



## City of Snoqualmie Home Elevation Projects

### Full Mitigation Best Practice Story

#### *King County, Washington*

**Snoqualmie, WA** - A river constriction at Snoqualmie Falls causes the river to back up into the City. Past floods have exceeded six feet above grade in places. The elevation of several homes made the City of Snoqualmie a positive national model as it demonstrates how to reduce the likelihood and extent of repetitive flood damages.



Snoqualmie has been part of 15 Presidential flood-disaster declarations between 1964 and 2006. Snoqualmie's close-knit community and historic homes have encouraged homeowners to remain in that location, and this made property acquisition costly, so the decision to elevate homes was made.

Several million dollars were committed by Washington Emergency Management Division (EMD), the Federal Emergency Management Agency (FEMA), the Small Business Administration (SBA), King County, City of Snoqualmie, and homeowners to elevate or relocate more than 100 residential structures. Special studies have been done on the effects of home elevations in Snoqualmie. One study evaluated the losses avoided, and another compared sales prices of elevated versus non-evaluated homes.

Under the HMGP, 28 elevated homes at an estimated cost of \$1.3 million were studied to see if the mitigation measure worked and to see if the losses could be quantified. Data on these homes was used in equations that account for the fact that the magnitude of flood damage is related to flood depth and the value of the building and its contents. The loss per home was determined in terms of the repair cost or in some cases the replacement cost if the home had been at its pre-mitigation elevation during the November 2006 flood. Unelevated homes would have been inundated with 2 to 8 feet of water.

All elevated homes were above the peak level of November 2006 flooding. Estimated losses avoided ranged from approximately \$22,000 to \$262,000. Total losses avoided were nearly \$1,625,000, which exceeds the \$1,316,000 overall elevation project cost. Thus, the cost effectiveness of the mitigation project was demonstrated by the analysis for a single flood. Percentage of cost savings increases with subsequent floods in the future.

Another analysis for approximately 130 homes in Snoqualmie suggested there are measurable financial gains for owners of flood-prone homes to participate in grant-supported home-elevation projects.

When the elevated homes matched the character of other homes in the neighborhood, the selling price of those homes was higher than that of comparable, non-elevated homes in the same market area. The difference in price ranged from 25 to 75 percent of the cost of the elevation retrofit. The homeowner share of the elevation cost is eventually recovered through a combination of reduced flood-insurance premiums and a slight increase in the selling prices when the home is re-sold.

Since these benefits are typically a small percentage of the project cost, homeowners who elevate are primarily encouraged to do so by the availability of state and federal assistance programs.

#### Activity/Project Location

Geographical Area: **Single County (County-wide)**

FEMA Region: **Region X**

State: **Washington**

County: **King County**

## Key Activity/Project Information

Sector: **Public**  
Hazard Type: **Flooding**  
Activity/Project Type: **Elevation, Structural**  
Activity/Project Start Date: **01/2004**  
Activity/Project End Date: **11/2006**  
Funding Source: **Homeowner; Local Sources; State sources; U.S. Small Business Administration (SBA)**

## Activity/Project Economic Analysis

Cost: **\$1,300,000.00 (Estimated)**

## Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster? **Unknown**  
Value Tested By Disaster? **Yes**  
Tested By Federal Disaster #: **No Federal Disaster specified**  
Year First Tested: **2006**  
Repetitive Loss Property? **Yes**

## Reference URLs

Reference URL 1: <http://www.ci.snoqualmie.wa.us>  
Reference URL 2: <http://floodsmart.gov>

## Main Points

- Repetitive flooding caused houses to flood and be subject to repetitive damage.
- Relocating not an option due to the historical value of the city and homes.
- Received money from Washington Emergency Management Division (EMD), the Federal Emergency Management Agency (FEMA), the Small Business Administration (SBA), King County, City of Snoqualmie, and homeowners.
- Home elevated to prevent future flooding.
- Houses sustained little or no damaged in the November 2006 flooding.
- Project Cost: \$1.3 million.