Case Study

Don't Let Wireless Connectivity Issues Hamper The Effectiveness Of Your Mobile Workers

Colorado Springs is mapping out its wireless strategy with the help of a wireless network evaluation tool.

by Brian Albright

Like a lot of communities, Colorado Springs uses wide-area wireless communications for a number of municipal departments, from public works right up through the smartphones used by executive staff. Public safety officers there are equipped with in-vehicle laptops for doing background checks, running license plates, and writing reports, and city inspectors use mobile computers to complete work in the field. In all, there are some 300 mobile devices in use by city workers.

Unfortunately, connectivity issues sometimes hampered the effectiveness of some of these mobile applications. The city was, in fact, listed as having the second-worst cell phone service in the U.S. by *TIME Tech* magazine last year, based on data from OpenSignalMaps. City leaders don't necessarily agree with that judgment, but the community's rugged terrain can affect coverage in some areas.

A year ago, the city decided to centralize its cellular contract to save costs through economies of scale. "We primarily use one carrier, but we didn't require anyone to sign up with it," says Colorado Springs Deputy CIO Jesse James. "We wanted to partner with a cellular carrier to drive down costs, to get a better picture through bill-

Mobile broadband measurement and analysis software from Mobile Pulse is helping Colorado Springs improve connectivity for its variety of mobile workers.

ing reporting mechanisms, and gain more visibility into how cellular costs were being managed."

Wireless Coverage Gaps Waste Time

For police officers, coverage gaps and dropped connections cause countless problems. Officers write reports on their in-vehicle laptops, then wirelessly transmit them to substations for printing. "Where we had coverage issues, they would arrive at the substation and the reports wouldn't be there," James says. "That wasted a lot of time, both for the officer and in trying to troubleshoot the technology."

When officers lost connectivity, they would have to rely on their radios to ask dispatchers to run license plates and drivers' licenses. Public works inspectors would be unable to access applications in the field and instead had to rely on handwritten notes that were later key-entered. "It was not uncommon for public works inspectors to work at a remote site, then drive to an area with better coverage, park, enter the data, and then drive to the next site," James says.

As a stop-gap measure, the city has deployed wireless LAN hotspots to help improve coverage for public safety officers. Officers can access the network using a NetMotion wireless virtual private network (VPN), both over the cellular network and the WLAN solution.

By consolidating with one wireless provider, James says the city hopes to be able to not only negotiate better pricing, but also to work more closely with the carrier to improve coverage. In order to enter those negotiations, the city needed a way to see which carrier offered the best wireless coverage but without going through the

time-consuming task of using city employees to sample the coverage across the municipal area. In 2012, Mobile Pulse, a Denver-based start-up, reached out to the city about piloting its new mobile broadband measurement and analysis software solution.

How To Measure Wireless Coverage

The Mobile Pulse solution gathers data over time, across geographies, carriers, and devices so that customers can see both coverage and data throughput. The city decided to pilot the technology for six months to test multiple carriers' networks in advance of selecting a vendor and entering into contract negotiations.

The Mobile Pulse application was installed on employee devices (both laptops and smartphones) on a volunteer basis. Once the application is installed, the solution automatically measures network performance (both coverage and throughput) without requiring any action from the end user. The data is transferred to Mobile Pulse, then analyzed and made available via a Web-based dashboard.

James and his team can view detailed maps, comparison charts, and reports online. "It gives us a perspective on overall coverage," James says. "Not just signal strength, which is an area that people always want to look at. This gives us information on throughput as well. It also provides us information on connectivity drops."

The solution also logs the GPS location of each device to match coverage, throughput, and connectivity drops with specific areas. "We ran this at the same time as we issued our cellular request for proposal," James says. "The providers that responded provided us with equipment, and we used the Mobile Pulse app to measure the performance of the networks we were evaluating."

Coverage Gaps Identified, Addressed

That initial data has changed the criteria the city's network selection team will use to evaluate potential vendors. "The team here that will help make a decision about which provider to use originally came in thinking that they wanted the carrier with the most coverage," James says. "But when we saw the results, we determined that the provider that gave us the widest coverage had the worst throughput. So we're looking at the vendor with the best throughput that also gives us the coverage we need in critical areas."

The city was also able to identify areas where there are coverage gaps. "We also identified excessive connection drops in certain areas," James says. "We wouldn't have understood that or known what to do with that information without this application." The city plans to use that data to work with carriers to improve coverage through network expansion around Colorado Springs.

"One of our mayor's goals is for Colorado Springs to be the most business- and citizen-friendly city in the nation," James says. "There is an expectation that you have to have good coverage. With the proliferation of applications and how they work, we need connectivity. These devices require a certain level of bandwidth to make those applications useful."

The pilot is ongoing. Even with the devices currently involved in the pilot, James says he has not been able to gather sufficient data for every section of the city. "We want to continue measuring the service for at least another year," he says. He adds, however, that the data collected so far shows that, despite the claims in the *TIME Tech* magazine article, the city actually has much better coverage than was initially reported.

He said the city may use Mobile Pulse to continue to evaluate coverage and throughput and simplify troubleshooting, even after the wireless carrier is selected. "We can take this data and work with the vendors and the city planning department to find out where we can streamline the process to get approval and increase coverage in areas where we really need it," James says. "That will be our main focus." •

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