Reduce crashes, improve traffic management and save lives

# **Reduced Visibility Prediction**

There are over 5.8 million vehicle crashes per year and approximately 23% of those-or 1.3 million-are weather-related. Many locations throughout the world have experienced tragedies related to reduced visibility and dangerous road surface conditions. On February 5, 2018, a 70-vehicle pileup near Ames, lowa on Interstate 35, killed one and severely injured several others. That morning, Iowa State Patrol troopers responded to 185 crashes between 6 a.m. and 9 a.m. In 2012, along a stretch of I-75 just south of Gainesville, Florida,11 people perished and more than 20 were injured when smoke and fog combined reducing visibility to nearly zero. Only four years earlier on I-4 in Polk County, Florida, four people were killed and 30 injured in a similar tragedy.

# Solution

In what began as a research project in 2014 with the Florida Department of a Transportation, DTN validated that an array of low-cost meteorological sensors can detect fog. DTN continued this work to combine the initial research with site-adaptable software algorithms and customized weather modeling to predict the onset of fog and reduced



### visibility,

exceeding the existing performance of traditional and much more expensive technologies. This low-cost, scalable, solution is based on a combination of affordable Wireless Sensor Nodes (WSNs), an amalgamation of data and highly-accurate numerical weather modeling. Most importantly, the DTN solution, EnvisiCast<sup>™</sup>, puts primary focus on future fog and other reduced-visibility events (predictive) versus generalized information from traditional road weather systems or past traffic events (reactive).

### Results

The solutions accuracy has been proven positive and validated independently. During the 2015-2016 fog season, the pilot program had an accuracy of 70-85% with lead times of two to four hours for dense fog events. During the 2016-2017 fog season, expanded sites achieved an accuracy of 81-91% with lead times of two to four hours and a low false positive rate. In the 2017-2018 fog season, the increased sites achieved an accuracy of 91 to 94%.

# EnvisiCast™ delivers

- Alerts for the prediction of reduced visibility:
- Prediction of dense fog (less than ¼ mile)
- Heavy precipitation which reduces visibility and deteriorates road conditions
- Reliable and accurate Planning tool for Traffic Management Centers, Highway Patrol and other stakeholders

<u>www.dtn.com</u>

 Improved highway safety, traffic flow and dynamic tolling operations. EnvisiCast<sup>™</sup> supports **USDOT FHWA's vision** of zero deaths and serious injuries on the Nation's roadways.



# About DTN°

DTN delivers actionable insights to help our customers prosper to the Nth degree in the agriculture, energy, weather, financial analytics and transportation markets.

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# Summary

Fog can occur suddenly, so it is vital to know when fog is forming and if there are other factors such as fires or heavy air pollution in the area. Improved prediction of visibility obstructions can reduce crashes, improve traffic management, save money and, most importantly, save lives.

# EnvisiCast<sup>™</sup>

- Is an innovative, highly-accurate fog and reduced visibility system
- Predicts reduced visibility due to onset of dense fog or heavy precipitation
- Combines advanced prediction of reduced visibility from DTN's patent-pending algorithms and low-cost IoT technology, along with confirmation using L3Harris patented ML Helios capabilities



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