Rural Applications of Adaptive Traffic Signal Control

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While adaptive traffic control systems are typically thought of as a solution for traffic congestion in urban and suburban areas, rural communities are beginning to explore how this real-time signalization technology meets their unique needs.

This presentation will feature case studies of several rural communities that have deployed InSync adaptive traffic control to solve their particular traffic engineering challenges.

The City of Texarkana, Arkansas, a community of less than 25,000 people, selected InSync for three intersections on two intersecting arterials. The City found signal coordination difficult due to the fact that there were no dedicated turn lanes. This meant split phasing had to be used, and through movements were difficult to coordinate. It seemed the only option was to embark on an expensive road widening project.

However, instead of road construction, the City of Texarkana opted for adaptive traffic control technology which consisted of four video detection cameras, a processor and other support equipment plugged into the existing traffic control hardware at each intersection. The system, InSync, is able to coordinate movements on the two arterials and even reduce wait time on side streets. The technology reduced stops at all three intersections, resulting in less time wasted stopped at red lights, less fuel consumed during idling and acceleration, fewer emissions from less fuel burning and less opportunity for rear-end accidents. The visible benefits to motorists are that they can drive through multiple intersections without stopping, they don't sit at a red light when there are no cars using the green light, don't stop twenty cars driving at 35 mph just to serve one car on the side street, and don't waste green light time on approaches without cars needing the green light. InSync adaptive traffic control has improved both safety and traffic flow at a challenging set of intersections.

Another community, the City of Raymore, Missouri, with a population of just 19,000 people, chose adaptive traffic control to solve the challenges of a rural intersection near their high school and a city park. Video detection was not an adequate traffic management solution due to the heavy volume the intersection experiences before and after the school day and variable traffic for school-related activities. By using InSync adaptive traffic control, the traffic signals are able to instantly adjust phasing to accommodate traffic demand as it happens. This means green time is distributed more effectively and more vehicles move through the intersection wherever the highest demand is. Like Texarkana, the adaptive technology also improves roadway safety by reducing stops and serving green time more intelligently.

Real-time adaptive traffic control is revolutionizing our roads by enabling traffic signals to adapt to actual traffic demand each second and synchronizing signals along corridors on the fly. This technology reduces traffic stops 60-90%, travel time up to 50%, fuel and emissions by 20-30%, and even reduces crashes 17-30%. Because adaptive traffic control replaces manual signal timing with automated, artificially-intelligent signal timing, it's a good solution for rural transportation agencies that may have limited staff resources available. If communications are used to connect the adaptive intersections to each other and make them accessible to an external network, the intersection camera views can be

monitored through any standard web browser (such as in a TMC or even on a tablet or smartphone), further adding to the efficient, cost-effective nature of adaptive traffic control in rural areas.

In addition to the latest rural case studies, this presentation will cover 2012 advancements in the adaptive traffic control arena such as vast improvements in the speed and ease of installation (just minutes per intersection); new universal compatibility with all major traffic controllers, detection devices and communication networks; and the latest independent data measuring the technology's operational benefits in cities across the country.