# Connectivity and Collaborative Mapping Software Improve Storm Response

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The Pacific Northwest was hit several times this past year with near hurricane-force winds and torrential rains, knocking down trees and poles for several utilities. A particularly severe wind storm devastated the Spokane-based Avista Utilities system in eastern Washington on November 17, 2015. Within hours of the storm's start, approximately 180,000 of Avista's 369,000 total customer base were without power.

Fortunately, weather forecasts had put Avista and its contractors on alert a couple of days in advance. Line repair crews were brought in by Avista and 12 additional tree crews plus supervision were quickly moved in from Asplundh operations in Montana and coastal Washington. They assisted approximately 17 local Asplundh crews who were contracted to perform vegetation management (VM) work on the Avista system in parts of eastern Washington and northern Idaho.

The tree crews on Avista's system have used tablet computers in their
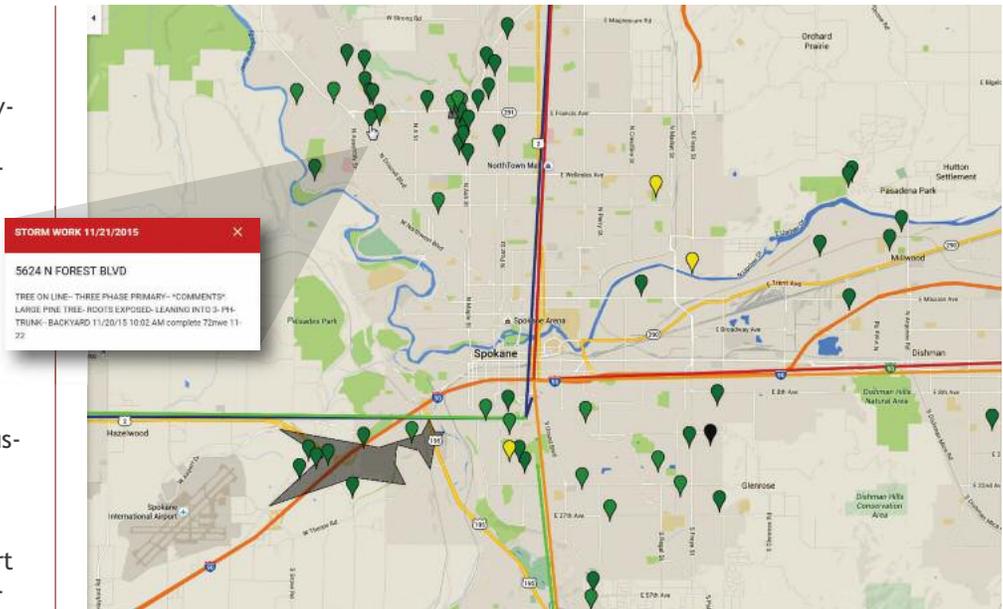
This is a Google My Maps screen shot taken on November 21, 2015, four days after the wind storm hit Avista's system. By clicking on the nearest yellow pin (pending ticket), a tree crew was able to see the street address to navigate to and any comments describing the tree damage, electrical facilities affected or customer concerns to note. After clearing the lines, the crew would use their truck's 4G Wi-Fi-enabled tablet to change the pin's color to green and add any notes for Avista's future reference.

trucks for almost four years to document their work and support electronic timesheets and invoicing. Only three weeks before the storm hit, 4G LTE mobile hot spots were activated in each Asplundh vehicle, making connectivity in the field much faster and more reliable. The hot spots, installed as part of the company's Truck-as-a-Hub initiative, helped the crews respond quickly to the hundreds of trouble tickets that Avista and its contract work planners placed in Google My Maps, a collaborative mapping application to which they all share access.

"It was a painless transition from mapping our routine maintenance pruning, risk tree, and customer service request programs to creating storm damage response maps," said

After the November 17, 2015 storm, Asplundh Foreperson Matt Nelson maneuvers a backyard aerial lift into position to carefully remove a pine that pulled down Avista's primary and secondary power lines.

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Program Administrator Larry Lee of Avista Utilities' VM Department. "We were able to capture jobs as they came in not only from our Avista damage assessment teams, but from outside entities such as the Spokane City Parks, the County Roads Department, and the DOT. We then populated independent maps for each entity—for tracking and documentation—and overlaid them onto one map for the tree crews."

To expedite the restoration work and keep the tree crews productive, the general forepersons would assign a particular geographic area of the Avista system to a group of tree crews (usually a mixture of local and out-of-town crews). Each crew would use the truck's tablet (or even a smartphone) to sign in to the collaborative map program to see all the pending ticket locations in the assigned area, marked in yellow. When the crew finished a job, they would change the color to green. If grounds were needed at a particular location, the color was changed to red and Avista was notified of the need for grounds from a line crew before the tree work could proceed safely. The tree crew was then able to move on to other yellow tickets until they were notified that it was safe to return to the red ticket.

"Since we can monitor the maps in real time, as the crews complete work and turn the sites green, it's easy to see where resource allocations are needed," said Lee. "Dividing the county into quadrants eliminated the need for crew 'staging areas' and greatly reduced crew travel times. They simply worked in their assigned quadrant each shift on the jobs closest to them until they were reassigned as needed."

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Broken poles and sagging lines, often caused by wind-damaged trees, made it difficult to drive in parts of Spokane until Asplundh and Avista could clear roadways.

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Thanks to Avista's Incident Command System and Emergency Operations Center, as well as more than 120 additional line crews and a total of almost 30 Asplundh tree crews, 90 percent of the utility's customers were restored in seven days. The remaining 10 percent took another two

days. The monumental task of safely clearing thousands of limbs and trees from power lines and roadways was completed within 10 days.

"It would have been a much less efficient process without the speed of the mobile hot spots, our tablets, and a collaborative mapping program," said Dennis.