The InvisiConnect[tm] Cellular Communications and Control System Case Study #3010: Missouri Department of Transportation

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One of the major benefits of the InvisiConnect[tm] system is its ability to simultaneously carry data traffic for multiple user applications. This directly translates to a dilution of enterprise overheads in terms of training, spare parts, infrastructure maintenance and speed of deployment. So, instead of having a different communication system for each application, e.g. dynamic message signs, signal controllers, traffic data collectors, etc., InvisiConnect[tm] provides a virtually infinite IP over cellular communication platform that saves both time and money. Nowhere is this concept better displayed than in the state of Missouri.

In January of 2006, MODOT rolled out its first use of InvisiConnect[tm] in support of communications to four different brands of portable, dynamic message signs (DMS) located along its portion of I-70. Complicating the situation was the fact that each brand of sign had its own proprietary software program for control. With its multiple application interfaces and end-to-end, client-server design, the InvisiConnect[tm] system was selected as being uniquely capable of providing a common "pipe" for communication and control of these signs.

Tyson King, Project Manager at MODOT, commented on the situation as follows: "Our purchase history left us with multiple brands of signs for which we needed remote access in order to cover the defined geography. Integral to these sign brands, we had multiple analog cellular solutions that were unreliable and we knew the analog service was being discontinued. We were not sure how to integrate the assets we had with the digital cellular technology and the InvisiConnect[tm] system made it seamless, quick to deploy, secure and cost effective. Moreover, we know that as we add new assets that support the NTCIP standards for Intelligent Transportation Systems (ITS), InvisiConnect[tm] already supports these as well and without additional investment".

Taking note of the successful deployment of the portable DMS application, the District 6 (St. Louis) Traffic Operations group instituted a test of InvisiConnect[tm]. This test was conducted at multiple traffic signal control locations where no communications circuits were available. The test involved making connections between a Siemens ACTRA[tm] central control system and several types of compatible traffic signal controllers. Despite the unique communication protocols being used, InvisiConnect[tm] made the connectivity seamless and secure with no modifications needed to either the central system or the signal controllers. Unlike the portable DMS application, where connections were made "on demand" (i.e. emulating dial-up), the signal control application requires "always on" connectivity. Here again, InvisiConnect[tm] is up to the task, and is today providing in

excess of 80 connections simultaneously, so the ACTRA^{tm} system can continuously poll the intersections for status and events.

At MODOT, District 6 ITS Traffic Operations Engineer, Greg Owens, P.E., had this to say about his application: “As population and development continue to expand, we are constantly faced with long periods of time where our networks have not reached our field assets. Clearly, this makes traffic management more difficult. After seeing the value proposition realized successfully for the portable DMS users, we felt it would be wise and very timely to take advantage of the in-house InvisiConnect^{tm} platform and the experience base, to get all of our signal controllers connected and under real time management.”

During the summer of 2007, another DMS project was taken on by MODOT and again, word of continued success with InvisiConnect^{tm} lead the project team to select it for the program. This time the DMS units are permanent ones, provided by a company called LEDStar of Ontario, Canada. And like the signal controller application, these signs need to be managed with “always on” connectivity. Of course, InvisiConnect^{tm} fully supports the transport of the NTCIP messaging protocol used to monitor and control the signs in real time. Other features of the system include a second serial data port integral to the InvisiConnect^{tm} cellular client modems. This port can be used to access data from co-located power systems or other devices. Additionally, real-time forwarding of remote site alarm conditions can be activated using InvisiConnect^{tm} Server. Alarm forwarding can send customizable emails or text messages, via the cellular network, to make individuals or groups aware of specific conditions at remote asset locations.

Ron Rudroff, Senior Telecom Information Specialist with MODOT, was in charge of the permanent DMS deployment. Ron commented on InvisiConnect^{tm} as follows: “As the third application deployment to use the Metretek InvisiConnect^{tm} system at MODOT, we expected a positive outcome and have not been disappointed. We further expect to soon increase the size and scope of our DMS network and are certain that the distributed, multi-tasking architecture of the InvisiConnect^{tm} system will be able to handle the added thru-put requirements, as well as any other tasks we require of it.”

N.B. all of the InvisiConnect^{tm} deployed applications as discussed herein are utilizing the GSM/GPRS and EDGE cellular data services provided by AT&T Wireless.

End of Case Study #3010