
8 Mitigation Projects

8.1 Overview

This chapter provides brief descriptions of common types of flood mitigation projects that are eligible for funding by FEMA's five mitigation grant programs. Brief summaries of those programs are included. Because program priorities and policies change from time to time, communities that are interested in these programs should obtain current information from their State Hazard Mitigation Offices (see Appendix A).

Many buildings that are damaged by flooding were built before communities adopted floodplain management regulations and Flood Insurance Rate Maps. Many of these pre-FIRM buildings have experienced repetitive flooding and some are vulnerable to significant floods and are likely to sustain substantial damage at some time. Communities may seek mitigation grants to address both problems.

Some of FEMA's grant programs are funded annually and can be used to support projects in the "pre-event" period: Pre-Disaster Mitigation (PDM); Flood Mitigation Assistance (FMA); Repetitive Flood Claims (RFC); and Severe Repetitive Loss (SRL). One program, the Hazard Mitigation Grant Program (HMGP), is available only after major disasters are declared by the President. Many post-disaster mitigation projects include buildings that have sustained substantial damage. Projects that acquire properties, remove flood-prone buildings, and deed-restrict the land to open space, obviate the need for owners to bring buildings into compliance. Projects involving other measures that directly affect a building, such as elevation-in-place or dry floodproofing (non-residential buildings only in A zones), must be conducted in compliance with the community's floodplain management regulations and codes.

HMGP and PDM are funded by general Treasury funds. FMA, RFC, and SRL are authorized under the NFIP and are funded by income collected by the NFIP. The NFIP-funded programs are focused primarily on mitigating flood losses sustained by NFIP-insured buildings, specifically those that have received multiple flood insurance claims, called repetitive loss properties.

8.2 Mitigation Planning

In accordance with 44 CFR Part 201, State and local governments and Indian Tribal governments must have hazard mitigation plans as a condition for receiving hazard mitigation grants. The most common types of projects used to mitigate flood losses are described in Section 8.3 and FEMA's mitigation grant programs are briefly described in Section 8.4.

Mitigation planning refers to a process that leads a planning committee through a framework of steps to develop a mitigation plan. The primary objective of the planning process is to facilitate development of strategies that will reduce damage, protect people and property, and improve resistance to natural hazards. The process involves four basic steps:

1. Organize resources
2. Identify hazards and assess risks
3. Develop a mitigation plan
4. Implement the plan and monitor progress

While eligible applicants for FEMA grant programs must have FEMA-approved mitigation plans, the benefits of mitigation planning go beyond simply qualifying for those funds. States, communities, higher education institutions, and other entities that undertake mitigation planning also consider the value of actions that improve disaster resistance by modifying programs and policies, such as adoption of more restrictive development standards, and initiating efforts to inform citizens about risks and steps they can take to reduce damage.

FEMA's guidance documents related to mitigation planning are online at <http://www.fema.gov/plan/mitplanning/index.shtm>.

8.3 Types of Flood Mitigation Projects

This section provides brief descriptions of the most common types of mitigation projects that are implemented to reduce exposure to flooding. In practice, a single project may involve using one or more of these project types.

8.3.1 Identifying Flood Mitigation Projects

While mitigation planning is the first step, each property needs to be evaluated individually to determine which method is appropriate. Communities that engage in flood mitigation projects have many factors to evaluate before identifying the most effective type or types of activities that will both solve their problems and also meet other community objectives. Only communities can make those decisions, although many States help communities evaluate the many factors to consider. FEMA offers several tools to facilitate decision-making:

- *National Flood Mitigation Data Collection Tool* (FEMA 497). This tool was developed for nationwide use to gather information about flood-prone structures in order to determine potentially appropriate long-term mitigation measures. The goal is a standardized, systematic approach to collecting and interpreting property data and mitigation project development. While the focus of the tool is data collection for repetitive loss properties, it can be used to gather information related to flood risk, building construction, and building value for any structure.
- *Reducing Damage from Localized Flooding: A Guide for Communities* (FEMA 511). This non-technical guide is intended to help local officials and others understand what can be done to reduce localized flood damage. It focuses on a community's capability to minimize its existing localized flood problems and avoid future problems. It outlines the types of actions that can be taken, explains why they are important and what their potential benefits are, and points the reader to other sources.

- *Selecting Appropriate Mitigation Measures for Floodprone Structures* (FEMA 551). This manual provides guidance for interpreting data collected with the *National Flood Mitigation Data Collection Tool* and other sources, in order to develop detailed proposals for flood mitigation projects. The manual assumes that areas that are considered high priority for mitigation have been identified and the community is evaluating which types of mitigation measures will address specific problems. It identifies technical issues associated with mitigation measures and includes references to other documents that provide more detailed guidance.

FEMA 511 and FEMA 551 describe measures that reduce flood damage. Some of those measures may not result in full compliance and cannot be used to satisfy the requirement to bring substantially-damaged buildings into compliance. Some of the measures described may not be eligible for FEMA grant funding.

8.3.2 Property Acquisition/Demolition and Relocation

FEMA and the States have encouraged communities to acquire and remove flood-prone buildings since the early 1990s. A property acquisition project involves the purchase of properties that have sustained flood damage or that may be subject to severe or repetitive flooding. Eligible acquisition projects are those where the property owner voluntarily participates. Buildings are either demolished or physically removed. Local and/or State governments agree to deed restrict the property so that it remains in open space in perpetuity to fulfill natural and beneficial floodplain functions. Acquisition projects can be planned to meet compatible objectives, including passive recreation, environmental education, or wetlands mitigation.

8.3.3 Building Elevation

An elevation project involves detaching a building from its foundation and placing it on an NFIP- and code-compliant, taller foundation. The structure must be elevated as required by local regulations to be at or above the BFE or the post-disaster advisory BFE, if applicable. Although the costs and elevation methods vary, buildings with all types of foundations have been elevated, including those on crawlspaces, piers, or pilings. The cost to elevate a structure can vary greatly, depending on the elevation method used, condition of the structure, and the height above grade and other construction requirements. Elevation methods that require significant demolition or the construction of new living space may not be eligible for Federal grant funds. Communities interested in property elevation should consult their State Hazard Mitigation Office and FEMA's program guidance.

Communities consider elevation instead of acquisition projects for many reasons: for buildings that are structurally sound; to avoid disconnected, publicly-owned lots; for buildings in areas with extensive floodplains where alternative sites are not available; and for buildings in highly attractive areas. While elevation-in-place projects reduce flood damage, other flood-related risks and needs continue. Communities will still have to provide warnings, residents will still have to be evacuated, emergency shelters will have to be opened, and lives will be disrupted.

8.3.4 Relocation

If flood-prone buildings are structurally sound, and if acceptable receiving sites are close by, a relocation project may be viable. Physically relocating buildings to sites outside of the SFHA reduces the risk of future flood damage and the vacated land can be retained in open space. Relocating a building is similar to elevation-in-place because the building must be detached from its foundation and placed on a new foundation. The difference is the process and equipment required to move a building over the distance and terrain to the receiving site.

8.3.5 Floodproofing for Non-Residential Structures or Historic Structures

Dry floodproofing involves sealing non-residential structures to be watertight so that floodwaters do not enter the building during base flood conditions. Modifications may include structural strengthening of walls, special doors and closures for other openings, application of waterproof membranes, measures to handle seepage, and other measures. A structural evaluation is necessary to determine whether a structure can withstand anticipated flood loads, especially hydrostatic pressure and buoyancy. Currently, only non-residential structures and residences that are listed as historic structures may be dry floodproofed.

Compliance with the NFIP requirements cannot be achieved by using wet floodproofing measures in which floodwater is allowed to enter a building. An owner may elect to implement these measures unless a determination finds the work would constitute substantial improvement.

8.3.6 Other Types of Projects

Other types of projects may reduce flood damage, but are not direct solutions for individual buildings that are substantially improved, unless the SFHA is revised:

- **Stormwater management.** Stormwater management or drainage improvements can reduce the frequency and severity of flooding, but a property owner cannot propose such improvements in place of bringing a substantially damaged building into compliance. The exception is if a drainage project results in a revision of the SFHA in which the building is located, which may mean the building is no longer in the SFHA.
- **Minor localized flood reduction projects.** For larger buildings or groups of buildings, one option may be to install or modify culverts, floodgates, or minor floodwall systems that protect an individual structure. Engineering analyses are necessary to determine if these measures are feasible and to determine their impacts on flood elevations. Only if a project qualifies for a map revision that removes areas from the SFHA would buildings no longer be subject to the SI/SD requirements. To be eligible under FEMA's FMA, SRL, and RFC grants, the mitigation activity must protect structures that are insured by the NFIP.

8.4 FEMA's Mitigation Grant Programs

FEMA administers five mitigation grant programs. Fact sheets for the programs are available online at http://www.fema.gov/media/fact_sheets/mitigation.shtm. A chart that compares

the programs (authorities, purpose, priorities, available funds, applicant and subapplicant eligibility, eligible project types, cost-share requirements, eligible management costs, planning requirements, application and review procedures, and deadlines) and links to descriptions of each program are found at http://www.fema.gov/government/grant/hma/grant_resources.shtm, which also lists other resources to support mitigation planning and mitigation projects.

8.4.1 Elements Common to All Grant Programs

All of FEMA's grant programs have certain required elements in common:

- **Application submission.** State emergency management agencies or similar offices of the States may apply directly to FEMA. Local governments and other applicants must submit applications through the State as subapplicants. Depending on the grant program, applications may be ranked by the State, FEMA, or a national evaluation panel.
- **Mitigation plan requirements.** All States must have a FEMA-approved hazard mitigation plan. Except for the RFC program, local governments and Indian Tribal governments also must have FEMA-approved hazard mitigation plans.
- **Feasibility and effectiveness requirement.** Projects must be both technically feasible and effective at mitigating the flood hazard. Engineering analyses and project plans and specifications may be required to demonstrate feasibility and effectiveness.
- **Cost-effectiveness requirement.** Hazard mitigation assistance grants only fund cost-effective mitigation projects. A benefit-cost analysis is a well-established method for quantitatively comparing benefits and costs of projects.
- **Environmental and historic preservation.** Applicants must answer a series of environmental and historic preservation review questions. All projects must meet the requirements of applicable Federal, State, Indian Tribal, and local laws, implementing regulations, and Executive Orders.
- **Flood insurance requirement.** For structures that will remain in the SFHA after a mitigation project is implemented, flood insurance policies must be maintained after the project is completed.
- **Non-Federal match.** Recipients must provide the non-Federal share of the costs and cover all costs that are determined to be ineligible for funding by the grants. Many communities require property owners to cover these costs and some States may provide matching funds.

Each year, FEMA issues guidance for each grant program. Some priorities and limitations may change from year to year. Communities that are interested in these programs should contact their State Hazard Mitigation Officers (Appendix A).

8.4.2 Pre-Disaster Mitigation Program

The PDM program is a nationally competitive program that provides funds to States, local governments, and Indian Tribal governments for implementation of cost-effective hazard mitigation activities that complement a comprehensive mitigation program. The program provides applicants with an opportunity to raise risk awareness and reduce disaster losses through use of

grant funds to develop all-hazard mitigation plans and flood mitigation plans and to implement mitigation projects.

Each year's funding level is determined by Congress. A limit is placed on the maximum amount that a single project can receive and recipients must provide a cost-share of at least 25 percent of a project's eligible costs. In addition to supporting development of mitigation plans, PDM funds can be used for flood mitigation projects, including:

- Elevation of existing public or private structures to at least the BFE or higher, if required by FEMA or if required by State or local regulations
- Voluntary acquisition and demolition or relocation of structures and real property for conversion to open space in perpetuity
- Relocation of public and private structures outside of the SFHA
- Dry floodproofing non-residential buildings and certain residences that are listed as historic structures
- Stormwater management projects to reduce or eliminate long-term risk from flood hazards
- Localized flood reduction projects
- Protective measures for utility infrastructure to reduce or eliminate flood damage

8.4.3 Hazard Mitigation Grant Program

HMGP funds are available following a Presidential disaster declaration. Eligible applicants include States, local governments, Indian Tribal governments, and some private non-profit organizations. Communities may apply for HMGP assistance on behalf of affected individuals and businesses, and all funds must be used to reduce or eliminate losses from future disasters. FEMA allows a portion of the funds to be used to support development of mitigation plans. At a minimum, recipients must provide a cost-share of at least 25 percent of a project's eligible costs.

HMGP provides each State that receives a major disaster declaration an amount of funding that is determined on a formula that is based on a percentage of funds spent by FEMA under the Public Assistance and Individual Assistance programs. Under the formula, States with approved Standard State Mitigation Plans receive 15 percent for the first \$2 billion of estimated aggregate amounts of disaster assistance, 10 percent for disaster assistance amounts between \$2 billion and \$10 billion, and 7.5 percent for amounts between \$10 billion and \$35.333 billion. States with approved Enhanced State Mitigation Plans receive 20 percent for the first \$2 billion of estimated aggregate amounts of disaster assistance and the same percentages when assistance amounts exceed \$2 billion.

HMGP funds can be used for eligible activities that reduce damage from any natural hazard. Examples of flood mitigation projects that have been funded include:

- Elevation of existing public or private structures to at least the BFE or higher, if required by FEMA or if required by State or local regulations

- Voluntary acquisition and demolition or relocation of structures and real property for conversion to open space in perpetuity
- Relocation of public and private structures outside of the SFHA
- Dry floodproofing non-residential buildings and certain residences that are listed as historic structures
- Stormwater management projects to reduce or eliminate long-term risk from flood hazards
- Localized flood reduction projects
- Protective measures for utility infrastructure to reduce or eliminate flood damage

Eligible subgrantees submit grant applications to the State, which sets mitigation priorities, performs technical reviews, and offers technical assistance. FEMA conducts the final eligibility review to ensure that all projects are compliant with Federal regulations, including the Federal law that requires States and communities to have FEMA-approved mitigation plans in place prior to receipt of HMGP project funds.

8.4.4 Flood Mitigation Assistance Program

The FMA program provides funding to States and communities for measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures that are insured by the NFIP. Each State's allocation is based on its percentage of NFIP policies. Subapplicants must be participating in the NFIP (not suspended or withdrawn). The program provides grants for mitigation planning and projects with the goal of reducing insurance claims, especially repetitive claims. All applicants must have a FEMA-approved hazard mitigation plan. At a minimum, recipients must provide a cost-share of at least 25 percent of a project's eligible costs. The non-Federal cost share may be reduced to 10 percent if the State has a FEMA-approved mitigation plan that also addresses how the State has and will continue to reduce the number of severe repetitive loss properties. Examples of eligible projects include:

- Elevation of existing public or private structures to at least the BFE or higher, if required by FEMA or if required by State or local regulations
- Voluntary acquisition and demolition or relocation of structures and real property for the purpose of creating open space
- Relocation of structures outside of the SFHA
- Dry floodproofing of existing non-residential structures and certain residences that are listed as historic structures
- Minor localized flood reduction projects where 50 percent of the structures that directly benefit from the mitigation activity are insured by the NFIP

8.4.5 Repetitive Flood Claims Program

The RFC program is designed to reduce or eliminate the long-term risk of flood damage to structures that are insured by the NFIP and have received one or more NFIP flood insurance

claim payments. RFC funds may only be used in a State or community that is participating in the NFIP and that cannot meet the requirements of the FMA due to lack of cost share or lack of capacity to manage grants. RFC grants are awarded to applicants on a nationwide basis without reference to State allocations, quotas, or other formula-based allocations. All grants are eligible for up to 100 percent Federal assistance.

Eligible mitigation activities include:

- Elevation of existing public or private structures to at least the BFE or higher, if required by FEMA or if required by State or local regulations
- Voluntary acquisition and demolition or relocation of structures and real property for the purpose of creating open space
- Relocation of structures outside of the SFHA
- Dry floodproofing of existing non-residential structures and certain residences that are listed as historic structures
- Minor localized flood reduction projects where 50 percent of the structures that directly benefit from the mitigation activity are insured by the NFIP

Awards are prioritized to fund projects that create the greatest amount of savings to the NFIP based on benefit-cost analyses. A FEMA-approved State/Tribal standard or enhanced hazard mitigation plan is required for eligibility. A local mitigation plan is not required.

8.4.6 Severe Repetitive Loss Program

The SRL program provides funds to assist States, Indian Tribal governments, and local governments that participate in the NFIP to implement projects that reduce or eliminate long-term flood risks to certain properties, thus reducing claims paid by the NFIP. To be eligible, a property must qualify under the statutory definition that requires that it:

- Be a residential property currently insured by the NFIP, and
- Have incurred flood losses that resulted in either (1) four or more flood insurance claim payments that each exceeded \$5,000 with at least two of the payments occurring within a 10-year period, or (2) two or more flood insurance claims payments that cumulatively exceeded the value of the property

The SRL requires a specific consultation process that includes property owner notification and information gathering. Applicants are required to follow the specific process to make mitigation offers. SRL property owners who decline a formal offer under the SRL program will be subject to an increase in their insurance premiums.

SRL funds are allocated annually to States, Territories, and Indian Tribal governments based on the number of severe repetitive loss properties in their respective jurisdictions, with certain “target states” receiving 90 percent of available funds. “Non-target states” compete for the remaining 10 percent of available funds. Grants may provide up to 75 percent of a project’s

eligible costs. The non-Federal cost share may be adjusted to 10 percent if the State has a FEMA-approved mitigation plan that also addresses how the State has and will continue to reduce the number of severe repetitive loss properties. Eligible SRL activities include:

- Voluntary acquisition and demolition or relocation of structures and real property for the purpose of creating open space.
- Relocation of structures outside of the SFHA.
- Elevation of existing public or private structures to at least the BFE or higher, if required by FEMA or if required by State or local regulations.
- Floodproofing measures only for residences that are listed as historic structures.
- Minor localized flood reduction projects where 50 percent of the structures that directly benefit from the mitigation activity are insured by the NFIP.
- Mitigation reconstruction, which involves the demolition and rebuilding of structures. It is allowed only when traditional elevation methods are not feasible. Grant-eligible costs are limited. Applicants should check with their State Hazard Mitigation Office for current guidance.

8.5 Additional Information

FEMA's mitigation assistance programs provide the opportunity to help communities and property owners address substantially damaged structures. While the programs differ based on their statutory requirements, they share a common goal of reducing loss of life and property due to natural hazards, including flooding. To learn more, visit FEMA's websites referenced above or contact the appropriate State Hazard Mitigation Officer (Appendix A).

