

Examples of Mitigation Options

Option	Description
Acquisition	<p>Requires structures to be removed from acquired property, either by demolition or relocation, and property to be forever maintained as open space. Structures that are unsound or otherwise unsafe (e.g., those flooded by contaminated water) probably should be demolished. Certain structures that are sound may be relocated. The least-expensive and most cost-effective structures to relocate are those built on crawl space or basement foundations; made of wood frame or masonry, but are small and compact; and less than three stories high.</p>
Elevation	<p>Raises the first habitable floor of a structure above the base flood elevation (BFE). Steel beams are installed under a structure and hydraulic jacks lift both the beams and structure. A new foundation made of fill, foundation walls, columns, or piles that allows flood waters to flow through it, is then constructed beneath the raised structure. When the foundation is complete, the structure is lowered onto and secured to it. Elevation is a poor mitigation alternative for slab-on-grade, attached (e.g., row houses), and large brick or masonry structures. It is not a practical alternative for structures in a high-velocity floodway because swift water and debris can undermine the new foundation.</p>
Wet floodproofing	<p>Actually allows water to enter a structure, but takes precautions against damages by equalizing pressure on walls and floors, and moving contents out of reach of floodwaters; for example, relocating utilities, furnaces, appliances, etc. above the BFE. Wet floodproofing is not a good mitigation alternative in areas subject to flash floods, and it does require extensive cleanup after a flood.</p>
Dry floodproofing	<p>Seals a structure with waterproofing compounds, sheeting, or other impermeable materials to prevent floodwaters from entering. The seals can be either permanently installed, or temporarily put into place during a flood. It is best used on structures in good condition, constructed of concrete blocks or brick veneer on wood frame, and subject to less than three feet of floodwaters. It is inappropriate for wood-frame structures, structures with a crawl space or other elevated foundation (because they are not watertight), and structures located in a high-velocity floodway.</p>
Barriers	<p>Protect an individual structure or a small cluster of structures, and include levees and floodwalls. Levees are earthen dikes built around a property. Floodwalls are protective walls made of masonry block, reinforced concrete, or similar impermeable material. Levees usually require more space, but are less expensive and more permanent than floodwalls. Floodwalls usually contain openings that must be closed in the event of a flood and, therefore, must rely on warning systems. Both are feasible protection against flood depths up to 6 feet in the flood fringe. Generally, neither is feasible in a floodway because both obstruct the flood flow. Both are useless against floods that exceed the heights of their protective walls.</p>

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Re-channelization	<p>Opens up a stream or waterway by changing its shape. Usually this involves clearing out debris, dredging, widening, or straightening a channel. The wider, deeper, and straighter a channel is, the more water it can handle before overflowing its banks. Re-channelization requires a permit from the Army Corps of Engineers, and typically one from a State water regulatory agency. If the stream or river is designated a floodway, then re-channelization also requires a “no rise” certification from a professional engineer, which certifies that the re-channelization will not raise the water elevation in the event of a 100-year flood. Modifications to waterways often have adverse environmental impacts and many produce unintended up- or downstream problems.</p>
Detention or retention ponds	<p>Serve to slow down the runoff from a basin that might otherwise overwhelm the capacity of an existing adjacent waterway. These hydraulic structures can be built out of earth, concrete, or a combination of both. They have some type of release mechanism, possibly a weir or pipe. They normally are empty. However, they are designed to hold the entire quantity of runoff that would be produced in a significant storm event and discharge the water at a predetermined rate. Spreading out the flow of water to the nearby stream over a longer period of time gives the stream a chance to carry the water away without over-topping its banks. Runoff in amounts greater than those for which it was designed would result in water being discharged over a spillway. At that point, the benefit of the pond is eliminated.</p>
No action	<p>Legitimate mitigation alternative that can be used to evaluate the effectiveness of other alternatives by comparing and contrasting them. In some cases, for example where the costs outweigh the benefits regardless of the mitigation option, no action might be the appropriate alternative.</p>

The HMGP can provide funds for each of the above alternatives under certain conditions, and if they meet the requirements identified in Chapter 1. If you are in doubt, ask your State Hazard Mitigation Officer (SHMO).