ADVANCED ENVIRONMENTAL MONITORING

HIGH SIERRA ELECTRONICS, INC
environmental monitoring solutions

Bexar County Automates Flood Detection to Protect Drivers at Flooded Roadways

Overview

Flash flooding is the leading cause of weather-related fatalities nationwide and the State of Texas leads the country in weather-related and flood-related deaths. Bexar County, which is located in Central Texas and includes the city of San Antonio, is particularly vulnerable to flooding because storms stall along the Balcones escarpment. In addition, its relatively dry climate and rolling hills create low water crossings that are highly susceptible to roadway flooding - earning this region the nickname “flash flood alley”.

Roy Alaquinez, Civil Engineering Assistant for the County of Bexar Public Works Department, has worked with High Sierra Electronics for over 10 years helping to reduce the risk to the public.

> Our High Water Detection System Project consists of installing monitoring systems at low water crossings throughout the county,” Roy said, “High Sierra Electronics provided all the equipment, did all of the installations and they continue to provide preventative maintenance on these systems. The company has provided quality products and professional service throughout this period. Our experience with High Sierra Electronics has been positive.
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> **Roy Alaquinez -** Civil Engineering Assistant for the County of Bexar Public Works Department

Operational Challenges

With over 300 low water crossings, Bexar County has one of the highest frequencies of flooding in the United States. Absence of a reliable way to quickly notify motorists when flash floods occur at these crossings has resulted in an increased level of motorist fatalities during flood events. The County needed to find a way to better prepare residents for roadway flooding during such storms. Without efficient flood alerting, Bexar County faced the following operational challenges:

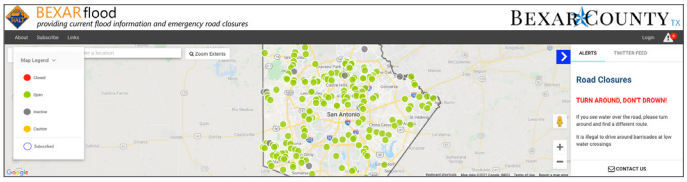
No Driver Warning System
Inability to monitor rainfall and hazardous road conditions in real-time and automatically notify motorists when flash floods occur at low water crossings.

Manual Situational Awareness
Reliance on county personnel to manually place flood warnings and road closure signs is time-intensive and costly, and often happens too late to prevent accidents.

Response Time Inefficiency
Increased risk of injury or death due to time for emergency personnel to identify and reach motorists in need of assistance on flooded roadways.

Solution: Adopting High Sierra Electronics Technology

Since 2008, High Sierra Electronics has worked with Bexar County installing and maintaining our High Water Detection Systems (HWDS), which the county has locally named HALT (High-water Alert Lifesaving Technology). The HWDS uses a combination of rainfall and water level gauges to monitor conditions at low points on the roadways. This technology has offered Bexar County innovative solutions to improve motorist safety when flooding occurs on roadways.



Automated Motorist Warnings
When water rises to an unsafe level at low water crossings, sensors automatically trigger flashing beacons and/or barrier gates to alert motorists of danger.

Improved Response Time
Using Contrail software and AI technology, locations with integrated HD PTZ Cameras provide real-time event verification and notify officials when emergency response is needed.

Remote Monitoring and Alerting
Operational staff receive text and email alerts when a system is activated to more efficiently monitor locations where drivers may need assistance.

Solutions in Action

On May 1, 2021, Bexar County experienced severe flooding that was measured by the High Water Detection System and the integrated camera systems, all while being recorded in Contrail. The HWDS was able to communicate the rising water levels that initiated the flood warning flashing beacon signs and activate the gates to protect motorists from the flooding roadway. The real-time monitoring of High Sierra's automated High Water Detection System ensures that motorists were aware of a severe flooding event before encountering it, keeping them safe in an efficient and timely way.

Why High Sierra Electronics?

High Sierra Electronics, part of the Advanced Environmental Monitoring family, has been designing and manufacturing environmental monitoring systems for the protection of lives and property since 1992. The comprehensive systems, from sensors in the field to a central software platform to visualize data, help identify threats posed by the weather, such as flooding, dangerous road conditions, and vulnerable dams and levees.

In 2017, Bexar County and High Sierra Electronics received a Project of the Year Award for Phase III from the Texas Chapter of the American Public Works Association in the $5M - $25M Disaster or Emergency Construction/Repair Category. Bexar County's HALT system uses the features below to protect motorists from the dangers of flooded roadways.

1 **High Water Detection System (HWDS)**
Complete roadside warning system monitors rainfall and water levels at a roadway monitoring site and signals flashing lights and automatic road crossing-arm gate barriers when flooding conditions are present.

2 **Integrated PTZ Camera System:**
The integrated PTZ camera system provides complete awareness by alerting officials about stranded drivers who have driven into a flooded roadway. Contrail® Camera provides centralized web-based image storage and management with advanced featured Vision license for AI (Artificial Intelligence) to detect and alert on events and incidents.

3 **Contrail® Software**
Web-based platform provides automated real-time hydromet data collection, visualization, advanced custom alarms and notifications, and two-way gate control.

Importance of Flood Warning Systems

Floods are the most common natural disaster in the United States. Without High Water Detection Systems, people could mistake how dangerous the a flood is and continue to drive through it. Alerting motorists when there is a flood and stopping them is essential to keeping communities safe.

In addition to protecting motorists in real time from flooding on roadways, the data collected by the HWDS system is used by SARA (San Antonio River Authority) for their Flood Modeling Application to predict flooding throughout the county.

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