Unit 4: Mitigation

Time: 3 hours

Purpose

The purpose of this unit is to explain how the concept of mitigation is evolving and how it can be used by various types of businesses in the community to lessen the impact of disasters. It also covers business continuity planning.

Objectives

At the conclusion of this unit, participants will be able to:

1. Identify the stages of the disaster life cycle
2. Define the evolving concept of mitigation
3. Explain types of risk reduction methodologies appropriate to the business community
4. Describe continuity planning
5. List tools for continuity planning
6. Describe role of insurance
7. List ways to fund mitigation activities elements of continuity planning

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Instructor Preparation

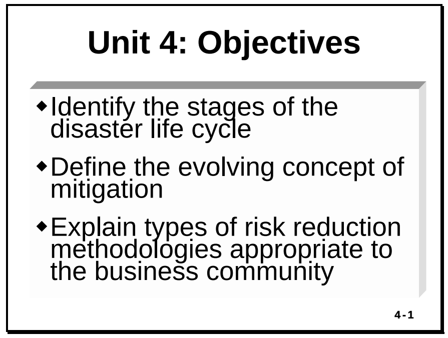
COURSE MATERIALS	EQUIPMENT
• Facilitator Guide • Course Agenda • PowerPoint presentation	• Easel, easel pad, and markers • Overhead projector and projection screen and/or computer display unit and monitor

Where Are We in the Planning Process?

2 minutes

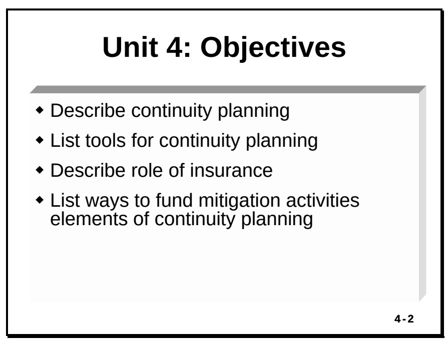
Show Visual 4-1.

Introduce the unit and review the objectives.



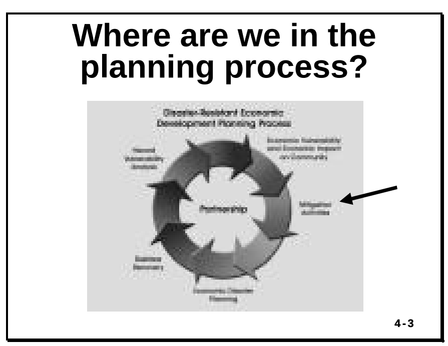
Show Visual 4-2.

Review the objectives.



Show Visual 4-3.

Review where we are in the planning process cycle.

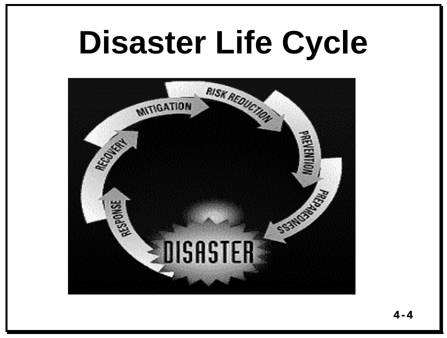


The Disaster Life Cycle

10 minutes

Show Visual 4-4.

Briefly review the disaster life cycle and how FEMA assists at every stage.



Discuss the fact that, in the emergency management response and recovery phases, businesses are incurring costs and losses. We need to invest more resources into mitigation and preparedness.

The disaster life cycle describes the process through which emergency managers **prepare** for emergencies and disasters, **respond** to them when they occur, help people and institutions **recover** from them, **mitigate** their effects, reduce the risk of loss, and prevent disasters such as fires from occurring.

Preparedness

Preparedness ensures that if a disaster occurs people are ready to get through it safely and respond to it effectively. Preparedness means figuring out what you'll do if essential services break down, developing plans for contingencies, and practicing the plan.

Response

Response begins as soon as a disaster is detected. It involves mobilizing and positioning emergency equipment; getting people out of danger; providing food, water, shelter, and medical services; and bringing damaged services and systems back online.

Recovery

The task of rebuilding after a disaster can take months, even years. Federal loans and grants may help to rebuild homes, businesses and public facilities, to clear debris and repair roads and bridges, and to restore water, sewer, and other essential services.

Mitigation

Mitigation is the ongoing effort to lessen the impact of disasters on peoples' lives and property through damage prevention and flood insurance. This includes such measures as building safely within the floodplain or removing businesses altogether; engineering buildings and infrastructures to withstand natural forces; and creating and enforcing effective building codes. The Federal Insurance & Mitigation Administration combines organizational activities to promote protection (insurance), prevention (mitigation measures), and partnerships at the Federal, State, local, and individual levels.

Risk Reduction

Risk reduction is the goal of all mitigation efforts. FEMA reduces the cost and damage of flood disasters through the Federal Insurance Administration. The FIA partners with national insurance companies to provide affordable flood insurance, available nationwide. Communities become eligible for such insurance by enforcing floodplain management practices. As communities require individuals and businesses to comply with these guidelines the risk of damage and injury is reduced.

What is Mitigation?

10 minutes

Show Visual 4-5.

Ask participants the following question.

Write their answers on an easel pad.

Show Visual 4-6.

Define mitigation.

Mitigation is defined as **"sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects."**

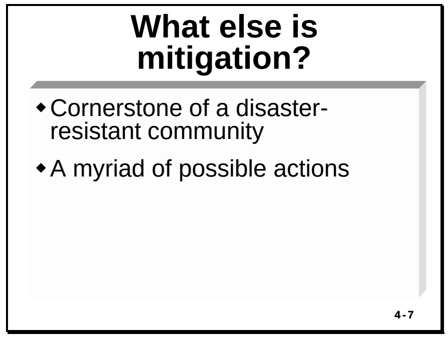
Mitigation focuses on lessening the impact of disasters on:

- Loss of life
- Families
- Property
- Environment

Disaster costs and the impacts of natural hazards can be reduced by emphasizing proactive mitigation before emergency response; both pre-disaster (preventive) and post-disaster (corrective) mitigation is needed.

Show Visual 4-7.

Continue discussing the term, mitigation.



Discuss how the concept of mitigation has evolved over the years.

As our view of disasters has grown to encompass human-made, terrorist incidents as well as natural and technological events, mitigation has changed. Mitigation has changed to include more education, partnerships, and social marketing (breaking through cultural barriers). The public education efforts of fire departments, for example, were formerly considered “first response” only. With today’s integrated approach to all types of disasters, where first responders play an increasingly more visible role in risk reduction, the overall effort to keep businesses “in business” is one aspect of mitigation.

Relate the concept of mitigation to the business community.

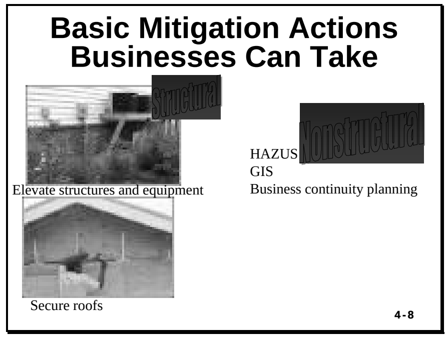
No matter where a business is located, hazard events have the potential for shutting down a business for days, weeks, or more. Disasters are costly for business owners who are not prepared. Mitigation is an important means of protecting business operations from the effects of natural, technological, and human-caused hazards.

On 2 easels, quickly do a brainstorm of mitigation actions they know from their community.

Mitigation is the cornerstone of building a disaster-resistant community. Mitigation supports the building (or rebuilding) of communities as models of sustainable development to assist in the reduction of, and recovery from, economic impacts of disasters.

Show Visual 4-8.

Highlight some basic mitigation measures a business can take. Mention the structural and nonstructural approach to mitigation.

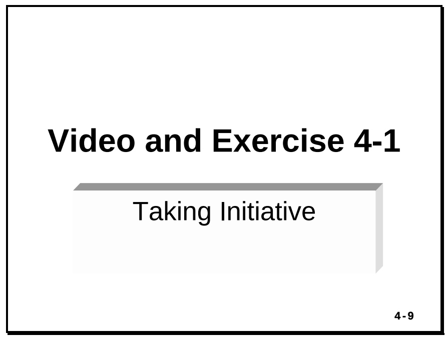


Mitigation measures can be used to help business and industry reduce or avoid damages to their facilities and remain operational in the face of catastrophe. In practice, physical mitigation can take many forms, both structurally and nonstructurally. It can mean choosing a location or a structural design to prevent predictable damage or retrofitting an existing building to meet safer standards. Mitigation can also mean utilizing GIS-based programs such as HAZUS, which can help estimate the potential impact of a natural disaster.

Video and Activity 4-1: Taking Initiative

40 minutes

Show Visual 4-9.



Introduce the video. Before showing the video, ask participants to look over the discussion questions. This will serve as a guideline for the discussion following the video.

After the video, give participants time to complete the worksheet and then review the answers.

The answer key for this exercise is in Appendix A.

Exercise 4-1: Taking Initiative

Time

- 1 minute (to look over questions)
- 15 minutes (video)
- 9 minutes (completing worksheet)
- 10 minutes (class discussion)

Purpose

The purpose of this exercise is to generate discussion among participants concerning the content of the video and to see how other communities have formed partnerships to mitigate future disasters that threaten their existence.

Directions

1. Read the questions on the following worksheet. As you watch the video, keep these questions in mind so that once the video is over, you can fill in the worksheet.
2. After the video, work in your small groups or individually to complete the worksheet.
3. You will have an opportunity to share your answers with the class.

"TAKING INITIATIVE" DISCUSSION QUESTIONS

1. In the context of this video, what does mitigation mean?

2. The video mentions elements that are essential for a community's sustainability. What are those elements?

3. Roseville took actions such as building a berm wall, constructing retention basins, and removing culverts and installing bridges to mitigate damage from floods. How will these actions help them in the future?

4. Why did IHOP spend time and money on mitigation actions?

5. How did the communities of Kinneoloa and Pasadena unite to educate property owners on taking the initiative to build a disaster-resistant community?

How Does the Business Community Currently Approach Mitigation, Preparedness, and Loss Reduction

Show Visual 4-10.

Discuss how businesses view their present mitigation and preparedness needs.

Businesses are receptive to mitigation, and many are doing mitigation – though it may be called something else. As the saying goes, "A rose by any other name is still a rose." Mitigation by any other name (i.e., business continuity planning) is still mitigation. Businesses may be involved in other loss reduction activities to remain competitive.

A business's decision to mitigate may depend on many factors, including any of the following:

- Size
- Business sector
- Regulatory requirements
- Cost
- Insurance availability
- Debt burden

Show Visual 4-11.

Stress the importance of discussing loss reduction in terms business owners will understand.

For those businesses who are reluctant to mitigate, it's important to communicate with them in their own language.

- Some ideas for sending mitigation messages are: Focus on business needs, not just on public imperatives
- Make it meaningful to business goals and processes
- Consider customized vulnerability assessments using HAZUS or other tools
- Use business impact analyses (internal) and regional business impact analyses (external) within a private/public partnership
- Convey that using the Internet for business success means that eventual Internet disruption, which occurs as a result of natural and human-caused disaster, is fast becoming a threat to business recovery
- Explain that business quality management = mitigation

Business Continuity Planning

15 minutes

What Is Business Continuity Planning?

Using easel, ask for a brainstorm of business continuity planning.

Define business continuity planning.

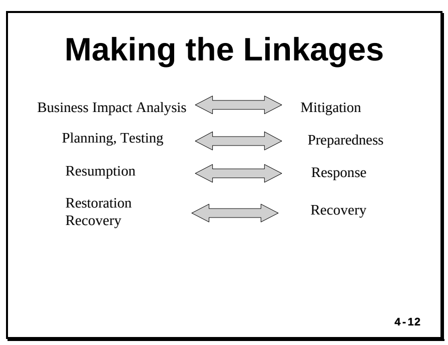
Business continuity planning is the ongoing process of creating, testing, and maintaining policies and procedures to follow in the event of disaster (creating the disaster plan). Its primary goal is to increase the likelihood of a business surviving a disaster.

Note: Different cultures use a variety of terms.

Business continuity planning and management today includes addressing the identification and continuity of time-sensitive business and service functions and processes and all of their complex internal and external interdependencies as well. (Moore, 1999).

Show Visual 4-12.

Discuss the linkages between business continuity phases and comprehensive emergency management.



If a business didn't have a plan in place before the disaster, then the recovery period is the time to consider mitigation plans.

Importance of Business Continuity Planning

Highlight the importance of business continuity planning.

Disasters can inflict huge losses on businesses so communities must have a disaster-resistant economic base that includes jobs that will survive during and after a disaster. As many as 40 to 50 percent of small businesses do not reopen after a major disaster. Destroyed or damaged property and loss of revenue from disruption of critical services and customer base in the aftermath pose great threats to the survival of businesses and the economic well-being of owners and employees.

Businesses, especially small businesses, can bounce back quickly, if such mechanisms as the following are in place:

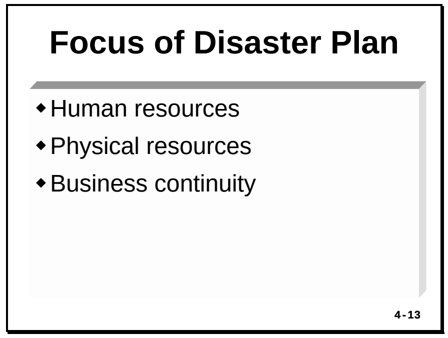
- Business interruption insurance
- Redundancy built into systems
- Plans to ensure that damaged equipment or processes can be repaired or put back into place quickly
- Employee preparation

The benefit of ensuring business continuation in areas recognized as disaster-prone is immense. Business continuity planning helps to reduce the organizations vulnerability to a disaster.

Preparing a Business to Stay in Business: Developing the Plan

Show Visual 4-13.

Identify the three areas that a business continuity plan should focus on.



Every business needs to develop a disaster plan that focuses on three areas:

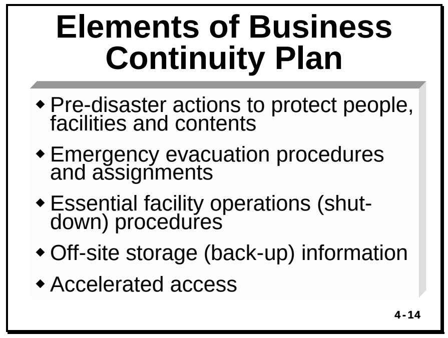
- Human resources (how a disaster could affect your employees, customers, vendors, local community, and workplace)
- Physical resources (what you would need to serve your customers if your facility is closed or destroyed)
- Business continuity (how you could continue doing business if the area around your facility is closed or destroyed or streets are impassable)

The business disaster plans need to identify ways to reduce potential damage. This could include taking precautions to prevent or reduce disaster damage in your facility, such as securing equipment and shuttering windows.

The disaster plans need to consider how it will protect its employees, customers, and workplace. This begins with taking steps to ensure that all employees know how to prepare for a disaster and what to do if a disaster occurs.

Show Visual 4-14.

Identify and explain some elements of a business continuity plan. Mention the resources available for helping businesses develop these plans.



A business continuity plan should contain the following elements:

- Pre-disaster actions to protect people, facilities, and contents
- Emergency evacuation procedures and assignments
- Essential facility operations (shut-down) procedures
- Off-site storage (back-up) of information
- Accelerated access

For more information on developing a business continuity plan, refer to the following sources:

- *Open for Business: A Disaster Planning Toolkit for the Small Business Owner (*Institute for Business & Home Safety, Small Business Administration*)*
- *Emergency Management Guide for Business* (FEMA)
- FEMA Standard Checklist for Business Recovery
- *Before the Aftermath: Business Actions to Reduce Disaster Losses Scorecard* in the toolkit is also a useful tool for assessing your critical business functions and determining actions to reduce disaster losses.

BUSINESS CONTINUITY ISSUES

Business Priorities

- Critical Functions/Critical Services
- Timely Restoration of Workforce, Facilities and Other Essential Business Functions

Assess Business Impact

- Additional Expense
- Lost Revenue
- Lost/Shifted Market Share and/or Embarrassment

Determine Internal Dependencies

- Personnel
- Equipment
- Utilities
- Services/Functions
- Critical Infrastructures
- Internal Chain of Communication (Leaders, Insurance, Emergency Responders, Key Personnel)

Protect Information Systems and Critical Documents

Identify Key Vendor(s)

- Contact Information Stored On-Site and Off-Site
- Transportation Routes
- Vendor's Contingency Plans
- Back-Up Suppliers

Means to Secure Area, If Necessary

Evacuation Procedures for Employees and Guests

Back-up Facilities with Necessary Equipment

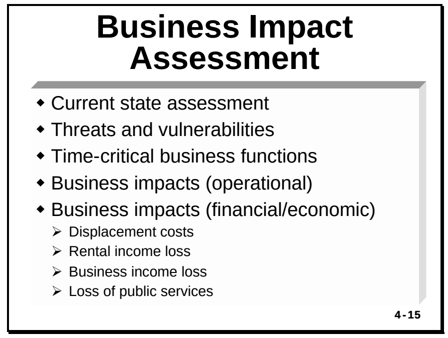
Checklist for Employee Actions in Emergency (SMART)

Media Relations: Preplanned/Prescripted Messages

Doing a Business Impact Assessment

Show Visual 4-15.

Mention the importance of calculating economic losses.



Though it's not easy to determine exact figures regarding the economic losses to businesses and the community, it's important to try to estimate the losses.

A business impact assessment is a critical component in business continuity planning. It should cover the following:

- Current state assessment
- Threats and vulnerabilities
- Time-critical business functions
- Business impacts (operational)
- Business impacts (financial)
- Recovery approach

Businesses should try to estimate economic loss for:

- Displacement costs
- Rental income loss
- Business income loss
- Loss of public services

Calibrate the losses you determined with potential mitigation alternatives to further identify cost-effective options. If possible, work with your economic development office to obtain this information.

Recovery is considered complete when the local economy returns to the same level as before the event. Gauges of this recovery could be any of the following:

- Unemployment rates
- Per capita incomes
- Other locally used economic indicators

You could monitor trend lines of these indicators before and after the event. You many even notice an upward trend in employment rates because of a construction boom due to repairs and rebuilding. Assess and account for this short-term effect when examining how the local economy recovered.

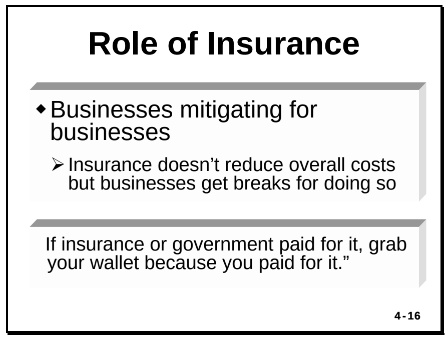
The amount and speed of reinvestment to repair damaged businesses and lifelines will also affect how fast the economy recovers.

Role of Insurance

15 minutes

Show Visual 4-16.

Discuss the role of insurance in business continuity. Refer participants to the articles in their manual for more details.



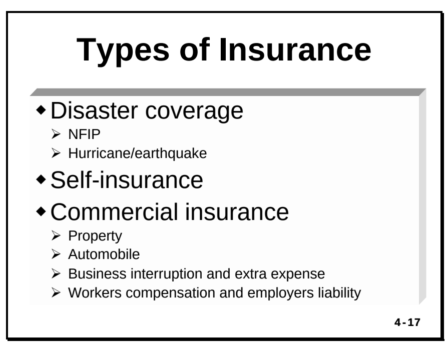
Insurance does not ensure a business's post-disaster survival.

The right insurance will help finance a successful recovery of a *viable* business.

Types of Insurance

Show Visual 4-17.

1. **Ask how often participants experience success stories in their communities from good insurance coverage. Ask for examples.**



2. Highlight key points about types of insurance.

Self-Insurance

Self-insurance refers to insurance that the business provides for itself. This means that a business in reality may have no insurance other than what it can cover with its own resources.

Self-insurance is most appropriate when the business can identify internal financial resources or other reliable sources of funding (line of credit, commitment to provide additional capital) for retained disaster losses.

Reliance on self-insurance could mean that the business be vastly underinsured for the disaster losses.

Commercial Insurance

Commercial insurance is another source of post-disaster funding that provides timely access to financial resources after a disaster.

This insurance usually includes the following:

- Property coverage
- Automobile coverage
- Business interruption and extra expense coverage
- Workers' compensation and employer's liability

Property Coverage

Most businesses own business personal property, such as equipment, furniture, machinery, and tools. Some businesses also own real property with improvements that are used as the business's premises. A disaster that damages or destroys business real or personal property can force a business to close or limit operations. Property insurance that funds repair or replacement of damaged business property will help the business stay open or return to operation as quickly as possible.

> Refer to the *"The Role of Insurance in Business Disaster Planning and Recovery" article* for a list of issues businesses need to consider when buying property insurance.

Automobile Coverage

Many businesses own or lease motor vehicles. A disaster that damages or destroys motor vehicles essential to the business's core functions can force a business to close or limit operations. Insurance that funds repair or replacement of damaged vehicles will help the business stay open or return to operation as quickly as possible.

> Refer to the *"The Role of Insurance in Business Disaster Planning and Recovery" article for* a list of issues businesses need to consider when buying automobile insurance.

Business Income Interruption and Extra Expense Coverage

Business income interruption and extra expense coverage protect a business's income stream rather than its property.

However, such insurance may not cover all losses associated with business interruption. For instance, hotels and restaurants that escape damage but don't have any guests or patrons because tourism declines, won't be covered. It only covers lost profits and extra expense to the affected business.

Businesses should be familiar with the types of events that might force them to close and know whether these events arise from perils excluded from their property coverage. If so, the business may want to consider paying an additional premium to add these perils to its policy.

> Refer to the *"The Role of Insurance in Business Disaster Planning and Recovery" article* for detailed information on issues related to business income interruption and extra expense coverage.

Workers' Compensation & Employer's Liability Coverage

Workers' compensation insurance pays the employer's statutory obligation to pay lost wages, medical expenses and other benefits to workers who are injured on the job. Uninsured employers can face significant penalties and uninsured losses.

Employer's liability insurance is often packaged with workers' compensation coverage. It protects the employer from liability for employee work related injuries that are not covered by workers' compensation coverage

Workers' compensation and employer's liability insurance protect employers by preserving their resources to address other disaster-related needs.

3. Discuss the role of NFIP and other insurance such as earthquake or hurricane insurance.

The Role of Insurance in Business Disaster Planning and Recovery

Claire Lee Reiss, J.D., ARM, Director of Grants and Research, Public Entity Risk Institute

A community's first concern after a natural or human-caused disaster is locating and attending to victims and survivors. After the community addresses its citizens' immediate life safety and shelter needs, a major concern is the disaster's effect on the community's businesses. Local businesses are the foundation of a community's economy, and their recovery is essential to the community's recovery.

Graphic news footage of widespread destruction may be our first mental image of disaster, but physical damage is only one way disaster can devastate and ultimately destroy a business. Businesses also suffer financially when their employees cannot (or will not) come to work after a disaster; their customers cannot reach the premises due to infrastructure damage or order of civil authority; their customer base has changed; they cannot open due to a disruption of essential utility services; or their transactions with a critical supplier or a major customer are disrupted. Successful recovery requires that businesses address these and other barriers.

Timely access to financial resources can help businesses address the barriers to post-disaster recovery. Businesses are faced with many competing financial needs after a disaster. They may need to repair or replace damaged business property, including premises, inventory and business equipment. Businesses also have fixed expenses such as rent, utilities, insurance, license/permit/franchise fees, loan payments, and property taxes, which continue even if a disaster disrupts their cash flow. Some businesses may also want to continue to pay skilled employees who are vital to the business and would be difficult to replace. Businesses without the funds to repair or replace damaged business property, to pay fixed expenses or retain valuable and skilled employees during a cash flow disruption may be forced to close, even if the business is viable in the long run.

Many businesses, especially small businesses, do not have adequate internal financial resources to cover these post-disaster needs. Business owners often invest all their available resources in starting or expanding the business. When a disaster occurs, these businesses are left scrambling to find emergency funding at a cost they can pay.

The best time to plan for post-disaster financial needs is before the disaster. A business that plans in advance makes better decisions because it has more time to analyze its critical financial needs and evaluate its options. It does not have to identify, evaluate and pursue potential funding sources while coping with the other personal and business effects of the disaster. And its options are not limited by post-disaster conditions, which may reduce available funding and produce intense competition for the funding that is available.

Businesses can plan for post-disaster financial needs in several ways. The business can purchase commercial insurance, which promises to pay the business for a covered loss in exchange for a premium. Businesses can also "self-insure" possible losses from disasters, relying on their own internal resources to meet post-disaster financial needs. A line of credit arranged in advance can provide businesses with access to needed funds after a disaster. And some businesses mistakenly rely on federal Small Business Administration post-disaster loans, which must be repaid, may not be available to all affected businesses, and not available unless the President of the United States declares a federal disaster or the Small Business Administration makes an administrative disaster declaration. No one approach is correct, or even possible, for all businesses. The focus of this discussion will be on the self-insurance and commercial insurance options.

Self-Insurance

Self-insurance is a commonly used term, but is somewhat of a misnomer. "Insurance" is generally understood to exist where, by contract, one party agrees to reimburse another party for losses caused by a covered peril. Self-insured losses, however, are borne by the party that suffered the loss, not by an insurer. The business "insures" itself. Many businesses use a combination of the two methods: self-insuring losses up to a level they can afford, and buying insurance for larger losses that would significantly disrupt their operations.

Businesses may self-insure their disaster loss exposures either intentionally or by default. Businesses self-insure by default when they make no advance plans for other financing. This usually happens because a business fails to identify a hazard, believes it has no options for addressing the hazard, or erroneously believes that the government will cover all its post-disaster needs. It can also happen when a small business owner operating from home erroneously believes that the homeowner's coverage for the premises will cover the business as well. Most homeowner's policies cover a very limited amount of business property and exclude liability arising from business activities on the premises. For businesses that are self-insured by default, the only option is to cover disaster losses using whatever internal resources are available.

Businesses may also intentionally self-insure all or part of their loss exposures. These businesses decide how much loss they can fund internally ("retain") without adversely affecting their operations, adopt a plan for funding those retained losses, and buy insurance to cover larger losses. The business often establishes internal financial reserves it can use to pay its self-insured losses. These reserves protect the business's operating funds, permitting it to continue financing its operations even if it must respond to a disaster.

Self-insurance is most appropriate when the business can identify internal financial resources or other reliable sources of funding (line of credit, commitment to provide additional capital) for retained disaster losses. Without secure funding sources, businesses that intentionally self-insure are in no better position after a disaster than businesses that self-insure by default. Both will be scrambling for funds after a disaster.

Commercial Insurance

Commercial insurance is another source of post-disaster funding. Insurance is not the least expensive way to finance losses. In the long run, an insured's premium should equal the value of its expected losses plus the insurer's overhead and profit. For businesses that are unable to set aside financial reserves to cover potential losses, or for those financially able to self-insure only part of their losses, insurance provides timely access to financial resources after a disaster. Insurance has the added advantage of helping to stabilize a business's financial results over time.

The financial results of a business that self-insures its losses may vary more from year to year, with good or bad results depending on the amount of losses occurring each year. For insured businesses, the cost of losses is spread out more evenly over years of paying premiums, resulting in more stable long-term financial results.

Insurance does not ensure a business's post-disaster survival. A business can buy the appropriate insurance coverage and still fail if its customers no longer need or want its goods and services.[1] However, the right insurance will help finance a successful recovery of a *viable* business by providing an infusion of cash when a loss is greater than the business can absorb, or the owner needs help paying ongoing expenses. An insurance recovery may also allow the owner of a nonviable business to walk away with some of the equity.

As the September 11, 2001 terrorist attack on the World Trade Centers proved, disasters produce many different types of loss. Employees can be killed or injured on the job, causing workers' compensation liability. The business's real and personal property can be physically damaged and unavailable for use. The business's customer and revenue base may disappear, as it did for many small businesses around the World Trade Centers. The business may be unable to operate because it cannot receive deliveries of supplies, has no operable utilities, or is denied access to its premises by surrounding conditions or by order of civil authorities. The business may be able to continue operation, but only by expending funds in addition to its normal operating expenses to meet some special need.

These potential losses are not all covered by one "disaster" insurance policy. Generally the needed coverage is provided through multiple policies of insurance that cover losses from some (but not all) disaster-related perils along with losses from more mundane perils, such as an ordinary fire. Selection of insurance can be complex: so how is a small business owner supposed to identify the insurance the business needs? Much information about insurance is freely available to the public, and some businesses can rely on this information to identify their general insurance requirements. Other business owners rely on an insurance agent or a risk management consultant to help identify perils, potential losses, and the types and amounts of insurance coverage required. The information below provides general information about the role of insurance in meeting business's post-disaster recovery needs. Every situation is different, however, and business owners should contact a qualified professional for advice.

Property Coverage

Most businesses own business personal property, such as equipment, furniture, machinery, and tools. Some businesses also own real property with improvements that are used as the business's premises. A disaster that damages or destroys business real or personal property can force a business to close or limit operations. Property insurance that funds repair or replacement of damaged business property will help the business stay open or return to operation as quickly as possible.

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[1] *Organizations at Risk: What Happens When Small Businesses and Not-for-Profits Encounter Natural Disasters*, Daniel J. Alesch, James N. Holly, Elliott Mittler, and Robert Nagy, Center for Organizational Studies, Univ. of Wisconsin-Green Bay, 2001, available online at www.riskinstitute.org.

Some issues to consider when buying property insurance include:

- ❑ Are the limits and deductibles adequate to serve the financial needs of the business?
- ❑ Is all the business's personal property covered under the policy, or are some items excluded from coverage by the policy. Be familiar with all exclusions. For example, electronic data processing equipment and media may be excluded or covered with limitations.
- ❑ If the business owns real property, are important structures on the property covered, or are some structures, such as outbuildings, excluded? If building code requirements would increase the cost of rebuilding the structure, or law would require demolition and clearing of the remainder of a partially destroyed building before rebuilding, does the policy cover these increased costs?
- ❑ Does the policy cover the cost of removing the debris of a destroyed building before rebuilding?
- ❑ How is payment for damaged or destroyed property determined under the policy? Will the payment be adequate to replace the property, or will payment be reduced for depreciation? Will the payment be lower if the business chooses not to replace the property?
- ❑ If the lease for business personal property makes the lessee responsible for loss of the property or for maintaining insurance on the property, does the insurance cover the leased property? If not, the business may be contractually required to replace leased property without insurance proceeds to fund this expense.
- ❑ If the business leases its premises, does its coverage comply with requirements in its lease?
- ❑ Is there a coinsurance penalty in the policy that reduces loss payment if the building is not insured at or close to its full value? Is the business's property adequately valued to avoid the coinsurance penalty?
- ❑ What perils are covered by the insurance policy? Are any excluded perils relevant to the business? For example, losses from earthquake and flooding are routinely excluded from property coverage and must be added back for an additional premium.
- ❑ Does the policy cover the business's property that is away from the business premises?
- ❑ Does the policy cover the property of others that is damaged or destroyed while on the business's premises?
- ❑ Does the policy's coverage for accounts receivable records and reconstruction of other valuable papers and records meet the business's needs?
- ❑ If the policy includes business interruption and extra expense coverage, is it sufficient to serve the business's needs? (See below, Business Interruption and Extra Expense Insurance)

Automobile Coverage

Many businesses own or lease motor vehicles. These are covered by automobile specific policies rather than the business personal property coverage discussed above. Some businesses that own or lease motor vehicles could continue to function temporarily without them. Other businesses rely on a fleet of motor vehicles to accomplish the core functions of their business. A disaster that damages or destroys motor vehicles essential to the business's core functions can force a business to close or limit operations. Insurance that funds repair or replacement of damaged vehicles will help the business stay open or return to operation as quickly as possible.

Coverage for damage or destruction due to a disaster is provided under the automobile policy's comprehensive coverage. This coverage is separate from collision coverage, which covers insured automobiles from damage due to collision and rollover.

Some disaster related issues to consider when buying automobile insurance include:

- ❑ Does the business's auto insurance policy provide comprehensive coverage on the vehicles?
- ❑ If the insurer requires that all covered vehicles be individually identified on the policy, are all covered vehicles identified, and does the business have a system for ensuring that the insurer is notified of additions to and deletions from the list of insured vehicles?
- ❑ If the vehicles are leased, does the lease agreement require the business leasing the vehicle to insure them, and does the business's automobile insurance cover those vehicles as required by the terms of the lease agreement? Does the policy cover the business for all its financial obligations under the lease agreement when a leased vehicle is damaged or destroyed?
- ❑ What perils are covered by the insurance policy? Are any excluded perils relevant to the business?

Business Income Interruption and Extra Expense Coverage

Business income interruption and extra expense coverage protect a business's income stream rather than its property. By paying the insured for its ongoing and extra expenses and its lost net profits, this insurance can make the difference between post-disaster survival and failure for an otherwise viable business that is suddenly forced to limit or close its operations due to a covered loss.

Business income interruption and extra expense coverage are usually included by endorsement on an insured's commercial property coverage. They are also included in most business owner's package policies[2]. This coverage protects businesses only from perils covered by the insured's property coverage. If a business owner's property coverage excludes loss from floods and earthquake perils, as most do, its business income interruption and extra expense coverage also exclude those causes of loss. Exclusions may vary depending on the risk in different geographic

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[2] A business owner's package policy combines basic property and liability coverage into one policy form, which is sold for one premium. It does not include workers' compensation coverage or coverage for automobiles owned by the business or its owner.

areas. For example, in Florida, windstorm may be an excluded peril. Exclusions also evolve over time. In the wake of September 11, terrorism may become an excluded peril. Businesses should be familiar with the types of events that might force them to close and know whether these events arise from perils excluded from their property coverage. If so, the business may want to consider paying an additional premium to add these perils to its policy.

Basic Business Income Interruption and Extra Expense Coverage

In its basic form, business income interruption coverage protects a business against temporary loss of net income and ongoing business expenses if a covered loss to the insured's premises forces the business to limit its operations or close. Subject to any applicable deductibles, coinsurance provisions, or limits of coverage, the insured is paid for net lost profits and continuing expenses during the period of repair, or until the business reopens in another location. The insured must resume operations as quickly as possible, either at the insured location or elsewhere, or risk denial of part of its claim for lost income and extra expenses. The policy may cover "extended business income" losses for a period of time after the business resumes operations, to help the insured while business returns to its former level.

A limited form of extra expense coverage is usually provided with business interruption coverage. It reimburses a business for expenses beyond normal operating expenses, if those expenditures reduce the business income interruption loss by allowing the business to continue operations or resume operations sooner. Extra expenses include the additional expenses associated with continuing operations either at the insured's premises or at replacement or temporary locations. Examples include the costs of relocating to temporary alternative premises, the costs of outfitting those premises with necessary equipment and furniture, and employee overtime.

Pure Extra Expense Coverage

A business may be able to buy a broader form of extra expense coverage as a separate endorsement to its property coverage. This broader form of extra expense coverage (sometimes called "pure extra expense" because it is not coupled with protection for loss of business income) covers extra expenses without requiring the insured to prove that they offset business interruption losses. This broader coverage is useful for businesses that may face severe ongoing financial losses if they close even briefly. This may be the case for businesses in highly competitive industries, where a brief closure can cause a large loss of market share. Pure extra expense coverage may also benefit organizations such as nonprofits, public entities, and other providers of essential services that cannot be discontinued.

Civil Authority Coverage

Most business income interruption and extra expense insurance covers losses when a civil authority prohibits access to the insured's premises due to direct, physical damage to a different property in the area. This "civil authority" coverage usually requires that the damage causing the civil authority action result from a peril covered by the insured's policy. If the peril that caused the civil authority's prohibition is excluded from the insured's policy, the insured has no business income interruption or extra expense coverage for that loss. Civil authority coverage may be more limited in duration than coverage based on direct damage to the insured property.

Contingent Business Interruption Coverage

Businesses that are highly dependent on a crucial supplier or customer base may be able to negotiate and buy coverage for “contingent business interruption.” Contingent business interruption insurance covers an insured business’s losses resulting from a third party’s inability to complete a business transaction with the insured. The third party must be unable to perform because it has suffered a loss caused by a covered peril. The third party may be a supplier that is unable to provide essential supplies or services to the insured. For example, franchisees depend on regular delivery of branded supplies from their franchiser, and may have to close if they do not receive those deliveries. The third party may also be a major customer (or customer base) that is unable to accept delivery of goods or services from the insured.

Service Interruption and Off Premises Power Failure Coverage

Some businesses are highly vulnerable to loss of utilities such as electricity, gas, water and telecommunications services. For example, grocers may depend on electrical service from an off premises utility to keep their food inventory refrigerated and frozen. Vulnerable businesses may be able to buy insurance coverage for losses resulting from this “service interruption” or “off premises power failure.” The service interruption must result from a covered peril. Businesses must use care in selecting policies because they do not all cover the same types of loss. Policies may cover lost income, damage to the insured’s property, or both. Some industry groups offer package policies that provide service interruption/off premises power interruption targeted to the needs of that specific group.

Record-keeping Considerations

Business interruption and extra expense claims require extensive documentation of past business income and expenses. The time to begin this documentation process is before a disaster. Maintain thorough and accurate income, expense and property records. Keep a duplicate of these records in another location. And have a plan for resuming operations, including alternative locations and sources of essential equipment and supplies.

Some disaster-related issues to consider when buying business interruption and extra expense coverage include:

- ❑ How vulnerable is the business to interruption? Is the business service based and easily conducted out of an alternative location? Is the present location a crucial part of the operation, perhaps because the business has a customer base in the surrounding area or manufactures goods using complex and expensive machinery that cannot be duplicated or relocated on a temporary basis?

- ❑ Does the coverage include the causes of loss (perils) to which the business is vulnerable? If the geographic region is subject to floods or earthquakes, are these perils covered?

- ❑ How long must the business wait before payments for lost income and extra expense begin? How long will those payments continue?
- ❑ Will the lost income payments be sufficient to keep the business alive financially while repair or reconstruction is completed? Understand any coinsurance requirements and how they will affect payments.
- ❑ Does the coverage include closure by order of Civil Authority?
- ❑ Does the coverage include extended business income losses, and does any time limit give the business sufficient time to return to its previous level of operations?
- ❑ If the business suffers a loss, what information must it submit to document the claim? Does the business have a system to track this information?
- ❑ Does the lost income coverage include a schedule of payments that will delay the business's receipt of funds?
- ❑ Does the business need contingent business interruption coverage?
- ❑ Does the business need service interruption/off premises power interruption coverage?
- ❑ Does the business have contingency plans to resume operations as soon after a disaster as possible, either from its own premises or from an alternative site? Has the business identified the resources it will need and the expenses it will incur?

Workers' Compensation & Employer's Liability Coverage

Workers' compensation insurance pays the employer's statutory obligation to pay lost wages, medical expenses and other benefits to workers who are injured on the job. Most states require employers to secure payment of these benefits either by purchasing workers' compensation insurance or obtaining state approval to operate as a self-insured employer. Uninsured employers can face significant penalties and uninsured losses.

Employer's liability insurance is often packaged with workers' compensation coverage. It protects the employer from liability for employee work related injuries that are not covered by workers' compensation coverage. This coverage includes protection of employers from claims by spouses of injured workers, third parties that have been sued by the injured worker, and injured workers whose injuries are not covered by the state's workers' compensation law.

If a disaster injures employees on the job, there is a good chance that agencies administering the traditionally liberal law of workers' compensation will award benefits. If not, employers may be vulnerable to lawsuits claiming that they did not take adequate steps to protect their employees from the disaster that caused the injuries. Either can drain an uninsured employer's resources. Workers' compensation and employer's liability insurance protects employers by preserving their resources to address other disaster-related needs.

Is Insurance All a Business Needs?

No discussion of business disaster recovery is complete without acknowledgement of the crucial role of contingency planning. Contingency planning is a process to identify and address the perils that endanger a business's operations. It includes planning in advance, and in detail, how the business will respond if a disaster occurs. Insurance is only one small part of that planning process: a funding mechanism the business will use to finance implementation of its post-disaster plans.

No amount of insurance will duplicate the benefits of effective contingency planning. Contingency planning helps businesses identify and correct vulnerabilities before they cause a loss. Businesses that identify their vulnerabilities and develop post-disaster plans in advance will also use their financial resources, including insurance payments, to respond more effectively. A business without a contingency plan may receive insurance payments, but will lack a coherent plan for using those funds to achieve the best result. It will still be evaluating its options when businesses with contingency plans are getting back to business.

Excellent resources are available to help businesses and other organizations with contingency planning. Check the following web sites for additional information:

Institute for Business and Home Safety: www.ibhs.org. Publishes the *Open for Business Toolkit*, the *Open for Business Disaster Recovery Plan*, and the *Getting Back to Business* brochure.

Nonprofit Risk Management Center: www.nonprofitrisk.org. Publishes *Anticipating, Preventing and Surviving a Crisis in a Nonprofit*.

Greater Cleveland Chapter of the American Red Cross: http://www.redcross-cleveland.org/. Publishes *Planning 4 Survival*, a business continuity planning tool on CD-ROM.

Conclusion

Major catastrophes may never affect most businesses, but preparation is not a waste of time or effort. The preparation that protects a business's financial resources after a major catastrophe will also help the business survive the more likely smaller events. Insurance can play a crucial role for businesses that cannot fund their recovery with internal resources.

About the Public Entity Risk Institute

The Public Entity Risk Institute (PERI) is a nonprofit, nonmembership organization that serves the risk management needs of local governments, small businesses and small nonprofit organizations. PERI's goal is to provide its constituents the knowledge, resources, and information that will help them address their risk management needs. PERI's website, www.riskinstitute.org, houses an information Clearinghouse, free online articles and publications, and periodic free Internet Symposia on cutting edge risk management topics.

THE BEST WAY TO INSURE YOUR BUSINESS
BY HAIG NEVILLE

There are many different events to insure your business against; some may be unnecessary for your business needs. Finding the right plan and budget is almost as difficult as running the business itself. How do you know the amount to insure against and which events or "catastrophes" you should cover?

One of the insurance lessons of Hurricanes Andrew, Hugo and Fran, the California fires and other catastrophes, is that having enough insurance to cover the value of a home or business is not good enough. You have to consider the costs of tearing down, clearing and the removal of debris before you can start building again. These costs can use up 10 percent to 25 percent of the available coverage before you even begin to rebuild the property!

One way to avoid this is to buy more insurance than the property reconstruction value or to inquire into "Guaranteed Replacement Cost" coverage which will pay for whatever it takes to rebuild your property — even if it is more than the policy amount.

Another problem is that after you have built your home or office, building ordinances may be enacted that require upgraded and more expensive new construction, including revised plumbing, electrical and structural codes. Your policy may not pay for these increased costs, unless you specifically asked for it. That's something that many property owners in southern Florida didn't know. Some properties were built without adequately anchored roof trusses in order to withstand high winds, as required by construction codes. Be sure to always keep your insurance up to date.

Risk Management

You cannot insure against every conceivable loss, but you should try to get your money's worth when you buy a policy. Most consumers are not aware that buying insurance generally costs twice as much as actual claims, in the long run. If you are really smart, you assume some of those risks yourself in order to save money. Deciding when and how to do that is call "risk management".

The first step is to identify what risks you face before you can decide how to treat them. This is a principle that is frequently overlooked. For example, a paint distributor may store drums of toxic chemicals which could leak into the subsoil resulting in contaminated wells throughout the community. The risk has been identified.

The second step is to eliminate the risk. In this example the distributor may be advised to build a concrete containment storage area with frequent monitoring of the ground water for contamination levels around the site. Another option to eliminate the risk is to outsource certain hazardous work. For example, a Midwestern manufacturer of small anodized computer components identified an explosion risk in processing parts at the plant. By outsourcing the job, the plant became a safer workplace.

The Deductible Approach

If you are unable to eliminate a risk, a third option is to transfer the risk to someone else. The most common method of doing this is to purchase insurance. The downside of this option is that the cost of commercial insurance can be more expensive than self-assumption of many risks. This method is good for unpredictable, serious and immeasurable losses, and should be avoided for those that are predictable. For example, if your cost of business automobile scrapes and dents averages $1000 annually, your insurance premium is eventually going to approach $2000. Don’t insure against “first dollar” losses; adopting a “deductible” approach makes good business sense for these predictable losses.

The primary purpose of insurance is to protect against catastrophic financial losses. What is catastrophic for one firm may differ from another depending on its financial resources. Though one thing is certain, every organization should retain some portion of its risk.

How much of a deductible that should be considered depends on several factors, including the firm’s cash flow, resources, loss expectancy and frequency. All of which is equated against how much you save in premiums. Whatever those savings are at the bottom, you should consider spending them at the top of your insurance program before they are deposited in your treasury. Higher coverage limits may cost you relatively little compared to the coverage you’ll get.

Reducing Your Chances for Loss

The best way to avoid costs is to reduce your chances of loss. Speak with insurance inspectors and loss control people and follow their advice. Make them an active participant in your business as they can offer the best guidance on combining coverages and preventing losses. These professionals will help keep you current with your policies and advise you when they need to be updated. You can also avoid chances for loss by investing in company safeguards as well. For example, install central station alarms, fire extinguishers, and properly store solvents and flammables.

All businesses should maintain a neat and organized facility and conduct periodic safety meetings with its employees. For special risks, consider hiring a risk manager or use a risk management consultant or an insurance agent with risk management training. Staying apprised of practices that similar businesses adopt to cover their unusual risks can be helpful and less costly.

Each business, big or small, should look into employment practices liability coverage as another avenue to reduce risk. We now see so many companies involved in lawsuits that fall under this policy, that it is becoming a necessity. These policies cover almost anything that involves your employees that you could be held liable for, in or out of the workplace such as sexual harassment and improper termination, to stalking a customer.

Every business has different needs and the insurance should cover you accordingly. Making sure you accept some responsibility for the cost of damage incurred is a way to help keep the cost of insurance within your budget. Always review your situation and talk with experts about the degree of insurance you require; everything cannot be done on your own. These experts have the experience to guide you in your decision process and help you choose an insurance plan best for you.

For more information contact: Haig Neville Associates, 3400 Commerce Rd., West Bloomfield, MI 48324. The phone number is 248-683-0380.

Neville, Haig. "Determining the Best Way to Insure Your Business." *Disaster Recovery Journal*, vol. 12 (Fall 1999).

Tools and Approaches for Mitigation

15 minutes

Show Visual 4-18.

Discuss the tools and approaches for mitigation to make the community more disaster-resistant, emphasizing those related to businesses.

Mitigating damages to structures and building contents is not enough to ensure continuity of business operations. Business interruption is often attributable to factors originating outside the business property, such as lifeline failures. Businesses need to be concerned about the level of natural hazard mitigation in their communities, as well as mitigation of their own facilities. Lifeline services, like water, electricity, and telephone services, are an ongoing requirement for the economic well-being of a community.

MITIGATION MEASURES	DESCRIPTION
Business Contingency Planning	The most effective method for minimizing loss caused by a disaster. It involves developing plans to ensure continuity should a disaster strike. A business impact analysis is a key component of this planning process.
Relocate or elevate critical facilities	Move critical systems (emergency lighting and electrical systems, fuel storage, etc.) out of harm's way.
Modify building architecture and systems	Retrofit buildings and systems to withstand the elements.
Protect information technology systems	Maintain a backup system for critical data; secure equipment and evaluate the facilities where they are housed to assess susceptibility to wind and water damage. (The cost to secure a computer is about $17, whereas replacing a computer and software could cost thousands of dollars.)
Protect vital records and inventory	Consider storing vital records and inventory off-site in a safe location. If not, ensure proper procedures are taken to protect records from damage from flood waters, fires, etc.
Floodproof, Windproof, Evaluate	Mitigate to secure and protect equipment and property. Lighting and ductwork can fall from ceilings, shelving and office machines tumble, and desks can be overturned – causing damage and injuries. Anchor and secure contents and infrastructure where possible. Secure roofs and shutter windows.
Preparedness and Response Training	Conduct preparedness and life safety training programs for employees.
Public Education and Awareness	Education is an important contributor in encouraging all affected persons in becoming active participants in mitigation. This can occur through public awareness and educational campaigns to disseminate information about hazard mitigation programs and the benefits of doing hazard mitigation.
Partnerships	It is increasingly common for businesses, government, citizens and non-governmental organizations to find themselves participating in a collaborative effort in developing a coordinated program prepare for and to respond effectively to disasters and to recover from them, both in the short-term and the long-term through mitigation measures and risk reduction strategies. Through partnerships, we can save lives, lower vulnerability to, and reduce the impact of future disasters.
Land Use Planning and Zoning Ordinances	Land use planning, hazard mitigation, and sustainable communities are practices with a shared vision—communities where people and property (personal and business) are kept out of the way of hazards, where the mitigative qualities of the natural environment are maintained, and where development is designed to be resilient in the face of natural forces.

MITIGATION MEASURES	DESCRIPTION
Building Codes and Standards	Disaster-resistant construction is an essential component of local resiliency to disaster. Widespread use of building codes and standards can strengthen the constructed environment, both for homes and office buildings.
Insurance	Because it redistributes rather than reduces losses, insurance itself is not considered a mitigation measure. But insurance does help minimize disruption after disasters by ensuring that at least some people and businesses are compensated for their losses and can thus begin to recover. Insurance is never an acceptable alternative to loss prevention, but a carefully designed insurance program can encourage the adoption of loss-reduction activities by putting a price tag on the risk and by creating financial incentive through rate discounts, lower deductibles, and higher coverage limits.
Property Acquisition	Relocate homes and businesses in high hazard areas or restrict building in those areas.
Capital Improvement Programs Focused on Sustainability	Local governments should support sustainability through its capital improvement program, where emphasis is on locating public infrastructure outside of high hazard areas and on using hazard reduction measures and retrofitting in high hazard areas where it is not feasible to move them.
Taxation and Fiscal Policies	Distribute the public costs of private development of high hazard areas more equitably. Shift more of the cost burden directly onto owners of such properties. Businesses could elect to develop in areas that offer tax breaks for reducing land use intensities in high hazard areas.
Technology	Many tools aid in mitigation, such as geographical information systems, HAZUS, decision support systems, risk analysis, remote sensing, etc.

Visual Examples of Mitigation Action

Mitigation measures must be evaluated in the context of myriad constraints: time, resources, geography, the level and nature of development and vulnerability, and the attitudes and desires of the affected communities and property owners, to name a few. **Choices must be realistic and attainable** when these constraints are taken into account.

Show Visual 4.19 and introduce the visual examples that follow.

Note to course facilitator: Familiarize yourself with the following set of visuals before presenting the visuals to the class participants. Prepare ahead of time the points you would like to make in regard to each visual.

Visual Examples

- The following visuals contain a number of images of the disastrous effects of natural hazards and then a number of images of mitigation activities that can be taken to reduce these effects.
- In your community, mitigation efforts will be based on many things.

4-19

Show Visual 4.20.

Urban/Wildland Interface
Impact on Community

4-20

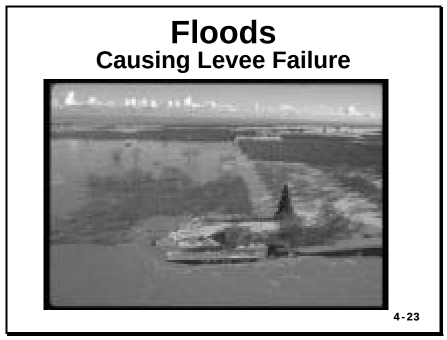
Show Visual 4-21.

Urban/Wildland Interface
Impact on Individuals

4-21

Show Visual 4-22.

Show Visual 4-23.

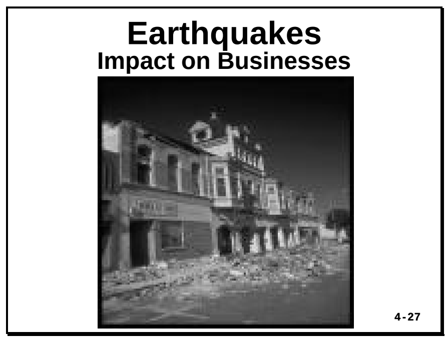


Show Visual 4-24.

Show Visual 4-25.

Show Visual 4-26.

Show Visual 4-27.



Show Visual 4-28.

Show Visual 4-29.

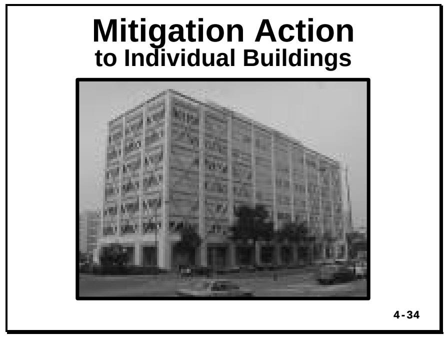
Show Visual 4-30.

Show Visual 4-31.

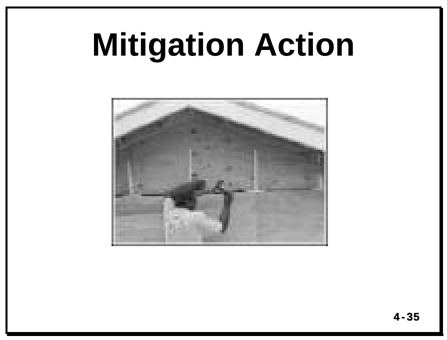
Show Visual 4-32.

Show Visual 4-33.

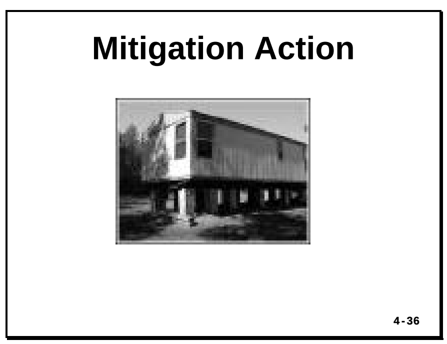
Show Visual 4-34.



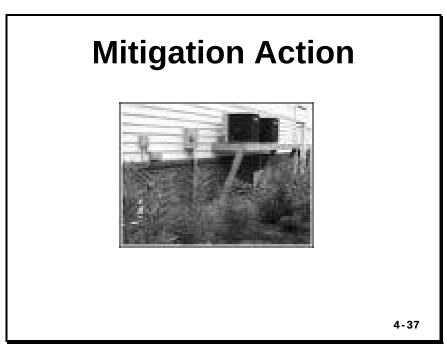
Show Visual 4-35.



Show Visual 4-36.



Show Visual 4-37.



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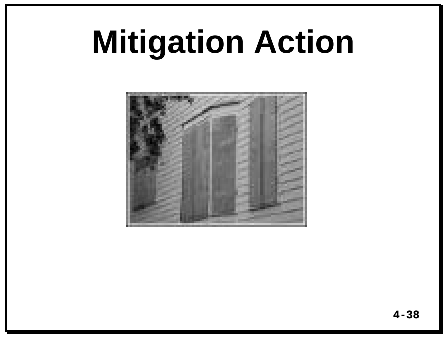

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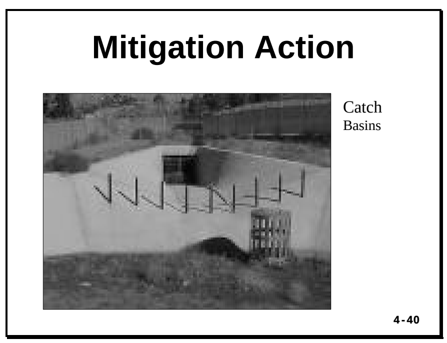
Show Visual 4-40.



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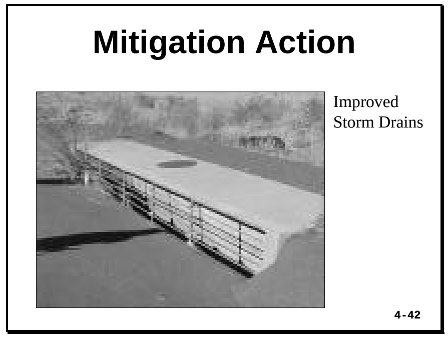
Show Visual 4-42.



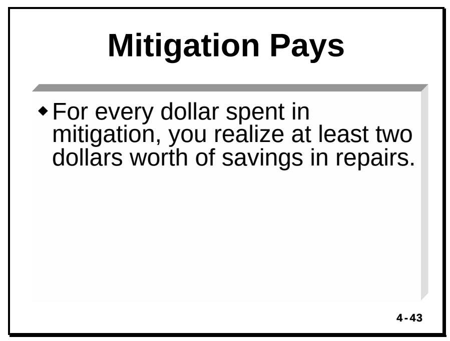
Funding Mitigation Activities

15 minutes

Considering Benefits and Costs of Mitigation

Show Visual 4-43.

Highlight the effectiveness of mitigation in reducing costs.



Overall, even modest investments in mitigation measures and loss reduction activities pay off in real, bottom-line savings when disaster strikes.

Lead a discussion about benefits for mitigation and the incentives for doing so. Tell participants to use the worksheet to record their reactions.

BENEFITS FOR MITIGATING	INCENTIVES FOR MITIGATION

Benefits

The benefits to businesses from mitigation are far-reaching, and may include:

- Increased life safety for employees
- Reduced down-time in production and getting the business up and running again
- Protected information systems
- Reduced damages to facilities and nonstructural components
- Reduced damages to vital equipment
- Enhanced insurance coverage or reduced insurance deductibles

Incentives

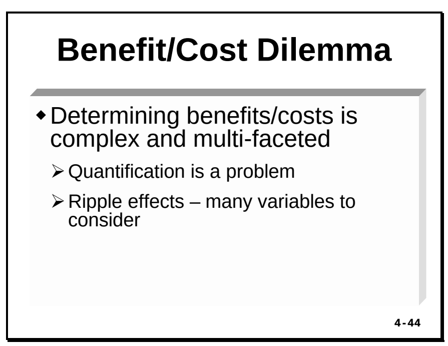
Discuss community mitigation incentives vs. business incentives.

Mitigation is a concern of everyone: individuals, businesses, and governments. Of the three, businesses need to focus the most on the associated economic benefits of mitigation. If a large segment of a business's profit base is supported by the functioning of one facility, protection against disasters is critical. The community could consider giving incentives that would encourage building owners and facilities to undertake projects to improve the performance of their structures when subjected to the natural forces of hazards. These incentives could include:

- ♦ A real estate transfer tax rebate
- ♦ Waivers of fees, such as permit fees
- ♦ Grants, loans, and other mechanisms for upgrading or structural improvements
- ♦ Density bonuses
- ♦ Reduced parking requirements
- ♦ Development credits for building in a less hazardous area

Show Visual 4-44.

Mention the complexities in evaluating benefits and costs.



Ask class to brainstorm funding sources for pre-disaster mitigation.

Record on easels.

Evaluating mitigation approaches is complex because it's not easy to quantify the benefits and costs associated with a particular mitigation measure. There are often hidden costs; some of the costs are non-financial and difficult to quantify. Nevertheless, benefit-cost analysis is one of the best ways to evaluate and prioritize mitigation activities.

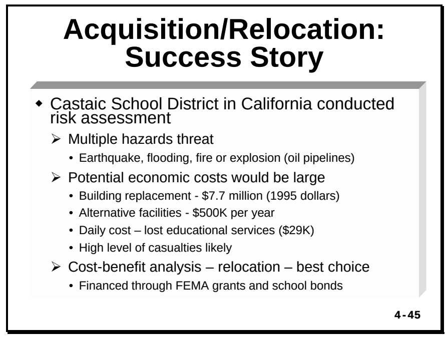
Mitigation Success Stories

Ask participants to share some mitigation success stories.

Share other mitigation success stories. Use the text examples or use your examples.

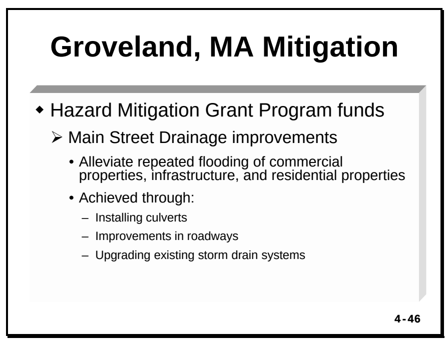
Show Visual 4- 45.

Briefly review the acquisition/relocation project for the Castaic School District in California.

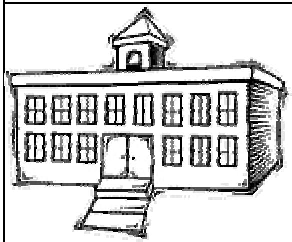


Show Visual 4-46.

Briefly review how the HMPG program assisted in a drainage mitigation project.



After you've shared mitigation success stories, move on to the group activity where participants can begin thinking about some risk reduction strategies that could work in their community.



Acquisition/Relocation from Multiple Hazards: The Castaic School District in California

The case studies presented so far in this report have a single hazard mitigation focus. Castaic Union School District, located in southern California, is a case study that demonstrates the threat from multiple hazards. After the 1994 Northridge Earthquake, Castaic Union School District conducted a study of the earthquake-related risks that threatened their elementary and middle schools, and administration buildings. The assessment revealed that earthquake-related structural damage was not the only risk the school District faced.

As of 1993, the District maintained and operated 63 buildings (77,000 square feet of usable space) in Northern Los Angeles County that consisted of a mix of permanent and portable structures with construction dates as far back as 1917. These structures service approximately 1,200 students and 115 staff. The San Andreas and San Gabriel fault systems, two of the most active faults in the country, pass through the area in which the District is located. In addition, the U.S. Geological Survey has concluded that significant new earthquake activity may occur along both the San Andreas and San Gabriel systems. The San Gabriel fault system has had fewer large earthquakes than expected over the last 200 years; while 17 large earthquakes would be expected, only two such events have occurred. Also, the San Andreas fault system has historically experienced a large earthquake every 170 years, and it has been 140 years since the last large seismic event (the 1857 Fort Tejon earthquake).

These factors led the Castaic Union School District to conclude in their study that the probability of a large earthquake affecting their facilities was high. They also learned however, that the risk went well beyond possible damages caused by ground shaking. Along with the expected seismic damage, the study revealed two additional threats: flooding from the Castaic Dam and fire or explosion from a rupture in nearby oil pipelines.

The District's risk assessment study indicated that the school buildings were located within the inundation area of the Castaic Dam (located only 1.7 miles upstream). If the dam were to fail, the school buildings and their occupants would be inundated with catastrophic flooding. The 2,200-acre reservoir above the dam could release nearly 105 billion gallons of water, inundating the area below the dam with 50 feet of water. In 1992, the California Department of Water Resources (DWR) re-examined the seismic performance of the dam. Based on the 1992 and previous analyses, the DWR considers the dam to meet all current safety requirements, and able to resist failure due to the maximum credible earthquake.[47] However, the district's risk assessment concluded the probability the Castaic Dam will fail is never zero. In a catastrophic earthquake, the seismic ground motion could exceed the dam's design basis, and other factors such as flooding, high water levels, or large landslides flowing into the reservoir, could lead to the dam's failure.

Along with the threat posed by the Castaic Dam, the study also revealed that the buildings were at high risk of damage from both fire and explosion should nearby pipelines fail. Two high pressure crude oil pipelines currently cross the campus (a 1925 gas-welded pipeline, and a 1964 modern arc-welded steel pipeline), both of which could rupture during ground shaking or ground displacement in earthquakes. An analysis of the lines and the fault conditions near the District indicated that the 1925 line had a 35% chance of failure somewhere in the Castaic area as a result of any large earthquake. The study also revealed that during the 1994 Northridge Earthquake, both oil lines sustained some damage within 25 miles of the Castaic School District.[48]

This information caused alarm about the safety of the District's facilities. In the event of a pipeline failure, a fire or explosion could result from the ignition of the released oil, putting both facilities and people at great risk. Additionally, the ability to prevent a nearby fire from spreading would be limited by the decreased reliability of water lines and hydrants, as well as the increased demands on emergency fire services after an earthquake.

Using the results of the District's risk analysis, it was determined that the potential economic costs from either a dam failure or oil pipeline break following an earthquake were enormous. The first potential cost to the School District would be incurred from both building and content damage. Replacement of the school buildings would cost an estimated $7.7 million in direct construction costs (1995 dollars). Second, if such an earthquake occurred, alternative school facilities would have to be located and rented at an estimated cost of over $500,000 per year. Third, the community would have to absorb the costs of losing the educational services provided by the District in the time period between the actual loss of the facilities and the relocation to temporary facilities. The School District calculated the cost of the lost public services based on the operating expenses required to provide the services. The daily cost of lost educational services was estimated at $28,601.[49]

In addition to these direct and indirect financial losses, the risk of earthquake-related casualties in the District's facilities was determined to be significant. In an earthquake-induced dam failure, the predicted speed of inundation on the campus caused the risk of casualties to be very high. When calculating this risk, a casualty rate of 250 individuals was determined based on the average hourly rate of campus usage in a typical week. However, in the event of a dam failure during school hours, the loss of life could be as high as 1200 students and 115 faculty members. In an earthquake-induced potential pipeline failure, the District calculated a casualty rate of 9 individuals and injury rate of 45 individuals. Once again, the actual number of casualties increases dramatically if the earthquake and pipeline failure occurs during school hours.[50]

Through the cost-benefit analysis, the District determined that the most feasible method to reduce their risks would be to condemn the structures on the old, high-risk site and relocate the campus to a low-risk area. Given the nature and severity of the potential hazards, mitigation options other than relocation were judged infeasible.

Once the decision had been made to relocate, the District went to work to identify an alternative site for the school facilities. The selected location for the campus was completely out of the dam inundation area and far removed from the high-pressure oil pipelines. Thus, the risk posed by the dam and oil pipelines hazards would be eliminated. While the campus would still be within an active earthquake fault area, the new campus building would be constructed to fully conform to 1995 building code provisions, thus making them more resistant to seismic damage than the buildings being replaced.

The District then agreed to turn the land over to the Newhall County Water District as soon as the relocation effort was underway. The old school property is located above two active wells, which the water district can use to supply their customers in Castaic. In doing so, they changed the property deed to restrict human habitation and development, and to return the site to natural open space.

The Castaic School District financed the relocation effort through a combination of grant money from FEMA and the sale of bonds. The District applied for and received a $7.2 million grant through FEMA's Hazard Mitigation Grant Program for the market value of the property, including the existing structures and infrastructure. The district used this funding, plus $20 million generated by school bonds, to rebuild the elementary school, district office and middle school; and to relocate the elementary school students into temporary buildings during the construction of the new facilities. The new middle school opened in the fall of 1996, and plans call for the new elementary school to open in August 1997.[51]

[47]According to the DWR, the Castaic Dam is designed to resist both the maximum credible earthquake and the probable maximum precipitation flood. The dam's spillway has several time the capacity of creeks flow of record, and the dam's freeboard can easily handle any potential landslide which might occur into the lake. Additionally, the dam provides incidental flood control benefits downstream.

[48](*ibid.*, February 1996).

[49](*ibid.*, February 1996).

[50](*ibid.*, February 1996).

[51]Los Angeles Times, "Big Changes in Store for Castaic Elementary", 18 August 1996, Page AV1.

Town of Groveland, Massachusetts Receives $749,150 Hazard Mitigation Program Grant

Boston, MA, October 10, 2000 -- The Massachusetts Emergency Management Agency (MEMA), the state Department of Environmental Management (DEM) and the Federal Emergency Management Agency (FEMA) today announced that the Town of Groveland has received a grant totaling $733,480 from the Hazard Mitigation Grant Program (HMGP) for the Main Street Drainage project. FEMA will provide $565,780 in federal funding with a matching local contribution of $ 183,370.

The drainage project will alleviate the repeated flooding of commercial properties, infrastructure and residential properties along sections of Marjorie Street, King Street and Main Street. The Hazard Mitigation Grant Program makes it possible to install culverts, improve existing roadways and upgrade the existing storm drain system that flows westerly and discharges in the Merrimack River.

“These mitigation funds will ensure natural resource protection by eliminating the discharge of excess storm water that flows into the Merrimack River,” said Department of Environmental Management Commissioner Peter C. Webber. “The local businesses and residents in this area will also greatly benefit by no longer having to deal with flooding to their properties after every rainstorm.”

The program is funded by FEMA, and administered in Massachusetts by MEMA and DEM.

“This program is a great example of government agencies working together to help this local community and their citizens,” said MEMA Director Steve McGrail. “This drainage project will not only save lives and protect property, it helps to stabilize the effects of disasters on Groveland business community.”

“These cost effective mitigation measures assist the Town of Groveland to reduce or eliminate residential damages and property risks that are caused by disaster. Using common sense approaches like repairing or replacing culverts and storm drains will save lives, with every dollar we spend on prevention, we saved two dollars in damages”, said Setti D. Warren, Regional Director for the Federal Emergency Management Agency’s office in Boston.

The Massachusetts Emergency Management Agency (MEMA) is the state agency responsible for coordinating state, local and federal resources to protect the public during disasters and emergencies. MEMA helps develop plans for effective response to all hazards, trains emergency personnel, provides information to families and communities, and assists in recovery from disaster losses.

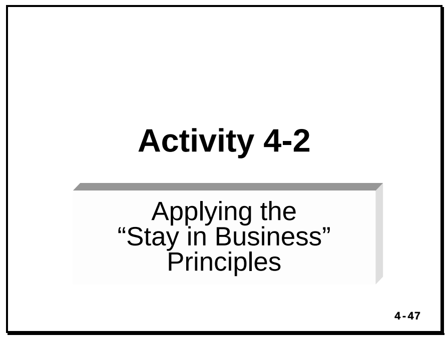
The state Department of Environmental Management (DEM) is the state agency responsible for assisting local communities in developing long term plans for mitigating natural hazards. DEM helps develop hazard mitigation strategies on local, regional and interstate levels, focusing on a watershed approach.

Activity 4-2: Applying the "Stay in Business" Principles

55 minutes

Show Visual 4-47.

Tell participants to work in their table groups to complete the activity.



Afterwards, review the activity using the discussion questions.

Discussion Questions

1. What types of risk reduction methodologies did you propose?

2. What were some strategies for approaching others who you would involve in your efforts?

3. What incentives and funding sources did you identify?

4. In what ways did you suggest that economic developers and emergency managers could help you?

5. In looking at what others have proposed, are their commonalties?

6. How would you envision being a change agent when you return to initiate more attention to risk reduction methodologies to address the community's economic vulnerability that could arise from a hazard threat?

Activity 4-2: Applying the “Stay in Business” Principles

Time

40 minutes (table group)

20 minutes (class discussion)

Purpose

The purpose of this activity is to expand your awareness about ways your community can work together to initiate risk reduction approaches.

Directions

1. Work within in your table groups to complete the worksheet. When you have completed the worksheet, you will have laid the groundwork for formulating a strategy for initiating a risk reduction methodology that you believe would be appropriate to the business community and that you believe would result in reducing the effects of a disaster on the community’s economy. You can use this as a starting point when you return to your community as a change agent.
2. Be prepared to share your responses with the class.

ACTIVITY 4-2: APPLYING THE "STAY IN BUSINESS" PRINCIPLES

1. Identify a hazardous situation that could affect the community and speculate about the community's vulnerability to this disaster, especially as it affects the economic vulnerability of the community or a particular business, such as a large employer or major industry sector.

2. What risk reduction methodology would most effectively address this hazard's threat to the community's economic vulnerability?

3. Who you would involve in this effort?

ACTIVITY 4-2: APPLYING THE "STAY IN BUSINESS" PRINCIPLES

4. How you would seek their involvement?

5. What are some possible sources for funding or some incentives that could spur their involvement?

6. How could economic developers and emergency managers help you with this?

Summary

3 minutes

Show Visual 4-48.

Summarize the unit.