

Safe to Proceed: Roadway Flooding Solution

Sue Swenor, Marketing Manager, High Sierra Electronics, Inc.

Flooding causes more deaths and property damage in the U.S. than any other severe weather-related event. Many people drown during flooding because few realize the incredible power of water. A mere six inches of fast-moving water can knock over an adult. It takes only two feet of rushing water to carry away most vehicles, which includes pickup trucks and sport utility vehicles.

Texas is prone to extremely heavy rains and flooding. Texas also had the most flood-related deaths in the past thirty-six years. Bexar County in central Texas, about 190 miles west of Houston, is particularly vulnerable because storms stall along the Balcones escarpment. This region, known as the Hill Country, has earned the nickname "flash flood alley". Due to this geography, floods are a natural hazard and a regular occurrence.

In order to better prepare residents, County officials implemented a High Water Detection System in 2007. This system is designed to target two primary goals. The first is to warn motorists they are approaching hazardous road flooding conditions, giving them the opportunity to stay out of harm's way. This is accomplished by activating warning beacons located at strategic locations. The other goal is to notify transportation and emergency management personnel of the flooded roadway condition so additional action can be taken.

High Sierra Electronics, Inc. (HSE) was awarded multiple contracts by Bexar County for the implementation of a flooded roadway warning system. The first in 2007 included four solar powered rain and stream gauging sites for monitoring conditions at two separate roadways.



When three inches of water threatens to flood the road, HSE's Advance Warning System automatically activates flashing beacons to warn motorists.



Pleased with the success of this system, the County awarded a second contract in 2009. The County now operates two base stations, twelve gauging sites, and twenty-seven warning stations with flashing beacons.

The County's system is monitored and controlled by a Windows platform base station software provided by HSE known as DataWise. The software is programmed to send commands that turn on or off flashing lights at each station. This can be a group command or an individual command. All radio traffic between the master and remote sites is displayed in real time and then automatically archived for the County. DataWise also automatically sends an alert message to key personnel via e-mail or text message when an event occurs. It generates a station report on a (prescribed) timed basis that includes the battery voltage, water level, control status, and the tipping bucket values from the various sites.

According to Art Villareal, Watershed Program Coordinator at Bexar County, the project was managed "in a professional manner. From hardware installation to software set-up and configuration, the system has performed and has helped our agency improve safety measures for area residents and visitors".

HSE is located in northern California and has been supplying weather monitoring systems, data management, and field services since 1992. HSE started in the field of flood warning and environmental monitoring and in 2000 expanded into the field of road weather management. Other road weather management solutions include the "Mini" RWIS remote processing unit for weather-responsive traffic signal management.