

FEMA/Manny Broussard

Local leaders promote integration of hazard mitigation within the community by framing the issue, making it a priority, building partnerships, and conveying the message. Conveying the message includes demonstrating and celebrating success.

Responsibility for promoting community safety and resilience does not lie with a single person or department. Hazards often cross jurisdictional boundaries, requiring communication and partnerships among neighboring communities and various organizations that can support integration efforts.

What Community Tools Support Community Resilience?

Building or enhancing community resilience does not need to mean expensive structural protection measures. Decisions that are made relating to land use, environmental protection, economic development, capital improvements, government operations, and budgets all have a role to play in mitigating hazard risks. The most effective way to promote resilience at the community level is to integrate the consideration of risk, and ways to reduce or eliminate risk, into all decisions.

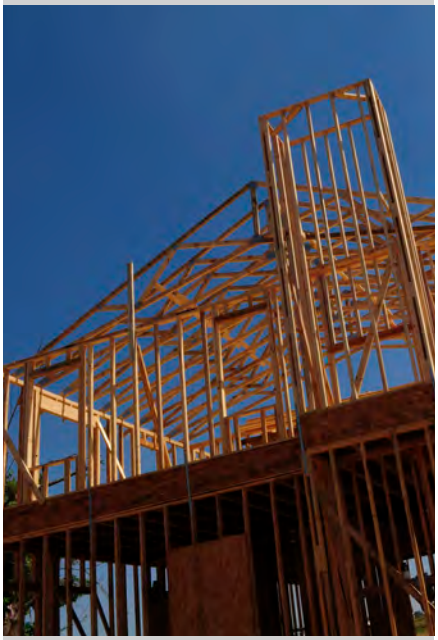
Examples of integrated hazard mitigation solutions include:

- Establishing goals, policies, and objectives that are linked to risk reduction and resiliency in the comprehensive, general, or other community plans;
- Incorporating hazard mitigation standards in permit reviews;
- Using tax increment financing, transportation improvement financing, or other public funding mechanisms to help pay for hazard mitigation measures;
- Using capital improvement programs to fund hazard mitigation measures;
- Using infrastructure improvements to guide growth away from known hazard areas;
- Using zoning and other land use controls to prohibit or discourage hazardous development patterns;
- Preserving natural areas or open space as buffers against known hazards, such as wildfire breaks;
- Preserving or restoring natural functions that minimize hazard impacts, such as wetland restoration;
- Incorporating structural retrofits or relocation of existing buildings or infrastructure during the post-disaster redevelopment process; and
- Incorporating the awareness of hazard risks and hazard mitigation into public outreach practices.

Why is Hazard Mitigation Important?

Hazard mitigation has value on a number of levels. Mitigation creates safer communities by reducing loss of life and damage to property. Mitigation also enables individuals and communities to recover more quickly from disasters. And, mitigation lessens the financial impact of disasters on individuals and all levels of government.

FEMA/Michelle Miller-Freeck



FEMA/Ruth Kennedy

For More Information

Refer to FEMA's integration guidance document, *Integrating Hazard Mitigation Into Local Planning*, available at www.fema.gov/hazard-mitigation-planning-resources

FEMA

Building Community Resilience by Integrating Hazard Mitigation

Social and Economic Benefits

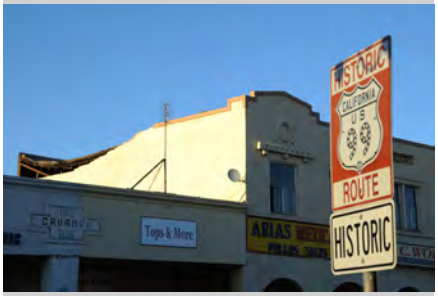
What Makes a Community Resilient?

Resilience is the ability to adapt to changing conditions and prepare for, withstand, and rapidly recover from disruption. Resilient communities proactively protect themselves against hazards, build self-sufficiency, and become more sustainable.

What Are the Benefits of Community Resilience?

Community resilience has multiple social and economic benefits, including:

- **Preventing loss of life and injury.** This is typically of paramount importance to most communities. The value of protecting buildings and infrastructure diminishes significantly if residents and property owners do not feel safe in their homes or places of business.
- **Reducing property damage to homes and businesses.** Minimizing physical damage to residential properties can help avoid expensive displacement costs, in addition to the cost of repairs. Any avoided damage to a business can help reduce loss of revenue and downtime for employees, in addition to the cost of repairs.
- **Reducing business interruption and revenue loss.** Businesses employ workers, provide for community needs and services, and generate revenue, allowing the community, both its members and government, to provide for itself. Reducing business interruption and revenue loss greatly aids in the speed and effectiveness of returning a community to self-sufficiency and vitality after a disaster.
- **Helping to lower emergency response and disaster recovery costs.** Emergency response costs can be lowered significantly when services such as fire safety, search and rescue, medical operations, disaster management, and other related services are needed less. Disaster recovery costs can also be lowered when prolonged activities such as long-term recovery planning, debris management, housing recovery, infrastructure recovery, natural resource recovery, and other related activities are needed less.



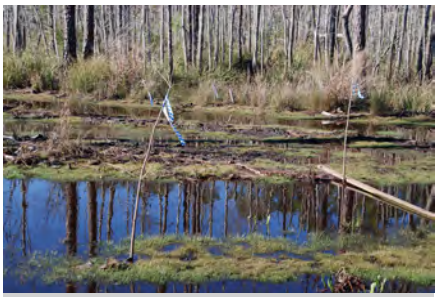
FEMA/Adam Dubrowa

"On average, a dollar spent by FEMA on hazard mitigation provides the nation about $4 in future benefits.

In addition, FEMA grants to mitigate the effects of floods, hurricanes, tornadoes, and earthquakes between 1993 and 2003 are expected to save more than 220 lives and prevent almost 4,700 injuries over approximately 50 years."

Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities by the Multihazard Mitigation Council
www.nibs.org/resource/resmgr/MMC/hms_vol1.pdf

- **Attracting new businesses and residents.** The ability to market a neighborhood or business district as "resilient" to hazards can help attract industry, commercial development, and a thriving population with positive impacts on a community's tax base.
- **Protecting cultural and historical assets.** Seeking to preserve, protect, conserve, rehabilitate, recover, and restore cultural and historical resources can have a significant positive impact on a community's overall health.
- **Reducing environmental damage.** Environmental assets and natural resources are important to community identity and quality of life and support the economy through agriculture, tourism and recreation, and a variety of other ecosystem services, such as clean air and water. The natural environment also provides protective functions that reduce hazard impacts and increase resiliency.
- **Building a sense of place and peace of mind.** A safe, resilient community results in residents and business owners feeling more confident and secure about their assets and investments, and can lead to a stronger sense of place and, ultimately, peace of mind.



FEMA/Jennifer Smits

The Added Value of Integration

Well-rounded community resilience as described above is often the result of integrating hazard mitigation with other local planning processes that help guide community development. Communities can build a stronger capacity for mitigation, preparedness, response, and recovery by building on the public, private, and non-profit institutions that enable day-to-day activities to run well. Integration can also lead to efficiencies and reduced costs as planning efforts and hazard mitigation activities are combined, productivity is optimized, and tasks and responsibilities are shared.

FEMA

Building Community Resilience by Integrating Hazard Mitigation Planning for Post-Disaster Redevelopment

FEMA/Robert Kaufmann


FEMA/Jennifer Smits

The purpose of a post-disaster redevelopment or recovery plan is to facilitate pre-disaster planning in a way that guides long-term recovery efforts (five years or more) following a disaster. There are a number of reasons to plan for long-term recovery before a disaster occurs, including:

- **Planning ahead.** Redevelopment is too complex an issue to address in the midst of a disaster response or during the immediate post-disaster recovery process. A community's attention and resources will likely be committed to more pressing needs, and stakeholders will likely not have the time or ability to engage in a long-term planning effort. Planning in advance provides the opportunity to properly integrate hazard mitigation into redevelopment and recovery with sufficient time to explore, discuss, and address the issues.
- **Rebuilding resilient.** Rebuilding damaged structures or infrastructure in the same location and/or in the same way may leave the community at risk from similar disaster losses in the future. Hazard mitigation measures such as property protection and hazard avoidance should be considered when rebuilding or repairing damaged structures.
- **Focusing long-term.** Disasters can force business closures, displace residents and have lasting effects on the vitality of a community. Understanding and addressing these social and economic drivers, along with their existing dependencies and vulnerabilities, can support the community in its mitigation and post-disaster redevelopment efforts.
- **Implementing the vision.** Disasters may present opportunities to target investments that help achieve a long-term community vision.

"Without a comprehensive, long-term recovery plan, ad hoc efforts in the aftermath of a significant disaster will delay the return of community stability. Creating a process to make smart post-disaster decisions and prepare for long-term recovery requirements enables a community to do more than react..."

Florida Department of Community Affairs and Florida Division of Emergency Management, Post-Disaster Redevelopment Planning: A Guide for Florida Communities

Integrating Hazard Mitigation into Redevelopment Plan Elements

FEMA/Jennifer Smits

The community's post-disaster redevelopment plan can identify roles and responsibilities of key people, departments, and agencies; address the need for temporary regulations such as post-disaster building moratoria; address potential impacts to historic resources; address potential impacts to non-conforming uses; and address location and other provisions for temporary housing.

In addition, a recovery plan can seek to integrate long-term hazard mitigation, public safety, and resilience goals, including:

- **Profiling and mapping hazard risks.** This can help synchronize geospatial hazard analysis and mapping efforts, leading to better informed policy recommendations. This information can also be utilized by emergency operations and response personnel in order to better understand hazard impacts as events unfold.
- **Establishing a safety or hazards element in the comprehensive or general plan.** A separate public safety or hazards element can be added to the comprehensive plan, or a "checklist" or matrix might be considered for inclusion as an appendix to the plan to track where and how hazard mitigation is integrated throughout each element. This facilitates better coordination between land use and emergency planners, and ensures that hazard profiles and mapping information are integrated into the land use planning process.
- **Using land use, zoning, subdivision, and other development regulations.** These tools can be instrumental in guiding growth to safer areas while limiting development in known hazard areas. A community's hazard profile should always be considered when making land use or development decisions.
- **Protecting or restoring natural areas.** This can maintain a buffer or other mitigating effects, such as flood storage, while directing growth to less environmentally sensitive and/or hazard prone areas.
- **Using capital improvement programs to fund safety measures.** This can also aid in guiding safe growth and establishing road improvements or other measures intended to facilitate continuity of passage, evacuation, and other essential community needs in the event of a disaster.

FEMA

Building Community Resilience by Integrating Hazard Mitigation

Protecting Community Infrastructure

Investing the time and resources needed to develop a local hazard mitigation plan is critical to a community's resilience to disasters. A key aspect of this is integrating hazard mitigation concepts into existing community infrastructure plans and projects. This typically requires long-term planning, coordination, community buy-in, and funding.

A range of hazard mitigation actions may be implemented to protect community infrastructure, including:

- Incorporating hazard mitigation into capital improvement programs;
- Flood protection measures for water or sewer facilities, road elevation, or drainage improvements;
- Increasing hazard resistance when repairing or replacing aging transportation infrastructure such as roads, bridges, and tunnels;
- Bolstering the protection of hospitals, fire stations, emergency operations centers, and other critical facilities through structural retrofits;
- Dam or levee maintenance;
- Underground power lines;
- Tree pruning/canopy management;
- Utility system redundancies; and
- Lightning protection measures.

The integration of mitigation into planned infrastructure projects can provide tangible benefits to the community and its public works staff. These include the reduction or elimination of service outages, which can free up public works personnel to provide response and recovery support elsewhere, and reduced recovery costs.

FEMA/Martin Grube

FEMA/Ralph Simcox

Infrastructure damaged by a disaster may not necessarily be replaced in the way it was originally constructed, but rather with hazard mitigation and community resiliency in mind.

Why is Coordination Important?

Public works officials may benefit from working closely with community planners and hazard mitigation specialists in a comprehensive planning process that addresses the needs of the whole community. Ideally, this coordination would occur in a pre-disaster environment. However, it is not too late to benefit from coordination if the first meeting between public works and other community planners occurs in the days following a disaster.

Some of these mutual benefits may include:

- Hazard mitigation plans may have already identified replacement values for structures or predicted where damages are likely to be greatest;
- Information in the hazard mitigation plan may assist public works officials with post-disaster damage assessments;
- Public works officials may have first-hand knowledge of what damage has occurred in the community and what needs to be done to mitigate it; and
- An opportunity to look at activities that will help the community in the short term, while reducing risk in the long term.

The Post-Disaster Window of Opportunity

If damaged community infrastructure is replaced in the same manner as it was originally constructed, without integrating hazard mitigation, it may remain vulnerable to future disasters.

Under the FEMA Public Assistance program for example, grant opportunities may fund hazard mitigation measures during the repair or replacement of public facilities damaged by a presidentially declared disaster event. This is often referred to as "Section 406 Mitigation." Examples can include relocation of facilities from hazardous locations, slope stabilization to protect facilities, and certain types of protection from high winds, floodproofing of buildings, flood protection of bridges and culverts, seismic protection, and utility protection. These activities are intended to enhance a facility's or system's resistance to similar events in the future.

It is important for community officials to coordinate with FEMA on the utilization of Section 406 Mitigation funding or other hazard mitigation assistance following a major disaster event to ensure that hazard mitigation is incorporated into the recovery and rebuilding process.

FEMA/Ed Edahl

FEMA/Norman Lenburg

Public Assistance funding for hazard mitigation is there to promote measures that reduce future loss to life and property, protect the federal investment in public infrastructure, and ultimately help build disaster resistant communities.

For More Information on Section 406 Mitigation

Go to: http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/hazard-mitigation-funding-under-section-406-0

Appendix A: How to Use the Safe Growth Integration Tool

The Safe Growth Integration Tool can be used to inventory your community's hazard mitigation approach and components of your planning framework and help identify integration opportunities. The blank tool included in this appendix can be used as-is, or can be modified to reflect the unique circumstances of your community. The Safe Growth Integration Tool is intended to be concise and flexible and can be an effective way to structure your integration conversation.

To use the tool, complete these five simple steps:

1. Review your community's hazard mitigation plan and list specific mitigation actions along the Z (vertical) axis of the matrix.

The matrix is organized by the basic categories of a hazard mitigation plan, including risk assessment, mitigation goals and objectives, and mitigation actions. The mitigation actions are further organized into the typical categories of local plans and regulations, education and awareness programs, natural systems protection, and structure and infrastructure projects. Within each of these categories, identify and list specific actions called for in your plan.

HAZARD MITIGATION			
Risk Assessment			
Mitigation Goals and Objectives			
Mitigation Actions	Local Plans and Regulations	Hazard Area Avoidance	
		Parks and Open Space Planning	
		Stormwater Regulations	
	Education and Awareness Programs	Hazard and Risk Awareness	
		Mitigation Best Practices	
		Monitoring and Reporting	
	Natural Systems Protection	Watershed Management	
		Wetland Preservation	
		Erosion and Sedimentation	
	Structure and Infrastructure Projects	Levees	
		Structural Retrofits	
		Acquisition	
		Stormwater Structures	

2. List the components of your community's planning framework along the X (horizontal) axis.

The x axis has been organized into categories that include comprehensive/general plan elements, zoning ordinances and development regulations, capital improvement and infrastructure programs, area plans, functional plans, special programs, and public and stakeholder engagement. Within these categories, identify the specific plans, policies, regulations, and programs that exist in your community. Try to identify everything that affects land use and development in some way, including those that you may not typically associate with planning such as an economic development plan or capital improvement program.

PLANNING FRAMEWORK		
Zoning Ordinances and Development Regulations		
Zoning	Subdivision	Critical Areas

3. Identify areas of existing overlap between your hazard mitigation plan and planning framework.

For example, your community may have a floodplain development ordinance that is called out as an action in your hazard mitigation plan and also exists within your land development ordinance. The simplest method for identifying overlap is to put a checkmark in the boxes where overlap exists. If you need more detail you could include specific code or plan citations.

✓ = Area of Existing Overlap ★ = Gap Between Mitigation Plan and Planning Framework		PLANNING FRAMEWORK		
		Comprehensive/ General Plan Elements		
		Hazards	Land Use	Environment
Risk Assessment		✓	✓	✓
Mitigation Goals and Objectives		✓	✓	✓
Local Plans and Regulations	Hazard Area Avoidance	✓	✓	✓
	Parks and Open Space Planning		✓	✓
	Stormwater Regulations	★		

4. Identify gaps between your hazard mitigation plan and planning framework.

For example, if your hazard mitigation plan calls for open space preservation of a hazard area to provide a buffer from developed areas, but there is no existing program to acquire open space, then identify where in your planning framework this action would best be integrated. You can use a different mark, or symbol, to distinguish gaps from existing overlaps.

✓ = Area of Existing Overlap ★ = Gap Between Mitigation Plan and Planning Framework		PLANNING FRAMEWORK		
		Comprehensive/ General Plan Elements		
		Hazards	Land Use	Environment
Risk Assessment		✓	✓	✓
Mitigation Goals and Objectives		✓	✓	✓
Local Plans and Regulations	Hazard Area Avoidance	✓	✓	✓
	Parks and Open Space Planning		✓	✓
	Stormwater Regulations	★		

5. Identify further opportunities for integration.

For example, your hazard mitigation plan may call for wetland preservation to provide additional flood storage, and you may have an ordinance that requires wetland preservation. However, there may be other opportunities to integrate this action, such as tying wetland preservation into an existing Transfer of Development Rights (TDR) program, or by acquiring and preserving wetlands as part of your open space acquisition program.

✓ = Area of Existing Overlap ★ = Gap Between Mitigation Plan and Planning Framework		PLANNING FRAMEWORK		
		Comprehensive/ General Plan Elements		
		Hazards	Land Use	Environment
Risk Assessment		✓	✓	✓
Mitigation Goals and Objectives		✓	✓	✓
Local Plans and Regulations	Hazard Area Avoidance	✓	✓	✓
	Parks and Open Space Planning		✓	✓
	Stormwater Regulations	★		
Education and Awareness Programs	Hazard and Risk Awareness	✓		
	Mitigation Best Practices	✓		
	Monitoring and Reporting	✓		
Natural Systems Protection	Watershed Management			✓
	Wetland Preservation			✓
	Erosion and Sedimentation			

Once you have filled in the matrix, you can quickly see where overlaps exist, where they are needed, and what future integration opportunities are available. The completed matrix can also help to identify priorities for your integration strategy. (Refer to Chapter 3, Figure 3-2 for a completed example.)

Safe Growth Integration Tool Worksheet (Page 1)

✓ = Area of Existing Overlap ★ = Gap Between Mitigation Plan and Planning Framework				PLANNING FRAMEWORK							
				Comprehensive/ General Plan Elements			Zoning Ordinances and Development Regulations			Capital Improvement and Infrastructure Programs	
HAZARD MITIGATION	Risk Assessment										
	Mitigation Goals and Objectives										
	Mitigation Actions	Local Plans and Regulations									
		Education and Awareness Programs									
		Natural Systems Protection									
		Structure and Infrastructure Projects									

Safe Growth Integration Tool Worksheet (Page 2)

✓ = Area of Existing Overlap

★ = Gap Between Mitigation Plan and Planning Framework

HAZARD MITIGATION				PLANNING FRAMEWORK									
				Area Plans			Functional Plans			Special Programs		Public and Stakeholder Engagement	
Risk Assessment													
Mitigation Goals and Objectives													
Mitigation Actions	Local Plans and Regulations												
	Education and Awareness Programs												
	Natural Systems Protection												
	Structure and Infrastructure Projects												