

Rebuilding

for a More Sustainable Future:

An Operational Framework





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Section 1.0

Introduction

This document provides guidance to the Federal Emergency Management Agency (FEMA) Sustainability Planner in the post-disaster response and recovery process. State emergency management officials, local jurisdictions, and other FEMA staff may also use it as a reference during nondisaster time.

What is the role of the Sustainability Planner?

The Sustainability Planner acts as a catalyst for sustainability and promotes a sustainable redevelopment component into the overall reconstruction effort. The Sustainability Planner evaluates opportunities for implementing sustainable redevelopment, presents these findings, and helps to build consensus on the appropriate level of effort to be pursued by FEMA, other Federal agencies (OFAs), state and local agencies, and nongovernmental organizations (NGOs).

The clients of Sustainability Planners are the affected local jurisdictions in the disaster declaration area. The client may be an incorporated village, town, or city; in some disasters, a sustainability initiative may involve townships, counties, or even regional or multijurisdictional levels of government. In essence, the Sustainability Planner is an advocate for these communities and helps them identify opportunities for building a disaster-resistant and sustainable future.

The Sustainability Planner facilitates and supports community-based planning initiatives; he or she does not dictate solutions. Like hazard mitigation, sustainability is ultimately a local responsibility and prerogative. The Sustainability Planner presents

information on opportunities, resources, and potential technical assistance; the community determines what will work best.

As the sustainability mission statement implies, the effectiveness of a Sustainability Planner has as much to do with people skills as with technical planning knowledge. Section 2 provides valuable suggestions on networking with the Disaster Field Office (DFO) staff, government officials, and the

Post-Disaster Sustainability Mission Statement: To promote and facilitate sustainable redevelopment at the local level by integrating the principles and practices of sustainable development into the broader goals of the post-disaster recovery process. This is accomplished in partnership with the state and in coordination with OFAs, local agencies, and NGOs.

general public. Communities will be more willing to accept the concepts of sustainable redevelopment if they receive a well thought-out message and are made to feel part of the process. The Sustainability Planner should be perceived as an advocate for the community's long-term recovery needs, not as someone who is promoting a Federal initiative. The Sustainability Planner must be able to place issues within the citizen's reach—move issues out of the abstract, and present them as tangible and practical alternatives. Understanding community needs and future vision is central to creating an opportunity for sustainability.

The goal of the sustainability initiative is to reduce the potential for disaster losses and to help communities realize opportunities to implement sustainable redevelopment during the recovery process. Although the goals and responsibilities of the Sustainability Planner are in many ways similar to FEMA's overall hazard mitigation goal, it is necessary to draw some distinctions. The Sustainability Planner focuses on developing comprehensive, long-term planning solutions and identifying opportunities to incorporate sustainable and livable community objectives. The mitigation specialist focuses on specific structural or nonstructural mitigation measures, such as buy-out or elevation of structures, National Flood Insurance Program (NFIP) compliance, building code enforcement, flood protection measures, and seismic and wind retrofit. The Sustainability Planner is more involved with comprehensive plans, zoning and subdivision regulations, and watershed and basin planning initiatives. The Sustainability Planner and the mitigation specialist are partners in building more disaster-resistant and sustainable communities, and their respective areas of emphasis complement each other.

FEMA's sustainability initiative began formally in November 1998 when the Associate Director for Mitigation encouraged Regional Directors to set up a sustainable redevelopment function in DFOs (see Appendix I). The Associate Director proposed the establishment of a *sustainability desk* as part of the mitigation function in DFOs and/or Disaster Recovery Centers (DRCs). Two pilot efforts were undertaken in Ohio

To achieve the goals of the sustainability mission statement, the primary responsibilities of the Sustainability Planner are to:

- Provide the disaster-affected community with information, contacts, resources, and technical assistance on the principles and practices of sustainable redevelopment through DFO operations.
- Publicize sustainable redevelopment during the critical window of opportunity to introduce new approaches to disaster recovery.
- Challenge the disaster recovery team to identify new opportunities to implement sustainable redevelopment during the early recovery phase of operations.
- Obtain useful information and lessons learned that will contribute to the development of policy and procedures for sustainable redevelopment during disaster recovery.
- Follow through from the Regional Office on sustainability efforts undertaken at the DFO.

and West Virginia flood declarations (FEMA-DR-1227-OH and FEMA-DR-1229-WV). This guide reflects some of the lessons learned from these and other early efforts and serves to launch this initiative on a nationwide basis.

What is sustainability and sustainable redevelopment?

Sustainability means many things to many people. What will you say when someone asks, “What is sustainability?” You might reply that it is the melding of environmental, economic, and societal values to ensure that the needs of the present are met without compromising the needs of future generations. When you associate this terminology with your responsibilities related to disaster operations and recovery activities, you may focus on building and rebuilding smarter—reducing the potential for future disaster impacts and the associated economic and societal effects of such losses. To someone else, sustainability may relate to improving the energy efficiency of a transportation network or improving crop yield while reducing water and pesticide usage. You will find a number of definitions of sustainability in this guide; this is to illustrate the broad scope of the concept and stimulate your own thinking on the subject. The theme common to all the definitions is the goal of balancing environmental, economic, and social values.

In its broadest context, sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. This definition was established by the World Commission on Environment and Development (the Brundtland Commission) in 1987. Essentially, sustainability means that decisions made today should not reduce the options of future generations, but pass on to them a natural, economic, and social environment that provides a high quality of life.

Sustainable communities make more efficient use of their land. They emphasize open space planning where appropriate by promoting greenways, parks, and landscaping. The effective use of open space can prevent development from encroaching upon floodplains, active fault zones, and other hazard areas. Sustainable communities also take advantage of underutilized urban areas and encourage infill and brownfield development. Energy and resource conservation are high priorities. Emphasis is placed on public transit and creating mixed-use environments that are less dependent on automobiles.

An essential characteristic of a sustainable community is its resilience to natural disasters. The term sustainable redevelopment refers to applying the concepts and practices of sustainable development to the disaster recovery process. The post-disaster environment presents a unique opportunity to implement sustainability initiatives and to increase the quality of the built environment. If reconstruction is a major element of the recovery process, affected communities are presented with an opportunity to address such issues as the compatibility of development with the environment and natural hazards, the use of renewable resources, and improved community planning and physical design.

This guidance is designed to provide you with the basic tools to focus sustainable efforts following a major disaster. It is the second in a series of guides to help implement sustainability. The first document, ***Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability*** is primarily intended to show

communities how the goal of disaster resilience can be a catalyst, both in planning for disasters and recovering from them, to help achieve a sustainable future. It is one of your most important tools in promoting sustainability. This companion guide develops these themes into detailed practical guidance for the Sustainability Planner.

Why is FEMA involved with sustainability issues?

- The Federal Government allocates significant resources to help communities recover from natural disasters.
- Recovery from natural disasters (FEMA's primary mission) presents a unique opportunity to consider alternatives to the damage-rebuild-damage cycle.
- Repetitive disaster losses diminish our country's quality of life and divert resources that could be better used to address other national economic and social objectives.
- By partnering with other public agencies, businesses, and private citizens, we can save lives, lessen vulnerability to disasters, and help make communities more livable.
- By identifying potential sustainability resources, we can promote actions that will enable communities to move toward a sustainable future.

How can this guide help implement sustainability?

The extent to which a sustainability initiative can be integrated into the recovery effort is dependent on the nature and scope of the disaster and, more importantly, on the willingness and capabilities of local communities to undertake such an initiative. Providing leadership and appropriate, timely information to communities in the midst of a recovery effort is vital to implementing sustainability. Although this guidance is specifically directed to the Sustainability Planner, it contains information of value to state and local officials who may be involved in implementing sustainability initiatives.

Many of the sustainability tools, programs, and resources described in Section 5 and the Appendices are directly applicable to local jurisdictions (e.g., the PowerPoint presentation, key references, and information on websites).

The guide is organized as follows:

- Standard Operating Procedures (SOP) (Section 2) The SOP is likely to be familiar to FEMA disaster staff. It delineates the responsibilities of the Sustainability Planner. Section 2 is organized around the four major phases of the disaster recovery process—readiness, predeployment, deployment, and transition/standdown. It includes checklists of activities, identifies key players in implementing sustainable initiatives, and lays out a plan of action within the DFO environment.
- Focus on the Community (Section 3) This section provides information on what motivates communities to take action and outlines techniques for maximizing public involvement in the sustainability initiative. This section also includes a discussion on the elements of sustainability that may be applicable in a disaster recovery setting.
- Sustainability by Hazard Type (Section 4) This section provides suggestions for implementing sustainability by each of the major types of natural hazards.
- Eighteen Sustainability Tools and Programs (Section 5) This section describes a broad range of FEMA programs, key reference documents, and other tools that can be used to implement sustainable redevelopment initiatives.
- The appendices include a glossary, commonly used acronyms, a listing of sustainable development websites, and a recommended reading list. Appendix E

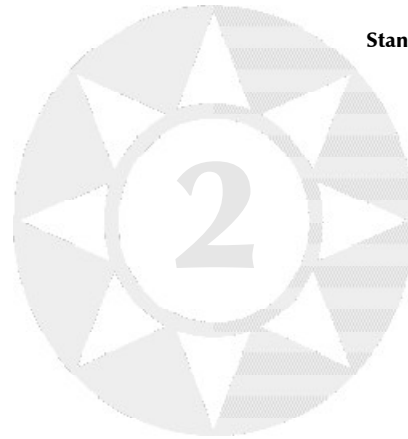
Federal Technical Assistance and Funding Matrix provides a concise guide to Federal resources that can be applied to sustainable redevelopment initiatives. Appendix K Quotable Material on Sustainability includes vision statements, principles, and quotes that can be woven into targeted community outreach materials.

Succeeding in Sustainability

To make the most of this guide, it is important to keep in mind that the sustainability initiative is a key element of FEMA's strategy to change the way America thinks about disasters. Its success depends on the proactive leadership of an interdisciplinary recovery team rather than traditional program management. The Sustainability Planner must seek innovative approaches to matching Federal programs with community needs and objectives.

Making sustainability a reality is best achieved through a collaborative effort of public agencies, the private sector, and key community leaders. The full range of benefits to the environment, cultural resources, and economic prosperity must be understood and the information shared with decision-makers and the public. As the Sustainability Planner, you must be flexible and adaptable in recommending approaches. The affected communities then determine how best to integrate sustainable development concepts into their overall reconstruction effort. By helping a community reduce its vulnerability to disasters, you assist it in taking one of the most significant steps toward sustainability.

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Section 2.0

Standard Operating Procedures

FEMA's Mitigation Directorate has developed SOPs and operational checklists to improve the delivery of disaster recovery services. *The Emergency Response Team (ERT)-Mitigation Field Operations Manual* (March 2000) describes Mitigation disaster operations. The Community Planner position description and operational checklist in the manual are most closely related to the newly created Sustainability Planner position and are included in this guidance as Appendix H.

This section includes a description of the duties assigned to the Sustainability Planner at a DFO. It is structured to provide sustainability staff with guidance at each phase of emergency management—readiness, predeployment, deployment, and transition/standdown.

- The readiness phase offers the opportunity to create a sustainability network by building partnerships and identifying potential participants in reconstruction.
- The predeployment phase includes preparations to implement sustainability in the field, including formulating and reviewing sustainability initiatives, coordinating with *Project Impact (PI)* program staff to identify local contacts, and reviewing past mitigation implementation strategies.
- Deployment begins upon arrival at the DFO, and includes collection and review of background data on local planning issues, and evaluation of opportunities for sustainability.
- Transition and standdown requires coordination between Federal, state, and local agencies to facilitate implementation of the sustainability initiatives.

2.1 Readiness Phase

The readiness phase provides the opportunity to:

- Increase awareness and understanding of the basic principles of sustainability among local, state, regional, and other Federal agencies that play a role in disaster recovery.

Readiness Phase Activities Checklist

- ☑ Conduct regional training, workshops, and presentations to increase awareness of the sustainability initiative.
- ☑ Create and organize targeted sustainability marketing materials.
- ☑ Review local mitigation plans.
- ☑ Review State 409 Plans and meet with SHMOs.
- ☑ Review State Profiles to identify potential partners for sustainability and to understand state priorities and organization.
- ☑ Keep up with sustainability literature and resources.
- ☑ Meet with regional *PI* Coordinator.
- ☑ Network with other Sustainability Planners, the Mitigation Directorate Program Planning Branch, and others in Mitigation.

- Establish relationships, build partnerships, and outline procedures to assist communities in implementing sustainable concepts when disasters strike.
- Conduct training, workshops, presentations, or staff meetings to improve staff awareness of sustainability among other FEMA Directorates and regional divisions.

The following sustainability activities are recommended during the readiness phase:

- Identify the key individuals or departments in other Federal, regional, and state agencies that may have an important role in future sustainable redevelopment recovery efforts. These key agencies include:
 - U.S. Department of Housing and Urban Development (HUD)
 - Economic Development Administration (EDA)
 - Small Business Administration (SBA)
 - U.S. Department of Energy (DOE)
 - U.S. Environmental Protection Agency (EPA)
 - State Emergency Management Agencies
 - State Natural Resource and Environmental Protection Agencies
 - State Economic Development Agencies
 - State Chamber of Commerce
 - State Historic Preservation Office (SHPO)
 - Sustainable Development Advocacy Groups
 - Regional Planning Organizations.
- Promote Federal and state partnerships for incorporating sustainable practices into disaster recovery, which is likely to yield significant dividends in the post-disaster recovery environment. The Sustainability Planner should encourage the participation of the regional *PI* Coordinator in this dialog. They should focus on the creation of a network of state agencies, regional planning or economic development commissions, and NGOs interested in increasing the sustainability of communities.
- Develop and maintain a regional reference library (see Appendix D). The Sustainability Planner can then expeditiously distribute documents or data to DFO sustainability staff.
- Develop marketing material for each region and state, to include brochures, flyers, posters, and presentations. Consider compiling marketing support material in a loose-leaf format to facilitate updating and easy access. Place a copy in the regional go-kits. Marketing material should also be made digitally available and can be included in the National Emergency Management Information System (NEMIS) library.
- Review State 409 Plans to identify sustainability initiatives.
- Review local mitigation plans.

The Sustainability Planner should meet individually with regional State Hazard Mitigation Officers (SHMOs). Developing a strong working relationship with SHMOs is vital to implementing a sustainability initiative. The Sustainability Planner and the SHMO should work jointly on creating and updating a statewide network of personnel who can be contacted in post-disaster situations to support sustainability initiatives. state networks should include private, nonprofit, and volunteer organizations, along

with appropriate state agency representatives who are interested in developing a long-term partnership with FEMA.

Although each region must have the autonomy to develop a sustainability initiative that reflects regional characteristics, it is also necessary to maintain consistency and continuity among regions in such basic areas as policy, terminology, and current technology. The Program Planning Branch within FEMA's Mitigation Directorate will assist in developing a national network to share successful sustainability initiatives and lessons learned.

2.2 Predeployment Phase

The predeployment phase occurs during the initial alert or warning period, such as when a hurricane threatens landfall or a river approaches flood stage. It may be necessary to prepare for deployment during this time.

If this is your first deployment as a Sustainability Planner, use the limited time available during this phase to compile necessary materials for the DFO.

- Review Section 3.0 to become more familiar with the various categories of natural disasters.
- Read some of the key sustainability references recommended in Appendix D.
- Make sure that a supply of the FEMA sustainability booklet, ***Planning for a Sustainable Future (FEMA 364)***, is available at the DFO.
- Review the Community Planner position description included in Appendix H.
- If you have not been in contact with the regional staff responsible for sustainability, discuss your assignment with them prior to deployment. The Mitigation Directorate Program Planning Branch staff is available to provide additional suggestions on sustainability initiatives and on networking individuals or institutions during the delivery phase.

The regional staff charged with coordinating the sustainability initiative must also make the most of time available during the predeployment phase to:

- Brief sustainability staff that may be deployed under a disaster declaration. Ensure that marketing materials and equipment are appropriate to the hazard, the anticipated intensity of the event, and the targeted community(ies).
- If another regional or National Emergency Response Team (ERT-N) is identified as the initial response team, brief these counterparts on past

Predeployment Checklist

- ☑ Review state profile for updated information.
- ☑ Contact potential partners regarding their interest in participating in sustainability initiatives.
- ☑ Review sustainability presentation and other regional marketing materials for possible revision and enhancement.
- ☑ Contact the *PI* Coordinator to obtain updated information on affected communities.
- ☑ Coordinate with the Technical Services Branch Chief to see if Preliminary Damage Assessment (PDA) teams can collect data in support of future sustainable redevelopment initiatives.
- ☑ Review past early implementation strategies, Interagency Hazard Mitigation Team (IHMT) reports (see Section 2.3 for discussion on IHMT), the disaster history of the area, and the current State Hazard Mitigation Plan.
- ☑ Review the Community Information System (CIS) for affected communities. *Note: Reviews of CIS can be completed by FEMA employees only and may be applicable only for flood disasters.*
- ☑ Coordinate with the Technical Services Branch Chief to ensure that the best available information on natural hazards for the affected area is available.

sustainability initiatives in your region, potential points-of-contact, and overall receptivity to sustainability initiatives at the state and local level.

- Consider deploying a Sustainability Planner as part of the PDA team to make an initial assessment of the potential for incorporating a sustainability initiative into the disaster recovery process.

2.3 Deployment

Deployment begins upon arrival at the DFO. The position description for the Community Planner (Appendix H) lists some of the initial processing, logistical, and administrative tasks necessary for deployment. This guide recommends that the Sustainability Planner report directly to the DFO Community Education Branch Chief (see DFO organizational charts in Appendix F). Depending on staffing requirements, the Deputy Federal Coordinating Officer for Mitigation (DFCO-M) may decide to locate the Sustainability Planner in another mitigation branch. In any case, the Sustainability Planner should meet with the DFCO-M and the Branch Chief to establish initial FEMA priorities, goals, and objectives for the Mitigation Branch and to establish protocols, meeting times, and reporting requirements for the sustainability desk.

FEMA's *ERT-Mitigation Field Operations Manual* (2000) and the *Federal Response Plan* (1999) provide essential information for understanding the DFO organization and operations:

1. The *Mitigation Field Operations Manual* describes standardized procedures for mitigation program activities at the DFO. It discusses mitigation authorities under the Stafford Act and explains how mitigation fits into the range of Federal response activities. The operations manual summarizes long-term recovery planning and sustainability initiatives, mitigation programs, and technical resources. Job responsibilities are outlined for all mitigation positions. It also discusses general DFO operations, including administrative and logistical responsibilities.
2. The *Federal Response Plan* is applicable to any disaster declared under the Stafford Act. It provides the broader context for the delivery of Federal assistance to state and local governments following a natural disaster. The plan defines the primary and secondary responsibilities of Federal agencies according to 11 essential emergency support functions (ESFs). FEMA acts as the lead agency, coordinating recovery efforts and organizing field operations, including setup of the DFO.

Evaluation of Opportunities

The initial period of deployment provides the Sustainability Planner with time to compile background information, evaluate the nature and extent of damages, and assess the geographic and political landscape of the disaster area. This is an excellent time to begin contacting representatives of regional and state agencies, such as OFAs and NGOs not directly involved in response activities. This opportunity should be used to initiate discussion about potentially applicable sustainability initiatives.

An evaluation of opportunities present in a specific disaster recovery effort needs to consider all elements of sustainability, including economic, environmental, historic preservation, and social issues. Did the disaster affect a major industry that is vital to the regional economy or place a number of small family-owned businesses in jeopardy of

bankruptcy? Did the disaster have a significant effect on natural resources in parks, wildlife reserves, or local forests? Did the disaster impact a central business district or large residential areas? Will the disaster recovery effort require reconstruction of low-

income or minority housing? Consideration of these issues will begin to shape a sustainable redevelopment initiative and target potential communities.

As you begin to identify potential communities for a sustainability initiative, some background research is necessary. Determine if the building code is up to date or whether a different version would better address the hazards present. Code enforcement is as important as the building code itself, so you should consider the local capability in this area. In some cases, FEMA can arrange and fund an assessment of code processing and enforcement capacity. Extensive damage (a high percentage of destroyed and substantially damaged structures) and a history of repetitive damages are strong arguments for a relocation initiative. In other situations, a high percentage of damaged but repairable structures would suggest an educational outreach effort to incorporate sustainable redevelopment concepts in reconstruction. Such a program might encourage the use of the NFIP Increased Cost of Compliance (ICC) provisions (whereby homeowners can receive up to \$15,000 above the flood damage claim to pay for mitigation measures). It is also critical to become familiar with existing local mitigation plans and to take the opportunity to promote a multi-hazard approach to mitigation and sustainability.

Some criteria to consider for targeting communities are motivated community leaders and citizens, local champions, extent of repetitive damages, NFIP participation, and the necessity for substantial reconstruction.

Preliminary Damage Assessment

Immediately following a disaster event, FEMA and state emergency management staff jointly conduct a PDA to verify actual damages and to estimate the amount of assistance needed. Just as the PDA is a crucial step in the declaration process, it is also a crucial step in formulating a sustainable redevelopment strategy.

If practicable, a Sustainability Planner should participate in the initial PDA process to assess the potential for incorporating a sustainability initiative into disaster recovery. If a more detailed Level II PDA is contemplated, it is strongly recommended that a Sustainability Planner be part of the mitigation support team. The Sustainability

Background Data Compilation Checklist

- ☑ Obtain and review state legislation that affects local planning, including any provisions for post-disaster reconstruction and mitigation.
- ☑ Work closely with the information and planning team to gain a geographic and political understanding of the extent of the disaster (e.g., declared counties, affected communities, and nature of disaster-related damages). Depending on demand and other priorities placed on the Emergency Support Function (ESF)-5 Geographic Information System (GIS), coordinate technical support, including map generation and briefing documents.
- ☑ Get a briefing from the regional mitigation liaison on the political landscape, potential networking contacts, and ongoing state mitigation or sustainability initiatives.
- ☑ Coordinate with the Technical Services Branch Chief to determine if the available hazard data is adequate or if it will be updated to aid the recovery process.
- ☑ Identify Federal, state, and local sustainable development initiatives or nongovernmental sustainable development advocacy groups operating in the disaster area or surrounding region.
- ☑ If a disaster is flood-related, obtain and review NFIP information for the affected area and jurisdictions. (Do not duplicate efforts. Coordinate with hazard mitigation planners; review community standing, policies in force, the Community Rating System (CRS) report, repetitive loss list, state and local mitigation plans, and potential substantial damage estimates.)

Planner should participate in the more intensive assessment, draft sections of any Level II report or memorandum, and initiate discussions with state counterparts on potential sustainable redevelopment initiatives.

Early Coordination

The question as to the most appropriate time to introduce the concept of sustainability to local governments is dependent on the specific recovery effort. Obviously, the ideal time to consider sustainability is prior to any disaster; however, the concept of sustainable redevelopment is often first addressed after a disaster occurs. The Sustainability Planner must be sensitive to the pressures confronting local officials, as many issues demand their attention during disaster response. Critical life and safety issues come first—search and rescue operations, treating the injured, re-establishing vital public services, and providing emergency shelter and temporary housing. Long-term recovery and sustainable redevelopment opportunities are likely to be overshadowed by the immediate response needs of the community. However, you should inform local officials of potential sustainability opportunities, so those ideas can percolate until the time is right for them to focus attention on sustainable redevelopment. If sustainability is introduced too late in the recovery process, it may be ignored because of the community interest in rapidly rebuilding.

Critical policy issues emerge following disasters that require communities to make difficult decisions about how best to rebuild. There is often a fleeting opportunity to influence these local recovery decisions. Disaster victims and their political representatives have an inherent desire to rebuild rapidly and return to normal to the predisaster condition. Pressure to restore normalcy can be so strong that safety, hazard mitigation, and community improvement objectives are compromised or abandoned. You can help communities balance these conflicts by providing input to reconstruction alternatives.

The Governor's Authorized Representative (GAR) schedules applicant briefings soon after the declaration. These briefings inform communities of state and Federal assistance programs and the procedures that must be followed to ensure effective delivery of services. Although the role of Federal and state emergency management staff in the briefings may vary significantly among the states and FEMA regions, the Sustainability Planner should discuss with the branch chief or the DFCO-M the feasibility of introducing the concept of sustainability during these briefings.

There is a point in the disaster recovery process where local officials and residents begin to shift their attention from immediate response to recovery. Generally speaking, it occurs after critical lifelines have been re-established, shelters and temporary housing are in place, and debris clearance/disposal is underway. This shift generally occurs between two and four weeks after the event. The community relations staff—which interacts directly with disaster victims, concerned citizens, and local officials—can be helpful in providing insight on the pulse of the community.

First Contact

The following suggestions and **action items** apply to initial meetings with targeted communities:

- Ensure that the initial meeting with local jurisdictions is brief. The objective is to introduce the concept of sustainability and to promote the value of long-term recovery planning. Provide attendees with copies of the booklet, ***Planning for a Sustainable Future (FEMA 364)***. Initial meetings can be held with the planning director, mayor, city council member, or president of the local Chamber of Commerce. Small, informal meetings in their offices or one-on-one meetings are advised. People that may not initially be receptive to the idea of sustainable redevelopment often come to understand its benefits; consequently, patience must be exercised.
- Follow up on the initial meetings with prospective communities to see if there is interest in a more formal public presentation on sustainability (Section 5.0 PowerPoint Slide Presentation). Many communities create a disaster recovery task force or committee to assist local officials in directing the recovery effort. These ad hoc groups may provide a good forum for the presentation. The presentation should be customized to include specific disaster-related information. The presentation is most effective if presented to a small group of influential officials and residents rather than to a large public meeting. A larger public meeting may be the next logical step, if these early approaches are successful.

Networking

The effectiveness of a Sustainability Planner has as much to do with people skills as with technical planning knowledge. Although you are expected to understand the broad range of potential sustainability elements (described in Sections 3.0 and 4.0) of reconstruction, you are not expected to be a technical expert in all of these disciplines. Your time is best spent matching a core group of local decision-makers with the technical assistance necessary to implement a sustainability initiative.

The DFO is not the place to get sidetracked with background research. Your role is to coordinate and facilitate a sustainable long-term recovery initiative. Hence, you need to effectively network with different levels of government representatives, the general public, and a variety of technical experts.

Both the DFO staff and individuals outside of the DFO organization can be effective in promoting sustainability. You have a much broader planning role than many individual members of the DFO staff. As such, you need to be part investigative reporter to find out what the key DFO staff is thinking, planning, and doing. Although participating in key meetings is important and the daily and weekly Situation Reports (SitReps) provide updates on the response and recovery effort, networking with your coworkers is critical. Seek out some of the old hands in the DFO organization to get their opinions and advice on tracking the flow of the recovery process. In addition to getting information, it is equally important to brief branch chiefs and staff from the Mitigation, Infrastructure, Human Services, Community Relations, Congressional Liaison, and Public Information Branches on sustainable redevelopment initiatives. They all have roles and responsibilities that can influence and support sustainability; it is essential to work with them to identify specific actions they can take to further this initiative.

Early Coordination Checklist

- ☑ With members of the PDA team, review results of damage assessments to determine affected areas and the extent of damage in specific communities.
- ☑ Coordinate with the SHMO and state emergency management staff to create a partnership on sustainability initiatives. Identify joint priorities and ongoing programs, review the 409 Plan, and propose shared management.
- ☑ With mitigation planners (Program Delivery Branch), participate in the early implementation strategy and IHMT process to ensure the inclusion of sustainability concepts.
- ☑ With the regional mitigation liaison, obtain information on state procedures and political sensitivities.
- ☑ With the environmental liaison, determine whether major environmental issues could be partially addressed through a sustainability initiative. Have hazardous waste or material releases put public health and safety at risk? Are historic preservation issues presented by this disaster?
- ☑ With the congressional liaison, determine if any House or Senate representatives are proponents of sustainable development or if there are any political sensitivities that the Sustainability Planner should be aware of.
- ☑ With community relations staff, gain an understanding of the concerns and issues facing residents in affected communities.
- ☑ Meet with Public Affairs, specifically, the Public Information Officer (PIO) to determine protocols for working with community leaders and officials, and developing and distributing sustainability marketing materials.
- ☑ With SBA representatives operating out of the DFO or DRCs, obtain information on the recovery issues facing small- and medium-sized businesses.
- ☑ With the infrastructure support liaison and human services liaison, coordinate FEMA assistance to incorporate sustainability into the community's long-term recovery and comprehensive reconstruction strategy.
- ☑ With the floodplain management specialist, discuss possible trouble areas, such as community compliance and hot issues that predate the disaster. Consider whether there are opportunities to undertake comprehensive watershed management planning or to strengthen floodplain management objectives.
- ☑ Through the DFCO-M, set up a briefing with the Federal Coordinating Officer (FCO) to discuss strategies to implement sustainable redevelopment in the recovery effort.
- ☑ With the DFCO-M, set up a meeting with the SHMO to secure buy-in from the state. Identify and prioritize prospective communities, and schedule a meeting with state and local officials to determine objectives and level of involvement.

The checklist to the left on early coordination within the DFO describes a number of networking tasks to consider in the initial phase of the recovery effort. Some additional discussion is warranted, however, to describe the ideal working relationship between the Sustainability Planner and the hazard mitigation specialists within the Mitigation organization. The Sustainability Planner is focused on comprehensive, long-term planning solutions and identifying opportunities to incorporate sustainable and livable community objectives, while the hazard mitigation specialist is focused on specific structural or nonstructural mitigation measures. These key personnel must work closely as partners in assisting communities to become more disaster-resistant and sustainable.

You may consider creating a core group on sustainability. Both Region V and Region IX proposed the concept of such a group in their regional guidance developed during the pilot phase of FEMA's sustainability initiative (see Appendix I). These regions proposed a small steering committee of four to eight members, to include FEMA DFO staff, a state representative, and representatives of interested OFAs or NGOs. If you pursue this approach, remember to stress to core team members that though they outline opportunities and potential assistance the affected communities themselves determine the overall direction of the sustainability initiative.

The core group will vary in each situation as to disaster type, staff

availability, and potential sustainability initiatives. If possible, the group should include a hazard mitigation specialist, and DFCO-M should periodically attend some of the meetings to support the initiative and remain informed. To facilitate key agency buy-in to the initiative, the core group can assist in developing the strategy for incorporating sustainability into the recovery effort.

Early Coordination Beyond the DFO

The list of public agencies, professional associations, nonprofit agencies and other NGOs, and academic institutions that could potentially support a sustainability initiative is almost endless. Many potential partners are discussed in Section 5.0. Appendix C provides links to many agencies that may offer partnerships or assistance. The list in the sidebar to the right includes some of the more important types of institutions and agencies that the Sustainability Planner should consider networking with early in the recovery process.

A very basic approach to networking beyond the DFO is to initially contact a variety of potential teaming partners and then narrow the list to those that have the interest, capability, and resources to make a difference. Targeted sustainability initiatives that are well thought out and have local support are far more effective than scattered approaches with inadequate resources.

The following **helpful hints** should be considered when networking with outside agencies and NGOs:

- Before advocating sustainability or promoting a particular sustainability initiative, ask questions and listen. Be aware of political sensitivities, individual interests, and agendas. Understand the motivation of each speaker.
- Even if you feel that a particular agency or institution is worth pursuing, remember that not all individuals will be receptive to your message. Know when to move on to other avenues for securing technical or financial assistance.
- In pursuing potential partners, look for local assets first, then consider the surrounding region and move outward to identify particular agencies or individuals. The sustainability initiative works only when it is locally driven. Although national or regional technical expertise may be useful, local participation is essential to success.
- Identify local champions who have respect within the community to build grassroots support for the initiative. Ideally, local champions have little damage to their homes or businesses that would otherwise absorb their energies during the recovery process.
- Do not hesitate to ask questions such as, "What specific resources can you bring to the table to support this initiative?" or "Have you considered this alternative?"
- Although you may have a personal vision for the community, understand that a sustainability initiative can move forward only by local consensus.
- Use existing institutions and organizations to the greatest extent in launching a sustainability initiative before proposing new organizational

Potential Partners

- Local champions
- Local civic associations and nonprofit organizations
- Chamber of Commerce
- Area academic institutions, including colleges and universities
- Local or regional foundations
- Major businesses or industries in the community or surrounding area
- Regional planning agencies, councils, or commissions
- Regional economic development agencies and commissions
- Water management districts and river basin commissions
- Historic preservation organizations
- State agencies
- HUD
- DOE
- EDA
- U.S. Army Corps of Engineers (USACE)
- U.S. Environmental Protection Agency (EPA)
- U.S. Department of Agriculture (USDA) Rural Development Agency
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Agency (NRCS)
- Association of State Floodplain Managers (ASFPM)
- American Institute of Architects (AIA)
- American Planning Association (APA)
- American Society of Landscape Architects (ASLA)
- American Society of Civil Engineers (ASCE)

structures. Build on existing local initiatives or programs that could provide a good fit to proposed sustainability initiatives.

Early Implementation Strategy

The Early Implementation Strategy is prepared by the Mitigation Branch and the SHMO to guide the mitigation effort for 90 days following the declaration. The strategy establishes an agreed-upon set of hazard mitigation priorities for recovery; as such, it has a significant effect on the short- and long-term recovery process. Therefore, it is essential that the Sustainability Planner include sustainable redevelopment concepts as part of the Early Implementation Strategy.

The Early Implementation Strategy is a collaborative effort between FEMA's Mitigation Branches and SHMO staff. One suggestion for the Sustainability Planner's participation in this effort would be to develop a brief sustainable redevelopment strategy for consideration by the mitigation staff. The sustainable redevelopment strategy evaluates disaster damages, targets potential communities or areas within the community, and outlines the basic elements of the proposed sustainability initiative. If favorably received, it should be incorporated into the early implementation strategy, and a more detailed action plan should be prepared that lists specific objectives, incorporates a 3-month timeline, and identifies required resources.

Interagency Hazard Mitigation Team Report

The IHMT report is not prepared in all disaster declarations. Some regions have moved away from activating the IHMT and place more emphasis on the early implementation strategy. The IHMT, when activated, normally consists of Federal (ESFs and OFAs), state, and local agencies, and includes a range of disciplines/areas of expertise according to type of disaster.

The IHMT identifies opportunities for reducing or eliminating the long-term hazard risk to people and property. The IHMT report normally includes an analysis of the disaster incident, a historical perspective regarding disasters in the impacted area, and recommendations to bring various governmental agencies together to reduce the potential for future losses.

The Sustainability Planner should coordinate with DFCO-M and the mitigation staff to be included on the IHMT, which provides an opportunity to network and coordinate sustainability initiatives with OFAs. It is one of the few formal mechanisms for bringing OFAs into the post-disaster recovery process.

Staffing Requirements

There are a number of different approaches to staffing a sustainability initiative. How you decide to proceed depends on the level of technical expertise needed, the resources available, the commitment level of various participants and agencies, specific components of the initiative, and time. Considering that the average operational life span of a DFO is 4 months, time is your greatest adversary. The good news is that many sustainability initiatives need only a firm foundation and a strong initial implementation to succeed.

The following six options for staffing are not mutually exclusive. Particular initiatives may call for combining several approaches.

- **Additional resources not required** - Some initiatives may not require additional staffing beyond a single sustainability planner. If a community is struck by a flash flood or tornado, the Sustainability Planner might work directly with the local government and a disaster recovery task force to develop a long-term recovery plan that emphasizes hazard mitigation and sustainable development. In other circumstances, affected jurisdictions may have adequate resources to undertake an initiative on their own. (In many situations, however, the Sustainability Planner may have insufficient time to effectively implement initiatives.)
- **Augment DFO resources** - Disaster Assistance Employees (DAEs) and local hires could be brought into the DFO organization to provide additional staff support to implement a sustainability initiative.
- **Mission assignment** - FEMA may task another Federal agency to provide resources that are beyond its usual authorities. Mission assignments may be appropriate in situations where the required resource or expertise is critical or time sensitive and can be best met by an OFA.
- **Hazard Mitigation Technical Assistance Program (HMTAP)** - FEMA has a nationwide contractor in place to provide technical assistance in post-disaster recovery. The HMTAP contract may be used to support post-disaster program needs in cases of large, unusual, or complex projects or in other situations where appropriate resources are not available. Over the past several years, the national hazard mitigation contractor has provided technical assistance to communities in developing long-term recovery plans and implementing sustainable redevelopment projects.
- **OFA resources** - The Sustainability Planner can facilitate and encourage the use of OFA technical assistance or funding programs to implement a sustainability initiative. These OFA resources are not necessarily disaster related.
- **NGOs** - The Sustainability Planner may be able to harness nontraditional funding sources and technical assistance to implement a sustainability initiative. Foundations, nonprofit organizations, universities, professional associations, or other civic organizations offer partnership potential.

2.4 Transition and Standdown

Many steps can be taken to ensure a smooth transition when responsibility for disaster relief is handed from a DFO or ERT-N to the home region and from the region, in turn, to the state. Introducing affected communities to the *Project Impact* approach at this time ensures a more sustainable recovery effort. It is important to identify someone at the regional office who has the time, authority, and capability to track standdown, transition, and post-DFO activities. During this phase, it is also necessary to take a long-term view on institutionalizing sustainability within the Headquarters and regional organizational framework.

Part of FEMA's role in the transition phase is to support and help coordinate continuing local and state efforts. There is a critical need for continued communication

Close Out/Transition Checklist

- Develop a closeout plan that includes operational timelines, staff downsizing, and project transition to the home regional office.
- Conduct required action steps, including staff performance reviews.
- Restock and update all source material and contact lists in go-kits and verify their return to the regional office.
- Arrange for shipment of multimedia, paper files, and backup computer files to the regional Mitigation Division.
- Return all equipment to the Logistics Branch.
- Provide after-action input to designated personnel.
- If feasible, participate in any DFO or regional hot-wash of debriefing activities.

between the state and communities. All transition participants must operate within a clearly defined sustainability initiative framework. Although FEMA's leadership role ends during the transition and standdown phase, regional staff should be assigned an ongoing responsibility to support the sustainability initiatives undertaken during DFO operations.

It is important to assess the success of sustainability initiatives and identify lessons learned. Although the host region determines the necessary level of post-disaster followup with communities, the Sustainability Planner should at a minimum consider periodic phone interviews or conference calls to evaluate post-disaster accomplishments. Followup letters to the communities or surveys are other techniques to evaluate sustainability initiatives. Be sure to document success stories for application to other disasters and share lessons learned with other regions.

Sustainable Redevelopment Activities Menu

What are specific activities that the Sustainability Planner might be involved with during the initial implementation phase? The following menu of activities presents some possibilities. Your choices depend on the nature of the disaster, an objective evaluation of the potential for successful implementation, and successful partnerships.

- ☑ Review local, general, or comprehensive plans; associated maps or reports; zoning; subdivision building codes; and other land development regulations or ordinances. Obtain and review any existing plans related to post-disaster recovery and reconstruction.
- ☑ Identify, encourage, and support local champions for sustainable recovery.
- ☑ Identify and prioritize target audiences for special educational projects and community outreach. These may include disaster victims; the general public; business and industry; the Chamber of Commerce; special groups such as the elderly, disabled, and low income, multilingual, or minority populations; the finance industry and lending institutions; and the building and construction industry.
- ☑ Identify and order relevant FEMA and non-FEMA educational and sustainability materials.
- ☑ Identify potential mentoring communities that have experienced a similar hazard and completed a successful recovery effort. Suggest the concept of a mentor community to affected jurisdictions and determine interest. Peer-to-peer dialogue is an excellent technique for conveying a hazard mitigation and sustainability message.
- ☑ Work with the Community Education Branch to customize or create sustainability marketing materials relevant to the disaster event, such as posters, brochures, and newsletters. Emergency Information and Public Affairs can also help in the development of print, video, and television media releases.
- ☑ Identify available distribution channels and methods, including traditional and non-traditional media, DFO program outreach, and local organizations.
- ☑ Discuss opportunities with fire, police, and local emergency management officials.
- ☑ Set up meetings with officials and the public in targeted communities (e.g., mayor, local planning officials, disaster recovery committee, and regional planning commissions).
- ☑ Give brief presentations to educate stakeholders on sustainability. Pair communities with local and regional resource groups (e.g., regional planning districts, university staff, and nonprofit organizations) to guide them into a long-term community planning process.
- ☑ Bring diverse groups together to develop innovative strategies for recovery, distinctive to their community. Empower citizens to compare their future visions for the community through workshops.
- ☑ Support activities of DFO operational outreach programs, including community relations, public affairs, congressional affairs, human services, SBA, and volunteer agencies (VOLAGs).
- ☑ If the recovery effort requires substantial new residential construction, seek innovative ways to get the message out to rebuild green, use indigenous materials, and incorporate energy conservation. Partner with local suppliers of these products to accomplish this. DOE and EPA have programs geared to residential elements of sustainable development.
- ☑ Support local officials in determining short- and long-term reconstruction and recovery objectives. Assist the community with the following activities:
 - Suggest short-term planning/operational strategies that incorporate sustainability into long-term recovery goals.
 - Identify multiobjective sustainability opportunities for long-term consideration within locally developed reconstruction plans or strategies.
 - Coordinate the delivery of appropriate DFO technical expertise to assist in evaluating alternative reconstruction strategies.
 - Support preliminary decisions regarding alternate reconstruction strategies by providing general program and administrative information on mitigation, planning, and reconstruction.
 - Function as a liaison to the community by identifying potential sustainability funding sources and networking with OFAs.
 - If local capabilities are lacking, bring in FEMA contractors or OFAs under mission assignments to support the development of long-term recovery plans. Other potential partners include regional planning agencies or economic development commissions.

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Section 3.0

Focus on the Community

Now that the Sustainability Planner's role and responsibilities within the DFO organization have been presented, the focus of this guide shifts to communities. Section 3.1 discusses what motivates communities to embrace the concept of sustainable development, describes different approaches to public involvement, and identifies local jurisdictional powers and authorities that can be tapped to implement sustainability. Section 3.2 *Elements of Sustainability* describes a range of recent initiatives that communities have used to create a more sustainable future for themselves.

3.1 Focus on the Community

Communities do not exist in a vacuum; a historical settlement pattern links them with the surrounding area, and the entire jurisdiction should be viewed in the political context of the region and the state. Conducting sustainability planning for towns and cities in the interior West, for example, is far different than working with communities in the Mid-Atlantic. The West places a greater emphasis on private property rights than on planning and land use regulatory approaches. In these situations, voluntary programs may work best. In other parts of the country, there may be more acceptance of land use planning and regulatory approaches; a precedent may already be set for state mandates for local comprehensive planning and zoning.

3.1.1 Community Motivation

What motivates communities to consider sustainable development or redevelopment initiatives? One strong desire in the aftermath of a disaster is to avoid a repeat occurrence of the same situation. The Sustainability Planner can use disaster resistance as a key element in gaining the public's support of a long-term recovery plan that incorporates sustainable initiatives.

Consider the following three elements in motivating the public toward a sustainability initiative:

- **Improving awareness** Residents are much more willing to accept the concepts and changes associated with sustainable redevelopment if they have been

Community Benefits of Sustainable Redevelopment

- Fewer damages incurred in the event of another disaster
- Economic gains through energy efficiency
- Improved environment
- Improved safety
- Preservation and restoration of natural resources
- More open space, parks, and recreational amenities
- Improved quality of life for the entire community

educated about them and made to feel a part of the process. Scheduling small meetings with key citizens is an effective tool to gain public support. Such meetings provide an opportunity to define sustainability and how it applies to the community. Local champions can sponsor or lead meetings to improve awareness of sustainability issues. Once in motion, the support of the public can provide powerful leverage for change. The goal of the Sustainability Planner is to place issues within the citizens' reach—move issues out of the abstract, and present them as tangible and practical alternatives.

- **Building partnerships** The Sustainability Planner builds public trust by helping the community draw upon experiences, resources, and policies already in place. Consider establishing a broad-based task force with representatives from all key sectors of the community (e.g., business leaders, civic associations, health care professionals, and representatives of the construction and housing sectors).
- **Defining benefits** To encourage public participation, the Sustainability Planner should clearly define the benefits of both sustainable redevelopment and the retrofitting of existing development. Explaining sustainability in terms of economic gains is a strong motivational message. For example, informing citizens of the long-term economic benefits of redeveloping with energy efficiency in mind can inspire them to look beyond immediate recovery needs. A sustainability initiative provides environmental protection, improves quality of life, and builds community goodwill.

3.1.2 Public Participation

The Sustainability Planner may be called upon to assist local officials in developing a comprehensive recovery strategy. Public participation in the recovery planning effort is essential. How a community structures community participation depends on its size, the capabilities of local officials to support a planning initiative, and the extent of involvement of citizen review boards and associations in setting community goals and policies.

Creating a task force of community leaders, representatives of local government agencies, and interested citizens is a common approach for structuring long-term recovery planning. Build on existing organizations or boards wherever possible, but do not be overly cautious in recommending a new task force or committee if you think it necessary. You might suggest standing committees to address specific recovery issues, such as housing, economic development, infrastructure, and hazard mitigation. Suggest a local champion to chair a task force or recovery committee. He or she should be prepared to make decisions, defuse controversial issues, and maintain momentum and enthusiasm.

Consider a large open community conference or workshop format, broken into smaller task groups, to quickly identify community needs, generate a future vision, or prioritize hazard mitigation approaches. Although public hearings and meetings are useful for disseminating information, they are not as useful for developing an overall recovery strategy. Far greater success can be achieved with small committees that reflect the wide range of community views and interests. Public meetings can then be held to

review the findings of these working groups and gain acceptance from the broader community.

Larger cities might want to consider building on capabilities that exist within their agencies and departments. A team of representatives from the planning, permitting, public works, and emergency management departments, among others, can be brought together to forge a recovery strategy. The coordinator should have access to the city's chief executive and establish a public forum to provide community feedback on the direction of the recovery strategy.

3.1.3 Community Long-Term Recovery Plan

An important decision facing the Sustainability Planner is whether to recommend a community-driven, long-term recovery planning process. A well-designed local planning effort can build a firm foundation for sustainable recovery. However, in situations where damages are not extensive, where political cohesiveness is absent, or where damages are dispersed over large areas, it may not be appropriate to implement a recovery planning process. It may be more effective for the Sustainability Planner to work with others in the DFO organization on a public education and outreach program targeted directly to affected residents.

The goal of recovery planning is to take advantage of the immediate opportunity to become more disaster resistant and to embark on a long-term path toward sustainability. The community, with technical assistance as necessary, should create a concise framework for long-term recovery. Given that the recovery plan is crafted during the disaster recovery process, it should briefly lay out the overall recovery strategy and identify immediate, short-term, and long-term action items. More detailed design and engineering plans for program implementation can follow. The sidebar outlines some important lessons learned from pilot recovery planning efforts undertaken over the past few years.

The Sustainability Planner should be aware that Federal environmental and historic preservation requirements must be considered if Federal funding is used to implement elements of the recovery plan.

Steps for Successful Recovery Planning

1. **Take advantage of the window of opportunity to develop an overall recovery strategy** Capitalize on the outside funding and technical assistance that become available after a disaster.
2. **Establish community goals and objectives** Unite the community behind agreed-upon goals and objectives.
3. **Consider the planning process as well as the plan itself** Structure the planning process so that it is open and participatory, but also quickly leads to agreement on a broad framework for recovery.
4. **Employ multi-objective planning** Look for opportunities to reap multiple benefits when incorporating hazard mitigation and sustainable redevelopment concepts into recovery efforts.
5. **Be flexible** Keep your options open and take advantage of unexpected opportunities.
6. **Realize that all sources of funding are fair game** Do not overlook nondisaster-related grant programs. If expertise is not locally available, seek experienced grant writing assistance from other sources, such as regional or state agencies and the private sector.
7. **Maximize community stakeholder involvement** Recruit local corporations, foundations, and nonprofit or civic organizations to participate in the planning process.
8. **Maximize the use of nontraditional partners** Solicit local nonprofit groups and organizations to supplement Federal and state agency support.
9. **Stay out of the weeds** Make sure that the recovery plan is brief. Prioritize immediate, short-term, and long-term recovery actions; allow detailed design, architectural, and engineering plans to follow.

Coordinate with the DFO environmental liaison or the regional environmental officer on National Environmental Policy Act (NEPA) compliance issues. The Federal entity responsible for coordinating NEPA among agencies, the Council on Environmental Quality (CEQ), is receptive to long-term recovery issues, and FEMA headquarters can work with you to bring them into the sustainability process on major disasters, if appropriate. Cultural resource issues are often addressed in NEPA compliance studies. However, the National Historic Preservation Act (NHPA) applies outside of the NEPA compliance process, and may require coordination with cultural resource specialists within the DFO and the SHPO.

3.1.4 Local Government Powers

It is the local jurisdiction that has the legal responsibility for planning and regulating land use. Five broad powers of local governments are highlighted in the sidebar.

To implement a sustainability initiative, local jurisdictions may consider comprehensive plans, zoning and subdivision ordinances, building standards, floodplain ordinances, capital improvement programs, property acquisition, or taxation and fiscal policies.

- **Comprehensive plans** Many states mandate that local jurisdictions periodically undertake a comprehensive planning process. A comprehensive plan is a general planning document that sets the overall pattern of future development. Normally, it does not prohibit particular development activities, but rather provides the justification for specific zoning districts. Land use planning is an ongoing process; comprehensive plans are prepared, adopted, and revised on a 5- to 10-year cycle. Community boards work with professionals on the planning staff to prepare draft plans, facilitate a public participation process, and present final recommendations to elected officials. Given the long lead times required for comprehensive planning, it is unreasonable to expect that this process can be effectively used in the immediate post-disaster recovery phase. However, the Sustainability Planner can recommend that an affected community consider incorporating a hazard mitigation component during its next cycle of the comprehensive plan update or

Local Government Powers

- **Planning** Although the degree of planning authority of a local jurisdiction is determined in part by state legislation, all local governments can use a planning process to educate, encourage participation, and reach consensus on promoting disaster resistance, livability, and sustainability.
- **Regulatory power** Local jurisdictions have the authority to regulate land use development and construction through zoning, subdivision regulations, building codes, design standards, and floodplain regulations.
- **Spending authority** The manner in which local jurisdictions use public funds can influence development in hazardous areas. One fiscal management tool that many communities embrace is the capital improvement program, generally a 5-year plan for funding improvements to public facilities.
- **Taxing power** If the private sector encourages development in hazardous areas, special taxing districts can be created to more equitably balance public investments. Preferential assessments can be used as incentives to retain agricultural and open-space uses in high hazard areas.
- **Acquisition** Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or the right of eminent domain.

if disaster damages are extensive – advise acceleration of the next update.

- **Zoning and subdivision ordinances** – These ordinances are the traditional site development tools that regulate the location, type, and intensity of new development. Various zoning techniques have been used across the nation to restrict development in high hazard areas. Some examples include floodplain regulations; setbacks from fault-lines, coastlines, and shorelines; hillside development regulations to reduce the risk of damage from landslides; and zoning overlay zones that apply additional development standards for sensitive lands. Great progress can be realized in moving toward a sustainable future by changing zoning and subdivision ordinances to encourage future development in areas of low hazard risk.
- **Building codes and standards** – Building codes and associated construction standards are important tools in implementing hazard mitigation. These regulations dictate the details of building construction and set structural standards for structures ranging from single-family dwellings to high rise office towers. There are several different building codes in use by local jurisdictions and the specific code adopted generally varies by region throughout the country. Many states have minimum building code standards that allow communities to adopt more stringent code requirements, although some states have passed legislation requiring the use of a specific building code. Following a disaster declaration, it is important to evaluate whether affected jurisdictions are using the most current version of the building code. A simple amendment to local regulations could require the most current mitigation construction standards for the reconstruction effort.
Small communities may be overwhelmed by requests for building permits and construction inspection, FEMA should encouraged them to ask for technical support and advice.
- **Floodplain regulations** – It is very important to note that the model NFIP floodplain ordinance is a minimum standard. Most of the communities that participate in NFIP simply adopt the model ordinance. The Sustainability Planner should encourage affected communities to strengthen their floodplain standards. Many jurisdictions have gone so far as to prohibit residential development within the 100-year floodplain. Many states have enacted more stringent floodplain management requirements than the NFIP criteria, so it is essential to coordinate with state floodplain management officials.
- **Capital improvement programs** – Although a local government’s spending authority can be a powerful tool to implement sustainability, it is often overlooked. Local public policies that support sustainability should be incorporated into the community’s capital improvement program. Locating schools, fire stations, and other public buildings, streets, and utilities outside of high hazard areas is an obvious worthwhile policy. When siting public facilities in hazardous locations is necessary, communities can incorporate hazard reduction measures into the design or require retrofits where economically feasible. Public facility siting is a key determinant for future privately financed growth, so a sustainable redevelopment policy would be that roads and public water/sewer lines should not be sited where they have the potential to encourage intensive growth in high hazard zones.

- **Property acquisition** – Another approach to sustainability is public acquisition of property in high hazard areas and restriction of development to uses that are less vulnerable to disaster-related damages. The purchase of development rights involves paying the difference between agricultural or open space value and the value of the land under its current zoning designation. FEMA is a strong supporter of voluntary acquisition programs that remove homes and businesses from harm's way. Outright acquisition of property, through the process of eminent domain, is the most expensive approach and may also have adverse political ramifications. Encouraging the use of conservation easements, which are often held by nonprofit organizations, is an inexpensive method of restricting development.
- **Taxation and fiscal policies** Taxation can be used to more equitably distribute the public costs of private development in high hazard areas by shifting more of the cost burden directly to owners. One incentive option is to provide tax breaks for reducing land use intensities in hazardous areas.

3.2 Elements of Sustainability

Establishing a sustainable community requires the integration of sustainable practices into the day-to-day decision-making of community institutions (e.g., planning commissions, public works and transportation departments). In many communities, the mechanisms to bring about change are in place, but the strategies—their applicability and the tools for their successful implementation—are not understood. This subsection builds upon the preceding discussion on local authorities by describing a range of innovative approaches that have been used by communities to implement sustainable development.

This subsection is devoted to three major elements of sustainability that are most applicable to sustainable redevelopment. The sustainability literature includes discussion of other elements, such as waste reduction and recycling, alternative energy sources, and climatic change. However, because it is unlikely that the Sustainability Planner, operating in a post-disaster scenario, would have the opportunity to influence these more national and global aspects of sustainability, this guide focuses on land use planning, housing, and infrastructure—which have the potential to yield discrete results.

During disaster recovery, the opportunity to initiate repairs, relocations, and redevelopment with sustainability as the focus is often overlooked. Sustainable redevelopment within the realm of emergency management is a valuable planning tool to avoid future damages due to natural disasters. The concepts described apply to the repair or restoration of damaged homes and public facilities, in addition to the major redevelopment that occurs in long-term disaster recovery.

3.2.1 Land Use Planning

Careful, comprehensive land use planning is essential for communities embarking on a sustainable development initiative. Comprehensive land use planning provides a firm foundation for this effort by considering the opportunities and constraints

inherent in the natural and physical environment. When promoting land use planning as part of a sustainable redevelopment initiative, the Sustainability Planner should advocate that communities incorporate a hazard mitigation element into the comprehensive plan. Simply put, if communities restrict future development in areas of high individual or multihazard risk and encourage more intensive development in areas of lower risk, they will have taken a significant step toward becoming sustainable. Although there is considerably more precedent for addressing flooding in natural hazards planning, a number of recent efforts have incorporated fire, landslide, earthquake, and high wind hazards into comprehensive planning.

What does a sustainable community look like? Areas of high hazard risk and important natural habitat are used for open space and the preservation of natural resources. Residents have nearby access to trails, greenways, and parks. From the Sustainability Planner's perspective, the effective use of open space prevents development from encroaching on floodplains, active fault zones, and other hazard areas. Housing that can support a diversity of life styles and differing income levels is integrated with appropriate commercial development and employment centers to reduce commuting time. Higher density, mixed-use environments support the sustainable development objective of energy and resource conservation. Multimodal transportation systems favor pedestrian and public transit service. Reclamation and the reuse of energy are integrated into community infrastructure. While all of these characteristics may not be possible or appropriate for many communities, they can serve to stimulate creative thinking.

Incremental improvements in the sustainability of a community are achieved through sound land use planning and eventually lead to markedly improved settings for living, working, and recreation. Land use planning that promotes sustainability reverses urban sprawl, low-density growth, traffic congestion, the loss of open space, and high levels of energy consumption. Without question, promoting land use policies that avoid intensive development in the areas most vulnerable to natural hazards is at the top of any sustainability planning techniques list.

Characteristics of a Sustainable Land Use Plan

A land use plan for a disaster-resistant and sustainable community integrates the three fundamental elements of sustainability—economy, society, and environment.

- It promotes effective use of the community's financial resources. The plan should be based on a Benefit-Cost Analysis (BCA) of land use alternatives. For example, single-family residential developments on large lots typically create demands for services (schools, roads, utilities, police and fire protection, etc.) that exceed tax revenues.
- It provides for diversity. A sustainable development/redevelopment plan promotes the creation of places to live and work that meet the needs of a broad range of community residents. In many cities and municipalities, the people that provide basic and vital services—police, firefighters, schoolteachers, etc. cannot afford to live in the communities where they work.
- It incorporates sensitivity to the community's natural and physical resources. Preserving the integrity of ecological systems is the most important environmental indicator of sustainability. Limiting degradation of the

environment and preserving key natural systems—such as wetlands, floodplains, dunes, and active fault or landslide zones—also increase a community's resilience to natural hazards. Cultural and historical resources of a community are other important aspects of the environment and should be included in sustainable land use planning.

Recent Initiatives in Land Use Planning

Summarized below are several sustainability initiatives that may be applicable to land use planning in jurisdictions either recovering from or facing the high probability of a natural disaster.

Smart Growth

Smart growth refers to a development approach in which growth or economic progress is in balance with the environment and an improved quality of life. It is about building on existing assets, becoming less reliant on the automobile, and using land more wisely. Smart growth directs expansion to limited areas, while renovating older areas and preserving natural lands by modifying the designs of new development.

The smart growth concept encourages mixed-use development. It encompasses traditional neighborhood patterns where people walk or take public transit to shops and to work. Streets in such an area are narrow, laid-out in a grid, and in scale with neighborhood buildings—in contrast to a low-density, suburban sprawl pattern. Smart growth incorporates green space with commercial, retail, recreation, education, and housing interests. In suburban areas, smart growth development involves housing projects that are designed to conserve open space and farmland. In cities, smart growth projects redevelop underutilized or vacant property. This type of development can generate profits for developers while maintaining higher density in older urban areas—with overall savings on infrastructure costs. Smart growth fosters a higher quality of life for residents and decreases operating costs for local governments.

Currently, local, state, and Federal governments are responding to growing dissatisfaction with sprawl by enacting policies and laws to encourage smart growth. These laws direct the investment of tax dollars to areas of existing development, change zoning and building codes, and revise tax laws. Smart growth is a means of achieving economic, community, and environmental goals. The Sustainability Planner should consider the smart growth initiative as having many parallels with FEMA's sustainable redevelopment initiative. Information tools such as the smart growth website (www.smartgrowth.org) are a valuable resource for post-disaster sustainable development initiatives. State agencies spearheading the smart growth initiative are strong potential partners for a sustainable redevelopment initiative. For example, the State of Maryland has embarked on a major smart growth initiative that ties in with long-term efforts to preserve the quality of the Chesapeake Bay ecosystem.

Urban Growth Boundaries

An urban growth boundary is a land use-planning tool that demarcates urban and rural land uses to avoid a lower density sprawl development pattern. The most notable use of urban growth boundaries is a program developed in Oregon in the 1970s (see sidebar).

Urban growth boundaries are intended to encompass an adequate amount of developable land to efficiently meet projected growth requirements for 20 to 30 years, while protecting rural lands. Urban growth boundaries encourage:

- Development at higher densities
- Mixed-use development
- Infill development and redevelopment in urban areas
- Land use patterns that reduce the need for automobile travel.

The objectives of urban growth boundaries are to plan and promote the efficient use of urban land, to improve the efficiency of public facilities and services, and to preserve farm and natural lands outside the boundary. Over time, additional undeveloped land can be added to the boundary.

The Sustainability Planner should be aware of this planning technique, whether it has been applied in local communities, and whether local jurisdictions and residents consider urban sprawl to be a major development issue. Even if the concept of urban growth boundaries is not applicable to smaller, rural communities, the broader principle of concentrating development and proximity to services is valid. Temporary housing sites and larger redevelopment projects that are a part of an overall recovery effort should be proximate to existing development and important public facilities and services.

Infill Development

Infill development promotes the development of vacant or underdeveloped parcels or the reuse of abandoned structures. It is best applied in older urban centers where there has been a slow exodus of residents, businesses, and industries. Promoting infill development generally requires that local governments adopt regulations and policies to encourage redevelopment in areas of urban decay.

Infill development is a sound planning approach that has beneficial implications for sustainability. It encourages compact dense development, reduces the need for continued sprawl, and provides economic development and quality of life improvements that are desperately needed in many urban areas. In recovery situations where a community might be evaluating new locations for housing for flood or other hazard victims, for example, the Sustainability Planner should be sure to encourage the consideration of infill development.

Minimum Density Zoning

Minimum density zoning (MDZ) is a land use planning tool that requires development densities to stay above a certain level by mandating average or maximum

Oregon, Urban Growth Boundaries - Adopted in 1979, the Metro urban growth boundary in Oregon is a 364-square-mile area that includes 24 cities (Oregon's Metro Website). Other areas such as Santa Clara, California, and King County, Washington, have followed Oregon's example and established urban growth boundaries in their jurisdictions.

Oregon's Metro has an official responsibility for managing the region's urban growth boundary. With such accountability, the Metro must:

- Coordinate between regional and local comprehensive plans and adopt a regional urban growth boundary.
- Require consistency of local comprehensive plans with statewide and regional planning goals.
- Plan for activities including transportation, water quality, air quality, and solid waste.

lot sizes. Traditional zoning requirements normally stipulate a minimum lot size, but do not regulate the upper limits of residential lots. MDZ is useful in residential areas dominated by single-family detached homes or multifamily developments. It is not likely to be appropriate in rural areas.

Because residential development often occurs at densities lower than those called for in a comprehensive plan, MDZ seeks to use land more efficiently by requiring development to be at or near planned densities in both residential and commercial areas. The Sustainability Planner should use caution in recommending MDZ. Although it addresses some of the environmental, social, and aesthetic problems associated with suburban sprawl, widespread misconceptions about increased density often prevent communities from adopting compact land use strategies. MDZ may be perceived as too intrusive and, perhaps, be considered only in those states with a strong precedent of community planning and land use regulation.

Transportation

Land use and transportation are intrinsically related. Land use patterns and population density dictate the nature and orientation of the transportation network. As transportation improvements are made, they can alter the land use pattern by attracting new residents and businesses. Land use plans that focus on sustainable development encourage compact and mixed-use strategies, along with policies to foster alternative transportation modes that help reduce reliance on the automobile. Advances in alternative transportation gradually reduce the high public cost of building, maintaining, and repairing roads, overpasses, and bridges—infrastructure that is often damaged in a natural disaster.

Communities should review transportation plans and policies before undertaking sustainable development or redevelopment plans. Transportation efficiency in land use planning is achieved by:

- Revising road standards and development to give people more transportation options, such as walking, riding the bus, or bicycling.
- Encouraging changes in development patterns, so that jobs, schools, housing, and shopping are closer together.
- Providing higher quality public transit in both urban and rural settings.
- Identifying opportunities to encourage more sustainable transportation planning. For example:
 - A flooding disaster might provide the opportunity for adaptive reuse of an old railway right-of-way for a foot or bicycle path (National Park Service Rails-to-Trails Program).
 - A floodplain acquisition program might incorporate a stream corridor park with walking paths that link recreational parks with the downtown business district.
 - Incorporating alternative transportation modes into redevelopment as part of a long-term disaster recovery plan.

Brownfields Development

Brownfields are vacant, abandoned, or underutilized industrial and commercial facilities where the redevelopment potential is adversely affected by environmental

contamination. These sites are usually found in urban areas and were previously industrial or commercial use facilities that generated or handled hazardous wastes.

Brownfields can be reclaimed if cost-effective hazardous waste remediation measures are available to address potential public health issues. Many businesses have taken advantage of local incentives for redeveloping brownfields, which in turn brings new revenue and jobs to the local community. This type of redevelopment requires a strong partnership between the public and private sectors. Successful brownfields redevelopment has provided a foundation for revitalizing neighborhoods, creating jobs, and restoring green space in urban areas. EPA administers the Brownfields Economic Redevelopment Initiative.

The Sustainability Planner should be aware of potential problems that may arise with brownfields. Recovery redevelopment projects must be able to move quickly from the design concept through detailed engineering to construction. If hazardous waste remediation is under discussion or incomplete, the site should not be considered for potential relocation projects because of time constraints. Even with the fast track procedures available for brownfields, negotiations over cleanup levels and remediation techniques can be extensive.

3.2.2 Housing

After a disaster, the temporary or permanent relocation of families can affect the social and economic foundation of the community. The cost of replacement housing to individuals and to society can be staggering. Relationships with neighbors, coworkers, and classmates may be strained or severed, and the business community may lose access to significant human and economic resources. To provide for a sustainable community, municipalities must seek innovative ways to ensure that new housing developments as well as replacements for homes lost to natural disasters are planned and built in a sustainable manner.

Ideally, housing developments in a sustainable community should do more than just provide shelter. Sustainable structures should use a minimum of nonrenewable energy, produce a minimum of pollution, and cost a minimum of energy dollars, while increasing the comfort, health, and safety of the people who live and work in them. Implicit in this definition is the concept that sustainable housing should be resistant to the risk of damages from natural disasters.

Sustainable housing is important to the long-term viability and prosperity of communities. On a basic level, sustainable housing provides the community with:

- A source of reliable, cost-effective shelter for residents with minimal environmental impacts
- A diverse and consistently available workforce to help drive regional economies
- A predictable consumer base for local businesses

Sustainable housing can take many forms, but a few basic characteristics are universal:

- Durability, energy efficiency, and cost effectiveness
- Environmental sensitivity in siting
- Diverse opportunities for residents.

The design and construction of sustainable housing must strike a balance between incrementally higher costs for initial construction and anticipated reductions in long-term maintenance, energy and utility costs, and the likelihood of damage due to natural

disasters. The long term costs of physical or environmental reparations or the loss of environmentally sensitive areas far outweigh the initial costs of well-sited housing development. In keeping with the strategies of sustainable development and the opportunities presented by disaster recovery, housing alternatives should consider the ages, income levels, family sizes, and transportation requirements of all residents. If available, the Sustainability Planner should review any recent housing surveys or recommend that a housing survey be conducted to understand market trends and future needs.

Initiatives in Sustainable Housing

Affordable Housing

Natural disasters can strike communities and neighborhoods of any socioeconomic status. However, it is frequently those at the lowest end of the economy that suffer the most. Their loss is often more traumatic because they do not have the resources to recover (e.g., insurance, savings, and investments).

Communities must consider lower income housing needs when evaluating long-term recovery alternatives. Many families may not be able to afford market rate houses, even with substantial financial support from recovery agencies.

Affordable housing may be realized through new uses of property previously set aside for standard single-family homes or institutional, commercial, or industrial purposes. In a society with a growing population of elderly and single-parent headed households, single-family homes may not necessarily be the best use for a property. New land use principles suggest that communities with greater density thrive, given the proper planning and design considerations.

Redevelopment

The adaptive reuse of buildings that have outgrown their original purposes is another housing initiative that moves a community closer to the goals of sustainability. Creative redevelopment of abandoned warehouses, for example, can spark further reinvestment in low-income areas. A recent trend in real estate development is to convert old warehouses into interesting loft-style apartments and condominiums. Redevelopment to create new housing options represents the ultimate in recycling.

Smart Building

What does it mean to build smart? Sustainable development and redevelopment are also known as green building or building smart. Homes that incorporate energy-efficient technologies are typically more comfortable, have lower utility bills, and have minimal impact on the environment. In a typical U.S. home, heating and air conditioning account for about 44 percent of energy use - the largest energy expense in most homes. Home heating is also one of the largest contributors to residential pollution. Homes that are built using smart fundamentals incorporate technologies known to save and conserve energy, while reducing pollutant emissions. Following a disaster, communities should make every effort to incorporate smart development concepts into their housing recovery plans.

Special Considerations Following a Disaster

Disaster Resistant Housing

Unfortunately, the United States faces a number of potential natural disasters that can adversely affect housing—earthquakes, hurricanes, tornadoes, and floods are the most common. Following any natural disaster in which housing is damaged or destroyed, a community is faced with difficult decisions on how to recover. There is often a push, especially by homeowners, to quickly repair, rebuild, and move on with their lives. However, a disaster in which many residential structures are damaged or destroyed presents unique sustainable redevelopment opportunities that can be addressed through the recovery process.

The community must thoroughly assess housing needs based on the unique characteristics of its population. In addition, it must consider relocating or retrofitting structures located in high hazard areas.

Retrofitting

Homes in the 100-year floodplain that are not substantially damaged can be repaired. (Substantial damage, as defined by NFIP, means that the cost of the improvements or repairs is more than 50 percent of the market value.) When homeowners start to make plans for repairing and replacing damaged structures, all efforts should be made to incorporate energy efficiency into the process. The homeowner faces fewer damages the next time a disaster occurs and also benefits from lower utility bills. The community as a whole is enhanced by the reduction in pollutants, as well as by improved, healthier housing stock and homes that are repaired and brought up to the newest building codes may help to increase the value of other residential property.

Replacement Housing

In situations where homeowners must totally replace their homes, sustainable redevelopment or smart building should be a crucial consideration. Replacement housing offers an opportunity to redevelop an area with a comprehensive sustainable concept from the very start. Communities should make a concerted effort to educate their citizens on how to build smart. FEMA and DOE officials can often provide technical assistance to area planners and residents. State emergency management staff may also provide information on sustainability or identify other state agencies with responsibility for energy conservation. DOE is an excellent resource for smart or green building initiatives (see Appendix C). In the aftermath of several recent disasters, DOE specialists on sustainable development provided direct technical assistance to affected communities.

Acquisition

Acquisition is often a key element of FEMA's hazard mitigation strategy for large flood disasters. It is one of the many options a community might explore in dealing with repetitive flooding damages. Through the Hazard Mitigation Grant Program (HMGP), FEMA provides mitigation funds for the state to acquire properties in the floodplain. In most cases, damaged structures are demolished, though some may be relocated. The acquisition program allows homeowners to escape the dangers of the flood zone by providing preflood fair market value for their damaged homes. It is

Valmeyer, Illinois Relocation

After the flood of 1993, over 90 percent of the buildings in Valmeyer, Illinois, were damaged beyond repair. Over 2,500 people in Valmeyer and the surrounding countryside were left without homes, and many moved into a trailer village set up by FEMA. The county took immediate action and developed several options for recovery. The citizens of Valmeyer chose to relocate their community to a nearby 500-acre parcel on a bluff overlooking the river.

Valmeyer was the first community to benefit from the Working Group on Sustainable Redevelopment, a group that came together in the aftermath of the flood. Using funds from DOE's Office of Energy Efficiency and Renewable Energy, a team of national experts helped incorporate sustainable technologies into the design and construction of a new town. The team organized several community planning sessions and offered workshops on passive solar design and ground-source heat pumps. These initiatives paid off through energy-efficient home construction, resource-efficient institutions, and future renewable energy development. The new homes offered better insulation, energy-efficient windows, low-flow showerheads, water conserving toilets, and efficient heating and cooling systems.

beneficial to the community because it permanently removes structures from the floodplain and allows the area to return to a natural state. Many communities have experienced considerable savings in disaster damages following an acquisition project simply because fewer structures are vulnerable.

Relocation

Relocation may refer to the physical relocation of a home to a property outside of the floodplain or to the removal of citizens from a disaster-prone area. If a home is not substantially damaged and is structurally sound enough to withstand relocation, the property owner is typically offered fair-market value for the property. The homeowner is then given financial assistance for the actual costs of moving the home to a new site, including site preparation (foundation, water, sewer, and utilities). Alternatively, a community may choose to relocate all or part of its citizens to a completely new site; such was the case with Valmeyer, Illinois (see sidebar, p. 3-13).

Relocation cannot be undertaken without substantial help from outside sources. Although it provides a golden opportunity to implement sustainability strategies, it requires substantial funding, comprehensive planning, and technical assistance from Federal and state resources.

3.2.3 Public Infrastructure

Shelby County, Tennessee, is located within the New Madrid fault system. Memphis Light, Gas, and Water owns and operates the supply system that provides water to the area. The company has initiated a seismic retrofit project to protect its pumping station and enhance the survivability of connections between the water distribution lines. At a total project cost of \$968,800, retrofit plans include:

- Reinforcement and anchorage of masonry walls.
- Strengthening of steel frames.
- Improved connection of a concrete wall and roof.
- Secured anchorage of pipes and valves.
- Bracing of pipeline.
- Bracing of sewer treatment and control equipment.
- Protection of an overhead crane.

The estimated cost to replace the pumping station in the event of a large earthquake is over \$17 million. Each day the station is not in service costs an additional \$1.4 million. The total estimated savings from this retrofit project are estimated at \$112 million.

Public infrastructure includes potable water supplies, sanitary sewer services, power distribution, cable and telephone, and transportation systems in addition to public services such as hospitals, schools, and communications. Immediately following a disaster, emergency management professionals and community leaders think first of health and safety issues. Is there electricity? Are the roads passable? Can medical assistance be reached? Is the water safe to drink? The answers to these questions greatly influence emergency management strategies and community response.

How is sustainable public infrastructure incorporated into an immediate disaster recovery process? Outlined below are some options for water, sewer, and energy systems.

Water

The United States is abundant in lakes and rivers, yet in many regions water resources are in critical supply. Even the Pacific Northwest has begun to feel the pinch as drier seasons coupled with urban growth strain water supply and distribution systems. To protect valuable water supplies, communities need to make an effort before disaster strikes to prevent them from being damaged or contaminated. Shelby County, Tennessee has instituted a plan to protect water distribution systems (see sidebar).

At the very least, communities in known disaster-prone areas should make prior arrangements to have emergency water

available for schools, hospitals, and fire departments. Emergency managers can help plan for a sustainable water supply by designating emergency water storage facilities and developing mutual assistance agreements with neighboring communities.

Wastewater Collection and Treatment

Conventional wastewater treatment technologies can be major environmental polluters because of effluent discharges or sludge byproducts. A disaster situation can further exacerbate the environmental damage from poorly designed sewage infrastructure and inadequate wastewater treatment plants (WWTPs).

In most U.S. cities, gravity sewers rely on the force of gravity to guide sewage down gently graded conduit systems until reaching a pumping station or WWTP. Treatment facilities are located at low elevations within the watershed, most often in or near designated floodplains. WWTPs are, therefore, often subject to flooding, which can damage facilities and discharge untreated waste into surface waters. Many smaller rural communities rely on lagoons for sewage treatment. Lagoons are often overtopped by flood waters, which creates severe water quality problems downstream. In older metropolitan areas and in smaller rural systems, stormwater and sewage may flow into a combined conduit system. During heavy rains, these systems can overflow, sending raw sewage directly into rivers and streams. WWTPs are overburdened with the sheer volume of waste to process during storms, and deluged facilities often sustain pump submersion and failure.

Several promising new technologies for sewage treatment have been implemented in WWTPs across the nation. Created wetlands have been used to assist in the storage and purification of wastewater. In communities where sewer and storm sewers are combined, substantial investments have been made to separate these systems. Another sustainable strategy is the repair or replacement of older sewer drains that allow infiltration of water, thereby reducing the overall capacity of the system. A sound hazard mitigation approach for pumping stations and WWTPs involves floodproofing and retrofitting. Levees or berms can be placed around WWTPs to provide protection from the 100-year storm event. Retrofitting pumping stations includes the elevation of pumps above 100-year flood levels. These improvements offer the opportunity to implement energy-efficient technologies.

Energy

Energy production is big business. The consumption of energy fuels our economy just as it fuels cars, heats and cools homes, and lights office buildings. Yet, consider the price of energy consumption on a local, regional, national, and global scale.

Environmental impacts include depletion of the ozone layer, acid rain, smog, climate changes (which can result in rising sea levels and changes in weather patterns related to drought or flooding), and other forms of global degradation. Our addiction to energy is manifested in congested roads, urban sprawl, and excessive expenditures for heating, cooling, lighting, and ventilation.

Two major sustainable development approaches in the field of energy are conservation and the use of clean, renewable energy sources. Reducing consumption is more cost-effective and practicable than increasing supply. By increasing efficiency, the same amount of electricity can serve more users without expanding power plant capacity. Efficiency is applicable to each of the critical elements of sustainability—land

In Portland, Oregon, energy planning became an integral part of comprehensive urban improvements. The benefits include cost savings, reduction in air pollution and traffic congestion, enhancement of quality of life, and stimulation of the local economy. Under Portland's energy policy, the city is improving energy efficiency in municipal buildings, residential buildings, commercial and industrial facilities, and transportation. The program also requires increased recycling, decreased waste, and development of telecommunications as an energy-efficiency strategy (DOE/EREN website).

use, housing, and infrastructure. Approximately 35 percent of all U.S. energy needs are supplied by electrical power. About two-thirds of this electricity is used in residential and commercial buildings, and one-third is used in industrial processes.

Alternative and renewable energy includes those forms of energy that cannot be depleted or that are quick to regenerate—such as solar, wind, hydro, geothermal, biofuels, ocean energy, and hydrogen power. Fossil fuels like coal, oil, and natural gas are depleted 100,000 times faster than their rate of development. Oil currently provides more than 40 percent of the nation's primary energy and 97 percent of its transportation energy.

What sustainable redevelopment issues regarding energy might arise in a post-disaster scenario? What should a community consider about energy efficiency? Disasters provide a unique opportunity to reflect on how things have been done in the past and how they could be improved to move toward the goal of sustainability. Smart building guidelines are a good place to start.

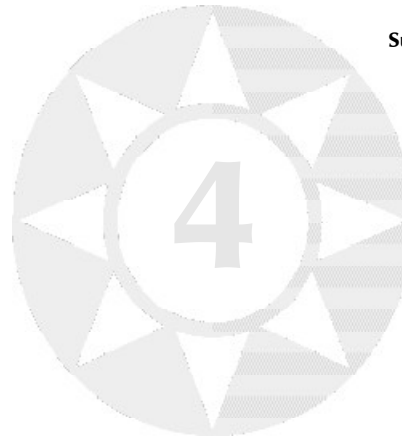
Communities should encourage their citizens to build or rebuild homes to a higher energy-efficiency status. If building materials and contents must be replaced, why not replace them with components that will reduce overall energy consumption and expense? A few

examples of sustainability redevelopment in terms of energy conservation are:

- High R-value insulation in walls and ceilings for major home repair or replacement.
- Underground power lines, which are not as susceptible to damage from winds, rain, or ice storms.
- Historical architectural designs that take advantage of naturally occurring shade areas and cross-ventilation.
- Keeping a structure's size in scale with its use to ensure that there is no excess space to heat and cool.
- Retrofitting heating, ventilation, and air conditioning (HVAC) systems.
- Double- or triple-paned windows.
- Development and use of alternative fuels to gasoline, such as biodiesel, electric fuel, ethanol, hydrogen, methanol, natural gas, propane, P-series, and solar fuel.
- Energy-efficient water heaters, refrigerators, dishwashers, showerheads, and fluorescent lighting. EPA's Energy Star program rates new appliances for their energy efficiency.

3.3 Summary

The implementation of sustainability concepts in conjunction with disaster recovery is still in its infancy. For sustainability to be institutionalized within the overall recovery process, there must be ongoing communication between local, state, and Federal planning and emergency management professionals—particularly in terms of sharing success stories of disaster recovery and sustainable redevelopment. As disaster recovery plans are developed, each component or step along the way is an opportunity to choose a more—rather than a less—sustainable direction for the future. The tools, programs, and references included in this guide provide the information and examples to achieve a sustainable recovery.



Section 4.0

Sustainability by Hazard Type

This section suggests specific approaches to incorporating sustainable practices into recovery and mitigation planning for the following types of hazards:

- Flooding
- Earthquakes
- Coastal storms
- Tornadoes
- Wildfires
- Landslides.

The hazard-specific discussions are followed by a relevant case study that provides one or more examples of sustainable mitigation processes. The Sustainability Planner new to emergency management should obtain background information on the particular hazards relevant to the disaster deployment. The FEMA document, *Multi-Hazard Identification and Risk Assessment: The Cornerstone of the National Mitigation Strategy*, provides an excellent overview on a broad range of natural hazards (see annotated reference in Appendix D). Understanding the anticipated intensity of a future disaster and the probable reoccurrence of the next threshold event that could trigger a disaster declaration is critical in identifying appropriate mitigation and sustainability approaches.

The discussions below outline different approaches to incorporating sustainable practices into the disaster recovery and mitigation planning processes. The recommended approaches are not intended to be all-inclusive. The relevance of each approach varies depending on disaster damages, the history of past natural disasters in the area, the statistical probability of future disasters, and community interest and political realities.

4.1 All Hazards

Hazard mitigation specialists working out of a DFO are understandably focused on evaluating mitigation opportunities relevant to the natural hazard event that led to the disaster declaration. However, it is important that the mitigation staff and

Sustainability Planner step back at this point and evaluate mitigation and sustainable redevelopment opportunities from a multi-hazard perspective. Are there other hazards present that would leave reconstruction vulnerable to disaster? Some excellent examples of a multi-hazard approach come from recent hurricane disaster declarations in the U.S. Virgin Islands and in Puerto Rico. Mitigation activities following these declarations focused on repair and reconstruction of structures damaged or destroyed by high winds. Where feasible from a cost and engineering perspective, mitigation specialists also considered incorporating seismic strengthening of the structures in reconstruction because of the high seismic risk present in this part of the Caribbean.

Many aspects of mitigation and sustainable redevelopment are common to all hazards. Therefore, if major reconstruction is part of the overall recovery effort, the following factors should be considered in addressing all hazard types:

Extent of Damage

Obviously, the more extensive the damage to a community, the greater the opportunity for incorporating sustainable redevelopment into the recovery effort. Following a major disaster, many communities may find it advantageous to reexamine how land uses can be rearranged and how the basic configuration of streets and utilities might even be altered to improve access and services. The first question for the Sustainability Planner is, How can the community avoid repetitive losses through the reconstruction process? If damage is extensive and the continued risk high in a particular area, alternative land uses such as open space or recreation may be appropriate. However, changing land use to avoid repetitive damages may not be a sound planning option nor politically feasible.

Where the extent of damage is limited and replacement of previous uses is desirable, significant measures may be employed on a structure-by-structure basis to provide for increased disaster resistance, energy efficiency, and environmental sensitivity.

Type and Age of Affected Facilities and Structures

As a general rule, recently developed areas are more likely to consist of homes and businesses where the owners have adequate insurance or other financial means to restore their properties. In addition, recent developments should more closely reflect community needs and current planning standards. Unless these developments are located in an area that is highly vulnerable to natural disasters, it is probable that the development will be returned to predisaster conditions. In these situations, there are opportunities to promote sustainability by recommending the use of building materials and replacement equipment that are energy efficient and disaster resistant.

In older disaster-damaged areas, other questions may be asked before the community embarks on reconstruction. Older residential or community areas were designed and built to meet community needs at that time. Does the community want things put back the way they were, or would another land use pattern better meet current needs? Housing needs today have shifted dramatically from the prevalent three-bedroom, single-family detached subdivisions built during the 1950s and 1960s. Based on an assessment of the community's needs, it may be appropriate to provide a greater diversity of housing types in a typical reconstruction project. In these situations,

it may be appropriate for the community to consider initiating a long-term recovery planning effort to evaluate alternative reconstruction strategies.

Environmental and Social Considerations

The Sustainability Planner should help to ensure that community recovery plans and proposed mitigation measures are environmentally sensitive, respect cultural and historic resources, and contribute to the sustainability of the residential and commercial elements of the community. When Federal funds are used in the reconstruction effort, Federal environmental and historic preservation requirements such as NEPA, NHPA, CoBRA, and the Endangered Species Act (ESA) may become an issue in the overall recovery effort. The Sustainability Planner can help local communities by facilitating an expedited review process and helping to resolve review and permitting issues as they arise.

Regulatory Controls

Because there is typically pressure to rebuild as soon as possible, it is important to assess current regulatory controls to determine whether they promote commonly accepted sustainable building techniques and rational land use patterns. A Sustainability Planner might provide recommendations to modify or amend zoning regulations to allow a greater diversity of housing types or promote flexibility in the review process to expedite approvals for reconstruction activities. If regulatory controls are lacking and there is hesitancy on the part of property owners to voluntarily incorporate sustainable development measures, the community may consider a building permit moratorium. In this case, no building permits are issued for a specified time (30 to 60 days) to allow time to identify and implement changes to relevant ordinances. Moratoriums are often controversial and may not be politically feasible; however, they can be crafted to apply only to substantially damaged structures. Another word of caution: moratoriums must be clearly justified and have the support of key local officials.

Public Education and Outreach

Community outreach is an effective sustainable redevelopment measure in almost all disaster declarations. Regardless of whether homes and businesses are only partially damaged or a substantial reconstruction effort is necessary, public outreach is crucial to provide timely information to the community. The Sustainability Planner needs to enroll people to help get the message out. Many people within the DFO organization and working at DRCs throughout the declaration area play important roles in bringing information to disaster victims. Prepare appropriate materials, hold briefings or training at the DFO or DRC, and enroll interested volunteers. Local officials—especially the building permit administrator, zoning inspectors, and planners—should be strong advocates in any outreach program.

4.2 Floods

Most disaster declarations are flood related. Hundreds of floods occur each year, making it one of the most common hazards in all 50 states and the U.S. territories.

Floods kill an average of 150 people a year in the United States. Property and flood damage losses amount to approximately \$4 billion annually. Flood losses today are often the result of inappropriate development within the floodplain, filled wetlands, and extensive impervious surfaces. Together, these factors affect the functions and capacity of the watershed and drastically increase the risk of flooding.

Mitigation and Sustainability Approaches

Planning

- Where appropriate, consider recommending development of a stormwater management plan. Extensive shallow flooding may indicate that stormwater facilities and storm drains or drainage ditches are inadequate.
- Be cautious in recommending that a community develop a comprehensive watershed management plan, which requires considerable time and effort, during the initial stages of recovery. This is a long-term initiative that has particular relevance when the watershed draining to the affected community is not too large and falls within a limited number of political jurisdictions.
- Coordinate with NFIP experts at the DFO or at the regional level to determine if the available flood hazard data is adequate to guide redevelopment. It may be necessary to develop additional flood hazard data quickly. Because flood hazards may change over time, it is critical to ensure that hazard data is current.

Extent of Damage/Type and Age of Affected Facilities and Structures

- Elevate older, nonconforming structures above the base flood elevation (BFE).
- For older residential areas, repetitive damages are an excellent clue that hazard mitigation and sustainable redevelopment measures should be considered in the reconstruction effort.
- Encourage use of the ICC coverage provision under the NFIP. ICC coverage provides additional funding for the cost to comply with state or community floodplain management ordinance for structures have been declared substantially or repetitively damaged.

Regulatory Controls

- Use zoning regulations to keep future development away from flood hazard areas, encourage cluster development, and require underground utilities (where feasible).
- Amend subdivision regulations to minimize residential encroachments into the floodplain.
- Strengthen floodplain regulations and enforcement. The CRS provides recommendations for measures beyond the model NFIP flood ordinance's minimum requirements that local jurisdictions can adopt. An effective additional measure would be to require at least 1 foot of freeboard above the BFE.
- Consider adopting a stormwater management ordinance for future development to minimize the potential for repetitive flood damages. Many states do not mandate minimum stormwater management requirements for local jurisdictions.

Land Management and Construction Practices

- Consider a full range of structural and nonstructural measures, such as elevation, wet or dry floodproofing techniques, and acquisition. Provide technical or financial assistance to property owners to implement hazard mitigation measures.
- Move all valuables and appliances out of the basement. Place main breakers/fuse boxes and utility meters above the anticipated flood level, and secure hot water heaters to walls instead of floors, with steel straps; in new construction, locate these components on upper levels. Consider elevation for residential properties located in minimal flood zone areas.
- Consider elevation as a means of protection against future damage. The building permit administrator must consider the necessary level of flood protection required based on the potential velocity, level, frequency, and duration of future floodwaters.
- A home must be elevated or relocated out of the floodplain if it has received substantial damage (50 percent of pre-flood market value).
- Institute a maintenance program for stormwater detention basins, culverts, and storm drains to minimize future flooding events.
- Use structural mitigation measures such as levees, floodwalls, and shoreline protection techniques as appropriate to minimize future flood damages.
- Purchase or relocate flood-prone properties and utilize the most vulnerable part of the floodplain as a greenway, park, wildlife habitat, or other use not so vulnerable to flood damages.

Public Education and Outreach

- Create a public awareness campaign on the many benefits of floodplain preservation and restoration.
- Develop an outreach program to increase property owner participation in NFIP.

Flood Case Study: Hazard Mitigation Planning in Massachusetts

Watershed Initiatives in the Upper Mystic Basin

A Unified Initiative

Nine municipalities in the Upper Mystic Watershed Basin (UMWB), northwest of Boston, Massachusetts, are working together to address hazard mitigation planning. Following significant flood events in 1996 and 1998, both resulting in Federal disaster declarations, the UMWB communities formed an alliance based on their watershed boundaries and informed by their recognition that flood mitigation planning cannot succeed if implemented only at the local level.

By joining the alliance, these communities are participating in a unique statewide watershed initiative. This program was designed to collect and share resources and information, target present and potential impacts to natural resources, assess impacts to natural resources, and develop and implement activities to protect and improve the Commonwealth's natural resources. The communities have organized flood hazard mitigation planning on the basis of this principle. UMWB has implemented three hazard mitigation grant projects, a drainage improvement project in Arlington, the Wrights Pond Dam upgrade in Medford, and a culvert/ drainage project in Winchester. Earlier this year FEMA designated UMWB as a *Project Impact* community. This recognition provides funding and resources to continue flood mitigation planning.

Watershed Initiative/Environmental Joint Powers Agreement

The fact that flood mitigation planning must transcend political boundaries has long been recognized. However, the Massachusetts watershed initiative and the legal and institutional mechanisms that support it are far from commonplace. Following an October 1996 flood event triggered by 2 days of precipitation combining to exceed the 100-year event, the Massachusetts Emergency Management Agency (MEMA) and the Department of Environmental Management hosted a workshop to facilitate development of a coordinated watershed approach to flood hazard mitigation. Since that workshop, the original communities—Arlington, Medford, Winchester, and Woburn—expanded their defined boundaries to include the communities of Burlington, Lexington, Reading, Stoneham, and Wilmington.

The mechanism that allowed the UMWB communities to receive Federal funding as a distinct, geographically delineated unit defined by watershed boundaries (drainage area) was twofold:

- The statewide watershed initiative, a program of the Massachusetts Executive Office of Environmental Affairs.
- The statewide legislation that set up an Environmental Joint Powers Agreement (EJPA).

The Watershed Initiative has continued to evolve since its inception in 1993. It originally was designed to address water quality within the state and particularly to reorganize the procedures for issuance of wastewater permits; however, use of the initiative to address water quantity issues through flood mitigation planning represents a unique application. The creation of the Upper Mystic River Watershed Agency through the adoption of an EJPA is the first application of enabling legislation adopted by a state legislature.

The legislation is intended to facilitate intergovernmental action on natural resource and environmental issues, though the originally defined objective is more narrow. The EJPA allows the communities to work jointly and cooperatively to reduce or eliminate the devastating effects of flooding and other hazards in the Upper Mystic River Watershed. It authorized the creation of the Upper Mystic River Watershed Agency, which consists of one voting representative and one nonvoting alternate from each participating community. The agency is entitled to receive and expend public and private funds to defray the operational, administrative, and contractual costs of this agreement, including, but not limited to salaries, wages, transportation, and administrative overhead.

Summary

Massachusetts has demonstrated a remarkable commitment to the initiative from the outset. Twenty full-time state employees were reassigned to the UMWB team. Community councils bring together a diverse array of stakeholders to assess watershed needs and establish consensus on proposed solutions. Furthermore, the state has developed watershed teams whose members represent seven state agencies and four Federal agencies (EPA, NRCS, USFWS, USACE).

Statewide environmental regulations, including the Rivers Protection Act, serve as the foundation for the watershed initiative. The EJPA enabling legislation empowers regional coalitions to pursue public and private funding to support those environmental objectives that are valuable within the boundaries established by their encompassing watershed. Massachusetts has taken great strides in only a few years to radically alter the governmental approach to addressing environmental challenges.

4.3 Earthquakes

Earthquakes are abrupt movement of the Earth's crust caused by the sudden release of accumulated tension between or within tectonic plates, which then causes violent ground motion or trembling. Tectonic plates are rigid, 50- to 60-mile-thick sections of the Earth's crust that can move either slowly and continuously or suddenly, with resultant collisions or separations. Most earthquakes occur in areas where large plates collide or slide against one another, but others occur along fault lines on the

interior of a plate. The variables that characterize earthquakes are ground motion, surface faulting, ground failure, and seismic activity. Magnitude refers to the seismic energy released during an earthquake, which is measured on the Richter Scale. Intensity is a subjective measure of the strength of the ground shaking; it is based on observed damage and varies according to proximity to the epicenter of an earthquake (the point on the earth's surface directly above the location of the rupture). Intensity is measured by the Modified Mercalli Intensity (MMI) Scale, which consists of 12 levels of intensity.

Liquefaction is an earthquake phenomenon that occurs when ground shaking causes hydric or sandy soils to lose stability and behave as viscous fluids. This characteristic is one of the most damaging; it is prevalent in areas that were developed on filled wetlands or in hydric soils that have been drained to accommodate growth. The Sustainability Planner should consider alternative land use strategies in areas where liquefaction occurs and in other areas of severe seismic risk such as active fault lines.

Damage from earthquakes includes settlement, impairment, or collapse of buildings, bridges, and dams. Underground infrastructure—such as tunnels, storm drains, water wells, water lines, sewer lines, gas lines, phone lines, and electric lines, is often damaged or destroyed. Transit systems, power, water, gas, telecommunications, and other basic services are disrupted. Deaths and injuries usually occur due to falling objects or the collapse of structures.

Secondary earthquake hazards are common and result from a variety of sources. These hazards include landslides; fires from ruptured gas lines; flash or localized flooding from damaged water mains, broken dams, and seiches; tsunamis or tidal waves (from earthquakes originating at sea); and hazardous materials incidents that may release poisonous chemicals, radioactive materials, or biological waste.

Mitigation and Sustainability Approaches

Extent of Damage

The first step for the community is to determine if damaged areas can be safely restored using earthquake-resistant building techniques and land development policies; if the area should assume a different development and land use pattern to address economic or social needs; or, perhaps, if the area should be redeveloped at all.

By taking a broad view of geologic and topographic circumstances, communities can mitigate the factors that exacerbate the effects of earthquakes, such as liquefaction and attendant secondary hazards such as landslides and flooding. For example, communities might designate severe hazard risk areas—such as those with steep slopes, those that are highly susceptible to liquefaction, and those adjacent to active faults—and restrict future development. Sustainable development is further enhanced by proposing alternative land uses, such as open space designations, wetlands reclamation, or recreation. Outside of these areas of severe seismic risk, the adoption and enforcement of up-to-date building codes is critical to achieving a more sustainable future.

Type and Age of Affected Facilities and Structures

Following an earthquake disaster, communities should examine remaining older buildings, especially those that do not satisfy current code requirements or have not

been upgraded for earthquake resistance. Communities should be cognizant of the historical value of structures and neighborhoods, and the possible hazard effects on special populations such as the elderly or handicapped, they must recover with an eye to the future—the choices made today may greatly influence the extent of damages from a future seismic event.

Land Management and Construction

- Designate areas of high seismic hazard for open spaces, such as parks or greenways. This is especially relevant for developed areas that have sandy soils or have been built on infill and are more vulnerable to the effects of liquefaction or areas vulnerable to landslides.
- Prohibit construction of critical facilities in areas of high seismic risk.
- Create guidelines for evaluating proposed projects in seismic hazard areas to minimize damage from earthquakes and landslides.
- Implement programs such as density bonuses, transfer of development rights, and tax credits to encourage land developers to practice earthquake mitigation and sustainability.
- Develop programs and financial incentives for seismic upgrade of buildings.
- Consider local development standards for installation and construction of utility services and roads.

Regulatory Controls

- Update building codes to include the most current National Earthquake Hazard Reduction Program (NEHRP) recommended provisions.
- The Sustainability Planner and local building officials should become familiar with and encourage the use of FEMA's Yellow Book series of publications dealing with the seismic safety of both new construction and existing buildings.
- Some key manuals in this series include:

- ***Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook (FEMA 154)*** and ***Rapid Visual Screening of Buildings for Potential Seismic Hazards: Supporting Documentation (FEMA 155)***

The Handbook presents a method for quickly identifying buildings posing risk of death, injury, or severe curtailment in use following an earthquake. Building inspectors are the most likely group to implement a Rapid Screening Procedure (RSP), although this report is also intended for building officials, engineers, architects, building owners, emergency managers, and interested citizens. The Supporting Documentation reviews the literature and existing procedures for rapid visual screening.

- ***Establishing Programs and Priorities for the Seismic Rehabilitation of Buildings: Handbook (FEMA 174)*** and ***Establishing Programs and Priorities for the Seismic Rehabilitation of Buildings: Supporting Report (FEMA 173)***.

These two volumes provide the information needed to develop a seismic rehabilitation program, with particular reference to establishing priorities. The Handbook is intended to assist local jurisdictions in making informed decisions on rehabilitating seismically hazardous existing buildings by providing nationally applicable guidelines. It discusses the pertinent issues that merit consideration, both technical and societal, and suggests a procedure whereby these issues can be resolved. The Supporting Report includes additional information and supporting

Earthquake Case Study: California Seismic Hazard Mapping

Seismic hazards can cause huge economic and physical impacts and force communities into a cycle of repetitive rebuilding. When compared to other hazards, seismic events are generally more difficult to predict, and their potential impacts more difficult to quantify. However, technology is available to help communities make the right decisions in building and adapting land uses to make their environment more sustainable.

As a result of the October 1989 Loma Prieta earthquake, the California legislature passed the Seismic Hazards Act of 1990 to identify and map the state's most prominent earthquake hazards. The State Department of Conservation established the seismic hazard zone mapping program to chart areas prone to liquefaction (failure of water-saturated soil) and earthquake-induced landslides throughout California's principal urban and major growth areas. The mapping program was originally funded by the Earthquake Insurance Fund and a portion of construction building permit fees. However, it is now supported by FEMA hazard mitigation funds.

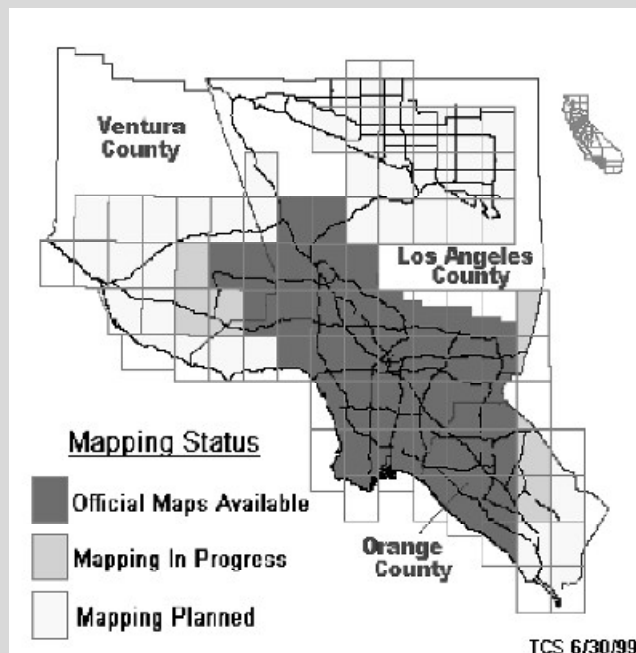
To produce the maps, Department of Conservation scientists and GIS specialists examine the latest information on surface and subsurface geology, historic groundwater levels and damage, and geologic effects of recent earthquakes. State-of-the-art GIS technology is used to integrate the information into a three-dimensional view of the ground. Each map covers an area of approximately 60 square miles.

California's seismic hazard maps offer:

- A standardized method of hazard assessment to evaluate hazard potential.
- Integration of the latest geotechnical data with state-of-the-art computer technology.
- A large scale (1:24,000) to provide a detailed look at a broad area.

The first maps produced by the program were issued in fall 1996. As of spring 2000, 43 maps of 107 cities and unincorporated areas in Los Angeles, Orange, San Francisco, and Ventura counties have been published.

A seismic hazard zone map does not show areas that should be excluded from development. Instead, it shows areas where the potential for damage is great enough so as to make it prudent to conduct geologic investigations to identify and mitigate the hazard prior to development. Mapping seismic hazards promotes the incorporation of hazard mitigation elements into structural design.



Potential seismic hazards are unique to each site, and the multiplicity of structural configurations makes it impossible to predict mitigation costs. However, in some cases, it may be possible to adequately mitigate liquefaction hazard—for example, by strengthening the foundation to withstand displacements of 1.5 feet, at a typical cost of \$3,000 to \$4,000. Engineers indicate that in many locations this simple measure could reduce the repair expenses of liquefaction damage from an average of \$70,000 to about \$15,000—a substantial savings.

In the past, land use planners have often assumed that only lower density developments are suitable in geologic hazard areas. However, planners may find that the high cost of mitigating liquefaction hazards along streams, bays, canals, and coastal zones requires a higher density of development. In situations such as this, for example, the seismic hazard zone maps provide another sustainability tool to guide decision making with regard to retrofitting existing buildings, building new structures, or rebuilding after a disaster.

documentation, annotated bibliographies, and reproductions of selected laws and ordinances that are presented in summary form in the Handbook.

Public Education and Outreach

The Sustainability Planner should encourage homeowners and businesses to use nonstructural earthquake mitigation techniques, such as anchoring bookcases to walls, applying safety film to windows, and securing masonry chimneys to roof framing.

Some examples of education and outreach messages in seismic hazard areas: take such basic safety steps as bolting or strapping cupboards and bookcases to the wall, and keep heavy objects on lower shelves. To prevent gas line fires, secure water heaters with straps to a nearby wall using bands of perforated steel (commonly known as plumber's tape). Install anchor bolts every 6 feet around the perimeter of a home to prevent costly damage.

4.4 Coastal Storms

The **coastal zone** is a highly dynamic and ecologically rich environment that continuously changes under the influence of natural forces. Historically, people migrated toward the coasts because of trade, transportation, and economic opportunities. Today, as people continue to move to coastal areas for aesthetic and recreational reasons, the density of development increases along with the risk to lives and property from tsunamis, hurricanes, tropical storms, nor easter, and storm surge flooding.

A **tsunami** (harbor wave) is triggered by underwater earthquakes or landslides that push a fast-moving series of waves across the open ocean at speeds that can reach 450 miles per hour (mph). The waves are barely noticeable as they travel across deep water, but can build up to significant heights as they near land. Tsunami heights over 100 feet have been recorded. They are most common along the Pacific Coast due to seismic activity around the Pacific rim, but they can occur in the Atlantic as well. A **nor easter** is a coastal low-pressure system occurring along the Atlantic seaboard during winter months that can produce heavy amounts of precipitation, inland snow and ice, high surf, and coastal erosion. Another storm of great concern to coastal communities is the **hurricane** because of its severity, frequency, and the tremendous area that can sustain damage. A hurricane is a cyclonic **tropical storm** with winds that reach or exceed a constant speed of 74 mph. These storms bring torrential rains, high winds, and storm surges to the Gulf of Mexico, the Atlantic and Pacific coasts, and the western Pacific islands. Hurricane season extends from June 1 through November 30; on average, five hurricanes strike the United States every 3 years.

Mitigation and Sustainability Approaches

Planning

In developing mitigation and sustainability development plans, local governments gather and analyze information about the suitability of land for development. A plan that effectively incorporates sustainable development concepts guides future development by balancing environmental protection, societal needs, and economic growth. The key tenet for sustainability planning in coastal communities is to avoid intensive development in areas of high vulnerability to natural hazards.

Land Management and Construction

- **Infrastructure** Government policies may seek to locate infrastructure such as roads and sewer lines so that development is steered away from hazardous areas. The CoBRA is a Federal program that employs this unique, free market approach to resource protection and hazard avoidance (see sidebar).
- **Engineering** Seawalls, groins, jetties, and other engineering solutions are used to control the effects of erosion and wave action. However, these types of construction have the potential to increase erosion downshore of the structures, so their impacts must be carefully evaluated before they are recommended.
- **Hurricane straps** Metal fasteners or hurricane clips attach the roof to the walls of a building to reinforce its ability to sustain severe winds. When adequately sized and properly installed, the straps enhance the structural integrity of a building by providing a continuous load transfer path from roof to foundation. Building codes may determine the use of hurricane straps and require that they meet both material and installation standards.
- **Shutters** Storm shutters are one of the most basic methods for high wind protection. They are placed over windows and other glass areas on the exterior of a building to protect against flying debris. They are made of plywood, corrugated metal, or polycarbonates. Building codes may determine the use of shutters and require that they meet both material and installation standards.
- **Elevation** Elevated buildings allow floodwaters to flow underneath and also make the buildings less susceptible to storm surge during a hurricane. Elevating utilities, such as hot water heaters, normally located on the ground floor or basement of a home to above expected flood or storm surge levels can prevent costly replacement after a flood. Roads, bridges, utility infrastructure, and transit facilities can also be elevated above expected flood heights.
- **Relocation** Structures that have suffered repetitive losses are favored candidates for FEMA relocation programs to move residents and buildings out of the hazard zone. The remaining property is typically acquired and maintained as open space.
- **Other measures** Other damage prevention measures available to property owners in coastal areas include wind-resistant windows, wind- and hail-resistant shingles, and hurricane-resistant doors.

Coastal Zone Management Act

CZMA, passed in 1972, is also designed to protect coastal resources, but it applies to the entire coastal zone, defined as coastal waters (including land under the water) and adjacent shorelands (including water under or on the land). The coastal zone includes islands, transitional and intertidal areas, salt marshes, wetlands, and beaches. CZMA provides grants to be used in maintaining coastal zone areas. It requires that Federal agencies comply with the enforceable policies of state coastal zone management programs when conducting or supporting activities that affect a coastal zone.

For the past 27 years, CZMA has provided coastal states and territories with incentives to properly plan and manage coastal resources through the development of coastal management plans. More than 99 percent of the nation's shoreline is currently covered under CZMA. The program is administered by the National Oceanic and Atmospheric Administration (NOAA).

Coastal Barrier Resources Act

In an effort to protect valuable coastal natural resources, to minimize loss of life and property, and to control the costs of Federal disaster relief efforts, Congress passed CoBRA in 1982. This Act prohibits most types of Federal assistance for development on designated barrier islands. Congress recognized that coastal barriers are unique ecosystems possessing great ecological value and subject to severe hazards which make these locations inappropriate for development and Federal investment. The Act designated various undeveloped barriers for inclusion in a Coastal Barrier Resources System (CBRS). These areas are ineligible for most federal financial assistance that might support additional development.

Regulatory Controls

- **Zoning codes** These codes are a form of land use regulations that set specific controls on where and how development can take place. In coastal areas, these often take the form of required set-back from high hazard and environmentally sensitive areas such as dunes, wetlands, or actively eroding shorelines.
- **Building codes** These codes set construction standards for withstanding the unusual forces exerted in a hazard event, such as high winds in a hurricane. Post-disaster assessments have proven that, in most cases, the use and enforcement of stricter building codes produce buildings that are more resistant to disasters. FEMA supports strong state and local building codes and can provide technical assistance to evaluate building codes and practices. FEMA also encourages the adoption and use of the new International Building Code (IBC), which incorporates multihazard disaster-resistant standards for construction.

Public Education and Outreach

- **Evacuation strategy** In recent years, hurricane warning systems have provided adequate time for people on barrier islands and the immediate coastline region to move inland. Devising and using an evacuation plan for communities in areas at risk is a necessary and vital exercise to safeguard lives. Due to rapid population growth, however, it is becoming more difficult to evacuate people from coastal areas because road improvements have not kept pace with development. Evacuation plans must be updated as needed and consider the capacity of the transportation infrastructure to move people away from the coast.
- **Warnings** Warning systems seek to reduce losses prior to the onset of a hazard event. An example is a system that automatically rings home phones to sound the alarm when floodwaters begin to rise.
- **Mapping** Maps that clearly delineate hazard zones are critical tools not only for local planners but also for residents, contractors, and engineers. For example, maps can identify high-risk areas that are prone to flooding or vulnerable to storm surge during a hurricane.
- **Disclosure** In real estate transfers, a standard notice can be placed in the written contract to warn all parties that a property is subject to natural hazards.
- **Education** Many people do not realize or understand the threat presented by hurricanes and other severe storms. The problem is further compounded by the fact that 80 to 90 percent of the population now living in hurricane-prone areas has never experienced a major hurricane. Many of these people have been through weaker storms. The result is a false impression of a hurricane's damage potential, which often leads to complacency and delayed actions that can result in the loss of lives in a more serious storm. Campaigns to inform citizens about areas that face the greatest risks from hazards, how to prepare for storms, and how to respond in a disaster can save lives and property.

Hurricane Case Study: River Communities in Recovery

Hurricane Floyd and Livability

The aftermath of Hurricane Floyd in September 1999 devastated the eastern third of North Carolina. As is typical for most hurricanes, it was not high winds or swelled seas that brought most of the damage, but flooding. Within just three of the state's 17 watersheds, flooding resulted in 52 deaths, the loss of millions of livestock, and the loss of 17,000 homes. Two-thirds of North Carolina counties were declared Federal disaster areas. An economic impact report prepared by FEMA and the EDA concluded that business and agricultural damage alone totaled \$6 billion.

Eastern North Carolina posed unique opportunities for creating a more livable environment in the aftermath of enormous destruction. Watersheds clearly defined the disaster area. Because of this geographic characteristic, hazard mitigation and livability planning had to focus on the entire watershed, not individual communities. This approach fostered consensus and collaboration among people with diverse interests.

River Communities in Recovery

Three months after the disaster, FEMA committed its support to the River Communities in Recovery project and began bringing together other agency representatives from Washington and the region. In addition to FEMA, the EDA immediately stepped forward as an equal partner in the project.

The Governor's advisor on long-term planning issues, an executive with the North Carolina Rural Development Center (the institution responsible for the recovery process), and a representative of the Conservation Fund with close ties to the foundation community formed the team that would outline local needs. FEMA, EDA, and USDA officials met with the team to plan the River Communities in Recovery project.

Working with these state partners, FEMA established guiding principles for the project:

1. Federal agencies should provide long-term support, in the form of funds and technical assistance, in addition to immediate disaster relief. The focus is on matching Federal programs with community needs.
2. Federal agencies should be creative in finding ways to support local community needs. Community requests should not be rejected because they do not match Federal programs.
3. River Communities in Recovery should build local capacity for both short- and long-term watershed planning.
4. Federal support programs should focus on each river basin individually in accordance with jurisdictional boundaries to promote collaborative decision making.

FEMA, working with North Carolina Emergency Management, developed a job description for a Recovery Manager. This individual is to be actively engaged in the redevelopment efforts for the county and surrounding areas, and direct the recovery work of rebuilding the communities. In addition, he or she serves as a mentor to other communities in terms of technical assistance.

Lessons Learned

At this time, the River Communities in Recovery project is where it should be: in the hands of local and state officials who will return to the Federal government with a prioritized list of projects that require financial or technical support.

There are many lessons to glean from the experience of launching River Communities in Recovery, including:

- The requirement for a broad community-based approach to include long-term recovery planning.
- The location of key Federal participants in the state or region, not in Washington, to facilitate the coordination of schedules and to improve long-term effectiveness.
- The need to build support for the initiative at all levels including Federal agencies, the state, and local leaders. This is especially important at the local level, where consensus must be built to establish and implement mitigation priorities and smart growth practices.
- The need to invite existing *Project Impact* communities to serve as mentors for other communities.

- Political subdivisions matter in disasters and sustainability if they get in the way of effective long-term sustainable redevelopment. Watersheds can break down these artificial boundaries, and Sustainability Planners should take a broad, inclusive approach to working with state and local officials both before and after disasters. (This same principle holds true for hazards other than flooding, e.g., consider forest ecosystem areas in wildfire mitigation planning and recovery.)

Coastal Storms Case Study: Project Impact Success Stories

Deerfield Beach, Florida, Wilmington, North Carolina, and Sanibel Island, Florida

The damage caused by coastal storms such as hurricanes has increased dramatically over time. Because this trend is expected to continue, it is important for those in harm's way to follow the lead of pioneering coastal communities that have already adopted risk reduction measures.

Two of these communities—Deerfield Beach, Florida, and Wilmington, North Carolina—are active participants in FEMA's *Project Impact: Building Disaster Resistant Communities*. *Project Impact* is a nationwide initiative that challenges communities to take proactive steps to reduce future disaster damages. It focuses on taking action in anticipation of disasters rather than just responding to disasters. The third community—Sanibel Island, Florida—illustrates the benefits of sustainable land use planning.

Deerfield Beach, Florida

Deerfield Beach is located on the southeast coast of Florida, in Broward County, 16 miles north of Fort Lauderdale. It is home to approximately 50,000 year-round residents. As one of Florida's low-lying oceanfront communities, the Deerfield Beach area is always susceptible to hurricanes, tropical storms, and flooding. Within the last 75 years, it has been hit by at least seven major hurricanes, including a 1928 hurricane that killed more than 2,000 people in the Lake Okeechobee area.

In August 1997, FEMA and the State of Florida selected Deerfield Beach as a pilot community for the *Project Impact* campaign. As a pilot community, Deerfield Beach received technical and financial support to encourage efforts to create a disaster-resistant community. FEMA gave the city a grant of \$1,000,000, and the local government committed \$125,000 as a match.

Local and national businesses have pledged to join the city and FEMA in building a disaster-resistant community. The city organized a business alliance that invites businesses to meet monthly to discuss public/private partnerships in long-term mitigation strategies. Corporate partners including Home Depot, State Farm Insurance, Florida Power and Light, the Promous Hotel Corporation, and the Fort Lauderdale Sun Sentinel are participating in the city's *Project Impact* initiative. In its Deerfield Beach store, for example, Home Depot created a display on disaster resistance and offers short courses for local homeowners on steps to protect against future storm damage.

Specific accomplishments and projects include the following:

- State Farm Insurance funded and designed the Good Neighbor House which was constructed to withstand a Category 5 hurricane with 156 mile-per-hour (MPH) winds. The model house demonstrates how common-sense building materials and techniques can protect a structure from hurricanes. Before Hurricane Floyd hit North Carolina in 1999, between 40 and 50 people toured the Good Neighbor House in Deerfield Beach every week. After Floyd, more than 100 people arrived on a single Saturday to view the 100-plus safety features. State Farm estimates that many hurricane-proofing measures, such as impact-resistant windows and properly nailed shingles, can be added to a house for an extra 5 percent of the total cost of the structure. The model house builds awareness in the community of materials and techniques that can be used to build stronger homes and demonstrates that hurricane-resistant construction is not as difficult or expensive as many believe.

- Marina One, a developer, broke ground in 1999 on the Marina One Yacht Club, which can house more than 200 boats in a steel and concrete structure designed to withstand winds of up to 125 mph. The new facility is the first of its kind in the marine industry, offering 2,600,000 cubic feet of hurricane-resistant marine storage.
- The Deerfield Beach Chamber of Commerce building was retrofitted with hurricane-resistant windows provided by Solutia, Inc., which became a *Project Impact* corporate partner in 1999. As part of Solutia's partnership, the company made a commitment of \$200,000 in materials and labor toward the retrofitting of commercial and residential structures in hurricane-prone communities nationwide. Solutia is providing its hurricane-resistant KeepSafe Maximum glass along with technical support. The special glass is an impact-resistant laminated glass that meets the most stringent building code requirements, including those mandated by the State of Florida. It is formed by bonding two pieces of glass to a hardy polyvinyl butyrol (PVB) plastic interlayer, which is produced by Solutia. This product will not shatter and fall out upon impact.
- Deerfield Beach is a partner with Broward County in the development of a Broward County Community Emergency Response Team (CERT). To date, 75 residents have completed the CERT Training Program.
- Deerfield Beach is taking an active role in public outreach and education. *Project Impact* funds (\$150,000) were used to put hurricane straps on the auditorium and cafeteria of the local high school, which also serves as a shelter during disasters. Wind shutters are to be installed on all the windows in the high school as well as those in the Deerfield Beach City Hall.
- The City of Deerfield Beach, Broward County, and the State of Florida are each hosting a Preparedness Week in late spring just before the hurricane season begins. The three-week program includes technical conferences as well as public events designed to raise awareness of mitigation strategies. The Corporation for National Service is helping to organize a Spring Break—a week for volunteer participation in *Project Impact* activities. The community designated a full-time staff member as a hazard mitigation coordinator for *Project Impact*.
- Construction in Deerfield Beach is already regulated by the state's building codes which are among the most stringent in the country. Deerfield Beach is also in the process of developing a citywide storm drain system to provide protection from the damage associated with hurricane flooding.

Deerfield Beach has outlined several major goals still to be accomplished as part of its *Project Impact* program.

These include:

- Retrofit of all public buildings and critical facilities against hurricane and flood hazards.
- Development and implementation of a home retrofit program.
- Identification of incentives for residents to pursue mitigation measures.
- Improvement of the efficiency of building and land development regulatory systems.
- Development of a comprehensive all-hazard education and outreach program.
- Creation of a marketing strategy to showcase disaster resistance.

This area boasts a history of strong building codes and engineering and enjoys the support of community residents and businesses in promoting sustainability. City, county, and state officials continue to create and implement effective mitigation strategies that will benefit the entire Deerfield Beach community.

Wilmington, North Carolina

Wilmington is located approximately 30 miles from the Atlantic Ocean, at the junction of the northeast and northwest branches of the Cape Fear River. It is the largest city in New Hanover County and home to approximately 148,000 people. Many of its residents are retired.

Wilmington is frequently hit by severe coastal storms. Hurricane Bertha, which struck in 1996, caused an estimated \$17 million in damage to homes, businesses, and utilities in New Hanover County. Eight weeks later, Hurricane Fran, which also ravaged counties far inland with its destructive winds and rain, caused an estimated \$240 million in damage.

FEMA also selected Wilmington and New Hanover County as a pilot community for the *Project Impact* campaign. Partners in the *Project Impact* program include FEMA, the North Carolina Division of Emergency Management, New Hanover County Emergency Management, the City of Wilmington, and private-sector entities such as General Electric, Lowe's Hardware, Barnes and Noble, and WGNI-FM Radio.

The devastation from Hurricane Hugo in 1989 created a push in North Carolina for more stringent building codes. In 1996, the state promulgated and began enforcement of a new set of regulations that require stronger and safer construction. In 1997, Wilmington launched its *Project Impact* campaign to reduce the effects of natural disasters. The campaign included an ordinance that required propane tanks to be anchored to prevent them from floating free in floodwaters, beach stabilization, and dune renourishment to protect against storm surge.

Among Wilmington's accomplishments are the following:

- Hurricane Bonnie hit Wilmington in 1998. Officials believe that efforts to make the community more disaster resistant demonstrated that *Project Impact* produces positive results. Although hurricane winds pounded beach communities for as long as 13 hours, homes elevated after Hurricane Fran in 1996 and rebuilt using hurricane straps survived Bonnie without major damage. The benefits of elevation were apparent at Wrightsville Beach, where 80 new or elevated homes escaped damage. Many older structures, in contrast, lay partially submerged under 2 feet of water. The public safety communications tower that went down during Hurricane Fran was retrofitted to be flood and wind resistant. The new tower easily switched to generator operations, and all systems stayed on line during Hurricane Bonnie.
- Nearby Wrightsville Beach initiated an LP gas tank ordinance, requiring that all tanks be dropped and secured to eliminate potential floating problems. This preventive action eliminated possible explosions and fire damage when Hurricane Bonnie hit.
- Lowe's, a *Project Impact* partner, distributed hurricane season preparedness brochures in its 90 stores located in coastal states. It also developed in-store displays to educate customers about home damage prevention measures.
- New Hanover County Emergency Management (NHCEM) supports training exercises and drills, participates in county disaster awareness programs, and staffs the emergency operations center. At its own expense, NHCEM installed an 800-MHz two-way radio communications network to mitigate against the breakdown of communication across jurisdictional and agency boundaries.
- Wilmington also renovated its Sweeney water plant. The plant is now located out of the 100-year floodplain and is designed to withstand 120 mph winds. It also has two 1,250-KW diesel generators, which supply all of the power needed in the event of an emergency.

The sustainability initiatives and community partnerships described above demonstrate Wilmington's determination to bolster itself against future disasters. The promotion of safety measures, such as elevating homes, contributed to property owners' increased interest in storm protection. Hurricane Fran was a bitter lesson for many residents of North Carolina. Wilmington took action by implementing damage reduction measures. It has realized the benefits of mitigation in the wake of Hurricane Bonnie. Other communities in the coastal region have expressed interest in the education programs of *Project Impact*.

Sanibel Island, Florida

The Town of Sanibel Island is a barrier island located in Lee County on the west coast of Florida. A causeway connects the island to the City of Fort Myers on the mainland. Sanibel Island, about 12 miles long and 3 miles wide, has a permanent population of 5,700 and a seasonal population of more than 20,000.

Sanibel Island is a successful model for environmental concern and sustainability planning. Wildlife refuges and other natural areas, including the Darling National Wildlife Refuge, protect much of its landmass. The remainder of the island is subject to carefully controlled development. Stringent zoning codes and a comprehensive land use plan ensure that no high-rises, traffic lights, or multilane roads mar the island's natural beauty.

Concerned about uncontrolled development, island residents incorporated the island as a township in 1974. The town convened a panel of scientific and technical experts to explore the relationships of the island's resources to the larger ecosystem and to recommend specific controls. In 1976, the town devised and adopted its first plan and development regulations.

A principal goal of the town was to conserve its natural resources. One of the major habitats targeted for protection was a large area of freshwater wetlands threatened by physical disruption and drainage. Protecting the wetlands would provide habitat for wildlife, aesthetic and recreational pleasure for people, and flood control for the community. The town used municipal land use ordinances and prevailed on state and Federal authorities to use the most restrictive environmental standards possible to prevent development of the wetlands. The community eventually purchased much of the wetlands area outright. Today, a large part of Sanibel remains free of development and in a pristine state.

On the remainder of the island's land, the size and character of development are strictly controlled. Building height is limited to three stories, or 45 feet. All floors must be above base flood elevation (BFE). No more than three units can be built on 1 acre. To minimize the threat posed by storm surge and coastal flooding, the island imposed a minimum setback line for all development along the waterfront. The town has also encouraged the relocation of buildings threatened by the encroaching ocean. In several cases, residents have engaged in "roll-back" activities by having their houses lifted and moved farther from the water.

In 1980, Sanibel instituted a cap on growth to maintain a more manageable set of infrastructure and service obligations, to prevent excessive demands on the natural environment, and to preserve the island's quality of life. Although caps on growth are typically difficult to implement and even more difficult to defend in court, Sanibel Island devised a unique and defensible solution. It hired land use consultants to calculate the number of people that could be safely evacuated from the island. Reasoning that it would be irresponsible to allow more inhabitants than could be moved safely in the event of a storm, this number became the basis for the growth cap. Sanibel recognized the threat posed by coastal storms, determined a safe carrying capacity, enforced a growth cap, and reduced its vulnerability to future disasters.

As a result of these measures, Sanibel Island has avoided the mass of high-rise condominiums and commercial establishments that typified development in much of coastal Florida during the 1980s and 1990s. Instead, it is following a more sustainable path. It has set aside large natural areas for protection and guided development in a way that maintains the historic and natural character of the island environment and lessens the threat posed by coastal storms.

4.5 Tornadoes

A tornado is a rapidly rotating funnel of air extending from a thundercloud toward the ground. Most of the time, these funnels do not touch down, but when they do they can last for a few seconds to several minutes, and cause severe damages. Tornadoes usually are accompanied by heavy rain, hail, and lightning. The most violent tornadoes are capable of tremendous destruction, with wind speeds of 250 mph or more. Because the geographical scope of damage is usually narrow (i.e., less than 1 mile in width and several miles in sustained path length), a tornado is typically not a Federally declared disaster. Tornadoes can occur in any state, but are more frequent in the Midwest, Southeast, and Southwest. Tornado season ordinarily runs from March through August; however, tornadoes can strike at any time of the year.

The impact of a tornado varies with its strength, the duration of touchdown, and the physical integrity of the buildings or other structures in its path. Tornadoes can

uproot trees and damage structures even at wind speeds of 100 mph. Much of the damage results from high-velocity flying debris. Inadequately built structures, manufactured homes, and mobile homes are the most vulnerable to substantial damage from tornadoes. The intensity of tornadoes is measured by the Fujita Scale, from less severe (F1) to the most severe (F5).

Mitigation and Sustainability Approaches

Extent of Damage

In many cases, the tornado path is narrow enough that restoration of the damaged areas to predisaster conditions is the most appropriate planning strategy to preserve coherent land use patterns. In other situations, tornadoes have been known to destroy considerable portions of communities, resulting in significant opportunities for sustainable redevelopment (see Arkadelphia Case Study).

Type and Age of Affected Facilities and Structures

- In cases where predisaster conditions will be restored, there is significant room for improvement by recommending the use of more effective wind-resistant and energy-efficient building materials.
- In recovery situations where extensive damage occurs in older residential neighborhoods, the Sustainability Planner should consult with local officials to determine community interest in evaluating alternative reconstruction strategies. Current housing needs should be evaluated to guide reconstruction efforts. The zoning code should be reviewed to determine if a greater diversity of housing types is possible.

Land Management and Construction

There are a variety of techniques that can help reduce losses from tornadoes:

- Using inexpensive metal connectors or strapping to strengthen the connection between the roof and walls, and walls to foundation, to reduce the uplift effect of strong winds.
- Reinforcing or replacing garage and double entry doors.
- Removing trees and yard materials that, in a storm, could become windborne missiles.

Regulatory Controls

The Sustainability Planner should check current building codes to see if they require commonly accepted wind-resistant building techniques, such as:

- Anchoring of walls to foundations and roofs to walls.
- Reinforced walls, floors, and ceilings.
- Tornado safe rooms in new construction and the retrofitting of existing structures to provide the most complete protection from extreme wind events.
- Community tornado shelters for mobile home communities.

The exact location where a tornado touches down is one of nature's most random events, and the probability of future occurrences in the same area is difficult to estimate. Recommending regulatory controls as a sustainability initiative should be considered only in those portions of the country with the highest potential risk. However, as Xenia, Ohio illustrates, tornadoes can strike the same place more than

once. Xenia, struck by an F4 tornado on September 20, 2000, has suffered four major tornadoes in the last 80 years, including an F5 storm in 1974.

Public Education and Outreach

- Safe rooms and other wind-resistant construction techniques should be promoted through community meetings, workshops, and exhibits at local businesses. Consult FEMA's Mitigation Outreach Branch for assistance.
- Special efforts should be made to inform mobile home residents about the effects of tornadoes and the location of safe shelters.

Tornado Case Study: Arkadelphia Recovery Plan, City of Arkadelphia, Arkansas

At approximately 2:45 pm on March 1, 1997, a tornado touched down just southwest of the City of Arkadelphia, Arkansas. It caused extensive damage to residential areas and the downtown business district. The National Weather Service classified the tornado as an F3 to F4 storm event on the Fujita Scale. The funnel was just one of a series of tornadoes that resulted in significant damages along a 260-mile corridor through the central portion of the state. Preliminary estimates indicated that at least 256 single-family homes, mobile homes, or multifamily units sustained major damage and 117 were destroyed; 46 businesses and 16 public buildings were damaged or destroyed.

The City requested FEMA's assistance in evaluating reconstruction strategies and preparing a Disaster Recovery Plan. Through HMTAP, FEMA provided direct technical assistance to the City. The project planning team included planners with national experience in disaster response and recovery, together with local experts in planning, urban design, and economic development.

Within days of the tornado, Arkadelphia established a recovery task force, and committees for housing, transportation, unmet needs, and media coordination were quickly formed. A smaller subcommittee of the recovery task force, limited to 8 to 10 members, was established to work closely with the project planning team.

Within 2 weeks of the disaster, the project team conducted what is known in the architectural and urban design profession as a charrette—an intensive urban design and land use planning exercise. During the day, project team members developed base maps, obtained background information, and developed alternatives for the recovery effort. Committee meetings were held in the late afternoon to develop goals and objectives.

A draft recovery plan was prepared within 1 month, and it was presented to the broader community at several public meetings. The final recovery plan was completed within 2 months of the tornado and was formally adopted by the City Council. The reconstruction master plan included an assessment of disaster damages, presented reconstruction design principles for housing and for the downtown business district, recommended changes to the zoning ordinance and building code, and included economic analysis and summary recommendations for immediate, short-, and long-term recovery.

The recovery plan included the following sustainable redevelopment elements:

- Adoption of the latest version of the Southern Standard Building Code and bringing all other applicable construction and fire safety codes up to date.
- New urbanism principles, emphasizing mixed-use development downtown to include housing and to foster new economic growth and revitalize residential neighborhoods.
- Recommendation of changes in zoning ordinances to allow a greater diversity of housing types and to maintain the historic character of the downtown business district. This was accomplished, in part, by a disaster overlay district and by urban design guidelines.
- Incorporation of energy efficient materials promoted by DOE into the reconstruction of substantially damaged homes.
- Implementation of an innovative equity buy-down program promoted by HUD to finance single-family home construction.

Several lessons learned during this long-term recovery planning effort are worthy of note:

- There should be a clear understanding of what a FEMA-funded recovery planning effort can accomplish considering time and resource limitations. In Arkadelphia, some key local officials expected a detailed block-by-block master plan. FEMA provided a broad framework for recovery planning. Detailed program and engineering design were to follow.
- The recovery planning process provided an effective mechanism for bringing in other Federal agencies to participate in long-term recovery. The HUD representative for Arkansas participated in the charrette and worked closely with the community to target HUD resources to community needs. Following the initial recovery planning effort, HUD used Community Development Block Grant (CDBG) funds to support development of a comprehensive 1-year master plan.
- National experts on disaster recovery must work hand-in-hand with local planning and urban design specialists.
- A construction moratorium can be effective in providing the necessary time to develop a reconstruction strategy. The recovery planning team worked closely with the local government to enact a 30-day moratorium, which was carefully crafted to permit necessary repairs and applied only to substantially damaged structures.

4.6 Wildfires

Wildfires can be devastating in terms of geographic scope. Contributing conditions such as climate, fuel, and rural development in remote mountainous or forested areas make some states more vulnerable than others at different times. The key issue for the Sustainability Planner is the urban-wildfire interface—a boundary zone between developed areas and surrounding forests or chaparral. Land management and regulatory programs to minimize future disaster damages should focus on the urban-wildfire interface. As the Wildfire Case Study illustrates, public education and outreach programs are an effective mitigation measure for residents in high fire hazard areas.

Damages include disruptions to electric, water, sewer, and telecommunications utilities; destruction or damage to valuable environmental, economic, and historical resources; roadway blockage; disruption of community services; devastation of agricultural/fishery economies; and human loss and suffering. Additionally, water

absorption and retention are significantly reduced when the majority of plant cover is removed by fire, thus creating the potential for future floods or landslides.

Mitigation and Sustainability Approaches

Land Management and Construction

- Create a fuel management program to reduce available fuel, establish fire-resistant vegetation, and construct fuel breaks and firebreaks in the urban-wildfire interface.
- Use nonflammable building materials (especially roofing) — tile, stucco, metal siding, brick, concrete block, and rock — and plant fire-resistant shrubs and trees.
- Create 30- to 100-foot safety zones around homes by raking leaves, dead limbs, and twigs.

Regulatory Controls

In selected geographic areas of the country and in special ecosystems such as pine barrens or chaparral along the southern California coast, communities may consider zoning regulations to reduce residential densities in high hazard areas, encourage

cluster development, and delineate urban-wildfire interface zones. Urban growth boundaries tied to the concept of urban-wildfire interface designations is a planning approach that may merit consideration by the Sustainability Planner.

Public Education and Outreach

Public outreach programs are probably the most effective sustainability initiative in most fire disaster declarations. The Sustainability Planner should consider developing educational materials to encourage residents to:

- Store gasoline, oily rags, and other flammable material in approved safety cans away from the base of buildings; dispose of newspapers and rubbish at approved sites; and prune tree branches and remove vines from walls.
- Stack firewood at least 100 feet away and uphill from homes; place stove, fireplace, and grill ashes in a metal bucket, soak in water for 2 days, and then bury in mineral soil.
- Regularly clean roof and gutters, inspect chimneys, and equip chimneys and stovepipes with spark arresters.
- Identify and maintain an adequate outside water source such as a small pond or swimming pool; have a garden hose long enough to reach any area of the home and other structures on the property.

Wildfire Case Study: Measures of Mitigation Success New Mexico

The Cerro Grande fire began in the late evening on Thursday, May 4, 2000, when a prescribed burn to reduce fuel loads ignited. Sporadic wind changes caused spotting over the fireline. By early afternoon on the following day, the prescribed burn was declared a wildfire. The fire spread rapidly over the next few days through the Ponderosa pine, mixed-conifer, and aspen forest on public, private, and Pueblo lands. By May 10, the wildfire—carried by very high winds—reached the community of Los Alamos, New Mexico. Approximately 18,000 people were evacuated from the towns of Los Alamos and White Rock. The fire continued to spread to the communities of San Ildefonso and Santa Clara Pueblo, encompassing a total area of approximately 42,900 acres. A total of 235 residences and an assortment of other structures were damaged or destroyed.

The Miracle House

Although wind-swept flames quickly engulfed many residences and structures, a 3,300-square-foot wood frame house in Los Alamos, owned by Thomas and Myrna McDonald, escaped with only a moderately singed west side. Their home now has a name—the Miracle House—which it well deserves.

There are 25 homes on the north side of Ridgeway Drive. The fire approached



The damages sustained by the McDonald residence in Los Alamos, NM were limited to the west end of the home.



Myrna McDonald holds open the severely singed solid core door that prevented flames from entering the interior.



Part of the ongoing maintenance at the McDonald residence included the regular removal of pine needles and other ground debris from around the house.

that could make contact with the house and provide a fire with a bridge to the structure.

When designing their home, the McDonalds included several items that helped save it from major damage during the fire. They installed double-paned windows and solid core doors. The flames that destroyed the home to our west were extremely fierce. They melted its chimney lining, which fire fighters say need to exceed 2,500 degrees. Flames shattered the outer layer of glass in our windows, but did not break the inner layer. Our home did not suffer any major smoke damage because of this. Also, the small side porch was burned, our west wall singed, and our entry door was severely scorched but the flames did not get through it. Had this door not been solid wood, I feel that our house would also be listed among those that were lost to the fire.

Thomas and Myrna McDonald credit the Los Alamos Fire Department for their home's survival. We evacuated the afternoon of the (May) 10th, and the fire struck our street around 3 a.m. on the 11th. When the fire department arrived and saw our home still standing while those on both sides were already going up in flames, they took immediate action to save it. They sprayed the sides and roof with (fire retarding) foam, which prevented major damage to and possibly even the loss of our home.

Positive action by the McDonalds paid off. Because of choosing appropriate building materials, and instituting a conscientious program of regular upkeep and maintenance, they did not become victims of the Cerro Grande fire. The damage to their home was limited to a burned porch, a singed wall, and a scorched door that can be repaired or replaced. The home itself a place filled with memories still stands.

from the west and quickly spread eastward, destroying all but three homes before it was contained by firefighters. One of the three that escaped the blaze was the McDonald residence. The street itself acted as a firebreak that saved homes on the south side from the flames.

The McDonalds began practicing a mitigation program of proactive grounds maintenance when the house was built 25 years ago. They work steadily to keep their property free of ground fuel, underbrush, and low tree limbs. I rake up and cart off the pine needles that fall from the trees on a regular basis, said Myrna. The last time I did so, which was a week before the fire on the front side and 2 days before in the back and side yards, proved to be the most important thing we did that saved our home. They also pay close attention to the trees themselves, and regularly prune off branches



The McDonald home had only minor exterior damage. Homes on both sides were completely destroyed by flames.



The McDonalds credit the use of double-paned windows as one of the construction barriers that prevented the fire from entering their home. The outer layer absorbed the fire's force and shattered.



A mitigation plan and measures undertaken by Harold and Joyce Cady helped save their home from destruction by the Cerro Grande.

Residential Mitigation Planning

Transforming a 3-acre wooded lot from a rambling array of overgrown undergrowth and saplings into a fire-mitigated wooded area helped save Howard and Joyce Cady's home during the devastating Cerro Grande fire. This wildfire destroyed more than 200 homes in Los Alamos on May 11 and 12, 2000. A long-term mitigation plan, begun in the spring of 1998 when they purchased the home on 47th Street, involved a lot of work and very little money.

When we bought this 55-year-old wood frame house 2 years ago, we knew it would be susceptible to destruction by fire," said Howard, so I contacted the United States Forest Service

(USFS) district office in Santa Fe for a professional assessment. A ranger came out, inspected our land and made several valuable recommendations. The first was to remove the tangled vines and brush that grew thickly throughout the acreage. Working five to six hours daily, he made progress cleaning up the area. Soon, Harold had a fire mitigation zone that was free of ground fuel.

Total cost: a chain saw, hand tools, and dedication.

Once the undergrowth was removed, Harold set about on the next task: cutting saplings, thinning out medium-sized trees to remove the ladder system leading to the crowns of mature trees, and pruning all branches to a point about 10 feet off the ground. The ranger marked the trees that were most likely to fuel a fire in the tops of the large trees. An added benefit of all this thinning and pruning was an ever-expanding woodpile, stacked and ready to provide us with fuel for the coming winters. A regular work schedule brought about the intended results.

A third area of consideration was access to the rear of the property. With the help of the USFS, Harold mapped out fire roads that encircled all sides of his home. First, we removed all plant growth and then kept these areas cleared year-round," Harold said.

This created a series of natural fire breaks, about 8 feet wide, that helped to separate our home from potential fire hazards.

Their efforts proved valuable when a section of the Cerro Grande fire swept down a hillside into Los Alamos and destroyed homes beginning at 47th Street and continuing down Ridgeway Drive. When the Los Alamos Fire Department and the Forest Service arrived, a number of homes in the subdivision were already

An 8-foot-wide firebreak prevented the flames from getting to the Cady home. Note the fire-ravaged trees to the left of the break and the healthy, untouched vegetation to the right.



Harold Cady points out one of the many areas on his property where clearing out the undergrowth and continual maintenance helped protect his home from the Cerro Grande fire.

engulfed in flames. Although the fire burned many trees that surrounded the Cady home, the house itself was spared.

The firefighters knew where our roads were, so they were able to enter the woods surrounding our house and control the burn. They foamed the house with fire retardant chemicals and kept the flames from jumping our firebreak. When we thanked the crews for saving our home, they told us that what



A hunting camp in the mountains above Ruidoso survived the Cree fire, though several nearby retreats and year-round homes were destroyed. Mitigation measures taken by the owner, the Ruidoso Fire Department Chief, proved successful. He had cut a wide firebreak between the forest and his cabin, and removed the underbrush and lower branches on the trees. The fire came within 15 feet of the structure, but was effectively halted in its path by the lack of ground and ladder fuel.

we had done—the cleaning, the thinning, the pruning, the fire break—had made our house defensible.

A look at the Cady property reveals several mitigation measures. Although the woods surrounding the home suffered burn damage, the Cady home was made defensible by creating a firebreak, removing undergrowth and vines, cutting down small and moderate-sized trees, and pruning limbs to about 10 feet off the ground. The woodpile was located about 30 feet from the house.

4.7 Landslides

Landslides occur when masses of rock, earth, or debris move down a slope. They are influenced by human activities or natural factors, such as geology, precipitation, and topography. Landslides occur all over the United States, but are most common in California, Colorado, and the Appalachian Mountains. They may account for a few cubic yards or extend hundreds of feet and include entire hillsides. A debris flow is a type of landslide where rapidly moving slurry masses consisting of soil, rock, water, and vegetation take on the consistency of mud and reach high velocities as they flow downhill. Debris flows are usually induced by rainfall and tend to recur in the same drainage areas. Landslides can be triggered by heavy rains, floods, earthquakes, and volcanic activity.

Mitigation and Sustainability Approaches

Land Management and Construction

Land use planners should consider the history of past landslides; bedrock type; slope; the presence of sandy soils; and hydrologic factors, such as high water tables and frequent freezing and thawing cycles. Some specific mitigation measures are:

- Install catchment basins to control runoff in landslide hazard areas.
- Plant ground cover and install riprap to hold soil in place on hillsides or slopes.
- Build retaining walls along essential evacuation routes.

Regulatory Controls

In areas highly susceptible to landslides, the following regulatory controls should be considered:

- Adopt a grading ordinance that requires geotechnical investigations in designated high hazard areas to analyze slope stability, provide surface/subsurface drainage specifications, and develop detailed design for fill placement and excavation.
- Use zoning to control maximum density, minimum lot size, road width, and setbacks in areas of high or severe landslide risk.
- Adopt soil conservation, slope stabilization, open space dedication, or steep slope ordinances.

Public Education and Outreach

- Provide information to homeowners on the benefits of installing flexible pipefitting to avoid gas or water leaks, and improving drainage around structures and property.
- Post community warning signs of potential landslide hazards.
- Map areas susceptible to landslides and post these maps on a community website and in the local planning or building permit office.
- Advocate early disclosure of hazard in real estate transfers.

Landslide Case Study: Multihazard Risk Assessment for Rural Municipalities

Puerto Rico

Puerto Rico has been struck by five natural disasters since 1989. The extent of damages to homes, businesses, and public infrastructure, and the corresponding disruption to the local economy, are strong arguments for a new approach to land development. FEMA Region II used HMTAP resources to assist seven rural municipalities devastated by Hurricane Georges in 1998.

This local planning effort involved developing a multihazard risk assessment for each community and holding a series of public meetings to identify and prioritize recommendations to create disaster-resistant communities. Existing GIS data on topography, floodplains, geology, and soils provided the foundation for the natural hazards analysis. The risk assessment involved mapping physical and land use data, and then evaluating opportunities and constraints for both reconstruction and future development. In addition to landslide hazards, flood, high wind, and earthquake hazards were analyzed. The risk assessment was then linked to a land suitability analysis to identify future growth areas, areas where new development should be discouraged, and areas where specific engineering design or Best Management Practices (BMPs) should be implemented. Several communities have already required that the findings of the multihazard risk assessment be incorporated into their comprehensive plans.

Local government representatives, planning commissions, and interested residents participated in three rounds of community meetings. The first meeting focused on public concerns; the second, on the multihazard risk assessment methodology and prioritization of planning recommendations; and the third, on those measures the community can readily adopt to institutionalize hazard mitigation at the local level.

Landslides can vary in size from a few cubic yards of soil to entire hillsides hundreds of feet long. Puerto Rico's steep topography combined with shallow, fine-grained soils over bedrock increases its susceptibility to landslides. Many of the landslides during Hurricane Georges occurred along road cuts or fills. An island-wide landslide susceptibility map prepared by the U.S. Geological Survey (USGS) delineates much of the central volcanic portion of the island as being prone to landslides.

As stated in FEMA's Building Performance Assessment Report (BPAT), prepared in the aftermath of Hurricane Georges, Landslides will become a greater problem in the future as more developments and houses are constructed in regions prone to such risks. To address this concern, project team geologists and geotechnical engineers conducted fieldwork and reviewed past technical studies to develop a landslide susceptibility methodology for use in the multihazard risk assessment.

This susceptibility analysis focuses on the risk of landslides caused by cutting and filling on natural slopes. Slope and bedrock geology are the two major determinants of susceptibility to landslides. A slope map derived from Digital Elevation Model (DEM) data combined broad slope classes with data on geologic formations to identify areas prone to erosion.

The following landslide mitigation recommendations were included in the final reports for the seven rural municipalities:

- Avoid intensive development in areas of historical landslide deposits.
- Discourage development in areas with natural slopes steeper than 50 percent. Consider limiting the number of times that property can be subdivided or limiting the density of development. Do not allow the construction of private roads in areas with slopes greater than 50 percent.
- Encourage future development where natural slopes are flatter than 35 percent; stable cut-and-fill slopes can be economically constructed in such areas, and the risk of slope failure is low.
- To limit contact with debris flows, avoid development within and directly below steep-sided drainages that extend up hillsides.
- Design all major cut-and-fill slopes in accordance with standard engineering practice. Consider adopting a hillside grading ordinance that requires a geological risk assessment report, a geotechnical engineering report, compaction specifications, suitable fill material, surface and subsurface drainage, maximum default cut-and-fill slope inclinations, and procedures for inspection and enforcement.



Section 5

Eighteen Tools and Programs for Sustainability

The Sustainability Planner has many resources for implementing sustainability initiatives. This section summarizes 18 particularly relevant and significant tools and programs. Many of these are independent of a disaster declaration, such as ongoing planning, hazard resistant building design, and identification of projects to reduce the effects of future disasters. Several of the tools apply to activities that occur immediately after a disaster, such as evaluation of impacts (to the built environment and the economy) and recommendations for recovery. Each of the tools and programs provides an opportunity for implementing sustainability as part of the disaster recovery effort, and should be used by the Sustainability Planner to help guide communities toward a sustainable future.

Index of Tools and Programs

1. Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability (FEMA 364)
2. Planning for Post-Disaster Recovery and Reconstruction (FEMA/APA PAS # 483/484)
3. Toward a Sustainable Community (Roseland 1997)
4. Mitigation Planning How-To Guides
5. Project Impact Toolkit
6. Building Performance Assessment Team (BPAT)
7. Hazards United States (HAZUS)
8. Community Rating System (CRS)
9. Economic Impact Assessments
10. Coastal Construction Manual
11. Sustainable Re-development PowerPoint Presentation
12. Hazard Mitigation Grant Program (HMGP) Desk Reference
13. Unified National Program for Floodplain Management
14. Natural and Beneficial Functions of Floodplains Report to Congress
15. Flood Mitigation Assistance Program (FMA)
16. Capability Assessment for Readiness
17. HAZMAT Response/Capability Assessment Program
18. Community and Family Preparedness Program

Tool #1 Planning for a Sustainable Future: The Link between Hazard Mitigation and Livability

This document is available from FEMA's distribution center at (800) 480-2520. The booklet, ***Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability***, (FEMA 364) was developed by FEMA to show how communities can use hazard mitigation planning and disaster recovery planning to implement sustainable development at the local level. It demonstrates methods for incorporating hazard mitigation planning into the broader goals of enhancing a community's environment, economy, and social wellbeing through policies that encourage sustainable development. This document is a key tool for introducing the concept of sustainability to the public, local officials, FEMA managers, and other state and Federal officials.

Planning for a Sustainable Future is a how-to guide that outlines the ingredients of effective hazard mitigation planning and the steps necessary to create a successful mitigation plan. This planning activity allows the community to determine how best to mitigate specific threats and incorporate sustainable redevelopment concepts into the recovery effort. Included within the development of hazard mitigation plans are strategies for improving infrastructure, decreasing sprawl, and taking advantage of infill and redevelopment opportunities. This booklet also describes the key steps for developing a successful mitigation plan, which include public participation, agency coordination, hazard assessment, problem solving, and goal setting.

Case studies highlight various types of hazard resistance measures for floods, hurricanes, fires, and earthquakes, and provide successful examples of sustainable redevelopment initiatives at the local level. The significance and functions of the Robert T. Stafford Act, NFIP, NEHRP, and National Dam Safety Program (NDSP) are discussed in relation to disaster recovery and hazard mitigation.

Tool #2 Planning for Post-Disaster Recovery and Reconstruction

Planning for Post-Disaster Recovery and Reconstruction is the result of a collaborative partnership between FEMA and the APA. It is a Planning Advisory Service (PAS) Report that is a state-of-the-art text on the importance of creating a community post-disaster recovery plan. This report is an invaluable guide to advance planning to increase disaster resistance and improve the disaster recovery process before a disaster strikes. It provides local planners and officials with an understanding of disaster recovery and identifies key players in the post-disaster scenario. The report's theme is that an effective disaster recovery plan mitigates future disasters and that planners have a key role in linking disaster resilience to the full range of local planning issues.

This report also illustrates how the Sustainability Planner can motivate local officials and the community toward sustainable redevelopment. Natural disasters and hazards are taken out of the abstract, and planners are given concrete tools to help them recognize opportunities to implement hazard mitigation measures through concerted planning. Although the report focuses on creating a disaster recovery plan that

integrates hazard mitigation and sustainability concepts prior to a natural hazard event, much of the information can be used in an emergency fashion in circumstances where no post-disaster plan is in place when a disaster strikes.

Planning for Post-Disaster Recovery and Reconstruction provides a step-by-step chronology for creating and implementing a post-disaster recovery plan. With the objective of familiarizing local officials and planners with the process of disaster-recovery prior to the occurrence of an event, this report describes relevant local, state, and Federal entities and their responsibilities. The report presents case studies of how three communities successfully created and implemented post-disaster recovery plans.

The planner's toolkit chapter describes a full range of hazard mitigation and disaster-recovery planning tools. It is divided into two sections—emergency measures and long-term measures. Emergency measures are usually under the direction of other departments or agencies, such as local building departments or public works offices; however, the Sustainability Planner should actively coordinate with these offices. Long-term measures can be used to reduce the community's susceptibility to losses in the event of future natural disasters. These measures include planning, zoning, subdivision, financial, and management tools which can be incorporated into existing plans or into recovery plans.

Planning for Post-Disaster Recovery and Reconstruction includes a model recovery and reconstruction ordinance that provides the fundamental steps for developing a comprehensive post-disaster plan. It is flexible and generic so that it can easily be modified to suit the needs of a specific community. The ordinance establishes a recovery organization and authorizes a variety of pre-disaster and post-disaster planning and regulatory powers for disaster recovery and reconstruction.

The model is designed to be most effective when implemented prior to a disaster event, though it has also been used following a natural disaster. The Sustainability Planner may recommend to an affected community that it adopt a recovery and reconstruction ordinance if local response and recovery efforts seem to lack cohesion and guidance from local authorities.

The core concepts of the ordinance are:

- To identify or establish a recovery organization prior to a disaster.
- To delineate departmental or agency roles and responsibilities in disaster recovery.
- To ensure the creation and adoption of a recovery plan that effectively addresses the community's needs for disaster-resistant reconstruction, while also addressing public safety, sensitive natural resources, and environmental concerns.

This report also includes five detailed case studies on a flood, tornado, hurricane, wildfire, and earthquake. Links to technical agencies are provided throughout the text.

Tool #3 Toward a Sustainable Community

The 1998 text, ***Toward a Sustainable Community: Resources for Citizens and Their Governments***, by Mark Roseland, provides an excellent starting point for local planners and officials who are just being introduced to the concepts of sustainable development. Roseland explains the implications of sustainability for existing

communities and contributing elements, such as transportation, infrastructure, and energy. He also discusses strategies for involving the public in implementing sustainability initiatives and suggests several approaches to assist area planners in achieving their goals. The appendix includes information on Federal, state and nonprofit agencies that can provide technical assistance to local planners interested in sustainable initiatives.

Roseland views communities as their own ecosystem, in which natural resources, human activity, and the economy are all key components. In planning for their future, communities must reconsider the way they use their natural capital. By definition, a truly sustainable community meets its current needs, while also protecting resources for future generations. Sustainability involves the interwoven elements of resource conservation, environmental protection, economic revitalization, and community dialog. The results are a community that protects its natural and social resources a community with little pollution and waste, recycled and reusable energy sources, minimal exhausted space and urban sprawl, plentiful green areas, a strong economy, and heightened efficiency. Roseland explores governing policies such as regulations, taxes, charges, and other forms of environmental economics to help motivate communities toward sustainable development.

The following are the building blocks of any sustainable community:

- Redevelopment and planning for green spaces.
- Control of land use, density, housing, and sprawl.
- Energy efficiency and renewable energy sources.
- Water resources, including water supplies and quality, and sewer infrastructure.
- Waste reduction and recycling.
- Local air quality, including climate and ozone factors, transportation planning, and reducing automobile dependency.
- Economic development within the realm of environmental responsibility.

Lastly, Roseland focuses on motivating the community's residents and government officials toward shared decision-making and consensus on sustainability issues. This may well mean asking the public to make sacrifices and choices that result in a higher short-term cost to ensure the longevity of their community. Several case studies are presented to assist the Sustainability Planner in introducing and implementing the planning and policy modifications that are required to ensure lasting sustainable changes.

Tool #4 Mitigation Planning How-To Guides

These FEMA guides are a series of documents created to aid states and local communities in developing a comprehensive mitigation program and planning process. The How-to Guides are slated for release during 2001.

The first volume, *Getting Started*, explains the planning process and the organizational steps required for a successful mitigation effort. It describes the types of people, agencies, and partners that are fundamental to mitigation planning; how to identify stakeholders; and how to include citizens throughout the planning process. This volume of the planning guides prepares communities for the political and financial challenges that often accompany initiatives for positive change.

The second volume takes the reader through the process of quantifying the potential impacts of natural hazards. Risk assessment is the driving force behind the natural hazard mitigation planning process because it provides the information necessary for communities to understand their vulnerability to disasters. This volume provides a framework for communities to evaluate their potential losses.

The third volume focuses on how to use the information generated by the risk assessment so that communities can set long-term mitigation goals; identify possible solutions and their economic, social, and environmental costs; and draft a long term strategy.

The fourth volume provides suggestions for ensuring that the community's mitigation plan is successfully implemented, maintained and kept up to date. This volume includes the tools needed to effectively manage projects, evaluate their effectiveness, and establish mitigation as a fundamental element of local administration.

Accompanying these four how-to's is a guide intended to help communities make the most of benefit-cost analysis (BCA) by providing tools to weigh the economic benefits of a mitigation project against its costs. While BCA is to be used primarily at the project implementation phase, this guide helps communities understand that this type of analysis can also be helpful in determining and setting priorities.

Tool #5 Project Impact Toolkit

Project Impact's Building a Disaster Resistant Community Toolkit was prepared as a tool for communities participating in FEMA's Project Impact initiative. **Project Impact: Building a Disaster Resistant Community** is an initiative that challenges and supports communities to become disaster resistant. For the Sustainability Planner operating in a post-disaster environment, it is a valuable tool for understanding the operational framework and goals of sustainability. The toolkit provides methods for prioritizing and implementing hazard resistance measures that are equally valid following a disaster event.

The community toolkit addresses four categorical segments of disaster resistance planning to improve the economy, environment, and community. *Building Partnerships* examines how partnerships can be used to turn the planning process from reactive to proactive damage prevention. *Assessing Risk* outlines step-by-step risk assessment guidelines and should help the Sustainability Planner in determining how a particular community is vulnerable to natural disasters. *Prioritizing Actions* explores formulas for identifying and prioritizing a community's most critical needs, and methods for reaching consensus. *Communicating Success* discusses approaches to gaining public support through the media, educational campaigns, and establishment of a collaborative group of partners, citizens, and volunteers.

Tool #6 Building Performance Assessment Team (BPAT)

The BPAT program is administered by the Program Assessment and Outreach Division of FEMA's Mitigation Directorate. The program uses the combined resources from a Federal, state, local, and private-sector partnership to study building

performance in response to a full range of hazards. A BPAT is typically composed of FEMA professionals; state and local officials; and private sector professionals with backgrounds in engineering, planning, construction, natural hazards, code development, and enforcement.

The objectives of the BPAT are to:

- Inspect buildings and their infrastructure.
- Analyze structures after a disaster to determine why they either survived or failed the event.
- Make recommendations to state and local governments on how to prevent future damages.

BPATs have been used since the early 1990s in response to Hurricanes Andrew, Iniki, Opal, and Fran; flood disasters in California, Georgia, North Dakota, Minnesota, and Texas; and the bombing of the Murrah Federal Building in Oklahoma City. The most recent deployments were in response to Hurricane Georges, which struck Puerto Rico and the Gulf Coast.

From disasters such as these, new and improved hurricane-, earthquake-, flood-, and bomb-resistant construction standards and methods can be developed for new construction and post-disaster repair and recovery. The success of any BPAT is measured in terms of implementation of the team's recommendations. If a BPAT is deployed for a disaster, the Sustainability Planner should coordinate with this effort and keep informed of early findings and recommendations that should be incorporated into the sustainable redevelopment strategy.

Tool #7 Hazards United States (HAZUS)

HAZUS is GIS-based methodology and software designed to estimate the losses related to natural disasters. HAZUS was developed by FEMA, in conjunction with the National Institute of Building Standards (NIBS). Initially, the software was designed to predict earthquake damages, but it has since been expanded into a multihazard methodology tool to also anticipate the losses from flood hazards (which include riverine and coastal hazards, such as storm surge). HAZUS is currently under revision so that it can also simulate the wind effects associated with hurricanes, tornadoes, and tropical storms.

The estimation of earthquake and flood losses is not an exact science. It is a forecast of physical damage and related socioeconomic effects. HAZUS is based on mathematical algorithms that include variables such as local geology, topography, and demography in addition to the prevalent construction materials, structural patterns, and designs of the area's dwellings and facilities. For example, HAZUS can simulate the intensity of ground shaking and the damages sustained in a given area. Loss estimates include number of casualties; level of damage to houses, utilities, and infrastructure; and estimated cost of repairs.

HAZUS can assist planners and engineers in identifying areas of high vulnerability in structures and local infrastructure. The areas estimated to sustain the most severe losses can then be prioritized for loss-reduction planning, hazard awareness, and emergency management and response activities.

Currently, several new initiatives are in progress for HAZUS. These include a hurricane preview model, a flood preview model, a building damage module, a mitigation planning guide, and of special note to sustainability planners, a training course designed to assist mitigation planners in incorporating HAZUS into mitigation efforts.

Tool #8 Community Rating System (CRS)

The CRS was designed to reward communities that do more than meet the minimum NFIP requirements, by providing an incentive to initiate new flood protection activities. The CRS grants reductions in flood insurance rates according to the level of community commitment to flood hazard mitigation measures. The rating system provides points based on the extent of floodplain management activities. For example, communities with higher standards and more comprehensive controls to ensure flood protection accumulate higher CRS points. The higher the number of cumulative points - the higher the CRS classification and associated flood insurance discount. Flood insurance policy holders in participating communities can receive up to a 45 percent discount, though most receive discounts ranging from 5 to 25 percent.

The Sustainability Planner should keep in mind that CRS participation offers many potential long-term benefits. A community committed to implementing long-term flood mitigation measures can enhance public safety, reduce damage to property and public infrastructure, avoid disruptions of service, and protect and restore the environment. Furthermore, the CRS planning process can be used as the basis for conducting broader sustainability and mitigation activities and may lead to the community qualifying for additional Federal mitigation grant funds. Politically savvy government administrators can use the resultant reduction in premiums as confirmation that the local government is attentive not only to citizens' safety, but also to their financial needs and the environment.

The activities suggested by the CRS encourage communities to implement a comprehensive flood mitigation strategy that includes floodplain protections, stormwater management techniques, floodplain management planning, and public education. Most communities will not immediately qualify for CRS under all activities, but they can set a long-term mitigation goal and strive for the maximum points. There are 18 activities under which communities can receive credit; those listed below are of particular relevance to the Sustainability Planner:

- Acquiring homes, especially repetitive loss properties, from within the 100-year floodplain and conversion of the land to open space, green space, wetlands, wildlife refuges, or recreational space.
- Implementing restrictive development regulations to prevent the construction of buildings or the placement of fill or other obstructions on reserved lands.
- Mapping, preserving open space, and regulating new development in areas subject to special hazards.
- Establishing floodplain regulations to prohibit fill within floodplains or flood fringes, or to require new developments to provide compensatory storage at hydraulically equivalent sites.
- Implementing stormwater management practices to regulate the quantity and quality of runoff and minimize erosion.

The CRS program recommends the following resources for additional information:

- The NFIP Community Rating System Coordinator's Manual is organized based on the activities for which communities may receive CRS credit. It includes sample hazard mitigation plans that may be used as a template for mitigation planning initiatives.
- The Emergency Management Institute offers free NFIP and CRS courses.
- The article, "Flood Mitigation Planning," from the July 1999 Natural Hazards Informer, provides guidance on creating a flood mitigation plan in line with the CRS planning process.
- The Association of State Floodplain Managers has produced a short video on the mitigation planning process.

Tool #9 Economic Impact Assessments

If the potential economic impact from a natural disaster is perceived to be significant, FEMA may task EDA to undertake a rapid assessment of the economic effects on businesses or agricultural activity. The objective of assessment reports is to:

- Determine the direct and indirect economic impacts of the disaster through surveys of affected businesses.
- Develop conclusions and wide-ranging recommendations to accelerate business recovery and support the creation of sustainable, disaster-resistant business enterprises.

The results of these studies may be available within a few weeks of the disaster event and can prove invaluable in decision making for all levels of government involved in the response and recovery process. As the Sustainability Planner, you should make sure that the findings of this study—especially recommendations that promote a more sustainable local economy—are integrated into immediate and long-term priorities. This is important because long-term community recovery and mitigation efforts can not be successful if key economic sectors cannot be replaced, restored, or protected.

The Sustainability Planner must understand the differences and relationships between direct and collateral economic impacts:

- Direct impacts to local economies include lost wages for workers at affected establishments and decreased revenues for business owners and farm operators.
- Collateral losses include broad-based decreases in local business activity because of declining consumer spending and decreased tax revenues for local and state governments due to lower sale volumes and property values. Many communities find it necessary to offer affected businesses sales and property tax rebates during the time they may be out of business, which increases the strain on potentially limited financial resources.

The Sustainability Planner must also understand that local economies may be affected by a loss of "lifeline" connections and customer base even if businesses are not directly damaged. These indirect causes include:

- **Loss of important "lifeline" connections to a community that can hamper or eliminate business activity and recovery** Typical scenarios include the prolonged loss of major utility services—such as electricity, water, or sewage disposal—or the loss of a key transportation route that carried raw materials and

goods to and from businesses and industries. Communication plays an important role in many information-age businesses, and even a short interruption in vital connections can be critical. Repair and restoration of business activity under these conditions may not be under the control or influence of the affected businesses and communities.

- **Loss of customer base due to extensive damage and destruction of residential areas** Where damage to housing is severe and rebuilding is not an immediate option (e.g., areas where recurrent flooding or landslides are possible), relocating significant numbers of residents and their consumer dollars to another sector of town or to other communities and regions may permanently change the market share of the commercial and service establishments they leave behind.

It is important to recognize trends in economic activity prior to a disaster. In communities and regions where economic activity was steadily increasing and the contributing factors are still in place or easily restored, economic recovery should be attainable. Where flat growth or downturns existed prior to a disaster, even a temporary loss of business revenues can be irreversibly detrimental. Difficult decisions may be required in cases where recovery efforts do not address the root cause of previous declines in business activity or farm productivity.

For examples of recent Economic Impact Assessment reports prepared for widespread flooding and damages caused by Hurricane Floyd in late summer 1999, see www.fema.gov/library/lib06d.htm. These particular reports to FEMA, the U.S. Congress, and the Executive Branch were used extensively in evaluating requests for supplemental appropriations for disaster relief from Virginia, North Carolina, and New Jersey.

Tool #10 Coastal Construction Manual

The **Coastal Construction Manual** was initially produced by FEMA in 1985 and was recently revised. The three-volume manual is designed to assist engineering professionals, builders, and state and local officials in mitigating hazards to coastal dwellings. Its content is largely based on findings of BPAT investigations conducted in U.S. coastal areas. The manual presents engineering and design techniques to combat hurricanes, nor easters, and coastal storm hazards. The techniques are specifically designed to address the multiple hazards that typically occur during such events, such as high winds, high water, storm surge, debris impact, and storm-induced scour and erosion. The manual discusses storm-resistant building materials and building foundations for coastal areas that are also subject to seismic activity.

The first volume covers the history of coastal disasters and evaluates post-disaster structures that have succeeded or failed due to their design and materials. Background information on coastal geology, geomorphology, and water and wave elevations according to FEMA Flood Insurance Studies is included. This volume describes suitable sites for coastal construction, along with the long- and short-term costs associated with hazard-resistant design, construction, insurance, and alternative locations in coastal hazard zones.

Engineering topics in the second volume of the ***Coastal Construction Manual*** include calculating the loads produced by high-velocity winds or waves, seismic events, and tsunamis. Structural failure modes, load paths, building systems, application of loads, structural connections, the building envelope, and utilities are examined in detail. This volume also addresses the hazards associated with existing development and maintenance and retrofitting for hazard mitigation.

The 12 appendices of the third volume list additional agency resources, such as regional FEMA offices and other state and regional offices that provide technical and regulatory guidance in coastal construction. Internet links are provided to coastal hazard studies and maps, along with technical bulletins on construction in coastal environments.

The revised ***Coastal Construction Manual*** will be published and distributed in late 2000. It will also be available in an interactive CD ROM format, to be used with the Acrobat PDF format. FEMA plans to offer a coastal construction training course at the Emergency Management Institute (EMI).

Tool #11 Sustainable Redevelopment PowerPoint Presentation

Note

This presentation is complete in itself, but can be customized for the particular region, state, or community audience.

Audience:

To be given at the community level to local officials and local agencies whose communities are recovering from repetitive natural disasters. Citizens, businesses, civic groups might also benefit from a public presentation, should they request it.

Introductions before the slide show starts:

Introduce yourself and those representing FEMA. Introduce participants (guest speaker, if any) Also have other agencies and guests in attendance introduce themselves and their titles. Outline the meeting and time estimation. Also tell them that at the conclusion of the slides, there will be time for discussion. (At a more formal meeting, you may want to have an agenda prepared but at the small community meetings, we recommend keeping it as informal as possible.)

We are here today to talk about Sustainable Development- a new strategy being used by communities nationwide to make themselves healthier, stronger and more disaster resistant. We are seeking ways to change the way communities deal with all natural disasters. Project Impact is one of these ways and is a participant in Sustainable Development. We hope to change what might be a meaningless term to you and advance it into a logical thought process with understanding and substance.

At this point in your disaster recovery, we can only imagine what it is that might be meaningful to each of you: --- probably actions with immediate results like, fixing the road or bridge into town or helping the local businesses so they don't leave town, and possibly elevating the row of homes that has been flooded 3 times in the last 10 years.

Each of those concerns are all related to sustainable activities. But today, through our slide presentation, we are taking it a step or two further. Sustainable Development gives thought that our *actions today* affect tomorrow. We need to look at the entire recovery process: boosting economic recovery, working in harmony with the natural environment and enhancing social and cultural considerations.

We are here today to talk about the Sustainability concept and *assist, advise, and encourage dialogue* with you and provide a favorable environment for pursuing sustainability. There is not a defined process with a road map to follow, guaranteeing success. We must mention what FEMA's limitations are regarding Sustainable Development. We do not bring funding to the table but can assist in identifying potential sources for funding. We do not bring the internal drive and strong desire that is needed by a united group of citizens. But it is our desire and hope to see that notion surface.

Start The Slide Presentation

SLIDE 1

Sustainability in Disaster Recovery

The concerns of the present do not have to be the problems of the future

Today in the United States, we spend tens of billions of dollars each year to rebuild communities after natural disasters. And the frequency and severity of these disasters is growing. A community living in the path of flooding or whose buildings are vulnerable to being blown down by hurricanes is fundamentally NOT sustainable. Disaster-prone communities are excellent candidates for sustainable development.

SLIDE 2

POINT OF VIEW

Sustainable Development is...

- ≡ Realistic and effective
- ≡ Being adopted nationwide
- ≡ Beneficial in multiple ways
- ≡ Wave of the Future (NOT JUST A FAD)

I want to make several key points during this talk. First, sustainable development is not an abstract concept. It is a realistic, effective new way for communities to build their future. Second, sustainable development is being adopted nationwide. Third, much of sustainable development's appeal is that it brings many different types of benefits to those who practice it. And finally, sustainable development is not this year's fad. It is not only the wave of the future but is here now, in the present, as witnessed by conferences and town meetings all over the country promoting the idea and identifying the need for it. Let's call it whatever we want, but this new strategy is how communities can and must develop in the future.

SLIDE 3

LOOK FOR PARTICIPATION FROM...

Local Government	School Districts
Private Industry	Environmental Professionals
State Government	Neighborhood Groups
Public/Professional	Coalitions
Financial Institutions	Local Religious Groups
Trade Shows	Special Organizations
Developmental Studies	Businesses
Disasters	Churches
Advocacy and Service Organizations	Colleges/Universities
	TECHNICALS

Everyone is getting on the band wagon and there are groups at all levels that want and must be involved to make it a successful partnership.

SLIDE 4

REBUILD A BETTER COMMUNITY

- ≡ Disaster recovery can be used to benefit the entire community by using it for mitigation and development projects.
- ≡ Avoid rebuilding damaged areas that will continue to create problems and expose the community to further disaster. This is not sustainable!
 - Disasters can be avoided
 - Use the past experience as the motivation for sustainable developmental projects.

There is a big challenge before you recover from [yet another] this disaster. In an effort to look on the positive side, we encourage you to look at this time as an opportunity to re-build your community with thoughts of enrichment, improvement, vitality and hope for the future.

SLIDE 5

Natural Disaster Statistics

441 Federally declared disasters in the last ten years... an increase of 50% from the decade before.
 \$24 Billion - FEMA dollars paid out in declared disasters over the past decade
 \$0.3 Billion - Flood insurance claims paid out since 1999
 \$,ADD DAMAGES WITHIN REGION OR STATE]

Property losses reach the multi-million dollar range during flooding events and other disasters [adjust these comments to the type of disaster that has occurred]. But that is only part of the story. Also consider, emergency response dollars, clean-up costs, environmental damage... what about the economic loss businesses and individuals experience during the disaster and post-disaster recovery periods. And the list goes on.

SLIDE 6

DISASTERS & SUSTAINABILITY

"Federal agencies... should incorporate sustainable redevelopment principles into the Federal disaster relief system."
 - President's Council on Sustainable Development

Why should FEMA be involved in educating communities in sustainable development? Federal, state and local governments have spent a disproportionate amount of time, money and resources recovering from repetitive disasters. Citizens in disaster areas that have experienced loss of life, loss of property and loss of jobs are no longer living in viable and healthy communities. Repetitive loss and deterioration diminish our ability to effectively mitigate the risk in these disaster-prone areas. If a community has the willingness to improve their circumstances and become sustainable we want to encourage them to take that step.

SLIDE 7

FEDERAL APPROACH TO SUSTAINABILITY

White House Task Force on Livable Communities
 Department of Post Disaster Planning
 Office of Sustainable Development and Communities (OSEC)
 U.S. Department of Energy
 Sustainable Development
 Council on Sustainable Development
 Office of Post-Disaster Reconstruction and Rehabilitation
 National Institute of Standards and Technology
 U.S. Environmental Protection Agency
 U.S. Department of Justice

Read the federal agencies involved. [These agencies can be further defined, if desired, by notes below]

- **President's Council of Sustainable Development (PCSD)**
 25 leaders from government, industry, environmental, labor, and civil rights organizations
 --develop strategy that fosters economic vitality
 --recognize outstanding achievements in Sustainable Development
 --raise public awareness
 --replaced in Summer 2000 by the Task Force on Livable Communities
- **White House Task Force on Livable Communities**
 --coordinates Federal agencies efforts to assist communities to grow in ways that ensure a high quality of life and strong, sustainable economic growth.
- **Environmental Protection Agency (EPA)**
 --charged with new thought process to approach environmental regulation with a more holistic, ecosystem-oriented approach
 --created Office of Sustainable Ecosystems and Communities (OSEC) to advocate and support community-based environmental protection
 --initiating a more integrative, cooperative approach to regulation that considers quality-of-life concerns
- **U. S. Department of Energy (DOE)**
 --implements new strategies to enhance local economies, environments, and quality of life
 --provides the Center of Excellence for Sustainable Development Website to educate communities in approaches and techniques for sustainable development
 --Operation Fresh Start - an initiative to help individuals and communities incorporate sustainable principles and technologies into their recovery from disaster
- **Federal Emergency Management Agency (FEMA)**
 --introduces the concept and approach of Sustainable Development within the framework of Disaster Recovery activities
 --directs communities toward materials and resources in their efforts toward sustainable development

- influences local officials, citizens, civic groups and businesses to consider the long term value of pursuing sustainable development for the present and for future generations
- identifies potential resources for technical assistance and possible funding

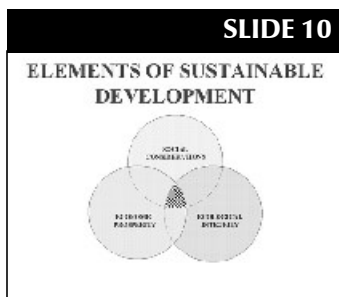


Today we will discuss the 5 topics of Sustainable Development. To clarify what we mean by Sustainable Development we will first talk about definitions. The second topic will present you with evidence of its benefits. Third, we will show you how sustainable development is being applied around the country and talk about a few success stories. Getting Started is the fourth topic, with pointers that other communities have used. Lastly, we will discuss those agencies that can help you focus on sustainable development issues and that you can build partnerships with.

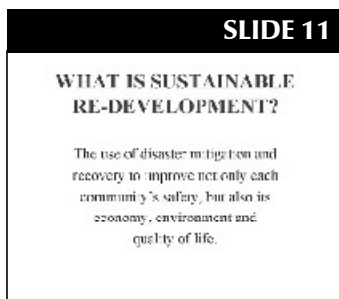


President's Council definition (read slide)

See www.livablecommunities.gov for new livability initiative.



Elements Graphic - This multi-level balanced approach will help insulate the community from economic fluctuations and give a sense of resiliency to the community. This balance of the social, economic and environmental concerns benefits all sectors of the community.



Sometimes we hear the term Sustainable Redevelopment. It refers to using disaster recovery dollars while considering the balanced concerns of a healthy community - not just re-building damaged areas that will exacerbate existing problems and expose the community to further crisis.

Section 5.0

Eighteen Tools and Programs for Sustainability

SLIDE 12

"The world will not evolve past its current state of crisis by using the same thinking that created the situation."

— Albert Einstein

Albert Einstein, in his day, was quoted as saying....

SLIDE 13

SUSTAINABLE DEVELOPMENT IS...

"... DEVELOPMENT THAT MEETS THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR OWN NEEDS."

— World Commission on Environment and Development (1987)

The standard and most widely circulated definition of sustainable development is this one developed by the United Nations World Commission on Environment and Development in 1987. It is that sustainable development is the practice of meeting our needs today without jeopardizing the ability of our children to meet their needs. In other words, we act not only in the interest of the short term, but also the long term.

SLIDE 14

SUSTAINABLE DEVELOPMENT IS...

"Then I say the earth belongs to each ... generation . . . fully and in its own right . . . no generation can contract debts greater than may be paid during the course of its own existence."

— Thomas Jefferson, September 6, 1789

Although the first definition was written in 1987, the concept of sustainable development is not new. Here is a quote by Thomas Jefferson in 1789. He says that no generation has the right to impose a debt on future generations - and every generation should have the right to inherit the world debt-free. We understand from historians that Jefferson was talking not only about economic debt, but also environmental burdens.

SLIDE 15

SUSTAINABLE DEVELOPMENT IS...

"Sustainability refers to a very old and simple concept—the ability to keep going over the long haul. Think of it as extending the Golden Rule through time, so that you do unto future generations as you would have them do unto you."

— Robert Gilman

This very clear definition comes from Robert Gilman of the Context Institute, which has been studying and communicating about the concept for many years. It says that sustainable development is the ability to keep going, to sustain one's economy, environment, and community. Think of it as the Golden Rule, extended through time. We do unto our children as we would have our children do unto us.

SLIDE 16

WHAT IS COMMUNITY?


It can be...

- a village, town or city
- a neighborhood
- the local school district
- county
- valley
- watershed area
- twin cities area

Participants, in pursuing Sustainable Development, should feel "connected" to each other and share a feeling of "being in the same boat."

Frequently we are asked, what do you consider a community? Involvement can be pursued by a number of different customers. Customers can be cities, villages, towns and neighborhoods and also communities of interest, like national parks and industrial parks. One thing that must be held in common is the commitment and the shared feeling that something needs to change.

SLIDE 17



"IF YOU DON'T KNOW WHERE YOU'RE GOING YOU MIGHT END UP SOME PLACE ELSE."

Copyright

Casey Stengel very aptly put it by saying, if you don t know where you are going, you might end up some place else. Define where you want to go. Look down the road and create a vision statement.

SLIDE 18

TODAY'S TOPICS...

- Definitions
- Benefits
- Success Stories
- Getting Started
- Building Partnerships

Let s talk a minute about the Benefits involved in pursuing Sustainable Development.

SLIDE 19

BENEFITS FROM LIVING IN A SUSTAINABLE COMMUNITY

A SUSTAINABLE COMMUNITY...

- Is an attractive, clear and safe community, rich in education and employment opportunities
- Ensures that citizens have decision-making power to shape their community
- Asks questions and identifies solutions
- Targets the root causes of problems

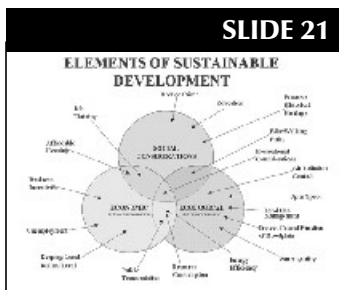
The kinds of benefits that you can expect from developing a long-term recovery plan are many. Each community with different concerns and ideas will benefit in various ways. (GO OVER THE THREE SLIDES) But the key is that the collaborative approach used by the groups involved will result in the benefit of many - not just a few.

SLIDE 20

BENEFITS FROM LIVING IN A SUSTAINABLE COMMUNITY

A SUSTAINABLE COMMUNITY...

- Joins forces with diverse interest groups
- Identifies the obstacles that lower its ability to pursue sustainable development
- Invests in education and training to help strengthen and attract business
- Uses a participatory approach to make consensus decisions for the greatest benefit of all



Section 5.0

Eighteen Tools and Programs for Sustainability

SLIDE 22

SHOULD WE CARE?

- | | |
|--|--|
| <p>FEDERAL BENEFITS ...</p> <ul style="list-style-type: none"> ➤ Dollars spent in line with highest national goals ➤ Biggest bang for the taxpayer buck ➤ Needs minimized for future Federal funds | <p>LOCAL BENEFITS ...</p> <ul style="list-style-type: none"> ➤ Multi-purpose improvements ➤ Move grant per Federal dollar ➤ Enhances local appeal as a business and residential location |
|--|--|

We are here today because the federal government can reap the benefits from this approach. It is prudent for the government to spend taxpayer dollars to the best possible benefit. You are here today because your community is recovering from a disaster, and over the long term, this approach can help you reap benefits. Most importantly, we all benefit when we help individuals to a better, safer, more secure future.

SLIDE 23

You are right on track when your solution for our problem... addresses other. You decide to minimize carbon dioxide to conserve fuel itself... realize that this will reduce noise... enhance bike and pedestrian travel... conserve land by minimizing truck and machine... multiply opportunities for local artists... beautify the neighborhood and make it safer for children.

-Michael Corbett

The benefits can be multi-dimensional. The solution to one problem may solve many others-- Michael Corbett explains by saying [READ THE SLIDE]

SLIDE 24

TODAY'S TOPICS...

- Definitions
- Benefits
- Success Stories
- Getting Started
- Building Partnerships

The third topic this morning [afternoon] will briefly outline a few communities that have chosen to recover from disasters in a more sustainable way.

SLIDE 25

APPLICATION
Cases in Sustainable Development

➤ A private builder demonstrates that sustainability is not just a buzzword for green buildings, but a holistic approach to creating affordable, resilient structures. The builder achieves a number of goals: local employment and growth, economic and environmental advantages of straw bale construction, and an improved quality of life for the community.

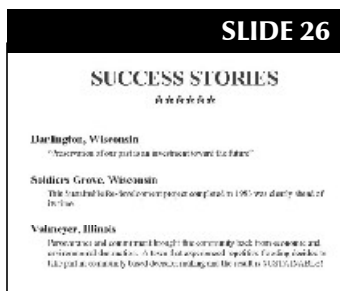
➤ A nonprofit organization helps build a sustainable community for people who are homeless and looking for ways to make and maintain a sustainable living. This group provides a safe and secure place to live, and a place where they can learn and grow.

➤ A city and county are collaborating to help residents deal with issues of hazardous waste, such as household hazardous waste, and to provide a safe and secure place to live. The program is designed to help the community deal with hazardous waste and to provide a safe and secure place to live.

-Beverly Greenfield

Before we talk about specific communities, we can answer that question of How can I, as one business, or one person be of any assistance in the pursuit of sustainability. 1) Read 1st paragraph: This private builder, by using straw bale construction, has benefited the environment and his business. 2) Read 2nd paragraph: Employment opportunities in commercial organic farming assist the homeless population. 3) Read 3rd paragraph: This city's recycling effort is keeping hazardous materials out of landfills.

[READ BLURB ON EACH COMMUNITY]



DARLINGTON

The preservation of our past is an investment in our future. The City's priorities were and are: economic development, historic preservation, tourism and flood mitigation. The City of Darlington is a small community in southwestern Wisconsin located along the Pecatonica River. After repetitive flooding in 1950, 1959, 1969, 1990 and the Great Flood of 1993, the citizens and local officials said "enough was enough". A comprehensive flood hazard mitigation plan that detailed a downtown rehabilitation and flood mitigation project outlined a multi-year project combining historic rehabilitation with innovative floodproofing techniques. The plan called for floodproofing 35 downtown buildings and relocating 15 businesses, which involved developing an alternative site on a 35 acre parcel south of Darlington. This not only ensured that businesses were safe from harm's way, but also protected the City's valuable tax and economic base, and its historic heritage. Darlington has also prevented future development near the river by acquiring this land and converting it to recreational space. This Darlington project has been completed in stages, beginning in 1994.

SOLDIER S GROVE

Twenty years ago, Soldier's Grove was a town of 600 people on the banks of Kickapoo River in southwest Wisconsin. With the repeated occurrence of flooding, the residents finally decided to build a new town center on higher ground. The new Soldier's Grove was officially completed in 1983. This example of Sustainable Re-Development was the pioneer effort, and ahead of its time. Villagers chose to work with the river rather than attempt to control it. They chose to take the opportunity to build a better community and not race to repair damaged property and infrastructure as quickly as possible. Ordinances were passed requiring structures to be rebuilt with solar heating and other energy efficient technologies.

VALMEYER

In 1993, the Great Midwest Flood overflowed the banks of the Mississippi and inundated Valmeyer. The flood gutted the village of about 900 people. In a referendum after the flood, the people of Valmeyer decided they would not try to rebuild back in the same path of flooding. They voted to relocate to higher ground. In January 1994, the mayor of Valmeyer attended a conference sponsored by the U.S. Dept. of Energy on sustainable redevelopment. A month later, he asked DOE to help Valmeyer design its new town. The Dept. of Energy helped assemble a team with the American Institute of Architects, creating a design team made up of nearly two dozen national experts. Over a 4-month period, they held intensive weekend sessions in which architects, legal experts, design professionals, and others worked with townspeople to build models and drawings to work out the details of the new village. The result of all this input was the beginning of a new town. One of the most important sustainable measures that Valmeyer incorporated into their new town was, obviously, removing themselves from the floodplain. Other actions were taken in the design of the new City Hall building, including installing a passive solar heating system in which sunlight is used to help heat the interior. Along with other energy efficient measures, this building will perform 75% more efficiently than the national model building codes. Other measures incorporated are: recycled content, geothermal heat and low-E windows. Rebates from the Illinois Department of Energy encouraged families to use similar building techniques for rebuilding their homes.

OTHER SUSTAINABLE DEVELOPMENT COMMUNITIES:

Pattonburg, Missouri, Rhineland, Missouri, City of Eau Claire, Wisconsin, East Forks, Minnesota, Chattanooga, TN, Burlington, VT. The list goes on and on ...

Section 5.0
Eighteen Tools and Programs for Sustainability

SLIDE 27

TODAY'S TOPICS...

- ☛ Definitions
- ☛ Benefits
- ☛ Success Stories
- ☛ Getting Started
- ☛ Building Partnerships

So you ask yourselves, this all sounds well and good, but how on earth can we get started down the road to Sustainable Re-Development?

SLIDE 28

"Given the right circumstances, from no more than dreams, determination and the liberty to try, quite ordinary people consistently do extraordinary things."

—Dr. W. Hark
The Cherokee Alliance

[READ QUOTE ON SLIDE] Many of us may think that the challenge is totally overwhelming, but in order to make it more reachable, take on the challenge with other people who want to create a vision for your community. When working together, the challenges don't seem so great.

SLIDE 29

SUSTAINABLE DEVELOPMENT PRINCIPLES

- ☛ USE CONSENSUS-BASED, LOCALLY DRIVEN PROCESS
- ☛ INVEST DISASTER RESOURCES IN SUSTAINABILITY
- ☛ CREATE BROAD PARTNERSHIPS
- ☛ EVOLVE FROM COOPERATION AND FLEXIBILITY BETWEEN INDIVIDUALS, VILLAGES, NEIGHBORHOODS, ETC.

The basic principles of Sustainable Development are

- Involvement of citizens so they can direct their own path
- Develop a long-term strategic plan so when the money becomes available, you can stay on track with your plan objectives
- Use the available resources out there and commit agencies and businesses to building partnerships
- Embrace and encourage differing perspectives build a community together

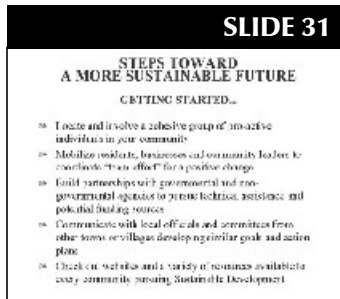
SLIDE 30

CONSENSUS...
isn't unanimous agreement...

It's a decision
that about everyone
can live with

—Unknown

REMEMBER That there is rarely 100% agreement when discussing viewpoints from a diverse-interest group. You can still move forward based on decision making for the mutual benefit of all.



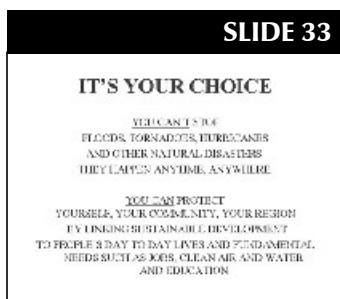
Steps toward a more sustainable community are

- 1) Read first bullet: Dedicated people who share a commitment to work together will keep the movement alive
- 2) Read second bullet: Develop a core committee designed to bring diversity to problem-solving (some people are good organizers and coordinators, some are good speakers, some are good doers) This group helps the community to develop its own solutions. One way to accomplish this is through town meetings and surveys. Find individuals who exhibit organization, commitment, patience, and a willingness to get things moving and hold respect within the community. Use available resources - don't re-invent the wheel. Capitalize on others successes.
- 3) Read third bullet: Do your research and make phone calls. Involve contacts from the state and community to solicit help.
- 4) Read 4th bullet: This is referred to as a peer-to-peer exchange or sometimes a mentoring program ; locate areas also working on Sustainable Development.
- 5) Read 5th bullet: Local non-profit groups, government agencies and the library have excellent resources. Spend a few minutes today at our resource table.



Once you get the core group together, you can look at the various options on how to begin. The EPA Website outlines one avenue of action. [Their reference to a Green Community is a sustainable one] Read the definition and the slide.

There are many guidebooks and references that get very detailed in the planning stages. See our resource table and look in the Internet.



[READ SLIDE] OR...You can go along with the typical traditional mode which leaves independent, unbalanced decision-making roles to a few people, making Sustainable Development remote and theoretical.

The movement toward becoming a prosperous and healthy community is here. Strong community leadership and involved citizens will be the catalyst for change. It's up to you.



[READ QUOTE] Never doubt that a small group of thoughtful committed citizens can change the world. Indeed, it's the only thing that ever has.

Section 5.0
Eighteen Tools and Programs for Sustainability

SLIDE 35

Building Partnerships is one key step in moving forward. In creating partnerships with Federal, state and local government, business and private citizens, we can save lives, lower vulnerability to, and reduce the impact of, future disasters.

TODAY'S TOPICS...

- 2nd Definitions
- 3rd Benefits
- 5th Success Stories
- 6th Getting Started
- 1st **Building Partnerships**

SLIDE 36

It is increasingly common for businesses, government, citizens and non-governmental organization to find themselves participating in a collaborative effort to solve environmental, social and economic problems. They are doing so because collaborative approaches lead to more comprehensive and acceptable outcomes.

PARTNERS IN SUSTAINABILITY

- | | |
|---|--|
| <ul style="list-style-type: none"> • Risk-Based Tailored and Durable Construction • Federal Emergency Management Agency • Department of Energy • Department of Transportation • U.S. Environmental Protection Agency • Department of Health and Human Services • U.S. Coast and Geodetic Survey • U.S. Department of Justice • U.S. Agency for International Development • U.S. Department of Commerce • U.S. Department of Agriculture • U.S. Department of Education • U.S. Department of Labor • U.S. Department of State • U.S. Department of Treasury • U.S. Department of Veterans Affairs • U.S. Department of War • U.S. Department of Wildlife and Fisheries • U.S. Department of Justice • U.S. Department of Justice • U.S. Department of Justice • U.S. Department of Justice | <ul style="list-style-type: none"> • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association • American Bar Association |
|---|--|

SLIDE 37

While the federal government bears responsibility for establishing national goals, standards, and priorities, these national interests may not always represent specific local interests. FEMA seeks to expand the roles played by states, counties and local communities in the sustainability process by encouraging inter-governmental partnerships, information sharing and multi-level coordination among all involved entities.

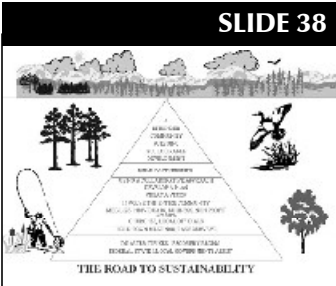
THE CHALLENGE

Local government **must** play a key role in creating stronger, healthier communities.

- Plan and facilitate development
- Create community partnerships
- Provide strong leadership

SLIDE 38

THE ROAD TO SUSTAINABILITY PICTURE This graphic indicates that the Federal government's involvement in Sustainable Redevelopment begins at the very onset of disaster recovery. While we assist in disaster recovery work, and attempt to get the communities working toward a healthier, more prosperous quality of life, we can only give you a nudge. With community drive and strong local leadership the road to becoming sustainable is within reach. And it's the road that you, the community -- not someone else -- has chosen.



SLIDE 39

KEY CONCLUSIONS

- ☞ All Communities are at risk from disasters
- ☞ Improved sustainability an important goal
- ☞ Mitigation and pre-disaster planning are crucial
- ☞ Locals should lead. Feds should help

Key Conclusion-Sustainable Development is a viable strategy for ensuring your community's future. Because it deals with your community as a system, rather than a series of unrelated problems and issues, sustainable development achieves multiple benefits.

By saving resources and by going after these multiple benefits, sustainable development gives you a bigger bang for your local buck. It is the most resourceful way for your local government and your private businesses to invest their development dollars.

Finally, sustainable development is a way to build bridges between your local economy, the quality of your environment, and your community's quality of life. We should no longer assume that we can only create jobs at the expense of the environment, or that we can only preserve the environment by sacrificing jobs. Because of new ways of thinking, and new approaches to community development, we can implement sustainable initiatives that ensure environmental quality, a strong economy, and a high quality of life.

SLIDE 40

Heroes
 They are not
 heroes. They
 are ordinary
 people who
 are doing the
 right thing at
 the right time.
 They are not
 heroes. They
 are ordinary
 people who
 are doing the
 right thing at
 the right time.
 They are not
 heroes. They
 are ordinary
 people who
 are doing the
 right thing at
 the right time.

FINAL NOTE
 It is impossible to provide a blueprint to
 develop a sustainable community due to the
 unique needs and desires of each community.

Let us emphasize the importance of making
 phone calls, left and to lists of people,
 reaching out to other communities and
 researching the facts. Each phone call you
 make will generate 2 or 3 more. The people
 you talk with will advise you of other
 contacts. Each agency that gives you
 guidance can also direct you to other agencies.

Final Note

When you start with a mindset that we control our own destiny, success will follow. Take baby steps and move forward. When setbacks happen, persevere and keep plugging along. You are not alone. There is a lot of support. Read Heroes quote.

SLIDE 41

**FOR FURTHER INFORMATION,
 PLEASE CONTACT**

[PROVIDE CONTACTS IN REGION]

SLIDE 42

IN SEARCH OF

Forward thinking individuals who nurture and support the idea that a long-term strategy, blended with planning and mitigation activities in disaster-prone communities will secure the future for themselves and their children.

[Leave up for the rest of the meeting]

Tool #12 Hazard Mitigation Grant Program Desk Reference

FEMA's Hazard Mitigation Grant Program (HMGP) assists states and communities to implement long-term hazard mitigation measures following a Presidential Disaster Declaration. Up to fifteen percent of the actual disaster response and recovery expenditures is allocated for these grants, and is provided to states with a cost-sharing provision of 75 percent Federal / 25 percent non-Federal funding. This program provides funding that can be used to implement sustainable redevelopment activities, which meet the eligibility requirements of reducing future disaster recovery costs. The HMGP project application process is as follows:

- Local communities identify and develop proposed mitigation projects, such as property acquisition, elevation of floodprone properties, seismic retrofitting, wildfire mitigation activities, etc.
- Local communities then submit the project applications to the state, which is responsible for administering the HMGP and for prioritizing the submitted project applications.
- The state then submits to FEMA for final review and approval those projects that are consistent with state mitigation planning objectives, cost-effective and environmentally sound, and for which there is available funding.

FEMA's **HMGP Desk Reference** is designed to assist state and local governments in reducing the loss of life and property as a result of natural disasters and in implementing mitigation measures during disaster recovery. The Desk Reference provides eligibility guidelines for hazard mitigation grants, which are administered through the states, with the goal of implementing long-term hazard mitigation measures after a major disaster declaration. Eligible applicants include state and local governments, selected nonprofit organizations, and Indian tribes or authorized tribal organizations and Alaska Native tribes and organizations.

The Desk Reference can assist planners in understanding the mechanics of the grant program and use it to help find ways to identify projects and obtain funding. The states administer the program and prioritize project funding. Each state is required to develop a Hazard Mitigation Administrative Plan that explains all pertinent hazard mitigation grants procedures.

Tool #13 Unified National Program for Floodplain Management

The **Unified National Program for Floodplain Management** (1994) is the Federal government's means of focusing the competing interests in floodplain management toward the national good. The 1994 report defines four goals for national floodplain management through state and local involvement:

- Formalize a national goal-setting and monitoring system.
- Reduce by at least 50 percent the risk to life and property in the nation's floodplains.
- Develop and implement a process to communicate a positive attitude toward floodplain management.
- Institute floodplain management in communities nationwide.

The Unified National Program for Floodplain Management works to achieve these goals through promoting strategies that alter development patterns within floodplains, and building codes, change people's attitudes concerning floods, and maximizes the natural and beneficial functions of floodplains.

Tool #14 Natural and Beneficial Functions of Floodplains Report to Congress

This is a report of an interagency task force established by Congress as a result of the National Flood Insurance Reform Act of 1994. The task force was formed to:

- Identify the role of natural and beneficial functions of floodplains in reducing flood losses.
- Recommend how the nation can further reduce flood losses through the protection and restoration of the natural and beneficial functions of floodplains.

The report examines how to lessen flood impacts through multi-objective management practices, resulting in the restoration, enhancement, and preservation of the nation's floodplains. Relevant topics for the Sustainability Planners include how to incorporate floodplain management into government programs, and how to increase public interest in sustainable land use practices within floodplains. The benefits of pristine or restored floodplains include increased water storage capacity during flood events, a healthy ecosystem, and a greatly reduced risk of losses and property damages from floods. **Natural and Beneficial Functions of Floodplains** is a valuable tool for Sustainability Planners in seeking to reduce flood risks while also initiating sustainable development practices related to floodplain environs.

Tool #15 Flood Mitigation Assistance Program (FMA)

The Flood Mitigation Assistance Program is a predisaster grant program designed to assist states and local communities in implementing measures to assess flood risk and identify actions to reduce or eliminate the long-term risk of flood damage to buildings, homes, and other structures that are insurable under NFIP.

Activities such as structure elevation, demolition, or property acquisition are eligible for funding under this program. Projects must be cost effective, cost beneficial to the National Flood Insurance Fund, technically feasible, and either physically located in a participating NFIP community or located so as to reduce flooding in an NFIP community. FEMA may contribute up to 75 percent of the total eligible costs; the remaining 25 percent must be provided by a nonfederal source. The broad objective of this program is to provide funding and mitigation planning assistance to strengthen communities against flood hazards, thus incorporating a significant component of sustainability. FMA program guidance is provided in **FEMA Publication 299**.

Tool #16 Capability Assessment for Readiness (CAR)

An essential characteristic of a sustainable community is its resilience to natural disasters. The post-disaster environment present a unique opportunity to implement sustainability initiatives and to increase the quality of the built environment while, at

the same time, instituting preparedness planning processes that can protect the community more effectively in the event of a subsequent disaster. As FEMA's mitigation program functions to reduce the impact of disasters, FEMA's preparedness program has, as its primary mission, the goal of ensuring that state, local, and tribal emergency managers can save lives and protect property by ensuring that they have appropriate plans, procedures, communications and systems in place before a disaster occurs.

One of the primary methods that FEMA uses to accomplish this is the **Capability Assessment for Readiness**. FEMA has been working with the National Emergency Management Association since 1996 on the development of the state CAR process based on recommended practices in emergency management. This initiative strengthens the current partnership and the negotiation of the annual Emergency Management Performance Grant (EMPG) process between the states, territories, and insular areas. The CAR answers two of the most basic questions: (1) *Are we ready for a disaster that could affect our community?* and (2) *Have we developed effective preparedness policies, exercised appropriate mitigation practices, and are we ready to respond and recover following a disaster?*

What is the CAR?

Prior to 1996, emergency management officials in the United States lacked a nationally accepted process and criteria by which states, territories, tribes, and insular areas could judge their emergency management readiness and capabilities. This inability to assess readiness capabilities left many communities vulnerable to the impact of a disaster because they were unprepared for the wide variety of activities that are necessary before, during and after a disaster strikes.

The state CAR is a self-assessment process focusing on 13 core Emergency Management Functions. These Functions were identified by emergency managers from across the country and address the preparedness, response, and recovery functions associated with disasters. The 13 Functions are:

- Laws and Authorities
- Hazard ID and Risk Assessment
- Hazard Mitigation
- Resource Management
- Planning
- Direction, Control, and Coordination
- Communications and Warning
- Operations and Procedures
- Logistics and Facilities
- Training
- Exercises, Evaluations & Corrective Action
- Crisis Communications, Public Education, and Information
- Finance and Administration

Each Emergency Management Function is subdivided into Attributes and further divided into Characteristics. Attributes are composed of broad criteria by which the Function can be assessed. Characteristics are more detailed criteria that clarify each of the attributes. A scoring scale of 1-5, NA is provided for a quantitative rating. The

process not only involves the state emergency management offices, but includes key departments and agencies throughout state government that have responsibilities for disaster response.

CAR Assessment Process

The first Capability Assessment for Readiness review was conducted in 1996 with participation from all 56 states, territories, and insular areas. A national report was prepared and provided to the President and the United States Congress. Following the assessment, Customer Feedback Workshops indicated that improvements to the assessment instrument were required. The second state CAR assessment was conducted in 2000 and again was completed by all states, territories, and insular areas. It included enhanced software, a CD ROM Tool Box that provides expanded explanations of questions as well as other background material. A User's Guide and a Facilitator's Guide were also developed. The CAR software also includes a Tool Box that provides expanded explanations as well as background materials. FEMA plans to develop a report to the President and the U.S. Congress by December 2000. It is intended that the states will complete the CAR on a biennial basis.

Benefits to the States

The benefit to completing the CAR is that a self-profile is developed of the strengths and weaknesses in the emergency management program. This profile enables the states to effectively target their program resources to those areas of greatest need. In addition, the states have the information they need for strategic planning and for justifying program resource requirements or new initiatives to state legislatures.

CAR and the NPFA Standards and Accreditation

Imbedded in the CAR are those important ingredients developed by the Fire Protection Association Emergency Management Standards (NPFA 1600). CAR is also being used as the foundation for the Emergency Management Accreditation Program, which is currently under development by the National Emergency Management Association.

Local and Tribal CAR

A draft local CAR was recently developed by FEMA at the request of the National Emergency Management Association. It will enable local jurisdictions throughout the states to conduct their own emergency management self-assessment. It is currently under review by the National Emergency Management Association, the states, and organizations such as the International Association of Emergency Management, the U.S. Conference of Mayors, the League of Cities, the National Association of Counties, and the International City/County Management Association. It was also field tested by six counties in the State of Iowa. A feedback session indicated that local Emergency Management Directors were very positive as to its potential in advancing the readiness in communities across the nation. Initial steps are underway to develop a tribal CAR assessment tool.

Tool #17 HAZMAT Response/Capability Assessment Program

Originally developed in FEMA Region VI, the Comprehensive HAZMAT Emergency Response/Capability Assessment Program (CHER-CAP) assists state and local communities in improving their response capabilities to hazardous materials incident. This is of critical importance to most communities since hazardous materials incidents are rated as their number one threat. The addition of the CHER-CAP program to assist in improved preparedness against hazardous materials incidents enhances the work that is being done to build Disaster Resistant Communities in *Project Impact* by adding the technological hazards component that many communities face.

CHER-CAP uses the skills and resources of local, state, tribal, and Federal governments and industry to identify and address the hazardous materials preparedness needs of local jurisdictions. It also enhances a community's ability to operate within the National Response System (as described in the National Contingency Plan). The Environmental Protection Agency and the U.S. Department of Transportation are key Federal partners in CHER-CAP.

The principal purpose of CHER-CAP is to:

- Identify opportunities for plan revisions.
- Identify communications needs.
- Identify resource needs.
- Improve coordination.
- Identify and accomplish required training.
- Clarify roles and responsibilities.
- Improve individual performance.
- Serve as a Train-the-Trainer initiative for additional jurisdictions.
- Test plans and systems in a comprehensive exercise.
- Motivate public and private officials to support emergency programs.
- Increase general awareness of proficiency and needs.
- Improve the Federal-state-tribal government-local-industry emergency management relationships.

CHER-CAP is conducted in phases spanning a total of four to six months. Communities interested in undertaking CHER-CAP notify their state emergency management agency and the state then selects jurisdictions for participation.

After selection of a CHER-CAP community by the state, an initial meeting is held between FEMA and the Local Emergency Planning Committee to discuss the scope of CHER-CAP and the time that will be needed to conduct the program. Following a commitment by the community, information gathering begins, including emergency response plans, any existing mutual aid agreements, agency-specific Standard Operating Procedures, existing data on hazardous substances in the community, documentation regarding training previously undertaken and training needs. Most CHER-CAP initiatives eventually include fire, police, emergency medical services, public works, health and environmental agencies, public officials and hospitals, in addition to industry.

After a review of the plan and Standard Operating Procedures, communities implement any necessary modifications. Local, state, and tribal government officials,

industry and the FEMA coordinator identify available training programs based on identified needs. A tabletop exercise may also be conducted prior to the full-scale exercise.

The final phase of CHER-CAP is a full-scale hazardous materials field exercise with live props, such as a tanker truck, rail car or fixed facility with simulated smoke, leaking liquid and casualties. The exercise typically involves 100-300 participants and lasts approximately four hours. Peer evaluators from nearby jurisdictions observe the exercise and record their observations. A final report is prepared and submitted to the participants following the exercise.

CHER-CAP has already proven to be invaluable in those communities that have implemented it and then experienced a hazardous materials incident.

Tool #18 Community and Family Preparedness Program

Like the readiness phase of the Sustainability Program, which offers the opportunity to create a sustainability network by building partnerships and identifying potential participants in reconstruction, the Community and Family Preparedness program ensures that all Americans have the necessary information, education and skills to protect themselves, their families, their homes and their business from disasters. The Community and Family Preparedness program emphasizes reaching children and schools, helping neighbors and vulnerable persons and cooperating through community and neighborhood organizations.

The Community and Family Preparedness program supports a variety of disaster public education programs and activities by working through a broad coalition of partnerships. It concentrates on providing reliable and accurate information and supporting the exchange of information to a nationwide network of disaster educators and the public. The program also supports the development of curriculum materials on disaster preparedness for classroom use, outreach through national partners, seminars for neighborhood associations, materials for individual school presentations, special seasonal disaster preparedness campaigns, special preparedness seminars for employees of business, industry or other organizations, as well as churches and youth groups.

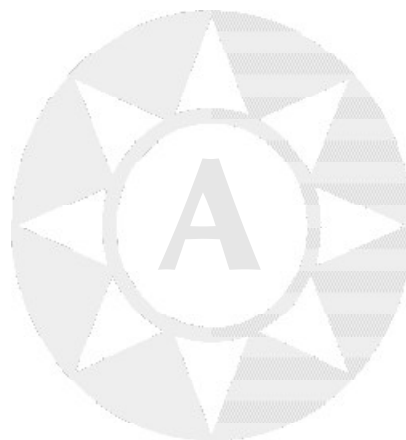
Community and Family Preparedness partners include state and local emergency managers, Boy Scouts of America Exploring program, Girl Scouts of the U.S.A., Church World Services, the Society of St. Vincent de Paul, The Salvation Army and others. New partnerships are being forged with other networks, such as the Women in the NAACP, the U.S. Department of Agriculture cooperative extension network, and voluntary organizations active in disaster relief.

FEMA cooperates with other Federal Departments and agencies such as NOAA's National Weather Service, the U.S. Geological Survey, the U.S. Department of Agriculture Cooperative State Research, Education and Extension Service, the Centers for Disease Control, the International Association of Emergency Managers, the National Fire Protection Association and the Institute for Business and Home Safety. These activities are accomplished through an informal National Disaster Education Coalition.

FEMA has developed and made widely available for distribution a number of basic disaster public information materials such as: *Emergency Preparedness Checklist; Your*

Family Disaster Plan; Your Family Disaster Supplies Kit; Preparing for Emergencies – A Checklist for People with Mobility Problems; Helping Children Cope with Disaster; Disaster Preparedness Coloring Book; Food and Water in an Emergency; an Emergency Management Guide for Business and Industry; and Adventures of the Disaster Dudes (a video popular in school presentations).

FEMA makes disaster public information materials available to state and local emergency managers and other partners who reproduce and disseminate them locally. Publications are available from the FEMA Publications Distribution Center via an 800 number, camera copies are available, and FEMA also provides the *FEMA Disaster Preparedness and Mitigation Library on CD Rom*, which holds electronic files of publications for such users. The information is also available for downloading from FEMA's website.



Appendix A

Glossary

The following is a list of terms and phrases that are typically used within the DFO. Some of these terms are used throughout this document, while others are terms that a sustainability planner should become familiar with in order to effectively communicate with DFO staff.

"100-Year" Floodplain	The area of a floodplain that historically and statistically has a 1 percent chance of significant inundation in any given year or the area of inundation by the "100-year" flood (also known as the "Base Flood").
Administrative Plan	See Hazard Mitigation State Administrative Plan.
Americans with Disabilities Act (ADA)	The ADA guarantees equal opportunity for individuals with disabilities in employment, public accommodations, transportation, state and local government services, and telecommunications.
Annual Flood	The annual flood is considered the most significant flood event in a one-year cycle of a floodplain.
Applicant	The applicant is a state agency, local government, and any political subdivision of the state, including Native American Indian tribes and Alaskan native villages that apply for FEMA post-disaster assistance. Applicants may also be private non-profit organizations such as medical, emergency (fire and rescue), utility, educational, custodial care, zoos, community centers, libraries, homeless shelters, and senior citizens' centers.
Automated Deployment Database (ADD)	The ADD is a system that provides a means of deploying disaster workers to locations for disaster operations. All FEMA employees, both DAEs and PFTs, are part of the ADD. The ADD system uses specific job titles and descriptions, and is accessible through FEMA's Wide Area Network (WAN).
Base Flood	The Base Flood is defined by FEMA as the flood having a 1 percent probability of being equaled or exceeded in any given year; also referred to as the "100-year" flood.
Base Flood Elevation (BFE)	The BFE is defined by FEMA as the height of the base ("100-year") flood in relation to a specified datum, usually the National Geodetic Vertical Datum of 1929 or North American Vertical Datum of 1988. Generally speaking, this is the elevation of the 100-year flood waters relative to "mean sea level."

**Building Performance
Assessment Team (BPAT)**

The BPAT is deployed by FEMA in response to disasters to conduct on-site field investigations. BPATs include representatives of public and private sector entities who are experts in specific technical fields, such as structural and civil engineering, building design and construction, and building code development and enforcement. Activities include inspecting disaster-induced damage to residential and commercial buildings and other manmade structures; evaluating local design practices, construction methods and materials, building codes, and building inspection and code enforcement processes; and making recommendations regarding design, construction, and code issues.

**Catastrophic Disaster
Response Group (CDRG)**

The CDRG is a national-level group with representatives from the Federal departments and agencies under the FRP; serves as the centralized coordinating group supporting on-scene Federal response and recovery efforts.

Charrette

A charrette is an intensive planning and/or design workshop involving people working together under compressed deadlines. Charrettes provide an interactive forum in which planners, designers, community representatives, and other interested and appropriate parties participate in proposing alternative visions that can help the group understand, evaluate and determine future plans and options.

**Coastal Barrier Resources
Act (CoBRA)**

CoBRA is Federal legislation identifying particular coastal areas that are environmentally sensitive and are subject to rules prohibiting certain Federal expenditures within them.

Coastal Zone

The coastal zone is defined as the area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas having direct drainage to the ocean.

**Coastal Zone Management
Act (CZMA)**

In recognition of the increasing pressures of over-development upon the nation's coastal resources, Congress enacted the CZMA in 1972. The CZMA encourages states to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats. A unique feature of the CZMA is that participation by states is voluntary. To encourage states to participate, the Act makes Federal financial assistance available to any coastal state or territory, including those on the Great Lakes, that is willing to develop and implement a comprehensive coastal management program.

**Community Assistance
Program - State Support
Services Element
(CAP-SSSE)**

The CAP-SSSE provides funding to meet negotiated objectives for reducing flood hazards in NFIP communities. The Program requires that participating communities identify, prevent, and resolve floodplain management issues before the issues require compliance action by FEMA. Available CAP funding is provided on a 75 percent Federal maximum and 25 percent minimum state cost sharing basis through the annual FEMA EMPG.

**Community Assistance Visit
(CAV)**

FEMA arranges for periodic CAVs with local officials to provide technical assistance regarding compliance with NFIP floodplain management requirements.

Community Development Block Grants (CDBG)	Administered by the Department of Housing and Urban Development (HUD); the objective of the CDBGs is to develop viable urban communities by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for low to moderate-income people. Disaster-related assistance can be eligible under this program depending on state priorities; mitigation activities have been funded under this program.
Community Rating System (CRS)	The CRS is an NFIP program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of these communities are reduced.
Community Relations (CR)	CR is a FEMA support function within the DFO that provides disaster information to victims of a disaster especially in remote areas and to low income, welfare recipients, elderly, or handicapped victims. CR ensures assistance opportunities are made available to all affected on an equal basis and provides the ERT management with information on ethnic and cultural diversity within the affected populations.
Congressional Liaison	The Congressional Liaison is a FEMA official within the Office of Congressional and Legislative Affairs who answers questions and concerns from Members of Congress and other elected officials during a disaster.
Cooperative Agreement (CA)	The CA is a mechanism whereby FEMA can reimburse states to utilize state resources to expedite the completion of a specific task associated with damage occurring from a disaster.
Damage Survey Report (DSR)	The DSR (currently referred to as Project Worksheet, PW) is the public assistance inspector's report that is reviewed by FEMA and is the basis for approving Public Assistance.
Deputy Federal Coordinating Officer for Mitigation (DFCO-M)	As part of the FCO's command staff, the DFCO-M manages and directs the mitigation component of either the regional ERT or ERT-N. The DFCO-M advises the FCO, manages the mitigation operation, and provides Federal leadership by forging partnerships to integrate effective planning and program implementation activities in the disaster operation.
Disaster Assistance Employee (DAE)	DAEs are trained temporary employees that augment permanent FEMA personnel in disaster operations in the field.
Disaster Declaration	A disaster declaration is a Presidential determination that a jurisdiction of the United States may receive Federal aid as a result of damages from a major disaster or emergency.
Disaster Field Office (DFO)	The DFO is established in or near a designated disaster site to support Federal and state response and recovery operations. It is the operating site for the ERT.
Disaster Housing	Disaster Housing (formerly called Temporary Housing) is temporary housing supplied by emergency management officials to disaster victims whose homes are no longer inhabitable due to damages sustained in a declared disaster.
Disaster Information Systems Clearinghouse (DISC)	The DISC provides centralized control, deployment, and accountability of disaster information systems. It is located at FEMA's Mount Weather Emergency Assistance Center in Bluemont, VA.

Disaster Recovery Center (DRC)	The DRC is a location within or near the disaster site at which disaster assistance clients can obtain information about assistance programs and check on the status of their teleregistration for assistance.
Disaster Recovery Manager (DRM)	The DRM is the FEMA official (normally the FCO) who has the delegated authority from the Regional Director to manage authorities under the Stafford Act, including incurring financial obligations.
Early Implementation Strategy	The Strategy is a report that is jointly developed by FEMA, state, and local governments immediately after the initial disaster response to address immediate recovery needs and their potential implications for supporting long-term mitigation and redevelopment goals. FEMA's long-term goal is to implement mitigation as the foundation for establishing disaster-resistant and sustainable communities. The Strategy provides a framework for activities to be undertaken during the weeks immediately following the event, and serves as a starting point for in-depth consideration through the IHMT and/or state mitigation planning process.
Earthquake	An earthquake is a sudden motion or trembling of the earth caused by the abrupt release of slowly accumulated strain upon tectonic plates. Synonym: Seismic Event.
Economic Development Administration (EDA)	The EDA, part of the Department of Commerce, is the Federal agency that assists communities with grants and technical assistance for economic development.
Emergency	As defined in Title V of Public Law 93-288, Section 1.02(l), an emergency is "any occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement state and local efforts and capabilities to save lives and protect property and public health and safety."
Emergency Management Performance Grant (EMPG)	An EMPG is the mechanism by which FEMA provides funding to states to develop and maintain emergency management programs. States develop a "self-assessment" of their emergency management needs, including mitigation, and a 5-year plan to meet those needs. Based on the plan, FEMA provides various levels of funding through a FEMA/State Cooperative Agreement (CA).
Emergency Response Team (ERT)	The ERT is an interagency team consisting of the lead representative from each Federal department or agency assigned primary responsibility for an ESF, and members of the FCO's staff mobilized to carry out the FCO's duties.
Emergency Response Team - Advanced (ERT-A)	The ERT-A is the portion of the ERT deployed first to the field to respond to a disaster incident.
Emergency Response Team - Mitigation (ERT-M)	The ERT-M is the portion of the ERT responsible for field mitigation operations that support sustained actions that will eliminate or reduce long-term risk to people and property from hazards and their effects.
Emergency Response Team -National (ERT-N)	The ERT-N is a national-level field response team.
Emergency Support Function (ESF)	ESF is the term used to indicate a functional area of response activity established to facilitate the delivery of Federal assistance required during the immediate response phase of a disaster to save lives and protect property and public health.

Emergency Support Team (EST)	The EST is an interagency group operating from FEMA headquarters in Washington, DC to oversee the national level response effort and coordinate activities with the ESF primary and support agencies in supporting the Federal response requirements in the field. The EST consists of the lead representatives from each Federal department or agency assigned a primary ESF responsibility and members of the EST Director's staff.
ESF-5 - Information and Planning Section	ESF-5 is the section of the ERT responsible for collecting, processing, analyzing, and disseminating information about disaster operations in order to support planning and decision making at both the field operations and Headquarters levels. The ESF-5 also coordinates short- and long-term planning at the field operations level.
Executive Order 11988 (Floodplain Management)	E.O. 11988 requires that no Federally assisted activities be conducted in or have the potential to affect identified Special Flood Hazard Areas, unless there is no practicable alternative.
Executive Order 11990 (Protection of Wetlands)	The companion to E.O. 11988, it requires that no Federally assisted activities be conducted in or have the potential to affect identified wetlands, unless there is no practicable alternative.
Executive Orders 12699 and 12941 (Seismic Safety)	E.O. 12699 requires 29 Federal agencies to issue regulations or procedures, and adopt minimum design and construction standards for seismic safety. E.O. 12941 requires seismic rehabilitation of Federally owned or leased buildings.
Executive Order 12898 (Environmental Justice)	E.O. 12898 requires Federal agencies to make environmental justice part of their mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.
Fault	A fault is a fracture or fracture zone in the earth's surface, along which there has been displacement or the junction of two tectonic plates.
Federal Coordinating Officer (FCO)	The FCO is the responsible official who initiates action immediately to ensure Federal disaster assistance is provided in accordance with the declaration, applicable laws, regulations, and the FEMA-State Agreement; appointed by the President, FEMA Director, or FEMA Associate Director for Response and Recovery.
Federal Emergency Management Agency (FEMA)	FEMA is an executive agency whose mission is to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response, and recovery.
Federal Insurance Administration (FIA)	The FIA is the branch of FEMA that administers the National Flood Insurance Program (NFIP), providing flood insurance to individuals and communities that would otherwise not be protected.
Federal Response Plan (FRP)	The Federal Response Plan facilitates the Federal response to disasters in the United States, territories, and other jurisdictions. The Plan outlines the planning assumptions, policies, and concepts of operations, organizational structures, and specifies responsibility assignments of Federal departments and agencies prior to and during disasters.

FEMA-State Agreement	A FEMA-State Agreement is a binding statement of the understandings, commitments, assurances, and conditions for assistance under which FEMA disaster assistance shall be provided to states. This Agreement imposes binding obligations on FEMA, states, and their local governments in the form of conditions for assistance, which are legally enforceable.
Fire Potential Index (FPI)	The FPI was developed by USGS and USFS to assess and map fire hazard potential over broad areas. Based on such geographic information, national policy makers and on-the-ground fire managers establish priorities for prevention activities in the defined area to reduce the risk of managed and wildfire ignition and spread. Prediction of fire hazard shortens the time between fire ignition and initial attack by enabling fire managers to pre-allocate and stage suppression forces to high fire risk areas.
Flash Flood	A flash flood is a flood event occurring with little or no warning where water levels rise at an extremely fast rate.
Flood Insurance Rate Map (FIRM)	A FIRM is the official FEMA-prepared map of a community that shows base flood elevations along with special flood hazard areas and the flood insurance risk premium zones.
Flood Mitigation Assistance (FMA) Program	The FMA Program provides annual funding for states and local governments that are planning or taking action to reduce or eliminate long-term risk of flood damage to buildings, manufactured homes, and other insured structures. Grants may be awarded for planning assistance, implementation of mitigation strategies, and technical assistance.
Floodplain	Floodplains are low-lying areas adjacent to rivers and streams that naturally experience periodic inundation due to rainfall, snowmelt, or dam or levee failure.
Fujita Scale of Tornado Intensity	The Fujita Scale rates tornadoes with numeric values from F0 to F6 based on tornado severity and damage sustained. An F0 indicates minimal damage such as a broken tree limbs or signs, while an F6 indicates severe damage sustained.
Gap Legislation	Gap legislation authorizes the U.S. Army Corps of Engineers to assist communities with limited emergency work, providing 100 percent funding for up to 10 days after a disaster. The legislation was developed to provide a "fast-track" disaster assistance "revenue stream" for those instances where it might otherwise take 10-14 days for FEMA and the President to determine whether or not FEMA assistance is warranted.
Geographic Information System (GIS)	Computer software that links geographic information (where things are) with descriptive information (what things are like).
Hazard Identification and Risk Assessment (HIRA)	The HIRA attempts to identify all the hazards that potentially threaten a community and provide an analysis of each hazard to determine the degree of threat posed by each. HIRA activities include identifying and mapping flood hazard areas; characterizing the impact of hurricanes using storm surge and wind decay models, mapping earthquake hazards, and using this hazard data to identify where damages may occur within a community.
Hazard Mitigation	Hazard mitigation is a sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects.

Hazard Mitigation Grant Program (HMGP)	Authorized under Section 404 of the Stafford Act, this Program provides funding for cost-effective hazard mitigation projects in conformance with the post-disaster mitigation plan required under Section 409 of the Stafford Act. Section 404 authorizes the President to contribute up to 75 percent of the cost of mitigation measures that are determined to be cost effective and substantially reduce the risk of future damage or loss in states affected by a major disaster. The remaining 25 percent of the cost may be a combination of state, local, and other non-Federal contributions.
Hazard Mitigation State Administrative Plan	The Hazard Mitigation State Administrative Plan is required to be developed to describe the state procedures for administering the HMGP
Hazard Mitigation Technical Assistance Program (HMTAP)	HMTAP is a nationwide contract to support FEMA, states, territories, and local governments with technical assistance to enhance the effectiveness of their natural hazard mitigation program efforts. HMTAP may be used to support post-disaster program needs in cases of large, unusual, or complex projects; situations where resources are not available; or where technical assistance is needed.
Hazards United States (HAZUS)	HAZUS is a PC-based GIS software that implements a standardized, nationally applicable earthquake loss estimation methodology (computer model). Flood and hurricane loss estimation models are currently under development.
HOME Investment Partnerships Program	This Program is sponsored by HUD and provides permanent housing for low-income homeowners or renters in large cities and urban counties. Funds can be used for acquisition, new construction, and rehabilitation.
Human Services (HS) (Formerly Individual Assistance, IA)	HS, formerly known as IA, provides supplementary Federal assistance (under the Stafford Act (408)) to individuals and families adversely affected by a major disaster or emergency.
Hurricane	Hurricanes are part of a family of weather systems known as "tropical cyclones." Depending on the strength of the winds extending in a counter-clockwise formation from the eye of the hurricane, it can be classified as a Category 1, to Category 5 hurricane, with 5 being the most severe.
Hurricane Program (HP)	HP is a FEMA program that provides funds to states at risk from hurricanes for the following: <ul style="list-style-type: none"> · activities that establish, enhance, and maintain basic levels of preparedness and mitigation capabilities; · activities that promote effective mitigation measures to reduce damage to public and private property; · HIRA and evacuation studies; · post-storm analyses to evaluate the effectiveness of mitigation measures; · training and exercises; and · activities that promote public awareness and education.
Increased Cost of Compliance (ICC)	ICC is a component of the standard flood insurance policy which provides up to \$15,000 coverage for complying with the cost of meeting substantial damage requirements or towards eliminating flood damage to a structure that has had repetitive flood insurance claims paid.
Individual and Family Grant Program (IFG)	IFG is a FEMA program that provides monetary aid to individuals and families to meet disaster-related expenses for necessary items or for serious needs.

Individual Assistance (IA)	See Human Services (HS).
Information and Planning Section	See ESF-5 - Information and Planning Section.
Infrastructure	Infrastructure is a term that refers to the public services of a community that have a direct impact on the quality of life. Infrastructure refers to communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treatment facilities, and includes an area's transportation system, regional dams or bridges, etc.
Infrastructure Support (IS)	IS (also known as Public Assistance, PA) is Federal financial assistance provided by FEMA under the Stafford Act (Section 406) to state and local governments or to eligible private non-profit organizations for disaster-related requirements.
Intensity	Intensity is a measure of the effects of an earthquake at a particular place. Intensity depends not only on the earthquake magnitude, but also on the distance from the earthquake epicenter and on the local geology.
Interagency Hazard Mitigation Team (IHMT)	IHMT is the mitigation team usually activated following major disasters, pursuant to the Office of Management and Budget directive and subsequent Federal Interagency Agreement. Shortly following a Presidential declared disaster, the IHMT, composed of Federal, state, and local officials, develops a report identifying post-disaster mitigation opportunities and common post-disaster recovery policies.
Landslide	A landslide refers to the processes and landforms involving the downslope movement, under gravity, of masses of soil and rock material.
Magnitude	Magnitude is a measure of the strength of an earthquake or the strain of energy released, as determined by seismic observations.
Major Disaster	As defined under Public Law 93-288, a major disaster is any natural catastrophe (including any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or any fire, flood, or explosion in any part of the United States, which in the determination of the President, causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Act.
Mission Assignment	Mission Assignments are mechanisms whereby FEMA can task another Federal entity to provide specified resources beyond their usual authorities and resources. Mission Assignments are appropriate in situations where the required resource or expertise is of a critical nature, unique, time sensitive, and where the nature of the requirement can be best met by an OFA.
Mitigation	Mitigation refers to sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.
Mobile Emergency Response Support (MERS)	MERS is a rapidly deployable resource operated by FEMA that provides immediate communications, logistics, and life support capabilities at a disaster site.

Mobile Mitigation Assistance Vehicle (MMAV)

An MMAV is a recreational vehicle (RV) equipped with educational tools and assigned trained mitigation counselors. The MMAV is used to implement a mobile community-based mitigation outreach program; it allows FEMA staff to provide damage prevention guidance and information to disaster-affected individuals in scattered locations and provides ancillary support to disseminate information about the Disaster Assistance Tele-registration process.

National Earthquake Hazards Reduction Program (NEHRP)

Created by Congress in 1977 to mitigate earthquake losses by providing technical and educational assistance to communities threatened by earthquakes, NEHRP is intended to mitigate earthquake losses through development and implementation of seismic design and construction standards and techniques; technical assistance materials; education and risk reduction programs; centers addressing specific aspects of the earthquake problem; and dissemination of earthquake information.

National Emergency Management Information Systems (NEMIS)

NEMIS is a computer-based data management and communications network that links FEMA and states. The network provides necessary databases, e-mail, and software applications to enable on-line case management and request processing. It also serves to simplify program management responsibilities.

National Environmental Policy Act (NEPA)

Passed by Congress in 1970, this Act established a national policy for the protection and maintenance of the environment by mandating a planning process that all Federal agencies must follow. NEPA requires that FEMA carry out its responsibilities in a manner that ensures that all practical means and measures are used to protect, restore, and enhance the quality of the environment or to avoid or minimize adverse environmental consequences (44 CFR Part 10).

National Flood Insurance Program (NFIP)

NFIP makes flood insurance available to property owners in exchange for the local adoption and enforcement of a minimum floodplain management ordinance that regulates new and substantially damaged or improved development in designated flood hazard areas.

National Historic Preservation Act (NHPA)

Consideration of cultural resources by Federal agencies is mandated under Section 106 of the NHPA, as implemented under 36 CFR Part 800. Requirements include identifying significant historic properties that may be impacted by a proposed project.

National Interagency Emergency Operations Center (NIEOC)

NIEOC is the focal point for national-level coordination and response activities; it receives and disseminates information on natural and man-made disasters, prepares daily reports on emergency activities, and houses and provides direct support to the EST in operations and exercises.

National Mitigation Strategy

Introduced in 1995 by FEMA to focus national attention on mitigation, the Strategy encourages all levels of government and the private sector to identify potential hazards and take steps to reduce the risks.

National Weather Service(NWS)

The NWS prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to Federal and state entities in preparing weather and flood warning plans.

Nor'easter	Nor'easters are low-pressure systems that move along the eastern seaboard, picking up moisture from the gulf stream as they move from the central states to the northeast. There, the storm drops the accumulated moisture in the form of heavy rain or snow. Severe flooding and erosion can be associated with the rains, winds, and waves that are part of this type of storm system.
Operations Section	The Operations Section of the ERT coordinates the delivery of Federal assistance and manages the activities of various emergency teams.
Preliminary Damage Assessment (PDA)	The PDA is the basis for a state's request for Presidential disaster declaration. It is a joint FEMA/State verification of actual damages and an estimate of additional resources that will be needed because of a disaster.
Preparedness	Preparedness refers to steps taken to decide what to do if essential services break down, developing a plan for contingencies, and practicing the plan. Preparedness ensures that people are ready for a disaster and will respond to it effectively.
Probability	Probability is the numeric likelihood of an event. Theoretically, the probability of the occurrence of an event is between zero (indicating that the event never occurs) and one (indicating that the event always occurs).
Project Impact	Project Impact is a FEMA initiative to demonstrate the economic, social, and environmental benefits of pre-disaster mitigation to states, local communities, businesses, and individuals. This nationwide initiative emphasizes long-term mitigation at the local level through partnering with businesses, industry, residents, and NGOs.
Project Worksheet (PW)	The PW (formerly known as the Damage Survey Report, DSR) is the public assistance inspector's report that is reviewed by FEMA and is the basis for approving public assistance.
Public Assistance (PA)	PA is the supplementary Federal assistance provided by FEMA, under the Stafford Act, to state and local governments or certain private, non-profit organizations (other than assistance for the direct benefit of individuals and families). PA deals with repair, restoration, and replacement of damaged public infrastructure and facilities and damaged private non-profit facilities.
Rapid Needs Assessment Team (RNA Team)	The RNA Team is a small, self-sufficient, regionally based interagency team designed to deploy to the disaster location within 12 hours of activation. The Team focuses on conducting a rapid assessment to determine potential requirements for immediate resources needed for basic human needs and protection of property.
Reconstruction Information Center (RIC)	RICs are centralized facilities established by FEMA to provide individuals affected by a disaster with mitigation information on reconstruction and rebuilding techniques. A RIC may be set up at a fixed or mobile location.
Recovery	Recovery activities include rebuilding homes, businesses, and public facilities; permanent repair of roads and bridges; and restoring water, sewer, and other essential services. These activities may receive Federal supplemental disaster recovery assistance under a Presidential disaster declaration.
Regional Operations Center (ROC)	The ROC is the operations facility for the coordination of Federal response and recovery activities and is often located at the FEMA regional office. The ROC staff manages Federal field response until the DFO becomes operational.

Regional Response Plan (RRP)	The RRP applies the emergency management components of the FRP to the geographic and demographic characteristics of each of the ten Federal Regions.
Response	Response activities address the immediate and short-term effects of an emergency or disaster. Response activities include immediate actions to save lives, protect property, meet basic human needs, and restore water, sewer, and other essential services.
Richter Scale	The Richter Scale is a numerical scale of earthquake magnitude devised by seismologist C.F. Richter in 1935. Small or microearthquakes can have negative magnitude values. In theory there is no limit to the upper scale an earthquake can reach, but because of rock strength there is an actual upper limit of slightly less than 9.
Section 404 of the Stafford Act (Hazard Mitigation)	Section 404 of the Stafford Act authorizes the Hazard Mitigation Grant Program (HMGP), which provides funding for cost-effective, environmentally sound hazard mitigation measures.
Section 406 of the Stafford Act	See Infrastructure Support (IS).
Section 408 of the Stafford Act	See Human Services (HS).
Section 409 of the Stafford Act (State Hazard Mitigation Plan)	Section 409 requires states to prepare a Mitigation Plan prior to receiving any FEMA assistance under the Act. The Plan must identify and evaluate the hazards in the areas where Federal disaster relief proceeds are provided, and set forth a plan of action to mitigate those hazards.
Seismicity	The likelihood of an area being subject to earthquakes.
Situation Report (SitRep)	Daily or weekly summaries of the disaster situation, status of operations, and identification of future priorities for response and recovery operations are known as SitReps.
Small Business Administration (SBA)	In a Presidential or SBA-declared disaster, SBA can provide additional low-interest loans for mitigation measures up to 20 percent above what an eligible applicant would otherwise qualify for.
Special Flood Hazard Areas (SFHAs)	SFHAs are areas designated on Flood Insurance Rate Maps (FIRM) in which specific NFIP requirements apply.
Stafford Act	The Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100- 107 was signed into law November 23, 1988 and amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs.
State Coordinating Officer (SCO)	The SCO is appointed by the Governor to act in cooperation with the FCO.

State Hazard Mitigation Officer (SHMO)	The SHMO is the representative of state government who is the primary point of contact with FEMA, other state and Federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.
State Hazard Mitigation Team (SHMT)	The SHMT is composed of key state agency representatives, local units of government, and other public or private sector bodies or agencies. The purpose of the SHMT is to evaluate hazards, identify strategies, coordinate resources, and implement measures that will reduce the vulnerability of people and property to damage from hazards.
State Mitigation Plan	The State Mitigation Plan is a systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the state and includes a description of actions needed to minimize future vulnerability to hazards.
Strike-Slip Fault	A fault that strikes or slips parallel with the strike of the adjacent strata involved.
Sustainability Desk	The Sustainability Desk disseminates information promoting the integration of the principles and practices of sustainable development in the post-disaster recovery process. This information is developed by FEMA, in partnership with the state and through coordination with other agencies and organizations (Federal or non-Federal). There may or may not be an actual desk in the DFO or the DRCs at which an individual works or distributes publications.
Sustainability/Sustainable Development	Sustainable development maintains or enhances economic opportunity and community well being while respecting, protecting and restoring the natural environment upon which people and economies depend. Disaster resistance should be considered an important element of sustainability.
Sustainable Re-development	Sustainable re-development incorporates the concepts and practices of sustainable development into the disaster recovery process.
Tectonic Plate	Tectonic plates are torsionally rigid, thin segments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that causes seismic activity.
Teleregistration	Teleregistration refers to telephone applications for individual assistance by disaster victims. Individuals may also register for assistance in person, but Teleregistration is FEMA's preferred approach.
Temporary Housing	See Disaster Housing.
Thrust Fault	A thrust fault has a dip of 45° or less over much of its extent. Horizontal compression rather than vertical displacement is its characteristic feature.
Tornado	A tornado is a violently rotating column of air, pendant from a cumulonimbus cloud, and nearly always observable as a "funnel cloud." Tornadoes are measured in intensity by the Fujita Scale (see Fujita Scale of Tornado Intensity).

Tsunami	A tsunami is a long-period (usually 15-60 minutes) wave caused by a large-scale movement of the sea floor (from a volcanic eruption, submarine earthquake, or landslide). Although usually barely noticeable at sea, its velocity may be as high as 400 knots so that it travels great distances and in shoal water may reach heights of up to 15 meters.
Volunteer Agency (VOLAG)	A VOLAG is any chartered or otherwise duly recognized tax-exempt local, state, or national organization or group that provides needed services to the states, local government, or individuals in coping with a disaster.
Wide Area Network (WAN)	A WAN interconnects computer users in a geographic area larger than those serviced by local area networks.

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Appendix B

Acronyms

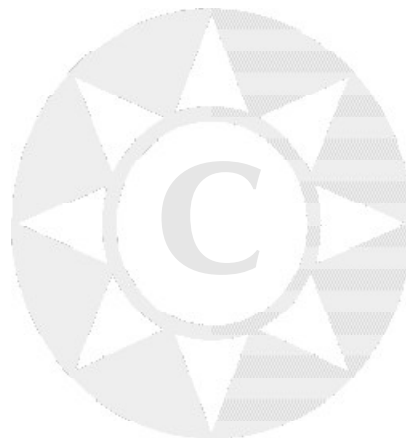
Many of the following acronyms are used within this guidance document. However, other commonly used acronyms are included because they are used within the DFO and throughout the recovery process.

ADD	Automated Deployment Database
AIA	American Institute of Architects
APA	American Planning Association
ASCE	American Society of Civil Engineers
ASFPM	Association of State Floodplain Managers
ASLA	American Society of Landscape Architects
BCA	Benefit-cost analysis
BFE	Base flood elevation
BMP	Best Management Practices
BPAT	Building Performance Assessment Team
CA	Cooperative Agreement
CAP-SSSE	Community Assistance Program – State Support Services Element
CAR	Capability Assessment for Readiness
CAV	Community Assistance Visit
CBRS	Coastal Barrier Resources System
CDBG	Community Development Block Grant
CDRG	Catastrophic Disaster Response Group
CEQ	Council on Environmental Quality
CERT	Community Emergency Response Team
CHER-CAP	Comprehensive HAZMAT Emergency Response/Capability Assessment Program

CR	Community Relations
CRS	Community Rating System
CZMA	Coastal Zone Management Act
DAE	Disaster Assistance Employee
DEM	Digital Elevation Model
DFCO-M	Deputy Federal Coordinating Officer for Mitigation
DFO	Disaster Field Office
DOE	U.S. Department of Energy
DISC	Disaster Information Systems Clearinghouse
DPIG	Disaster Preparedness Improvement Grant Program
DRC	Disaster Recovery Center
DRM	Disaster Recovery Manager
DSR	Damage Survey Report
DTE	Disaster Temporary Employee
EDA	Economic Development Administration
EJPA	Environmental Joint Powers Agreement
EMI	Emergency Management Institute
EMPG	Emergency Management Performance Grant
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ER	Emergency Response
EREN	Energy Efficiency and Renewable Energy Network
ERT	Emergency Response Team
ERT-N	National Emergency Response Team
ESA	Endangered Species Act
ESF	Emergency Support Function
EST-M	Emergency Support Team - Mitigation
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
FIA	Federal Insurance Administration
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance Program
FPI	Fire Potential Index
FRP	Federal Response Plan

GAR	Governor's Authorized Representative
GIS	Geographic Information System
HAZMAT	Hazardous Materials
HAZUS	Hazards United States
HIRA	Hazard Identification and Risk Assessment
HMGP	Hazard Mitigation Grant Program
HMTAP	Hazard Mitigation Technical Assistance Program
HP	Hurricane Program
HS	Human Services
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
IA	Individual Assistance
IBC	International Building Code
ICC	Increased Cost of Compliance
IFG	Individual and Family Grant Program
IHMT	Interagency Hazard Mitigation Team
IS	Infrastructure Support
MDZ	Minimum Density Zoning
MEMA	Massachusetts Emergency Management Agency
MERS	Mobile Emergency Response Support
MMAV	Mobile Mitigation Assistance Vehicle
MMI	Modified Mercalli Intensity
MOA	Memorandum of Agreement
NDSP	National Dam Safety Program
NEHRP	National Earthquake Hazards Reduction Program
NEMIS	National Emergency Management Information System
NEPA	National Environmental Policy Act
NFDRS	National Fire Danger Rating System
NFIP	National Flood Insurance Program
NGO	Nongovernmental Organization
NHCEM	New Hanover County Emergency Management
NHPA	National Historic Preservation Act
NIBS	National Institute of Building Standards
NIEOC	National Interagency Emergency Operations Center

NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservation Agency
NWS	National Weather Service
OFA	Other Federal Agency
OSEC	Office of Sustainable Ecosystems and Communities
PA	Public Assistance
PAS	Planning Advisory Service
PCSD	President's Council on Sustainable Development
PDA	Preliminary Damage Assessment
PI	Project Impact
PIO	Public Information Officer
PVB	Polyvinyl Butyrol
PW	Project worksheet
RIC	Reconstruction Information Center
RNA-Team	Rapid Needs Assessment Team
ROC	Regional Operations Center
RRP	Regional Response Plan
SBA	Small Business Administration
SCO	State Coordinating Officer
SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SHMT	State Hazard Mitigation Team
SHPO	State Historic Preservation Office
SitRep	Situation Report
SOP	Standard Operating Procedures
UMWB	Upper Mystic Watershed Basin
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOLAG	Volunteer agency
WAN	Wide Area Network
WWTP	Wastewater treatment plant



Appendix C

Websites

Extensive information is available over the Internet regarding programs, references, case studies and resources that can support the advancement of sustainable development. The following is not an exhaustive listing, but does include governmental, non-profit, academic, and international sites that can provide links to more specific information.

Advisory Council on Historic Preservation

<http://www.achp.gov>

The Advisory Council on Historic Preservation is an independent Federal agency that provides a forum for influencing Federal activities, programs, and policies as they affect historic resources. Its mission is to promote the protection and enhancement of those resources. The goal of the National Historic Preservation Act (NHPA), which established the Council in 1966, is to have Federal agencies as responsible stewards of our nation's resources when their actions affect historic properties. The Council is the only entity with the legal responsibility to balance historic preservation concerns with Federal project requirements.

The American Planning Association

<http://www.planning.org>

The American Planning Association is organized to advance the art and science of planning and to foster the activity of planning—physical, economic, and social—at the local, regional, state, and national levels. The objective of the Association is to encourage planning that will contribute to public well-being by developing communities and environments that meet the needs of people and society more effectively. APA works in conjunction with FEMA to integrate disaster mitigation into comprehensive planning throughout the nation.

Association of State Floodplain Managers

<http://www.floods.org/>

The Association of State Floodplain Managers (ASFPM) supports comprehensive nonstructural and structural management of the nation's floodplains and related water

resources. The ASFPM believes that, through coordinated, well-informed efforts, the public and private sectors can:

1. Reduce loss of human life and property damage resulting from flooding,
2. Preserve the natural and cultural values of floodplains, and
3. Avoid actions that exacerbate flooding.

The ASFPM is an organization of professionals involved in flood hazard mitigation, floodplain management, flood preparedness, warning and recovery as well as the National Flood Insurance Program. This website offers access to information on the many conferences and workshops the association holds throughout the year, often in cooperation with FEMA or local agencies. There is a link to the Honduras Project, where ASFPM is working with the Pan American Development Foundation and Honduran floodplain professionals to speed that country's recovery from Hurricane Mitch. The Association offers a Certified Floodplain Manager Program, as well as awards and graduate fellowships.

The Building Seismic Safety Council **<http://www.bssconline.org>**

The Building Seismic Safety Council (BSSC) was established in 1979 under the auspices of the National Institute of Building Sciences as an entirely new type of instrument for dealing with the complex regulatory, technical, social, and economic issues involved in developing and promulgating building earthquake risk mitigation regulatory provisions that are national in scope. By bringing together in the BSSC all of the needed expertise and all relevant public and private interests, it was believed that issues related to the seismic safety of the built environment could be resolved and jurisdictional problems overcome through authoritative guidance and assistance backed by a broad consensus.

The BSSC is an independent, voluntary membership body representing a wide variety of building community interests. Its fundamental purpose is to enhance public safety by providing a national forum that fosters improved seismic safety provisions for use by the building community in the planning, design, construction, regulation, and utilization of buildings.

BSSC has a variety of publications including *The (HAZUS) Natural Hazard Estimation* and *The Construction Criteria Base (CCB)*.

Center for Livable Communities **<http://www.lgc.org/clc>**

The Center for Livable Communities is a national initiative of the *Local Government Commission* (LGC). A nonprofit, nonpartisan membership organization of elected officials, city and county staff, and other interested individuals throughout California and other states, the LGC helps local governments identify and implement solutions to today's problems.

The Center for Livable Communities helps local governments and community leaders be proactive in their land use and transportation planning, and adopt programs and policies that lead to more livable and resource-efficient land use patterns. Center programs can help jurisdictions expand transportation alternatives, reduce infrastructure costs, create more affordable housing, improve air quality, preserve

natural resources, conserve agricultural land and open space, and restore local economic and social vitality.

Center for Renewable Energy and Sustainable Technology

<http://solstice.crest.org/index.shtml>

The Center for Renewable Energy and Sustainable Technology (REPP-CREST) and the Renewable Energy Policy Project Internet information service (Solstice) provides information on sustainable energy initiatives. This site contains information and links on renewable energy including bioenergy, geothermal, hydrogen, solar and wind energy. There are also links about energy efficiency in buildings, appliances, and other infrastructure, as well as information and guides to sustainable living.

City of Austin: Green Building Program

<http://www.ci.austin.tx.us/greenbuilder/>

Part of the Austin City Connection page in Austin, Texas, this site provides useful information on resources related to sustainable building practices, products, and techniques. The site profiles publications such as The Sustainable Building Sourcebook, developed for the Austin Green Builder Program. In-depth reviews of sustainable building products and methods and information on where to access unbiased information are available at Environmental Building New Beta Site. The **Green Building Program** encourages construction professionals and consumers to incorporate sustainable building practices, systems, and materials into residential and commercial construction.

The Coastal Society

<http://www.thecoastalsociety.org>

The Coastal Society is an organization of private sector, academic, and government professionals and students dedicated to actively addressing emerging coastal issues by fostering dialogue, forging partnerships, and promoting communication and education.

Empowerment Zones and Enterprise Communities (EZ/EC)

<http://www.ezec.gov/>

This site details the EZ/EC Program, a Presidential Initiative implemented to revitalize distressed communities across the U.S. by rebuilding a sense of community and restoring economic opportunities for all citizens. It provides maps and lists of the EZ/EC communities as well as links to community home pages. It includes resources such as U.S. codes, successful economic development practices, and publications.

Energy Efficiency and Renewable Energy Network

<http://www.eren.doe.gov/>

This site is the home page of the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EREN). The site provides links to information on the whole spectrum of energy-efficiency and renewable energy topics, as well as a list of key contacts and a list of hot topics (the federal budget, for example). EREN offers access to DOE's national laboratory databases on a host of topics, such as solar access and wind regimes.

The EPA s Green Communities Assistance Kit

http://www.epa.gov/region03/greenkit/q5_disas.htm

The Green Communities Assistance Kit is designed as a comprehensive reference guide for identifying and resolving needs, interests, and problems for a range of communities - urban, suburban, and rural. Included in its topical tools is the Tools for Natural Disasters page offering a lengthy list of Internet resources divided into Policy and Planning Tools, Regulatory Tools, Technical Tools, and Financial Tools. Find everything from hurricane preparedness training and guidelines to disaster response and recovery programs.

The Farm Service Agency (FSA) s Natural Disaster Assistance

<http://www.fsa.usda.gov/pas/disaster/assistance1.htm>

This site deals with hazards that affect America s farmers and ranchers. The information covers earthquakes, tornadoes, hurricanes, or other natural events that can severely damage agricultural operations.

Farming or ranching operations that suffer a loss due to a natural disaster may be eligible for assistance under one or more of the following FSA programs:

- The Emergency Conservation Program (ECP)
- The Noninsured Crop Disaster Assistance Program (NAP)
- Emergency Loan (EM) Assistance
- Emergency Haying and Grazing Assistance

This link provides information on what kind of help is available, who may be eligible for it, and how to go about applying for FSA emergency assistance.

Federal Emergency Management Agency

<http://www.fema.gov/MIT/fldmitast.htm>

This site provides information for Flood Mitigation Assistance, Mitigation Assistance Program, Sustainability and Sustainable Re-development, and Community Assistance Program.

Firewise

<http://www.firewise.org>

The Firewise website was created for people who live or vacation in fire-prone areas of North America. The site will acquaint people with the challenges of living in areas susceptible to wildfire. It provides information that may lessen the risk of wildfire loss and includes a list of offline wildfire protection information as well as links to off-site fire resources.

A Guide to Internet Resources in Sustainable Development

<http://www.caf.wvu.edu/gdsouzawww/guide.html>

Partial list of Internet servers or World Wide Web sites (governmental, university, private, or other) relating to sustainable development. A brief description of the contents of each site is also provided. In most cases, these sites provide information on and links to a host of topics in addition to sustainability. A specific document is

often located several levels away from the main menu or initial link to the site, and therefore searching the menu or file hierarchy may be necessary.

The material in this Guide is organized into five sections: I.) Web sources of information on sustainability; II.) Gopher or Telnet Sources; III.) Organizations that provide sustainability-related information on the Internet; IV.) Newsgroups that include information on sustainability; and V.) List Servers or Discussion Groups.

HUD Community Planning and Development

<http://www.hud.gov/cpd/cpdhome.html>

This site provides access to many U.S. Department of Housing and Urban Development (HUD) programs that can serve as resources for sustainability efforts. Topics include community development, affordable housing, and energy/environment.

Institute for Business and Home Safety

<http://www.ibhs.org>

The Institute for Business & Home Safety (IBHS) is an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters. Its mission is to make natural disaster safety a core public value and to make disaster resistance an important consideration in the home and work environments.

Joint Center for Sustainable Communities

<http://www.usmayors.org/USCM/sustainable>

The ***Joint Center for Sustainable Communities*** represents an important collaboration between the **U.S. Conference of Mayors (USCM)** and the **National Association of Counties (NACo)** on behalf of our nation's communities. Its primary mission is to provide a forum for cities and counties to work together to develop long-term policies and programs that will lead to job growth, environmental stewardship and social equity—the three pillars of sustainable communities. The Joint Center is helping local elected officials build sustainable communities by promoting community leadership initiatives, providing technical assistance and training, and conducting community policy and educational forums. The overall goal of the Joint Center is to provide local elected officials with assistance in using the policies and tools necessary for creating sustainable communities.

Mitigation Success Stories (FEMA)

http://www.fema.gov/mit/sstory/sstory_q1.cfm

FEMA has a new web page for **collecting Mitigation Success Stories** or for searching for success stories in communities. The reader may search by a variety of categories, including state or community name, hazard type, project type. Through the sharing of mitigation success stories, communities can share their experience about the steps required to reduce risks associated with disasters. This web page allows the reader to view other projects, see how they were accomplished, and what benefits were derived, or to tell others about the projects your community has successfully supported. If a community shares its story, that information may be made available on this web

page for visitors to this site and thereby communities can encourage each other by good example.

National Association of Development Organizations Sustainable Development Links

<http://www.nado.org/links/index.html#SD>

The National Association of Development Organizations (NADO) provides training, information, and representation for regional development organizations in small metropolitan and rural America. The Association, a public interest group founded in 1967, is the largest and leading advocate for a regional approach to community, economic and rural development and provides a network for its members to share ideas and innovations.

National Council on Sustainable Development

<http://www.ncsdnetwork.org/>

The goal of the National Council for Sustainable Development (NCSD) is to: 1) promote sustainable development at the national level, 2) assist governments in decision-making and policy formulation, and 3) follow-up the implementation of international processes related to sustainable development. The NCSD is a mechanism for implementing sustainability as expressed in Agenda 21, the plan of action agreed to by national governments at the Earth Summit held in Rio in 1992. The NCSD concept legitimizes the role of civil society as a partner with government in making policy for implementing the sustainable development agenda and to move it from agenda to action. It brings together different major groups within society to get a balanced agreement on policies and activities for sustainability.

National Institute for Building Standards

<http://www.nibs.org/nibshome.htm>

The National Institute of Building Sciences (NIBS) was authorized by the U.S. Congress in recognition of the need for an organization that could serve as an interface between government and the private sector. The Institute's public interest mission is to: improve the building regulatory environment, facilitate the introduction of new and existing products and technology into the building process, and disseminate nationally recognized technical and regulatory information. Through NIBS, Congress established a public/private partnership to enable findings on technical, building-related matters to be used effectively to improve government, commerce, and industry. NIBS is a non-profit, non-governmental organization bringing together representatives of government, the professions, industry, labor and consumer interests to focus on the identification and resolution of problems and potential problems that hamper the construction of safe, affordable structures for housing, commerce and industry throughout the U.S.

The Natural Hazards Center at the University of Colorado

<http://www.colorado.edu/hazards/index.html>

The Natural Hazards Research and Applications Information Center is an international clearinghouse of information on natural hazards and human adjustments

to these risks. The Center's prime goal is to increase communication among hazard/disaster researchers and those individuals, organizations and agencies that are actively working to reduce disaster damage and suffering. The Center carries out its mission in four principal areas: information dissemination, research, library services, and an annual workshop.

Available at the site are Quick Response Reports resulting from timely analysis of damages from various natural disasters. The library provides access to HazLit, an online bibliographic database of the University of Colorado's extensive collection of social science literature regarding the effects natural disasters have on society. The library also has a fee-based custom search service to help with more specific needs.

NOAA Coastal Services Center

<http://www.csc.noaa.gov>

The NOAA Coastal Services Center works with various branches of NOAA and other federal agencies to bring information, services, and technology to the nation's coastal resource managers. The Center is a partner in over 100 ongoing projects geared to resolve site specific coastal issues.

Operation Fresh Start

<http://www.sustainable.doe.gov/freshstart/>

Operation Fresh Start is an initiative designed to help individuals and communities incorporate sustainable principles and technologies into their plans when they recover from a flood, earthquake, or other disaster. Sponsored by the Department of Energy's Office of Energy Efficiency and Renewable Energy, Operation Fresh Start is a gateway to information from a variety of federal agencies that deal with disaster recovery.

Partnership for Advancing Technology in Housing

<http://www.pathnet.org>

The Partnership for Advancing Technology in Housing (PATH) is a voluntary initiative that seeks to accelerate the creation and widespread use of advanced technologies to improve radically the quality, durability, environmental performance, energy efficiency, and affordability of the Nation's housing. PATH links key agencies in the federal government with leaders from the home building, product manufacturing, insurance, financial and regulatory communities in a unique partnership focused on technological innovation in the American housing industry.

Planners Web City and Regional Planning Resources

<http://www.plannersweb.com/>

The Planners Web is a broad resource for local or regional planners designed to provide informative articles through the *Planning Commissioners Journal* publication, which are available for purchase and download. The Planners Web contains agency links and resources for planners addressing the issues of sprawl, zoning, and dealing with the public regarding hotly debated planning topics. The site also surveys both the ten most successful and detrimental planning events that helped shape American planning as it is today. Other information available from this site includes a search

engine for articles and information on the restoration and preservation of natural resources and the development of green spaces in today's planning initiatives.

Rebuild America

<http://www.eren.doe.gov/buildings/rebuild>

Rebuild America is a program of the **U.S. Department of Energy (DOE)** that focuses on energy solutions as community solutions. Rebuild America partners with small towns, large metropolitan areas, and Native American tribes, creating a large network of peers. Rebuild America supports communities with access to **DOE Regional Offices, State Energy Offices, National Laboratories**, utilities, colleges and universities, and non-profit agencies.

Rocky Mountain Institute

<http://www.rmi.org>

Rocky Mountain Institute is a nonprofit research and educational foundation with a vision across political boundaries. Its mission is to foster the efficient and sustainable use of resources as a path to global security. The Institute creates, and helps individuals and the private sector to practice new solutions to old problems—mainly by harnessing the problem-solving power of market economics and of advanced techniques for resource efficiency.

Small Business Administration, Disaster Assistance Division

<http://www.sbaonline.sba.gov/DISASTER/>

The purpose of the SBA's Disaster Loan Program is to offer financial assistance to those who are trying to rebuild their homes and businesses in the aftermath of a disaster. By offering low-interest loans, the SBA is committed to long-term recovery efforts including hazard mitigation.

Sustainable Architecture

<http://www.aloha.net/~laumana/index.html>

This is an archive of information about sustainable architecture: ecological planning, design, integrated architecture, and landscaping for tropical, sub-tropical or temperate climates.

Sustainable Business Network

<http://sbn.netforchange.com>

The Sustainable Business Network (SBN) is a project of the EnviroLink Network and has been in existence since 1996. Its mission is to promote the growth and development of environmentally and socially responsible businesses, providing the tools and information necessary to make sustainable business a prominent global economic force.

Sustainable Communities Network

<http://www.sustainable.org>

This website discusses aspects of creating a community, smart growth, growing a sustainable economy, protecting natural resources, sustainable governing and sustainable living. It also contains case studies and links to sustainable communities.

United Nations International Strategy for Disaster Reduction

<http://www.unisdr.org/>

The UN Secretary-General proposed the International Strategy for Disaster Reduction (ISDR) as a successor to the International Decade for Natural Disaster Reduction (which ended in December 1999). A key aspect of the mission of the ISDR is to influence decision-makers and help communities focus on the creation of long-term, pro-active disaster prevention strategies. Its secondary mission is to help communities reduce the risk of longer-term social and economic disruption in the face of a natural hazard. This site provides information on various ISDR initiatives such as Public Awareness, Disaster-Resistant Communities, and El Nino. Numerous events are highlighted, including conferences on specific topics or regional areas and seminars & training classes.

United Nations Sustainable Development

<http://www.un.org/esa/sustdev>

The Commission on Sustainable Development (CSD) was established as a functional commission of the Economic and Social Council. Its role is threefold:

1. To review progress at the international, regional and national levels in the implementation of recommendations and commitments contained in **Agenda 21: The Rio Declaration on Environment and Development** and the **Forest Principles**.
2. To elaborate policy guidance and options for future activities to follow up UNCED (the Rio Conference) and achieve sustainable development.
3. To promote dialogue and build partnerships for sustainable development with governments, the international community, and the major groups identified in Agenda 21 as key actors outside the central government. These groups have a major role to play in the transition towards sustainable development, and include women, youth, indigenous peoples, non-governmental organizations, local authorities, workers and trade unions, business and industry, the scientific community, and farmers.

U.S. Department of Energy's Center of Excellence for Sustainable Development

<http://www.sustainable.doe.gov>

This site offers a menu of information and services on how communities can adopt sustainable development as a strategy for well being. Increasingly cities, villages, neighborhoods, and regions are using sustainable development as a guiding principle not only for near-term projects, but also for planning purposes. Sustainable projects strengthen local economies; improve and protect the quality of the environment; and enhance the quality of life and the well being of all people in communities.

This site describes communities that have discovered the benefits of sustainable development. There are links to help the reader locate technical and financial resources to help communities plan and carry out sustainable development projects and also links to access model codes and ordinances other communities have used to implement sustainable development.

U.S. Green Building Council

<http://www.usgbc.org>

The Council's mission is to accelerate the adoption of green building practices, technologies, policies, and standards. This committee-based organization is endeavoring to move the green building industry forward with market-based solutions. Another vital function of the Council is linking industry and government. The U.S. Green Building Council has formed effective relationships and priority programs with key Federal agencies, including the U.S. DOE, EPA, NIST, and GSA.

White House Livable Communities Initiative

<http://www.livablecommunities.gov/>

The White House Task Force on Livable Communities was created by the Clinton-Gore Administration in August 1999 to coordinate livable community policies and activities across 18 agencies of the executive branch of the Federal government. The Task Force is working to expand the choices available to communities to improve their quality of life, provide increased access to Federal information and data, and foster community partnerships.

The goal of the effort is to help revitalize communities, encourage new investments, bring historic neighborhoods back to life, develop alternative transportation methods, increase regional cooperation, protect the environment, create parks, preserve open spaces, and foster smarter growth.

World Business Council for Sustainable Development

<http://www.wbcsd.ch>

The World Business Council for Sustainable Development (WBCSD) is a coalition of some 130 international companies united by a shared commitment to sustainable development, i.e. environmental protection, social equity and economic growth.

In broad terms, the WBCSD aims to develop closer co-operation between business, government, and all other organizations concerned with the environment and sustainable development. They also encourage high standards of environmental management in business itself.

More specifically, the objectives are:

Business leadership: To be the leading business advocate on issues connected with the environment and sustainable development;

Policy Development: To participate in policy development in order to create a framework that allows business to contribute effectively to sustainable development;

Best Practice: To demonstrate progress in environmental and resource management in business and to share leading-edge practices among members;

Global Outreach: To contribute through the global network to a sustainable future for developing nations and nations in transition.

World Resources Institute Sustainable Development Information Service

<http://www.wri.org/sdis/>

The **Sustainable Development Information Service (SDIS)** provides country-level data about sustainable development and the environment. SDIS helps users identify and locate the best available information and in many cases provides direct access to online resources.

SDIS was developed by the World Resources Institute, in collaboration with the World Conservation Union (IUCN), and the International Institute for Environment and Development (IIED) as part of the International Environment and Natural Resource Assessment Information Service (INTERAISE). It was funded by the Netherlands Ministry of Foreign Affairs, and the U.S. Environmental Protection Agency.

World Wide Web Virtual Library Sustainable Development

<http://www.ulb.ac.be/ceese/meta/sustvl.html>

This site has a comprehensive list of Internet sites dealing with sustainable development, including organizations, projects and activities, electronic journals, libraries, references and documents, databases, directories or meta-databases.

Keywords: sustainable development, index, environment, development, resources, internet, world wide web, sites, durable, sustainability, Virtual Library, ecological economics.

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Appendix D

Recommended Readings in Sustainable Development

Introduction

The resources used in this Guide are categorized by content and relevance. The materials cited in Section I are strongly recommended readings that contain important resources for long-term sustainable redevelopment, hazard mitigation and recovery operations. Section II contains additional references, which will assist sustainability planners and community leaders in making informed decisions about the future of disaster-prone communities. Where possible, information and links have been provided for assistance in obtaining copies of these resources.

Section I. Recommended Reading

American Planning Association. 1998. *Growing Smart Legislative Guidebook: Model Statutes for Planning and Management of Change*. Chicago: American Planning Association Publications Office.

In *Growing Smart Legislative Guidebook: Model Statutes for Planning and Management of Change*, the American Planning Association addresses the need for new planning regulations in order to accomplish smart growth and the integration of such regulations on the state and regional levels. *Guidebook* emphasizes that states and regions have vastly differing needs in the present, and in the future, according to their location, population, and resources. To facilitate these distinct planning requirements, model statutes are highlighted in the text that gives examples of state, regional, and local alternatives according to their diverse needs. Also examined are the mechanisms for changing planning policy, and shifting the community's acceptance of policy changes that affect them.

Association of State Floodplain Managers, Inc. and The Federal Interagency Floodplain Management Task Force. 1996. Addressing Your Community's Flood Problems. Madison, Wisconsin: ASFPM.

Designed specifically for elected officials, *Addressing Your Community's Flood Problems* was created by The Federal Interagency Floodplain Task Force in 1996. The booklet provides strong guidance for local administrators in understanding their role as a leader relevant to the issues of flooding. Issues include potential flood losses, avoiding damages, coping with flood recovery, and utilizing available resources both before and after a flood disaster. Also included are the stories of four local governments that successfully addressed their flood problems while simultaneously achieving multiple community goals. Copies of this document are available from ASFPM Executive Office, 4233 West Beltline Highway, Madison, Wisconsin 53711.

Burby, Raymond J. 1998. Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities. Washington: Joseph Henry Press.

Multiple experts in the fields of land use management and natural hazards contributed to Raymond Burby's 1998 text, *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*. This valuable reference document is one of the first to link sustainability to disaster recovery. It explores the concepts of accomplishing sustainable development through land use management and identifies the current need for, and lack of, effective sustainable planning approaches in public policy today. *Nature*, ISBN# 0-309-063262-0 is available from the Joseph Henry Press, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.

Economic Development Administration and the Federal Emergency Management Agency. January 2000. Economic Impact Assessment of Hurricane Floyd for North Carolina. Washington, D.C.

The Economic Development Administration (EDA) and FEMA combined their efforts with those of several universities in North Carolina and local agencies to produce the *Economic Impact Assessment of Hurricane Floyd for North Carolina*. Hurricane Floyd struck the North Carolina coast on September 15th and 16th, 1999, leaving approximately thirty counties with damages ranging from moderate to devastating levels of severity. The purpose of the *Economic Impact Assessment* was to provide advice for speeding the business recovery process, particularly for small businesses suffering the greatest losses, and creating disaster resistant businesses and jobs through the recovery process.

Federal Emergency Management Agency. 1995. Disaster Assistance: A Guide to Recovery Programs. Washington: GPO.

The purpose of *Disaster Assistance: A Guide to Recovery Programs*, is to provide officials, businesses, and residents alike, with information concerning disaster assistance. Created in 1995 by FEMA, the text provides an extensive list of disaster-specific and disaster-applicable programs, and financial and non-financial agencies that may be of help in either planning disaster-resistant communities, or in post-

disaster operations. Aside from Agency names, the text details the type of assistance offered and explains who is eligible for assistance.

Federal Emergency Management Agency. 1993. Emergency Management Guide for Business & Industry. Washington: GPO.

The *Emergency Management Guide for Business & Industry: A Step-By-Step Approach to Emergency Planning, Response, and Recovery for Companies of All Sizes*, is a collective public and private agency effort, sponsored by FEMA in 1993. It is an effort to educate businesses about emergencies, ranging from floods, fire, earthquakes, and tornadoes, to civil disturbances and radiological accidents. Although it avoids the term disaster its purpose is to guide companies of any size through identifying possible hazards, their vulnerability, and the development process for emergency planning, and finally, implementation of the plans.

Federal Emergency Management Agency. 1997. Multi Hazard Identification and Risk Assessment: The Cornerstone of the National Mitigation Strategy. Washington: GPO.

In 1997, FEMA published the *Multi Hazard Identification and Risk Assessment*. This reference helps to refine our understanding of hazards and their impacts on people. For each specific natural and technological hazard, the report summarizes the state of scientific and technical knowledge on the identification of hazards, and the risks that have been or can be assigned to each hazard. Also, FEMA's risk assessment methodology, HAZUS is introduced.

Federal Emergency Management Agency. 1990. Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments. DAP-12. Washington: GPO.

This guidance, often referred to as DAP-12, should be used as a reference document by officials involved in the development of hazard mitigation plans. The primary focus of this hazard mitigation planning manual is Section 409 of the Stafford Act. The reader is provided with details of the four main components of hazard mitigation planning. These include responsibilities of Federal, state, and local officials in mitigation planning; initiating the process of developing a hazard plan; developing the hazard mitigation plan; and implementing and monitoring plans.

Federal Emergency Management Agency. 2000. Mitigation Field Operations Manual. Washington: GPO.

The *Mitigation Field Operations Manual* describes the functions to be performed by mitigation field management and staff as integral parts of the total FEMA response to catastrophic disasters. This manual was developed to provide structured and standardized operational procedures. The manual presents specific details on the operations, functions, organization, and programs instituted for the effective achievement of mitigation through national approaches. These approaches incorporate state and local communities into the disaster prevention and emergency response process. The manual is also designed to provide mitigation professionals with a comprehensive reference tool for reducing long-term hazard risks.

Federal Emergency Management Agency. 2000. The Natural and Beneficial Functions of Floodplains: Reducing Flood Losses by Protecting and Restoring the Floodplain Environment: A report for Congress by the Task Force on the Natural and Beneficial Functions of Floodplains. Washington: GPO.

The Task Force on the Natural and Beneficial Functions of Floodplains was established by Congress to help identify the natural functions and benefits of floodplains, and determine how the nation can reduce flood losses through floodplain restoration and protection. In their 2000 publication, *The Natural and Beneficial Functions of Floodplains*, the Task Force explores the valuable functions of pristine or restored floodplains and their contributions to flood reduction and prevention. The document also reveals the damages historically resulting from human development in flood hazard areas, but also explores the biological, environmental, social and economic functions and values of floodplains, along with restoration and protection initiatives.

Federal Emergency Management Agency. 1999. The President's Long-Term Recovery Action Plan: Puerto Rico, Hurricane George September 1998. Washington: GPO.

The President's Long-Term Recovery Action Plan: Puerto Rico, is an example of the type of document produced when the President's Long-Term Recovery Task Force is called into operation. This example was chosen because it is the first time that the President's Long-Term Recovery Task Force looked at the issue of sustainability, and incorporating that ideal into the recovery process. Hazard mitigation and sustainability, addressed through building codes, planning, and floodplain management, was a key element of the recovery operations. The actions of Federal entities for both the recovery and prevention of future disasters are examined in detail.

Mileti, Dennis S. 1999. Disasters by Design: a Reassessment of Natural Hazards in the United States. Washington: Joseph Henry Press.

Disasters by Design offers a way to view, study, and manage hazards in the U.S. that will help foster disaster-resistant communities, higher environmental quality, inter- and intragovernmental equity, economic sustainability, and an improved quality of life. The volume provides an overview of what is known about natural hazards, disasters, recovery, and mitigation. It reveals how findings have been translated into policies and programs, and advances a sustainable hazard mitigation research agenda. ISBN# 0-309-06360-4 is available from the Joseph Henry Press, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.

Planning for Natural Hazards: Oregon Technical Resource Guide. 2000. Oregon Department of Land Conservation and Development.

This guide is part of the state's response to damaging flood and landslide events in 1996 and 1997. The guide is written for a wide audience and will be a useful tool for anyone from city clerk to planning commissioner. It provides valuable information on how to identify, plan for, and address natural hazards in a user-friendly format. It also directs local governments to additional resources and information that may be needed to solve local problems. The overall emphasis of this guide is on strengthening local comprehensive land use plans. Many aspects of the guide are specific to Oregon, but could easily be adapted for use nation wide.

The President's Council on Sustainable Development. May 1999. Towards a Sustainable America: Advancing Prosperity, Opportunity, and a Healthy Environment for the 21st Century. Washington: GPO.

The President's Council on Sustainable Development was formed in 1993. *Towards a Sustainable America* is the third publication by the Council, aimed at promoting the benefits of sustainable development for an enduring, prosperous and healthy nation. This report encompasses the reduction of greenhouse gases, strategies for environmental management into the 21st century, strengthening partnerships between agencies and communities, and the development of U.S. regulations that would benefit international sustainable development policy. To obtain a copy of this report, contact: President's Council on Sustainable Development Publications at (800) 363-3732, or at the Council's Website: <http://www.whitehouse.gov/PCSD>.

United Nations Environment Programme. 1998. Sustainable Business: Economic Development and Environmentally Sound Technologies. London: The Regency Corporation Limited.

In an effort to shepherd business and industry towards environmentally sound technologies that result in higher production and less waste, the United Nations Environment Programme created *Sustainable Business* in 1998. The report explains and encourages environmental conservation, whose success depends on the development, support, and use of environmentally sound technologies. Resources discussed include energy and water, and renewable energy resources. The movement away from heavy-polluting industry, including the costs of technology upgrades and the roles of regulatory agencies in the transition are also discussed. Copies of the report may be ordered through: Regency Corporation Limited, Gordon House, 6 Lissenden Gardens, London NW5 1LX, UK, or from <http://www.regencycorp.com>.

Urban Land Institute. 1998. Smart Growth: Economy, Community, Environment. ULI on the Future. Washington: GPO.

The Urban Land Institute in *Smart Growth: Economy, Community, Environment*, presents an instructive look at the integral concepts of Smart Growth and Sustainability. Topics in the text include the benefits of infill development and redevelopment for cities and suburbs alike, transportation alternatives, and residential density policies and planning practices. Other issues detailed are state initiatives that foster smart growth and the elements of successful metropolitan redevelopment. The text, ISBN# 0-87420-862-9 is available from the ULI at 1025 Thomas Jefferson Street, N.W., Washington, D.C. 20007-5201.

Washington State Community, Trade and Economic Development. 1998. Optional Comprehensive Plan Element for Natural Hazard Reduction. Washington State.

This guidebook was designed to provide Washington cities and counties with the necessary tools for implementing effective hazard mitigation policy into their community plans. The guidebook is targeted to Washington planners with little or minimal experience, and is based on various scenarios regarding resources and population, etc. The guidebook encompasses hazards such as landslides, fire and floods, and guides planners from defining a need for hazard mitigation, through mitigation policy, to the development and implementation of hazard mitigation plans.

Section II. Additional References

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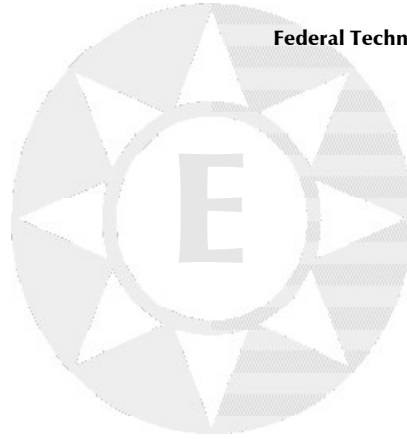
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Appendix E

Federal Technical Assistance and Funding

The Federal Government offers a wide range of funding and technical assistance programs to help make communities more sustainable and livable. Many of these are included in the following Federal Technical Assistance and Funding Matrix. Programs with potential effectiveness in the construction or reconstruction of housing and businesses, public infrastructure (transportation, utilities, water, and sewer), and supporting overall hazard mitigation and community planning objectives are emphasized in the matrix. Some programs are disaster-specific, activated by a presidential declaration of a major disaster or emergency under the provisions of the Stafford Act. Also included are many programs or grants that are not specifically disaster related.

Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact	Program Eligibility
EMERGENCY MANAGEMENT AND HAZARD MITIGATION					
Emergency Management Performance Grants (EMPG)	Federal Emergency Management Agency (FEMA)	To encourage the development of comprehensive emergency management, including terrorism consequence management, at the State and local level and to improve emergency management planning, preparedness, mitigation, response, and recovery capabilities.	Funding provided to States, which can be used to educate people and protect lives and structures from natural and technological hazards.	Office of Financial Management, FEMA 500 C Street, S.W. Washington, DC 20472 Telephone: 202.646.7057 http://www.fema.gov	All States are eligible (including the District of Columbia and territories and possessions of the United States).
Flood Mitigation Assistance Program	Federal Emergency Management Agency (FEMA)	To help States and communities plan and carry out activities designed to reduce the risk of flood damage to structures insurable under the NFIP.	The program provides planning and grants for projects that include mitigation activities that are technically feasible and cost-effective.	Director, Program Support Division, Mitigation Directorate, FEMA 500 C Street, S.W. Washington, DC 20472 Telephone: 202.646.4621 http://www.fema.gov/mit/flidmitast.htm#fludmit	All States are eligible (including the District of Columbia and territories and possessions of the United States). Structures must be insured through the NFIP at the time of application. States or communities requesting consideration for a Project Grant must have a Flood Mitigation Plan approved by the FEMA Regional Director.
Hazard Mitigation Grant Program (HMG-P)	Federal Emergency Management Agency (FEMA)	To prevent future losses of lives and property due to disasters; to implement State or local hazard mitigation plans; to enable mitigation measures to be implemented during immediate recovery from a disaster; and to provide funding for previously identified mitigation measures to benefit the disaster area.	Project grants can be funded for such activities as acquisition, relocation, elevation, and improvements to facilities and properties to withstand future disasters.	Director, Program Support Division, Mitigation Directorate, FEMA 500 C Street, S.W. Washington, DC 20472 Telephone: 202.646.4621 http://www.fema.gov/mit/grant.htm	Projects must be cost-effective, must meet Federal environmental requirements, and must be consistent with the overall State Hazard Mitigation Plan.
Community Development Block Grant (CDBG)	Department of Housing and Urban Development (HUD)	To develop viable urban communities by providing decent housing and a suitable living environment. Principally to benefit low-to-moderate income individuals.	Community Development activities that meet long-term needs. These activities can include acquisition, rehabilitation, reconstruction of properties and facilities damaged by a disaster, and redevelopment of disaster affected areas.	State and Small Cities Division, Office of Block Grant Assistance, CPD, HUD 451 7th Street, S.W. Washington, DC 20410-7000 Telephone: 202.708.3587 http://www.hud.gov/bdgy2000/summary/cpd/cdbg.html	Activities must meet one of the following broad national objectives: benefit persons of low and moderate income; aid in the prevention or elimination of slums or blight; or meet other community development needs of particular urgency. HUD has statutory authority to waive certain requirements for activities designed to address damage from Presidentially declared disasters.

Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact	Program Eligibility
HOUSING					
Economic Development and Adjustment Program, Sudden and Severe Economic Dislocation (Title IX)	Department of Commerce, Economic Development Administration (EDA)	To help States and localities to develop and/or implement strategies that address adjustment problems resulting from sudden and severe economic dislocation.	Project grants can be funded in response to natural disasters, including improvements and reconstruction of public facilities.	Disaster Recovery Coordinator, Economic Adjustment Division, EDA, DOC Herbert C. Hoover Building Washington, DC 20230 Telephone: 800.345.1222 or 202.482.6225 http://www.doc.gov/eda/html/prgtitle.htm	An applicant may be a state, city, or other political subdivision or redevelopment area recognized by EDA. The area to be assisted must either (1) have experienced, or anticipate, a change in the economic situation resulting in the loss of a significant number of permanent jobs relative to the area's employed labor force and/or other severe economic impacts; or (2) manifest at least one of three symptoms of economic deterioration (very high unemployment, low per capita income, or failure to keep pace with national economic growth trends over the last five years).
Disaster Housing Program	Federal Emergency Management Agency (FEMA)	To provide assistance to enable households to address disaster-related housing needs.	Program assistance may include 1) Short-term Lodging; 2) Home Repair Assistance to restore the home to a livable condition; 3) Rental Assistance; 4) Mortgage and Rental Assistance; 5) Small minimization grants to incorporate hazard mitigation in home repair.	Human Services Division, Response and Recovery Directorate, FEMA 500 C Street, S.W. Washington, DC 20472 Telephone: 202.646.3642 http://www.fema.gov/f-types.htm	Applicants must sign a declaration stating that they are lawfully present in the US and its Territories.
INFRASTRUCTURE					
Sustainable Development Assistance	Department of Energy (DOE), Community Services Team	The Team works with communities to help them define and implement sustainable development strategies as part of their comprehensive community planning efforts.	The Team provides technical assistance to disaster-affected communities as they plan for long-term recovery by introducing a wide array of environmental technologies and sustainable redevelopment planning practices.	DOE, Office of Energy Efficiency and Renewable Energy, Denver Regional Support Office 1617 Cole Blvd, Golden, CO 80401 Telephone: 303.275.4801 http://www.sustainable.doe.gov	Contact the Department of Energy's Community Services Team for the most current eligibility requirements.
Flood Control Works/Emergency Rehabilitation	Department of Defense, US Army Corps of Engineers (USACE)	To assist in the repair and restoration of public works damaged by flood, extraordinary wind, wave, or water action.	The Corps provides public works and engineering support to supplement State and local efforts toward the effective and immediate response to a natural disaster.	Program Manager PL 84-99 USACE, 20 Massachusetts Ave, N.W. Washington, DC 20314 Telephone: 202.761.0001 http://www.spd.usace.army.mil/hqepam.html	Applicant must meet current engineering and maintenance criteria, cost sharing (80 percent Federal and 20 percent non-Federal), and public sponsorship of non-Federal flood control projects.

Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact	Program Eligibility
INFRASTRUCTURE (continued)					
Public Assistance Program	Federal Emergency Management Agency (FEMA)	To provide supplemental assistance to States, local governments, and certain private nonprofit organizations to alleviate suffering and hardship resulting from major disasters or emergencies declared by the President.	These grants allow State and local units of government to respond to disasters, recover from their impact and mitigate impact from future disasters.	Infrastructure Support Division, Response and Recovery Directorate, FEMA 500 C Street, S.W. Washington, DC 20472 Telephone: 202.646.3026 http://www.fema.gov/r-n-r/ pa	Eligible applicants include State and local units of government, certain private non-profits, and Native American tribes. For insurable structures (primarily buildings) located in identified special flood-hazard areas, assistance is reduced by the amount of insurance that could have been obtained under a standard NFIP policy.
Transportation: Emergency Relief Program	Department of Transportation, Federal Highway Administration (FHWA)	To provide aid for repair of Federal-aid roads.	The funds can be used to repair federal-aid roads by using new technologies that improve the quality and lifespan of the roads.	Director, Office of Engineering, FHWA, DOT 400 7th Street, S.W. Washington, DC 20590 Telephone: 202.366.4655 http://www.fhwa.dot.gov/infrastructure/progadmin/erelief.html	No State match is required for emergency repairs accomplished within 180 days of the disaster, in order to restore essential travel. Otherwise, the Federal share is based on the Federal-aid highway on which eligible damage occurred. No State match is required for repair of roads on Federal lands. The estimated cost for repairs to Federal-aid highways must exceed \$500,000 for a State to be eligible.
Water Pollution Control	Environmental Protection Agency Office of Water	To help establish and maintain adequate measures for prevention and control of surface water and groundwater pollution.	Protecting the quality of ground and surface water today will insure the safety of water sources for future generations.	Office of Water, EPA, Washington, DC 20460 Telephone: 202.260.6742 http://www.epa.gov/owm/finan.htm#sec106	All States are eligible as well as interstate water pollution control agencies, including those in US Territories, the District of Columbia, and Indian Tribes.
Water and Waste Disposal Loans and Grants	Department of Agriculture, Rural Utilities Service (RUS)	To develop, replace, or repair water and waste disposal (including storm drainag) systems in rural areas and towns with a population of 10,000 or less.	Use energy-efficient pumps and incorporate mitigation measures when restoring or replacing damaged water and sewer systems.	Assistant Administrator, Water and Waste, RUS, USDA Washington, DC 20250-3200 Telephone: 202.720.9583 http://www.usda.gov/rus/water/programs.htm	Towns or rural areas with populations of 10,000 or fewer. During an emergency, funds would be made available for loans or grants for the repair of rural water and waste disposal systems damaged by natural disasters. Funds cover any facility that did not receive assistance from other sources, so that impacted communities can continue to provide safe drinking water and wastewater treatment facilities.
National Dam Safety Program (NDSP)	Federal Emergency Management Agency (FEMA)	To provide financial assistance incentives to States so they can strengthen their dam safety program.	Funds may be used to enhance an existing dam safety program and provide training, annual maintenance and dam inspections.	Director, National Dam Safety Program, FEMA 500 C Street, S.W. Washington, DC 20472 Telephone: 202.646.2704 http://www.fema.gov	Limited to States who provide up to 50 percent of the costs to establish and maintain dam safety programs.

Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact	Program Eligibility
HISTORIC PRESERVATION					
Repair and Restoration of Disaster-Damaged Historic Properties	Federal Emergency Management Agency (FEMA)	To evaluate the effects of repairs to, restoration of, or mitigating hazards to disaster-damaged historic structures working in concert with the requirements of the Stafford Act.	Preservation of historic structures is an important link to our past. By providing assistance in mitigating future damages, historic structures can be saved for future generations to enjoy.	Infrastructure Support Division, Response and Recovery Directorate, FEMA 500 C Street, S.W. Washington, DC 20472 Telephone: 202.646.3026 http://www.fema.gov/nwz99/fldhsthm.htm	State and local governments, and any political subdivision of a State; Indian tribes; and Alaskan villages are eligible. Also private nonprofit organizations that operate educational, utility, emergency or medical facilities, or provide custodial care or other essential services of a governmental nature to the general public. As a condition of the grant, applicants are encouraged to mitigate natural hazards.
Historic Preservation Fund Grants-in-Aid	Department of the Interior, National Park Service (NPS)	To provide matching grants to States to expand the National Register of Historic Places, the nation's listing of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture.	Grants-in-Aid are provided for the identification, evaluation, and protection of historic properties by such means as survey, planning, technical assistance, acquisition, development, and certain tax incentives available for historic properties.	Associate Director, Cultural Resources, NPS, DOI Washington, DC 20240 Telephone: 202.343.9509 http://www.cr.nps.gov/helpyou.htm#grants	Eligible applicants are the National Trust for Historic Preservation, and States and Territories defined in the National Historic Preservation Act that operate programs administered by a State historic preservation officer.
LAND MANAGEMENT					
Emergency Watershed Protection	Department of Agriculture, Natural Resource Conservation Service (NRCS)	To provide emergency technical and financial assistance to install or repair structures that reduce runoff and prevent soil erosion to safeguard life and property.	In preventing substantial run-off and erosion, the program helps prevent future property loss and preserves soil resources.	Deputy Chief for Natural Resource Programs, NRCS, USDA PO Box 2890 Washington, DC, 20013 Telephone: 202.720.3527 http://www.ftw.nrcs.usda.gov/pl566/EWP/ewp.htm	Eligible lands must be non-urban low lands, which are predominantly cropland, grazing land, hayland, or forest land, that lie adjacent to the channel of a river, stream, watercourse, lake, or ocean and have been subject to flood damage.

Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact	Program Eligibility
Land Management (continued)					
Coastal Zone Management Administration Awards	Department of Commerce, National Oceanic and Atmospheric Administration (NOAA)	To assist States in implementing and enhancing coastal zone management programs that have been approved by the Secretary of Commerce	The program aids in the protection and preservation of sensitive coastal zones and provides the added benefit of reducing development in high coastal hazard areas.	Chief, Coastal Programs Division, Office of Ocean and Coastal Resource Management, National Ocean Service, NOAA, DOC 1305 East-West Highway Silver Spring, MD 20910 Telephone: 301.713.3102 http://www.ocrm.nos.noaa.gov/	To be eligible, a State or U.S. Territory must have started developing a coastal zone management program prior to application of grant funds.
Coastal Wetlands Planning, Protection, and Restoration Act	Department of the Interior, US Fish and Wildlife Service (USF&WS)	To grant funds to coastal States for restoration, enhancement, and management of coastal wetlands ecosystems.	The program aids in the protection and preservation of sensitive coastal zones.	FWS, DOI 4401 N. Fairfax Drive, Suite 140 Arlington, VA 22203 Telephone: 703.358.2156 http://www.cfda.gov/public/viewprog.asp?progid=448	Funds are available to all States bordering on the Great Lakes or the Atlantic, Gulf (except Louisiana), and Pacific coasts. Also available to Puerto Rico, the Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, the Trust Territories of the Pacific Islands, and American Samoa.
Land and Water Conservation Fund Grants	Department of the Interior, National Park Service (NPS)	To acquire and develop outdoor recreation areas and facilities for the general public, to meet current and future needs.	Project grants may be used for a wide range of outdoor recreation projects, such as picnic areas, campgrounds, tennis courts, boat launching ramps, bicycle trails, and support facilities.	Chief, Recreation Grants Division, NPS, DOI PO Box 37127 Washington, DC 20013-7127 Telephone: 202.565.1200 http://www.ncrc.nps.gov/lwcf/	Participation is limited to State and Territory agencies that have entered into a cooperative agreement with the Secretary of the Interior.
Park and Recreation Recovery Program	Department of the Interior, National Park Service (NPS)	To provide for the rehabilitation of recreation areas and facilities, demonstration of innovative approaches to improve park system management and recreation opportunities, and development of improved recreation planning.	The program allows jurisdictions to provide recreational facilities in areas prone to natural disasters.	Chief, Recreation Grants Division, NPS, DOI PO Box 37127 Washington, DC 20013-7127 Telephone: 202.565.1200 http://www.ncrc.nps.gov/uparr/	Urban cities and counties that meet the eligibility requirements were listed in the October 9, 1979 Federal Register. Contact headquarters to inquire which communities qualify.

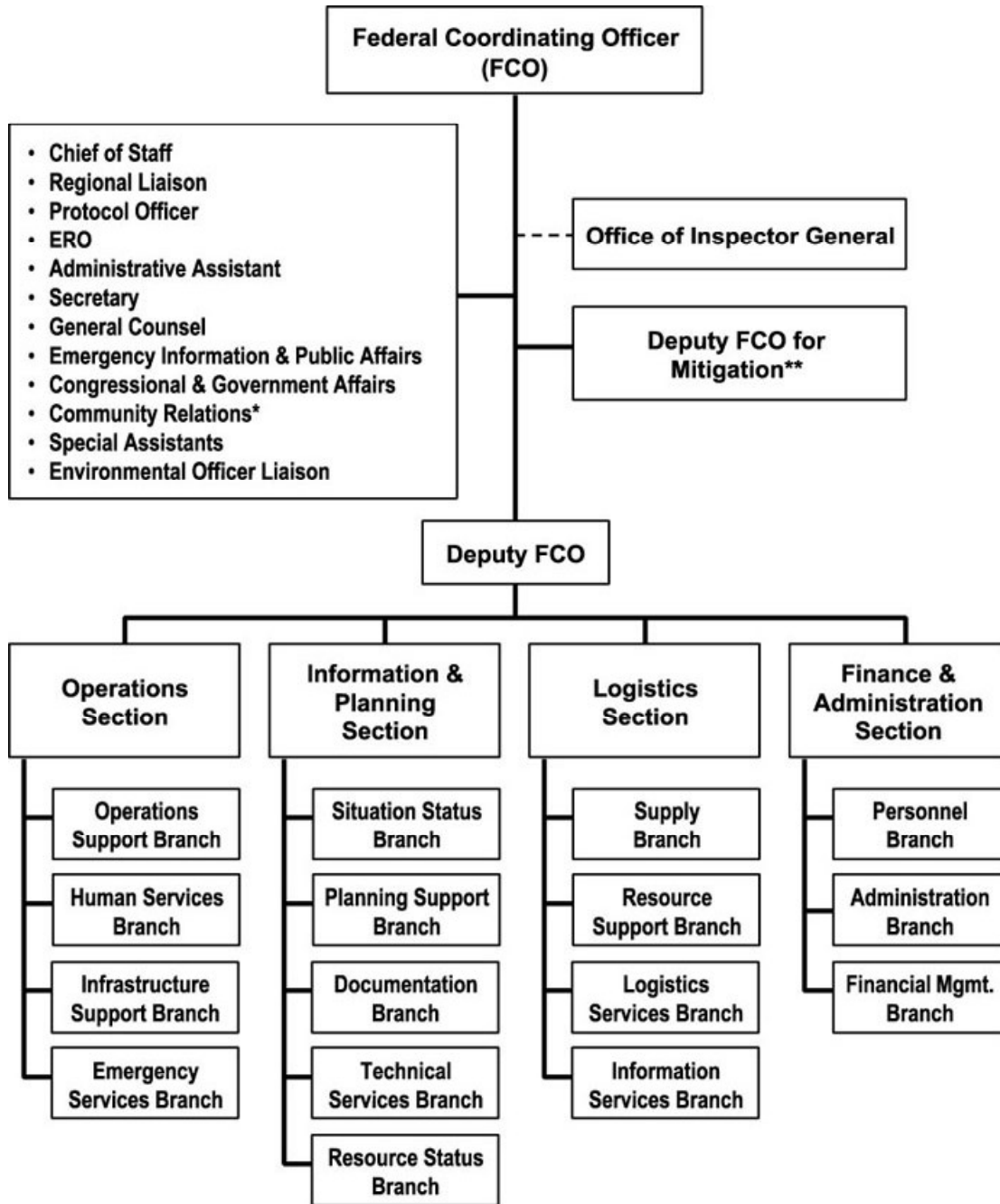
Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact	Program Eligibility
Land Management (continued)					
River Basin Program	Department of Agriculture, Natural Resource Conservation Service (NRCS)	To provide planning assistance to Federal, State, and local agencies for the development of coordinated water and related land resource programs.	Priority is given to projects designed to solve problems of upstream rural community flooding; water quality improvement that comes from agricultural nonpoint sources; wetland preservation; and drought management for agricultural and rural communities.	Deputy Chief for Natural Resource Programs, NRCS, USDA PO Box 2890 Washington, DC, 20013 Telephone: 202.690.4575	Any State or local water resource agency or other Federal agency concerned with water and related land-resource development. USDA participation is based on a cooperative effort with other agencies or Indian tribes. State and local agencies are expected to participate in the studies and to fund their own activities.
Watershed Protection and Flood Prevention	Department of Agriculture, Natural Resource Conservation Service (NRCS)	To provide technical and financial assistance in planning and executing works of improvement to protect, develop, and use land and water resources in small watersheds.	Protecting watersheds enables future generations to enjoy those watershed land resources in the future.	Deputy Chief for Natural Resource Programs, NRCS, USDA PO Box 2890 Washington, DC, 20013 Telephone: 202.720.4527 http://www.fw.nrcs.usda.gov/pl566/pl566.html	Watershed projects must address one or more of the following, including: watershed protection, flood prevention, and agricultural and nonagricultural water management. Projects must solve problems and needs that are beyond the capability of the individual landowners, and must be sponsored by entities legally organized under state law. Sponsors must also have the power of eminent domain and the authority to levy taxes or other adequate funding sources to finance their share of the project cost and all operation, maintenance, and replacement costs of works of improvement.

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Appendix F

DFO Organizational Chart

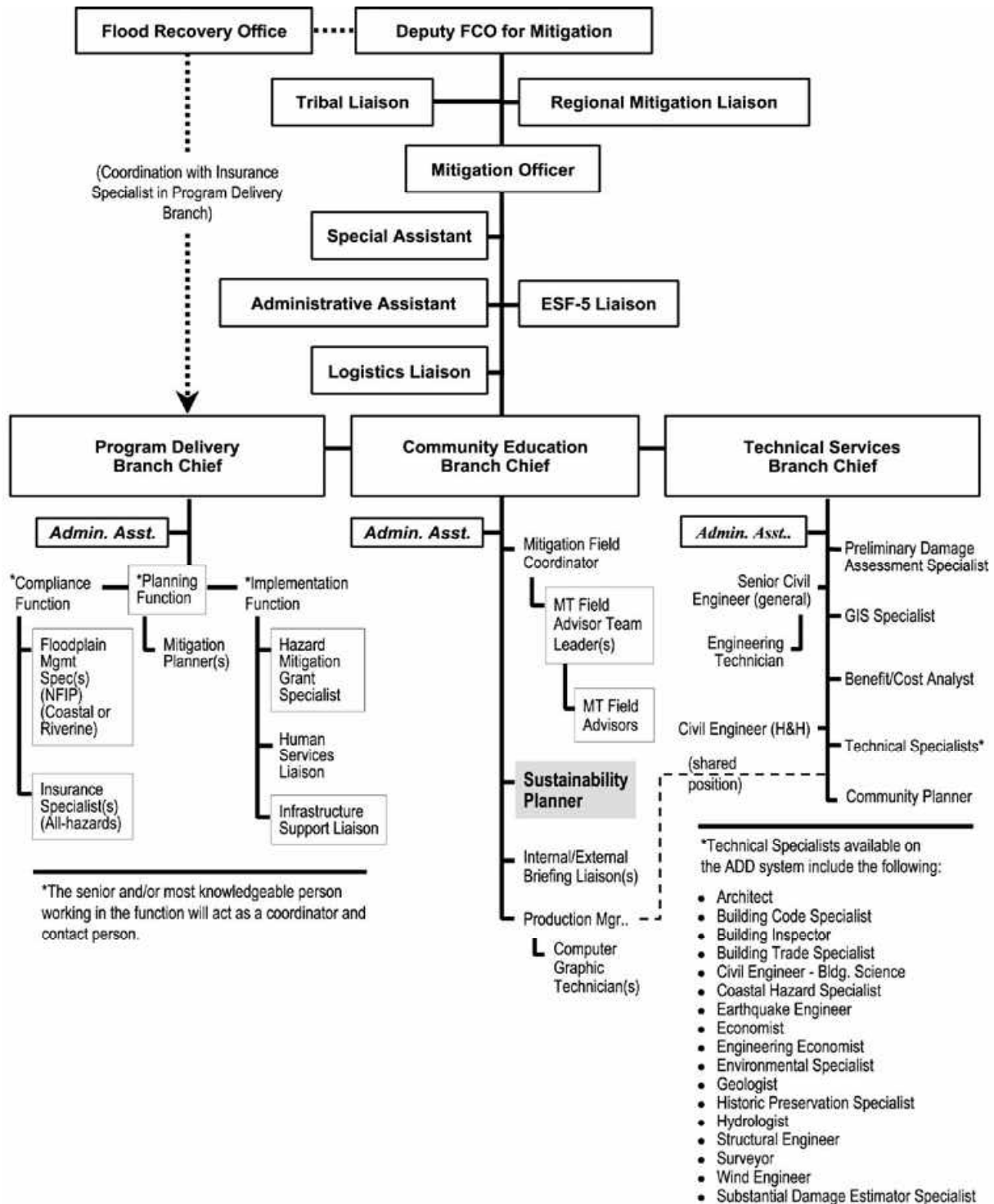


* Position includes outreach

** Operational responsibility for hazard mitigation only; no line responsibility for sections



Appendix G
**ERT-Mitigation Branch
Organizational Chart**





Appendix H **Position Description**

Position Description Technical Services Branch Community Planner

Duties

Facilitates the incorporation of mitigation and sustainable development strategies into the impacted communities' recovery and reconstruction *planning process*. Provides mitigation and sustainability outreach to the planners within impacted communities. Participates in the development of the Early Implementation Strategy, on the Interagency Hazard Mitigation Team, and in evaluation of the State Mitigation Plan.

Knowledge, Skills and Abilities

Knowledge

Knowledge of general planning principles, practices and procedures, including zoning ordinances, subdivision ordinances and capital improvement planning. Knowledge of principles and practices of sustainable development and how it is incorporated into reconstruction and mitigation strategies. Knowledge of land use planning and its application to hazard mitigation. Knowledge of community development and redevelopment principles and practices, including land economics. Knowledge of FEMA's pre- and post-disaster mitigation programs (HMGP, NFIP including ICC provisions, FMA, CRS, NEHRP recommended provisions, (Section 409) mitigation planning requirements) as well as other Federal agencies programs (HUD, EDA, SBA) that can provide technical and/or financial assistance for implementing reconstruction strategies. Knowledge of private/non-governmental programs that can support reconstruction and mitigation strategies. Knowledge of FEMA's technical assistance programs and contract vehicles. Knowledge of socioeconomic and demographic analysis as they apply to local mitigation and reconstruction strategies.

Skills

Consensus building and team building, communication (verbal and written)/interpersonal skills.

Abilities

Ability to operate a computer and use MS Office programs. Ability to interact and coordinate multiple and often complex issues with a wide range of technical and program specialists within local, state, regional planning and Federal government agencies. Ability to mobilize on short notice for an extensive period of time; work under stressful conditions; operate in a politically sensitive environment. Ability to accept responsibility, make decisions, establish priorities, and solve problems. Ability to work independently. Ability to analyze damage patterns to identify mitigation opportunities.

OPERATIONAL CHECKLIST

Technical Services Branch Community Planner

NOTE: Because tasks are often disaster-specific, they may not be listed in chronological order. Some tasks may need to be accomplished simultaneously.

PREDEPLOYMENT

Conduct administrative activities

- Verify travel plans, accommodations for lodging and rental car.
- Secure travel orders and supporting documentation.
- Establish specific address location of the DFO with directions to the location.
- Obtain estimate of duty tour and any instructions regarding the nature of the mission and specific duty required.
- Update answering machine/voice mail to reflect deployed status.
- Make necessary personal plans to address extended deployment from home.
- Make arrangements for coverage of ongoing job responsibilities.
- Collect initial disaster information (field reports, PDAs).
- Review past Early Implementation Strategies, IHMT/HMST Reports, past disaster history in same area, and current State Mitigation Plan if one exists.
- Review Community Information System (CIS) for community(ies) affected. (Note: **this can only be done by FEMA employees; and may only be applicable for flood disasters.**)

Additional Tasks

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FIELD OPERATIONS

Conduct in-processing and administrative activities

- [] On arrival, check in and put on DFO identification badge.
- [] Check in with designated supervisor to establish work assignments.
- [] Identify your tentative work schedule with your supervisor and times for briefings and staff meetings.
- [] Coordinate with the Logistics Liaison to set up your office space at the DFO.
- [] Give your name and phone number to the Logistics Liaison for internal listing.

On-going activities

- [] Attend all mitigation staff meetings as requested.
- [] Provide input to Branch Chief for daily situation report.
- [] Continue activities initiated during the Pre-Deployment phase, as needed.
- [] Maintain a daily log of activities and communications, noting after-action items for AfterAction report.
- [] Document mitigation success stories and submit them to the Community Education Branch Chief.
- [] Coordinate with the Technical Services and Program Delivery Branch Chiefs prior to contacting the SHMO regarding state or joint state-FEMA activities.

Collect and review background data

- [] Obtain and review state legislation affecting local planning, including provisions regarding post-disaster reconstruction and mitigation.
- [] Determine (i.e., by phone) those ordinances and/or regulations currently in effect in the affected communities, and obtain same.
- [] Review community(ies) general or comprehensive plan, and associated maps or reports; zoning, subdivision and other land development regulations and/or ordinances. Obtain and review any existing plans that deal with post-disaster recovery and reconstruction.
- [] Identify any state and/or local sustainable development initiatives or non-governmental sustainable development advocacy groups operating in the disaster area.
- [] Obtain and review NFIP information for affected area and jurisdictions (i.e., community standing, policies in force, CRS report, repetitive loss list, state and local mitigation plans, potential substantial damage estimates).

- [] Review results of PDAs/damage assessments.

Coordinate with the following:

- [] Mitigation Planners (Program Delivery Branch) to participate in Early Implementation Strategy process, and IHMT.
- [] Regional Mitigation Liaison (state procedures, background information, political sensitivities).
- [] Infrastructure Support Liaison and Human Services Liaison regarding coordination of FEMA assistance to support incorporation of mitigation into community's long-term recovery and comprehensive reconstruction strategy.
- [] Floodplain Management Specialist and Insurance Specialist to determine possible "trouble" areas (i.e., nature of community compliance issues, if any; any "hot" issues that pre-existed the disaster).
- [] Coordinate with others in the DFO to ensure that mitigation strategies developed within the DFO accommodate needs identified within the community's long-term recovery plan or strategy; participate in the Early Implementation Strategy, IHMT, and other planning activities within the DFO.
- [] DFCO-M to set up a meeting with community planning officials to determine short- and long-term reconstruction and recovery goals where they overlap with mitigation goals and encourage linkage of mitigation objectives with broader sustainable development objectives.
- [] Assist the community with the following activities:
 - Developing short-term planning/operational strategies that affect the ability to incorporate mitigation and sustainability into longer-term recovery goals. For example, initiating moratoria to facilitate optimal mitigation/reconstruction decision making, decisions involving road and bridge closures; decisions regarding post disaster inspection of homes, decisions regarding re-occupancy of homes that have been substantially damaged (under NFIP definition), decisions regarding obtaining outside assistance (i.e., mutual aid for building officials; state or local chapters of professional organizations such as APA or ASCE) repair/replace/relocation of critical facilities. (**Note:** this type of meeting is critical to charting the "correct" course for a community, and should be attended by senior DFO staff such as senior Infrastructure and Human Services staff.)
 - Identifying multi-objective mitigation and sustainability opportunities for longer-term considerations within locally developed reconstruction plans or strategies (if this has not been done previously by the community). Coordinate the delivery of appropriate DFO technical expertise to assist in evaluations of alternative reconstruction strategies.
 - Making preliminary decisions regarding alternate reconstruction strategies by providing general program and administrative information on programs that deal with mitigation, planning, and/or reconstruction within FEMA and within OFAs. Coordination with others within the DFO will be necessary.

- Securing FEMA (i.e. HMTAP) and OFA technical and financial assistance for implementing reconstruction strategies that incorporate mitigation. Assist community in coordinating complex recovery and reconstruction issues among such Federal agencies.
- Assembling parcels of land for acquisition/relocation mitigation strategies, or for redevelopment projects that incorporate mitigation strategies. This may entail securing outside technical assistance via FEMA contractor(s), or providing such expertise personally.

Additional activities

- Serve as a mitigation representative to the FCO's office for assisting in securing Federal long-term recovery resources.
- Serve as Project Officer for technical assistance tasks to outside contractors involving the development of long-term recovery strategies.

Additional Tasks

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DEACTIVATION

- Upon deactivation collect and transfer all files and records to the regional office.
- Return all equipment to the Logistics Liaison and go-kit contents to go-kit box.
- Provide after-action input to designated personnel.
- Complete and return to Operations Support all timesheets and vouchers.

Additional Tasks

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Appendix I
**Associate Director
Memorandum: Sustainable
Redevelopment Function
in Disaster Field Offices,
November 1998**



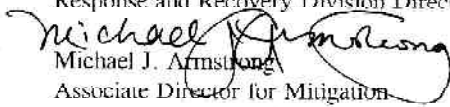
Federal Emergency Management Agency

Washington, D.C. 20472

NOV 20 1998

MEMORANDUM FOR: Regional Directors
Regions I-X

ATTENTION: Mitigation Division Directors
Response and Recovery Division Directors

FROM: 
Michael J. Armstrong
Associate Director for Mitigation

SUBJECT: Sustainable Redevelopment Function in
Disaster Field Offices

The purpose of this memorandum is to share with you an important new initiative of the Mitigation Directorate--the establishment of a *sustainability desk* as part of the mitigation function in Disaster Field Offices (DFOs) and/or Disaster Recovery Centers (DRCs). I would like to provide you some brief background, outline an approach to developing and piloting this concept, and, most importantly, solicit your participation in this effort.

What is sustainability?

The concept of sustainability brings a relatively new approach to environmental, economic, and social thought, and has the potential to enhance the achievement of mitigation goals in the post-disaster (as well as pre-disaster) environment. While there is no universal definition for sustainability, a definition that may be most useful for our purposes is the following (based on language from the Minnesota State Legislature):

...development that maintains or enhances economic opportunity and community well being while respecting, protecting and restoring the natural environment upon which people and economies depend.

What is sustainable re-development?

Sustainable re-development is simply the application of the concepts and practices of sustainable development to the disaster recovery process. As the post-disaster environment presents a unique window of opportunity to implement hazard mitigation measures, it may also provide the same window of opportunity to reduce human conflict with natural systems, reduce the consumption of non-renewable resources, and increase the quality of the built environment. If reconstruction is part of a community's disaster recovery process, the community may also have the opportunity to address issues such as the compatibility of development with the natural environment and natural hazards, use of non-renewable resources, and social and economic issues that may be affected by improved community planning and physical design.

Like sustainable development itself, sustainable re-development is locally driven and consensus based. After the Midwest Floods of 1993, as many of you are aware, FEMA worked closely with a public-private partnership group called the Working Group on Sustainable Re-development to assist Valmeyer, IL and Pattonsburg, MO, two severely damaged communities, determine how to incorporate sustainability into their recovery efforts. A package of assistance was made available to these communities that resulted in multiple benefits: removal of damaged structures from the floodplain; relocation of residents, businesses and community facilities to safer, more sustainable locations not vulnerable to flooding; the incorporation of cost-effective, energy-efficient technology into rebuilt or new structures; and neighborhoods designed to improve the quality of everyday life for their residents.

Building on this experience, participants (including myself) in the 1998 Wingspread Conference, "Communities in Harm's Way: Leadership Dialogue on Designing Disaster-Resistant Settlements," developed a set of principles to help communities and government agencies enhance sustainability in disaster-prone communities. These "Wingspread Principles," which may be found on the Internet in both websites referenced at the end of this memorandum, provide a vision of using the disaster recovery process as an opportunity to create more sustainable communities. I believe that the time is right for FEMA to actively assist States and communities to realize this vision.

Sustainability Desk

The term *sustainability desk* is shorthand for activities undertaken by FEMA, in partnership with the State and through coordination with other agencies and organizations (Federal or non-Federal), to promote integration of the principles and practices of sustainable development into the post-disaster recovery process. There may or may not be an actual desk in the DFO or the disaster recovery centers, at which an individual works or distributes publications. The nature of the sustainability initiative in any given disaster will depend on the particular recovery needs that must be met, and will be determined by the Region, FCO and Deputy FCO for Mitigation (DFCO-M). The activities FEMA, in conjunction with other Federal agencies, undertakes to encourage and support State and local governments to implement sustainable redevelopment will be under the authority of the DFCO-M or the Hazard Mitigation Officer, as part of the overall mitigation strategy for the disaster. The connection with mitigation is obvious: a disaster resistant community is far more sustainable than a community that is vulnerable to repeated disaster losses, and sustainability provides a holistic framework for communities to link mitigation to other broad goals.

The Mitigation Directorate intends to develop guidance and suggested procedures for the Regional Offices on Sustainable Redevelopment, in coordination with the Response and Recovery Directorate; other Federal agencies such as the Department of Energy (DOE), Environmental Protection Agency, and Department of Housing and Urban Development; and the National Emergency Management Association and Association of State Floodplain Managers. However, practical experience is invaluable to this process. Therefore, we have begun to take advantage of some disasters as they occur to pilot sustainability efforts. These efforts have occurred in Ohio

and West Virginia, and we anticipate integrating sustainable redevelopment into the recovery from future disasters as appropriate opportunities present themselves.

Pilot Efforts

In Ohio (FEMA-DR-1227-OH), FEMA supported the State's *Smart Recovery* initiative promoting flood mitigation with a number of sustainability activities. The headquarters Program Planning Branch arranged for the DOE's Denver Regional Support Office to provide an individual to assist and provide technical assistance to FEMA and State staff at the DFO. A Sustainable Redevelopment Steering Committee was established, composed of representatives of the Ohio Emergency Management Agency (OEMA), the Ohio Department of Development (ODOD) and FEMA. The Committee developed an action plan, including minimum criteria for the selection of target communities, and identified potential target communities. OEMA hosted representatives from Federal and State agencies as well as local planning commissions and universities at a DOE presentation on "Sustainable Disaster Recovery." The audience learned about "what" Sustainability is, "how, where and when" it can be applied, "who" can utilize it and "why" it is critical. The session was very well received, and these organizations should be prepared to play a role in assisting target communities to make sustainable redevelopment part of their flood recovery.

FEMA and OEMA facilitated a meeting with Rural Action, an advocacy group already involved with Sustainable Development in Athens County, in order to identify some of the activities currently taking place to maintain/increase the sustainability of the communities in the area. This effort led the DOE to provide a \$5,000 grant to Rural Action to support increased activity related to sustainable redevelopment in the area.

Region V is adapting the DOE Sustainable Development presentation to develop a new presentation that will include additional slides focusing on mitigation. They are also creating a Concept Summary (documenting the Sustainability Desk effort in Ohio for DR-1227), a Resource List, a Publications Inventory, a Community Newsletter and a tri-fold Sustainability Brochure. We will provide you with copies of these materials when they are available.

In West Virginia (FEMA-DR-1229-WV), conversations between the Governor and Director Witt resulted in a commitment to develop a long-term recovery plan, and both the State and FEMA determined that it would be appropriate to include sustainable redevelopment in the plan. Region III, working with the State, developed a Sustainability Action Plan with recommendations of activities and responsibilities for FEMA headquarters and regional offices and State agencies. They have also contacted several communities and organizations to provide information on sustainable redevelopment, and have made contact with a number of the regional planning commissions in the State. Some of Region III's other activities in WV include drafting a standard operating procedure for a Sustainability Officer, collecting sustainability material for use in future disasters, and identifying a number of procedural and substantive questions which need to be addressed as part of FEMA's future sustainable redevelopment guidance.

Next Steps

The Mitigation Directorate's Program Planning Branch has the responsibility of developing operational policy and procedures that will eventually guide FEMA's implementation of sustainable redevelopment in the post-disaster environment. Discussions with DOE have identified a number of activities that can assist us in this effort, including press kits, PSAs, videos, and articles for the Recovery Times promoting sustainable redevelopment.

We need your assistance, as you respond to future disasters, to pilot some sustainable redevelopment efforts with communities that you and the State believe would be receptive to this initiative. Please contact the Planning Branch both to discuss the appropriateness of this effort to your situations, and to obtain technical assistance. We can support you with experts from other Federal agencies, and publications and other materials. Lessons learned from recent experience in Ohio and West Virginia, as well as other sustainable redevelopment efforts, can help you in considering how to approach this initiative:

- It's important not to introduce sustainable redevelopment too early, when States and communities are completely absorbed with immediate response. But we need to discuss it as soon as they start thinking about recovery, and provide information and technical assistance to interested communities as soon as we can. Ideally, we should be looking for avenues to introduce sustainability in the pre-disaster mode.
- People who may not initially be receptive to the idea of sustainable redevelopment often, over a few days or weeks, come to see its benefits. We need to allow for this "fermentation period," and test the waters periodically during the early recovery phase.
- FEMA has a key role to play, as the most visible Federal presence, in publicizing sustainable redevelopment during the critical window of opportunity to introduce new approaches to recovery.
- The people left behind in the community after the Federal presence is gone accomplish the real work of sustainable redevelopment. Our job is to enhance their capability by providing information, contacts, and technical assistance through the DFO, and by following up from the Regional Office as the situation and resources dictate.
- The multi-objective community based planning that defines Project Impact communities is a natural spring board for sustainable redevelopment in a post-disaster environment. I encourage you to introduce this in your Project Impact discussions.

My intent with pilot efforts is two-fold: first, to avoid situations in which the current absence of formal guidance prevents us from seizing opportunities that may exist to promote sustainable redevelopment, and second, to obtain useful information and more "lessons learned" that will contribute to the development of policy and procedures for encouraging sustainable redevelopment during disaster recovery.

I sincerely appreciate your support for this initiative. We will be sharing additional material and information with you, and your input and feedback will be essential as we proceed. Please feel free to contact me or Terry Baker in the Program Planning Branch (202-646-4648) if you have questions or wish to discuss this initiative further. In addition, if you are interested in learning more about the concept, principles, and specific aspects of sustainable redevelopment, these two DOE websites will provide you with excellent information, ranging from introductory to more technical: <http://www.sustainable.doe.gov/> and <http://www.sustainable.doe.gov/freshstart/>.

cc: Lacy Suiter, Response and Recovery
Mitigation Division Directors and Branch Chiefs, Headquarters



Appendix J
**Associate Director
Memorandum: Continuing
the FEMA/State Dialog in
Mitigation, January 2000**



Federal Emergency Management Agency

Washington, D.C. 20472

JAN 11 2000

MEMORANDUM FOR: Regional Directors
Regions I – X

ATTENTION: Mitigation Division Directors

FROM: *Michael J. Armstrong*
Michael J. Armstrong
Associate Director for Mitigation

SUBJECT: Continuing the FEMA/State Dialog on Mitigation

The purpose of this memo is to request that you and your Mitigation staff begin to develop profiles of State-level mitigation programs and activities within your respective Regions. These profiles should be based on information gained during visits to States for technical assistance and support, and should be used by you in subsequent discussions with State management officials.

In a planning guidance memo dated October 22, 1999 I provided you with some ideas and thoughts on how, using our strategic partnerships with States and local governments, we might establish more collaborative and integrated mitigation planning processes that would yield more effective plans. Attached to that memo was a summary of planning guidance and tools as well as a "checklist." The checklist was designed to both communicate a new strategic vision for mitigation planning and to assist your staff in reviewing plans as they are submitted to you for approval. One of the central ideas expressed in the October 22 memo was that Regional Directors should use the results generated by the checklist to engage in a constructive dialog with States regarding their progress in establishing more effective plans that show clear linkages between State and local mitigation planning efforts.

As you know from my meetings and correspondence with you, I am fully convinced that the key to broadening and strengthening the current partnerships with States will be determined by our success in maintaining an open, constructive exchange of information and ideas. While we have established the basis for this in the area of planning, I believe we have an opportunity to do this in other areas of mitigation as well. Therefore, beginning in January 2000, I am requesting that your staff begin to provide you with an informal analysis of the mitigation initiatives and programs for each State within your region. The analysis might talk about creative new mapping initiatives under the Cooperative Technical Community (CTC) concept, new processes to expedite obligations under our mitigation grant programs and/or new ideas to quantify and measure the benefits of mitigation projects. Similarly, the analysis might highlight new initiatives used in other States that your staff thinks might work and benefit the State for which the analysis is being prepared.

After a time, I believe a profile will emerge that you can use as the basis for a "constructive dialog." Input for this analysis could be drawn from staff visits to the State and localities within the State, planning checklist results as well as from the Capability Assessment for Readiness (CAR) process. Attached for your review is a sample analysis that I had my staff develop to further illustrate this idea. This attachment by no means exhausts all the areas that might be explored.

As you know, we have worked long and hard to provide the States with the flexibility to focus resources and emphasis on the areas of emergency management that they believe need development or improvement. Therefore, I want to emphasize to you that this profile is not a report card, it is simply a suggested means to facilitate your discussion with the State on how together we can reduce disaster losses through mitigation.

Please send me a copy of all State profiles as they are completed. I am requesting that a profile for at least one state within each of your respective regions be completed and sent to me by February 18, 2000, with all States to be completed by June 2000. I intend to make this an item for discussion in our subsequent meetings and will continue to look for creative means to support you as you do mitigation business with FEMA's State partners.

STATE MITIGATION PROGRAM ANALYSIS

Mapping Hazards and Assessing Risks

- State staff is working more closely with local governments to provide improved mapping products to high-risk communities.
- Under the Cooperating Technical Communities initiative, communities and State are working together toward taking increased responsibility for maintaining up-to-date FIRMs. The State is coming up with innovative ways to provide assistance to communities so they can determine whether maps are accurate, and to determine what tasks would need to be accomplished to provide the updates. The State is also coming up with innovative ways to find new sources of funding, and to package funds and other resources needed to accomplish map updates.
- As communities get involved in local hazard identification and risk assessment activities, the State is beginning to compile a map of hazard "hot spots", which represent areas subject to a high degree of losses during a natural hazard event. This map will include State-owned facilities at risk.

Mitigation Planning

- The State is reviewing its current mitigation plan against the new mitigation planning checklist to determine where improvement is warranted. The State is seeking out plans from other States for comparison purposes and to reveal new ideas and concepts for mitigation programs. As a result, the State is updating its plan to reflect the items in the checklist.
- The State is developing an "all hazard" mitigation planning process whereby goals, objectives, projects and strategies are pursued in partnership with local government. Increased communication with communities and attendance at meetings during the planning process is resulting in the State becoming a more active partner in the development of local plans. Community mitigation plans are showing a closer relationship to State goals and policy.
- The State is developing ways to expand the number of State agencies participating in mitigation efforts by holding periodic meetings with agencies that may have goals in common with mitigation. Resources for mitigation are now being increased due to participation by these additional agencies.

Efficient Management and Use of Grant Funds

- State should increase the rate at which it obligates funds under the HMGP and FMA programs. State can do a better job in working with communities to target repetitive flood loss properties.

Project Impact

- State is promoting the principles of Project Impact by increasing the number of communities that approach loss reduction through forming community partnerships, assessing risks, prioritizing needs, and communicating successes.
- State is giving priority to Project Impact communities in the distribution of mitigation resources.
- State has developed innovative ways to share mitigation successes from Project Impact communities with all its other high-risk communities.

Provision of Technical Assistance to local jurisdictions

- State is working to provide an increased level of assistance to local jurisdictions in developing, adopting, and implementing building and fire codes, and land use ordinances. Greater attention should be given to establishing more effective enforcement capability.

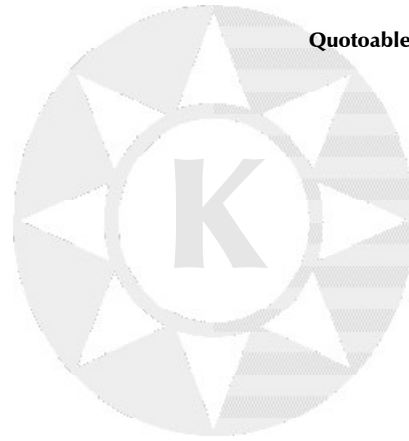
Commitment to Floodplain Management

- Local governments are beginning to review their existing floodplain management ordinances to determine if they still address existing and future flood risks. The State is assisting communities in revising or updating local ordinances, with priority given to communities with highest number of repetitive losses.
- The State needs to work to increase the number of communities participating in CRS.

Communicating Success

- The State has produced a first-rate publication documenting mitigation success stories and demonstrating the cost-effectiveness of mitigation.

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Appendix K

Quotable Materials on Sustainability

The Wingspread Principles: A Community Vision for Sustainability

This appendix contains materials from several sources and is intended to stimulate thinking about what sustainability may mean for different communities, provide ideas about actions that can be taken to enhance sustainability, and be helpful in preparing for meetings and presentations.

*The following is abstracted from the Wingspread Principles that were developed by attendees of the 1998 Wingspread conference, *Communities in Harm's Way: A Leadership Dialogue on Designing Disaster-Resistant Settlements*, to help communities and government agencies enhance sustainability in disaster-prone communities.*

To ensure the safety of people and the livability of communities, resources for disaster planning, mitigation, and recovery should provide for education and encourage the use of innovative approaches that result in positive changes. Resources should be invested consistent with the following principles:

Sustainability Disaster mitigation and recovery resources should be invested to improve the quality of life in the areas of public health and safety, environmental stewardship, and social and economic security.

Planning & Incentives Plans designed to reduce the impact of disasters and to encourage recovery should provide incentives to individuals, the private sector, and government to pursue sustainable development and redevelopment.

Partnerships Individual citizens, the private sector, and local, state, and federal governments should act as partners with shared goals and values to further the capacity of our communities to be self-sufficient.

Locally Driven Process Decisions should be driven by a consensus-based, inclusive process that stakeholders use and trust. The process should identify local sustainability priorities, leading to the investment of pre-and-post disaster resources that will meet those needs, emphasizing the need for local responsibility and self-sufficiency.

Post-Disaster Long Term Recovery Plan

- **Designate a recovery team** (distinct from the response team) that provides a two-way communications process with the community.
- **Educate the community** and its leaders about sustainable redevelopment and best practices with the assistance of outside expertise, video and electronic resources, and green resource directories.
- **Evaluate opportunities** to build a better, more disaster-resistant, sustainable community than existed before.
- **Develop a common vision** for a sustainable recovery development plan, charge the local planning and design professionals with implementing it, and develop a methodology for **on-going communications**.
- **Adopt a model code**, post-disaster, that will allow funding programs to upgrade reconstruction.

Policy Action Framework

I. Education

- Policy experts, advocates, government officials, and local elected leaders should help connect sustainable development constituencies with those who work on disaster mitigation and prevention, to better connect both sets of issues and to share information, resources, tools, and ideas.
- Sustainable redevelopment and mitigation experts should work to better educate the public, homeowners, and consumers about the benefits of disaster mitigation and prevention in lessening the impact of natural disasters. Information could include specific household prevention tips as well as broad information on the negative consequences of not planning for natural disasters (insurance costs, damage to homes and businesses, as well as to the local economy.)
- User-friendly pamphlets, reports, Web sites, and training materials should be developed to promote prevention, planning, and awareness of policies and practices that will make sustainable redevelopment available to more communities.
- Foundations, businesses, and all levels of government should support peer-to-peer learning about sustainable redevelopment. They should also work to develop champions for sustainable redevelopment among a broad array of constituencies. These champions should help lead their constituencies to further educate, inform, and serve as a resource on these issues.
- Following disasters, sustainable redevelopment experts should work within FEMA's Disaster Recovery Centers and at public meetings to inform interested citizens and community groups about the benefits of sustainable redevelopment.
- Create a state/federal/local outreach effort to educate local leaders in disaster-prone communities about sustainable redevelopment, and the cost-effective, cutting-edge technologies they can use to improve their communities during recovery.

- Conduct an on-going campaign in disaster-prone areas to educate citizens about the concept of sustainable redevelopment and how it can help them recover from current disasters and mitigate future disasters.
- Do a life-cycle cost analysis to evaluate investment of sustainable alternatives within disaster-prone communities.
- Immediately following a disaster, establish a sustainable redevelopment outreach effort to state and local officials to identify redevelopment priorities and alternatives.

II. Planning

- Sustainable redevelopment experts should clarify to the public, the roles that local, state, and federal agencies play in helping communities plan for natural disasters. This advance educational effort should help diminish frustration following a disaster by making the public more knowledgeable about where they can find help.
- Local communities should create lists of local providers of services, information, and technical training on a broad range of sustainable technologies and practices. These individuals can then be quickly mobilized and hired following a disaster.
- Local elected leaders, planners, and community development officials should integrate disaster planning into community planning and sustainable development/community initiatives.
- States, counties, and local governments should create local-state recovery teams to work together on disaster-planning, thereby creating partnerships that can be drawn upon in the event of a disaster.
- Develop plans and priorities for sustainable redevelopment prior to the occurrence of a disaster, so it is available, and has broad-based consensus, at the time of the next event. This should include a community-based vision for where the community wants to be in the future.
- Reconsider existing land use, building codes, and financial policies that stimulate disaster-prone development.

III. Incentives/Financing

- For communities to qualify for priority funding following disasters, incentives, financing, and funding should be closely tied to performance standards for prevention.
- Private sector and economic development agencies should lead the way in promoting disaster planning and sustainable mitigation efforts, given the potential catastrophic effects of disasters to local community economies.

IV. Building Local Capacity

- State and federal governments should build local disaster-planning capacity by better coordinating existing technical assistance, training, and other programs or activities in the areas of environmental protection, economic development, community planning, etc.
- There is no one-size-fits-all solution; decision-making should move to the most local level of government appropriate to the situation (regional, local, etc.)

- Local governments should institute management training with an emphasis on institutional quality management that would help build skills for handling emergency situations.
- Prepare and disseminate a sustainable development/redevelopment guide and resource book to provide general guidance and points of contact for more information (FEMA's booklet, *Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability* (FEMA 364), and portions of this guide, as appropriate, should be distributed in the disaster area after an event occurs).
- Sustainable redevelopment experts at all levels of government should provide technical assistance, as well as information on case studies of communities that have previously benefited from applying sustainable redevelopment principles before or after disasters.
- Communities should create local teams of government agencies and development groups to participate in planning efforts and that can also be quickly mobilized if disaster strikes.
- At local and regional levels, train and equip local planning officials in sustainable redevelopment prior to disasters so they can champion the strategy in disaster recovery.
- At all levels, instruct outside experts to work closely with, and not against, local planning officials. Find ways to encourage local planners' ownership in sustainable options.
- When outside experts are required in disaster recovery, deploy them early in the process, before local planners have invested time, money and reputation in unsustainable plans.

Vision Statements

Minnesota Sustainable Developments Initiative

- We Minnesotans make commitments and choices to preserve the options future generations will need to secure the quality of life we now enjoy.
- We see sustainable development as a positive, fundamental change in the way we define social progress, do business, and protect the environment.
- We view the health of our natural environment, the strength of our community, and our economic security as interdependent.
- We maintain our quality of life through sustainable use of energy and natural resources, recognizing that population growth, resource consumption, and lifestyle choices determine the options we leave for future generations.
- Our communities are places where all citizens enjoy rich opportunities in education, employment, involvement in community, and appreciation of the environment.
- Our economy is healthy, diversified, globally competitive, and in harmony with Minnesota's ecosystems; it provides all citizens with ample opportunity for a fulfilling life.

- Our national environment is biologically and ecologically diverse and able to provide the resource benefits, products, and services needed for the indefinite future.
- We continually work to change our political and economic systems so that they consistently reward economically efficient, socially beneficial, and environmentally sustainable behavior.

Sustainable America: Recommendations for Strengthening Communities

Community-Driven Strategic Planning: Create a community-driven strategic planning process that brings people together to identify key issues, develop a vision, set goals and benchmarks, and determine actions to improve their community.

Collaborative Planning: Encourage communities in a region to work together to deal with issues that transcend jurisdictional and other boundaries.

Building Design and Rehabilitation: Design and rehabilitate buildings to use energy and natural resources efficiently, enhance public health and the environment, preserve historic and natural settings, and contribute to a sense of community identity.

Community Design: Design new communities and improve existing ones to use land efficiently, promote mixed-use and mixed-income development, retain public open space, and provide diverse transportation options.

Community Growth Management: Manage the geographical growth of existing communities and siting of new ones to decrease sprawl, conserve open space, respect nature's carrying capacity, and provide protection from natural hazards.

Creation of Strong, Diversified Local Economies: Apply economic development strategies that create diversified local economies built on unique local advantages to tap expanding markets and technological innovation.

Training and Lifelong Learning: Expand and coordinate public and private training programs to enable all people to improve their skills to match future job requirements in communities on a continuing basis.

Environmental Economic Development: Capitalize on economic development opportunities from businesses and industries that target environmental technologies, recycling, and pollution prevention to create jobs.

Redevelopment of Brownfield Sites: Revitalize brownfields, which are contaminated, abandoned, or underused land by making them more attractive for redevelopment by providing regulatory flexibility, reducing process barriers, and assessing greenfield development to reflect necessary infrastructure costs.

Source: President's Council on Sustainable Development, Sustainable America: A New Consensus, 1996.

Quotes

Would you tell me, please, which way I ought to go from here?" asked Alice in Alice in Wonderland. That depends a good deal on where you want to get to, the Cheshire Cat answered.

Lewis Carroll

Then I say the earth belongs to each... to the living:...no generation can contract debts greater than may be paid during the course of its own existence.

Thomas Jefferson

Tornadoes/floods/natural disasters are natural occurrences. They are acts of nature not inherently catastrophic. They only become disasters when they conflict with people and property. The more development in a hazard area, the more disastrous the consequences.

Nature has given us fair warning. Powers that sustain life can also destroy. It is up to us to prepare. That is the challenge of living on this dynamic earth.

PBS Special

Living in a man-made landscape, we easily forget that our well-being is rooted in natural systems. Yet all human enterprise rests on the foundation of natural systems that provide a myriad of invisible life-support services. Our connections to these natural systems may be less direct and obvious than those of an eagle or an otter, but we are no less deeply implicated in life's web. No one has stated this fundamental ecological principle more simply than the early twentieth-century American environmental philosopher, John Muir. When we try to pick out anything by itself, we find that it is bound by a thousand invisible cords... to everything in the universe.

Our Stolen Universe

Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.

Margaret Mead

When you put your hand to the plow, you can't put it down until you get to the end of the row.

Alice Paul

We hold the view that the people make the best judgement in the long run.

John F. Kennedy

The greatest sin is to do nothing because you can only do a little.

Edmund Burke

The world we have created today as a result of our thinking thus far has problems which cannot be solved by thinking the way we thought when we created them.

Albert Einstein

Sustainability refers to a very old and simple concept - the ability to keep going over the long haul. Think of it as extending the Golden Rule through time, so that you do unto future generations as you would have them do unto you.

Robert Gilman

Cambridge, Massachusetts

Sustainable Community Characteristics

Economic Security: A more sustainable community includes a variety of businesses, industries, and institutions that are environmentally sound (in all respects); financially viable; provide training, education, and other forms of assistance to adjust to future needs; provide jobs and spend money within the community; and enable employees to have a voice in decisions that affect them. A more sustainable community also is one in which residents' money remains in the community.

Ecological Integrity: A more sustainable community is in harmony with natural systems by reducing and converting waste into nonharmful and beneficial products, and by using environmental resources for human needs without undermining their ability to function over time.

Quality of Life: A more sustainable community recognizes and supports people's evolving sense of well-being, which includes a sense of belonging, a sense of place, a sense of self-worth, a sense of safety, and a sense of connection with nature, and provides goods and services that meet people's needs both as they define them and as can be accommodated within the ecological integrity of natural systems.

Empowerment with Responsibility: A more sustainable community enables people to feel empowered and take responsibility based on a shared vision, equal opportunity, ability to access expertise and knowledge for their own needs, and a capacity to contribute to decisions that affect them.

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Those who cannot remember the past are condemned to repeat it — George Santayana



November 1, 2000
FEMA 365