Flood Statistics

- Flash flooding is the leading cause of weather-related deaths in the U.S. - approximately 200 deaths per year
- Over 50% of flood fatalities are vehicle-related.

U.S. Flood Fatalities from 1960-1995

The majority of these were vehicle-related.

1. Texas 612
2. California 255
3. South Dakota 248
4. Virginia 241
5. West Virginia 240

Source - National Climatic Data Center - "Storm Data" publications.
Photographer: Ian Britton
Flood Facts

• Studies indicate that one foot of water will float 1,500 pounds of vehicle.

• Cars will float and be swept away in 12-24 inches of moving water (18-30 inches for Trucks and SUVs)
Applications and Solutions

- Flood waters swept away compact car in Stanislaus County, CA. Man inside perished.
- Advance warning at three low water crossings.
- Flashing beacons and automatic solar powered barrier gates.
Fort Worth, Texas

- 17 people have died in vehicles caught in rising water since 1986.

- First Sites Installed 2003
  - 18 Master / Gauging Sites
  - 43 Advance Warning Sites
Pumps were overwhelmed in Nov. 2006, resulting in the death of a mother and young child.

Advance Warning Beacons added to under-crossing
Austin, Texas

- Frequent flooding of this roadway presented a traffic safety hazard.
- Railroad crossing style flooded roadway closure
Colleyville, TX

- Flooding occurs in this affluent neighborhood.

- Video cameras allow monitoring by Public Works
  - 6 Master / Gauging Sites
  - 12 Advance Warning Sites
  - 6 Video Cameras
Advance Flooded Roadway Warning System Goals

- Respond immediately to developing emergency

- Relieve manpower requirements during flood for other emergency response activities

- Notify Emergency Management personnel as actions are taken by the system

- Provide audit trail of system data and controller actions
System Components

- Master Gauging Station – Master
- Advance Warning Station - Remote
- Base Station radio equipment
- Base Station software
- Optional Video monitoring of selected sites
- Solar powered. Engineered for 72+ hours of autonomous operation.
- Lightning protection
- UPS at Base Station.
Communications Options

- Open Architecture ALERT protocol data format compatible with shared weather data systems
- Hydrological VHF Radio Frequencies
- 900 MHz Spread Spectrum
- Cellular Modem
- Ethernet
Base Station Software

- Software receives, acts on and displays system information
- Initiate commands via base station transceiver
- Override commands or request status
- Sends alarms to selected personnel via text message, email or page
- Interactive map displays
- Serves Public and Private web pages.