




ITS and Extreme Weather Events **FLOODING**




Intelligent transportation systems (ITS) can help enhance safety and efficiency during extreme flooding events by providing real-time flood monitoring and alert systems. These systems can adjust signal timings, reroute traffic away from affected areas, and coordinate emergency response efforts to optimize traffic flow and ensure quicker evacuation and relief operations. Additionally, they enable better communication between vehicles and infrastructure, facilitating the dissemination of critical information to drivers and emergency responders in a timely manner.

The featured benefits, costs, and lessons learned are based on ITS project evaluations contained in the ITS Databases at: www.itskrs.its.dot.gov. **Click on each example to learn more.**




BENEFITS

-  **Road Weather Information System (RWIS) in Montana**
Researchers conducted benefit-cost analyses for scenarios (different software/geographic conditions) to quantify the potential agency and societal benefits of RWIS. Modeled results showed estimated savings of up to \$2.2 million in crash occurrence and delay costs.
-  **Wet Pavement Detection System (WPDS) in North Carolina**
A deployment of a WPDS on I-85 yielded a 39% reduction in the annual crash rate under wet conditions, and average daily crashes per day dropped by 58% on days with heavy precipitation.
-  **Emergency Communications for Evacuation (EVAC) in Louisiana**
In a simulation of the 2005 Hurricane Katrina evacuation, researchers assessed potential impacts of the EVAC mobility application and found a 20% reduction in time congested.

COSTS

-  **Annual Software Costs for RWIS in Montana:**
\$63,000 to \$173,800
-  **Pump Station Monitoring System Upgrade in Texas:**
\$13,000 per station
-  **High Water Detection System in Texas:**
\$75,000

LESSONS LEARNED

-  **Weather-Responsive Management Strategies (WRMS) in Iowa, Missouri, and Nebraska**
Data and models can be useful to predict and prepare for flood events, especially for exceptional conditions when historical experience does not apply.
-  **Ultrasound Water Level Detection System in Texas**
Water level monitoring sensors at both pavement side and streamside locations provide more sensitive detection of urban flash flooding.
-  **Web-Based Mapping Tool in North Carolina**
Using a web-based mapping tool improved stakeholders' decision-making for flood events by providing real-time and forecasted inundation depths for roads, bridges, and other transportation assets.

