



## Brigham Hill Road: Preventing Washouts

### Full Mitigation Best Practice Story

#### *Chittenden County, Vermont*



**Towns of Essex, Colchester and Milton, VT** - The Vermont highway system can be vulnerable to flooding if proper mitigation techniques are not employed. Vermont has a high proportion of major roads that are gravel. Typically these roads follow watercourses between steep rocky hills. The bedrock slopes are impervious to water, so runoff flows quickly downhill. Soil saturation further aggravates the potential for flash flooding.

Vermont has received 11 Federally declared disasters in the past decade as result of flooding. Road damage has been the primary result. During flood events, entire towns can be isolated preventing the passage of emergency vehicles and services to those with special needs. The repair costs can devastate a small community's annual budget, even with FEMA's help.

In recent years, development has been stimulated in vulnerable areas from tourism and the construction of seasonal and retirement homes. In Vermont's northern temperate climate, gravel roads need proper engineering design and regular maintenance. Federal agencies, state and local highway engineers have developed numerous mitigation techniques to reduce damage to those roads.

The towns of Colchester, Milton and Essex joined together following the damage to tackle persistent flood damage on a shared thoroughfare, the Brigham Hill and Mars Hollow Roads. Today residents are seeing significant benefits from this mitigation. A grant from FEMA's Hazard Mitigation Grant Program (HMGP) covered 75 percent of the \$95,245 cost. Nearly 30 families reside along these well-traveled roads.

For the mitigation project, Essex supplied the engineering work and submitted the Federal grant application on behalf of all three communities. Each town paid a share of the mitigation activities including the addition of stone lined ditches and larger culverts that included several high-density polyethylene pipes.

Testing the project in the fall of 2004 was a series of severe storms and flooding that struck the area and resulted in the declaration of yet another Federal disaster. The town highway departments reported only minor damage to the Brigham Hill and Mars Hollow Roads. In previous years, annual municipal repair costs on the two roads exceeded \$18,000.

Essex Public Works Director Dennis Lutz commented that FEMA funded work on Brigham Hill Road demonstrated how to include effective mitigation during construction. Essex has since adopted local Codes and Standards for all roadwork. When extensive water damage occurred in August on Pettingill Road in Essex, their department quickly made repairs and installed stone ditching before federal staff had arrived. FEMA Public Assistance personnel inspected the Pettingill Road work and the town will be reimbursed for the mitigation ditching and other work currently underway.

The adoption of the Codes and Standard, developed for local communities in an initiative by the Vermont Agency of Transportation (AOT), has been a great benefit to many cities and towns. Communities that have adopted and enforced these Codes and Standards have secured over \$500,000 additional dollars in federal assistance that otherwise would not have been available.

With driveway runoff a source of limited damage in Essex, the Public Works department is initiating a public education program to inform homeowners how residents can prevent washouts on their private property and reduce damages to connecting town roads.

Vermont Emergency Management is distributing a flyer "Things to Consider When Constructing or Repairing Your Driveway" to communities. The literature was developed using information provided by the Vermont AOT and FEMA.

### Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region I**

State: **Vermont**

County: **Chittenden County**

City/Community: **Essex Junction**

### Key Activity/Project Information

Sector: **Public**

Hazard Type: **Flooding**

Activity/Project Type: **Flood Control**

Activity/Project Start Date: **03/1999**

Activity/Project End Date: **05/2002**

Funding Source: **Hazard Mitigation Grant Program (HMGP); Local Sources**

Funding Recipient: **Local Government**

Funding Recipient Name: **Towns of Essex, Colchester, and Milton**

### Activity/Project Economic Analysis

Cost: **\$95,245.00 (Actual)**

### Activity/Project Disaster Information

Mitigation Resulted From Federal  
Disaster? **Yes**

Federal Disaster #: **1063 , 08/16/1995**

Value Tested By Disaster? **Unknown**

Repetitive Loss Property? **Unknown**

### Reference URLs

Reference URL 1: <http://www.fema.gov/government/mitigation.shtm>

Reference URL 2: <http://www.floodsmart.gov>

## Main Points

- Vermont has a high proportion of major roads that are gravel. Typically these roads follow watercourses between steep rocky hills.
- For the mitigation project, Essex supplied the engineering work and submitted the Federal grant application on behalf of all three communities. Each town paid a share of the mitigation activities including the addition of stone lined ditches and larger culverts that included several high-density polyethylene pipes.
- With driveway runoff a source of limited damage in Essex, the Public Works department is initiating a public education program to inform homeowners how residents can prevent washouts on their private property and reduce damages to connecting town roads.