Stream Gages: An Essential Tool for Avoiding Transportation Hazards

Doug Kirk, P.E.
West Virginia
Division of Highways

GEOHAZARDS IN TRANSPORTATION
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Introduction & Background

- 37,370 miles of public roads
- 6,342 bridges
Hazards

• Flooding
• Erosion
  – Bridge Scour
  – Roadway Damage
Figure 7.1. Schematic representation of abutment scour.
Past Floods

- 1985 - Statewide
- 1996 – Eastern West Virginia

16 Federally declared flood disasters since 1996
November, 1985
Hardy County - 2003
Planning & Design

• Goals
  – Avoid impacts to Base Flood Elevations
  – Minimize risk for roads and bridges
  – Provide stable streams

• Tools
  – Archived gage data and analysis
  – Regression equations to predict peak discharge and verify channel geometry
Construction

• Goals
  – Build new roads and bridges without delay
  – Avoid flooding damage
  – Blame designers for all problems

• Tools
  – Realtime gage information
James Rumsey Bridge over the Potomac River at Shepherdstown
Operations & Maintenance

• Goals
  – Keep roads and bridges safe and serviceable
  – Mow grass

• Tools
  – Realtime gage data
USGS work Funded in part by WVDOH

• Past
  – Drainage Areas of West Virginia, 1979-1997
  – Estimating Magnitude & Frequency of Peak Discharges…in West Virginia, 2000

• Ongoing
  – Regional Curves for Natural Stream Channel Design
  – River Gage and Crest-stage network
Conclusions

• USGS Stream Gages help WVDOH avoid Geohazards

• Websites
  – http://wv.usgs.gov/
  – http://pubs.usgs.gov/wri/wri004080/
  – http://waterdata.usgs.gov/wv/nwis/current/?type=flow
  – http://www.engr.utk.edu/hydraulics/openchannels/cover.htm