



# **Acquisition, Evaluation, and Analysis**

## *Acquisition Successes in Birmingham, Alabama*

The City of Birmingham is located in north central Alabama. Though Birmingham stands in the heart of the Deep South, it is not an Old South City. The Birmingham metropolitan area covers approximately 163 square miles. With a population currently estimated at 849,194, covering four counties, it is the largest Metropolitan Statistical Area in Alabama.

# Case Studies

BIRMINGHAM, ALABAMA

Founded in 1871 at the crossing of two railroad lines, the City blossomed through the early 1900s and rapidly became the South's foremost industrial center.

Birmingham has been through a lot for a city so young. The City faces its greatest hazard from severe weather, primarily rain, high winds and tornadoes during the spring and summer months. The area is particularly vulnerable to such events due to the high density of population and development. The City is subject to flash flooding associated with severe thunderstorms particularly along Village Creek. For more than half a century, several residential areas of Birmingham in the floodplain of Village Creek were repeatedly flooded. These floods displaced residents and created a community health hazard due to sewage backups.



*Birmingham resident surveys the damage.*

**In an effort to end this damage cycle**, the Federal Emergency Management Agency (FEMA), along with the United States Army Corps of Engineers (USACE) has provided funding for the largest flood acquisition project ever implemented. **When severe storms hit Birmingham with four inches of rain on March 10-11, 2000, there was almost no residential property damage, no displacement of residents and no need for assistance even though floods elsewhere in the city were serious enough to result in a presidential declaration.** The 2000 deluge duplicated the 13.6 ft. flood level of March, 1996, when hundreds of properties in the Village Creek floodplain were damaged. By contrast, this time only five homes and ten apartments sustained minor damage. A cooperative effort by the city, the State, and the Federal government that spanned 20 years and cost \$37.5 million has removed 735 structures and returned the floodplain to its natural state as a retention basin for floodwaters.



*An example of the water level.*

**Village Creek’s floodplain makes up 53 percent of Birmingham’s Special Flood Hazard Area.** In some areas floodwaters can rise at a rate of 3 ft. per hour. Numerous neighborhoods sit in the floodway and floodplain of Village Creek including approximately 4,574 residential dwellings, 196 commercial/industrial structures and 87 critical facilities. Historically, repetitive flooding has inundated thousands of homes. In the last 20 years alone, Village Creek has flooded these neighborhoods more than 20 times. The following table represents Federally declared flooding events.

**How often will a flood be tolerated?**

Often, flooding occurred several times in a year. This damage history prompted the City of Birmingham and the USACE to seek congressional authorization and funding to accomplish both structural and non-structural solutions to resolve the repetitive flooding along Village Creek [1]. During the period between 1970 and 1980, the USACE dredged Village Creek in unsuccessful attempts to control flooding. In 1986 and 1990, Congress passed Water Resources Development Acts authorizing \$29.6 million for projects in the Village Creek Flood Hazard Area. The City of Birmingham contributed \$7.4 million and used the funds to purchase 642 properties in the floodplain.

Since the completion of the project by the USACE, FEMA, through its Hazard Mitigation Grant Program (HMGP), has funded the acquisition of additional properties in the floodplain in the same neighborhood. Under the provisions of the Stafford Act, FEMA has funded numerous mitigation projects to interrupt the cycle of damage to property and alleviate the suffering to residents in the disaster-impacted communities. The acquisition project along the floodplain of Village Creek in Birmingham, Alabama is one such project. In 1996 the City of Birmingham received two FEMA-

Year	Month	Notes
1977	September	
1983	December	Triggered USCOE \$29.6 million acquisition project
1995	October	Triggered FEMA-HMGP \$5 million acquisition project
1996	January	
1996	March	Triggered FEMA-HMGP \$7.6 million acquisition project
1997	January	
1998	January	
1998	May	
1998	August	
1999	January	Triggered FEMA-HMGP \$7.0 million acquisition project
2000	March	Triggered “Losses Avoided in Birmingham, Alabama” Analysis

HMGP grants totaling \$7.6 million and provided a 25 percent match with City funds and in-kind services. The funds were used to acquire approximately 250 properties. In total, more than 900 properties have been acquired.

### Village Creek Acquisition Project

#### Properties acquired by USACE

Key questions need to be answered. **To what extent are these mitigation programs working? Are we able to quantify the losses avoided (savings) as a direct result of implementing mitigation programs?** Village Creek in the City of Birmingham has a history of frequent flooding. The severe floods of March 2000 presented an opportunity to conduct an analysis to carefully estimate the savings due to losses avoided as a result of the acquisition and relocation projects.

The report, "Losses Avoided in Birmingham Alabama" documents the direct losses avoided (i.e., savings) resulting from the Federally cost shared Village Creek Acquisition Projects. The losses avoided are a direct

result of implementing the acquisition and relocation projects. For example, during the floods of December 1983, Village Creek rose above its flood stage by 4.8 ft. Flooding in the Ensley neighborhood of Birmingham damaged 400-500 homes.

There has been a need to develop a repeatable method for evaluation of completed hazard mitigation projects. The analysis presented in the "Losses Avoided in

Birmingham Alabama" document is a step towards this objective. Analysis in the report shows that the buy-outs implemented by the USACE have avoided losses of more than \$60 million on an investment of \$22 million since 1995. This saving in disaster costs



*Photos depicting property damage*



*Photos depicting property damage*



*Photos depicting property damage*

represents a greater than 150 percent return on investment. Further, the acquisitions cost shared by the City of Birmingham and FEMA have avoided direct losses of \$3.4 million for an investment of \$7 million in less than two years (1999-2000). Studying losses avoided in subsequent disasters measures the benefit resulting from a mitigation project. This process demonstrates the financial savings realized by the community as the direct result of implementing the mitigation project.

To perform the losses avoided calculations, detailed data was collected from the City of Birmingham's, Village Creek Project Office and the USACE Mobile District Office. The "Losses Avoided in Birmingham, Alabama" document includes the total losses avoided calculations due to repetitive flooding. The cost saving from these repetitive floods is very significant and clearly illustrates the financial benefits of this acquisition and relocation project.



### Each year, natural disasters cause billions of dollars in damage and

**economic losses.** As our population continues to migrate to hazard-prone regions, disaster-related losses will continue to escalate. A USA TODAY newspaper analysis found that an estimated 41 million people — more than one in seven Americans — now live in a county along the eastern or southern seaboard. That number swells by several million when inland residents with second homes near the shore are included [2]. Large numbers of



*Post-flood clean-up efforts is costly.*

people entering the retirement age, ever increasing demand for recreational activities, and the affluence of the baby boomer generation drives this migration.

Fortunately, there is an unprecedented effort in communities across the nation to reduce the risk of floods, earthquakes,



*Many families can not afford repair costs, particularly if they don't have flood insurance.*

# Case Studies

storm surges, tornadoes and other natural hazards. Hazard mitigation — those actions taken to permanently reduce or eliminate long-term risk to people and their property from the effects of hazards — is increasingly recognized as an integral feature of community planning.

Property acquisition or buyout of flood-prone structures and areas is the priority mitigation strategy for many states. Property acquisitions in the floodplain offer five key advantages:

1. Permanently reduces or eliminates susceptibility to future flood damage in high risk areas,
2. Achieves other flood management goals (e.g., increasing floodplain storage capacity),
3. Achieves natural resource conservation goals (e.g., preservation of ecologically important wetlands, estuarine ecosystems, and beachfront areas),
4. Attains community goals (e.g., provision of affordable housing, open space, and parks), and
5. Reduces the amount of disaster funding needed.



*Acquisitions programs reduce a community's vulnerability to future disaster losses*

**Summary  
of Avoided Losses**

*as a result of Birmingham acquisitions*

**Funding Sources**  
USACE/City of Birmingham

**Total Acquisition Cost**  
(1989-1994) \$36,332,343

**Total Losses Avoided**  
\$60,309,747

**Percent of Losses Avoided to  
Acquisition Costs**  
(Six Floods) 166 percent

### References

- <sup>1</sup> Public Information Brochure, Village Creek Birmingham, Alabama, US Army Corps of Engineers, Mobile District, 1985.
- <sup>2</sup> USA TODAY, page-1A, July 21, 2000.