

Satellite Communications for RWIS Provides Reliable Solution for Challenging Locations

From some of the most remote regions of Alaska to a scenic travel stop in New Hampshire to an important stretch of Arizona highway, state departments of transportation have experienced the same dilemma - a need for RWIS (Road Weather Information System) monitoring to obtain vital information on pavement and weather conditions used for roadway maintenance operations; but, with limited communications options.

RWIS technology is typically used for monitoring snow and ice, but it can also be used for high winds, flooding, and/or visibility. In that weather affects all modes of transportation, RWIS importantly enables maintenance and operations personnel to monitor changing weather conditions in real time and make informed and timely decisions.

An RWIS network can consist of multiple weather station locations or sites, each containing a suite of sensors that gathers weather and pavement data and then reports to a central location where authorized personnel can view the information.

A variety of communication methods are used to transmit data from the RWIS site back to a central location or server where the data is viewed by agency users. Telephone, cellular, fiber optic, solar power, radio and Ethernet are all modes of transmitting RWIS data. But what if these options were not available or reliable? Vaisala, Inc. turned “to the skies” for a viable solution - satellite communications.

Alaska’s Remote Terrain – An RWIS Challenge

The Alaska Department of Transportation and Public Facilities (ADOT&PF) is an RWIS “power-user”. Working with Vaisala over the years to implement an RWIS network, numerous challenges are faced in Alaska’s harsh climate. Despite these challenges, ADOT&PF is determined to get the most out of its RWIS network.

One of the main challenges ADOT&PF faces is a reliable communications method, which turns out to be satellite for reliability as well as the ability to stand up to harsh winter conditions.

“Communications for the Alaska Department of Transportation and Public Facilities (ADOT&PF) RWIS program is a continuing challenge,” states Jack Stickel, Highway Database Manager for ADOT&PF. “Telephone service is not continuous along the road network. Cell phone coverage is generally limited to urban areas. Access to the statewide area network goes through maintenance stations, which might not be close to the RWIS environmental sensor station. Internet access is even more problematic.”

Mr. Stickel adds, “Satellite service has been excellent—RWIS data and road images are always received on time and clearly. Additionally, the satellite modem has functioned at temperatures colder than -20°F. Satellite service costs slightly more than regular telephone service in the Alaskan rural setting, but is comparable with cell phone service—if it was available.”

The ADOT&PF RWIS system is comprised of 52 RWIS weather stations, all located in extremely harsh environments. The reliability of satellite communications has been tested and proven effective in these adverse conditions.

Mr. Stickel continues, “ADOT&PF is extremely pleased with our five existing installations and plans to use this communications solution in the future.”

Scenic and Functional in the Northeast

Near the New Hampshire–Canadian border, at a rest stop off of Route 93, the New Hampshire Department of Transportation was hoping to install a new RWIS, but had no cell phone coverage, and would have to rely on potential long-distance phone calls from the server located in Concord, New Hampshire. Vaisala proposed a satellite solution, which provided reliable transmission of data at an economic cost. The New Hampshire

Department of Transportation uses the RWIS data for its roadway operations, especially during the winter months when conditions can deteriorate quickly.

The New Hampshire Department of Transportation was concerned about the aesthetics of placing an RWIS at the rest stop, out of concern for the aesthetics of its landscape. Vaisala worked with the state to provide an installation that would not distract from the beauty of the surrounding landscape. “We provided a solution that was cost-effective and functional while keeping in mind the state’s desire to maintain a park-like setting at the rest area,” adds Benny Borrelli, Mid-South Field Service Manager, for Vaisala, Inc.

No Power, No Problem

Another challenge when deploying an RWIS network is the availability of electrical power at the desired sites. The Arizona Department of Transportation ran into this issue when expanding and upgrading its RWIS network. Again, the Vaisala solution was satellite. The challenges that Arizona Department of Transportation faced included lack of AC power available at the RWIS installation site, no cellular coverage and no landline dial-up connection. However, Vaisala was still able to provide a turnkey satellite solution utilizing solar power.

No matter which type of communications method is used, the RWIS data is delivered directly to Vaisala’s server, where customers view the data on user-friendly software; or, Vaisala hosts the data at its offices, and delivers it to the customer through a hosted software program.

With over 35 years experience in the RWIS industry and thousands of site surveys, Vaisala has installed, tested and maintained RWIS sites in the most remote locations and under the harshest of weather conditions. “Even in these remote areas and extreme temperature environments, the RWIS perform reliably,” adds Mr. Borrelli.