AASHTO Technology Implementation Group

Nomination of Technology Ready for Implementation

**2011 Nominations Due by Friday, September 17, 2010**

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| **Sponsor** | *Nominations must be submitted by an AASHTO member DOT willing to help promote the technology.* | 1. Sponsoring State DOT: Missouri Department of Transportation | | | | | |
| 2. Name: Julie Stotlemeyer | | | | | |
| Title: Traffic Liason Engineer | | | | | |
| Mailing Address: PO Box Box 270 | | | | | |
| City: Jefferson City | | State: MO | | Zip Code: 65109 | |
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| 3. Date Submitted: 09/17/2010 | | | | | |
| 4. Is the Sponsoring State DOT willing to promote this technology to other states by participating on a Lead States Team supported by the AASHTO Technology Implementation Group?  Please check one:  Yes  No | | | | | |
| **Technology Description (10 points)** | *The term “technology” may include processes, products, techniques, procedures, and practices.* | 5. Name the technology:  InSync Adaptive Traffic Control System | | | | | |
| 6. Please describe the technology:  The InSync system is an adaptive traffic control system that eliminates the need for traditional labor-intensive static timing plans by creating dynamic "greens" based on real-time traffic demand. The system utilizes artificial intelligence to make them most effective use of signal green time along with outfitted arterials. Digital IP cameras work with InSync processors to process images of real time vehicle platoons passing through or vehicle queues stopped at an intersection. InSync uses its logic to filter and prioritize the calls for a green light through the use of encoded mathematical algorithms. The InSync components are quick and easy to install and are compatible with most cabinets and controllers. Independent tests have shown that by using the InSync system on traffic corridors it can reduce stops by 60-90%, reduce fuel consumption by at least 20% and reduce emissions by at least 30 percent. | | | | | |
| 7. If appropriate, please attach photographs, diagrams, or other images illustrating the appearance or functionality of the technology. (If electronic, please provide a separate file.)  Please check one:  Yes, images are attached.  No images are attached. | | | | | |
| **State of Development (30 points)** | *Technologies must be successfully deployed in at least one State DOT. The TIG selection process will favor technologies that have advanced beyond the research stage, at least to the pilot deployment stage, and preferably into routine use.* | 8. Please describe the history of the technology’s development.  The InSync system was developed by a traffic engineer in Kansas named Reggie Chandra. He knew that there had to be a better way to control traffic signals but that traffic engineers alone could not solve the problem. In 2004 he assembled a team of computer scientists and mathematicians to look at the issue from a different perspective than a traditional traffic engineer. In February of 2008, Rhythm Engineering flipped the switch on an artificially intelligent, digital system that could time lights and coordinate signals to automatically respond to traffic in real time. | | | | | |
| 9. For how long and in approximately how many applications has your State DOT used this technology?  MoDOT installed the InSync system on MO 291 in early 2009. This location was the subject of a research project to determine it's effectiveness on reducing stops, lowering emissions and reducing fuel consumption. (See question 13 for results.) Due to the success of the installation, MoDOT has installed the InSync system in two other locations and many more are in the development process. | | | | | |
| 10. What additional development is necessary to enable routine deployment of the technology?  None, the InSync system is fully developed and can be plugged into existing signal hardware. thereby reducing costs at existing locations. | | | | | |
| 11. Have other organizations used this technology? Please check one:  Yes  No  If so, please list organizations and contacts. | | | | | |
| *Organization* | *Name* | | *Phone* | | *E-mail* |
| City of Little Rock, Arkansas | Bill Henry | | 501-379-1816 | | bhenry@littlerock.org |
| City of Rogers, Arkansas | Steve Glass | | 479-621-1117 | | sglass@rogersark.org |
| City of Springdale, Arkansas | Dub Janczys | | 479-750-8135 | | djanczys@springdaleark.org |
| Columbia County, Georgia | Glen Bollinger | | 706-868-3356 | | gbollinger@columbiacountyga.gov |
| City of Lenexa, Kansas | Steve Schooley | | 816-797-0011 | | sschooley@ci.lenexa.ks.us |
| **Payoff Potential (30 points)** | *Payoff is defined as the combination of broad applicability and significant benefit or advantage over other currently available technologies.* | 12. How does the technology meet customer or stakeholder needs in your State DOT or other organizations that have used it?  As funds become more limited, it is important to be able to reduce congestion and delay without building new roadways. The InSync adaptive signal technology has allowed MoDOT to increase corridor capacity at a low cost and with minimal disruption to traffic and the environment that would be associated with new construction. As states become more environmentally responsible it is also important to find cost-effective ways to reduce emmissions and fuel consumption. | | | | | |
| 13. What type and scale of benefits has your DOT realized from using this technology? Include cost savings, safety improvements, transportation efficiency or effectiveness, environmental benefits, or any other advantages over other existing technologies.  MoDOT hired the Midwest Research Institute, a 3rd party research firm, to assess the benefits of the InSync system installed in the Kansas City area. Most times of day and direction of travel studied noted decreased travel times, stops, and emmisions, however in the direction where the signals had originally been optimized, MRI found little if any improvement since it already had more dedicated green time. Some notable improvements were that travel times through the corridor reduced by 0 to 39%, morning off-peak and noon-peak period SB experienced nearly 2.5 minutes of improvement, and the change in average speed ranged from a decrease of 0.2 mph to an increase of 15.5 mph. For every study period where travel times were reduced, the average number of stops through the corridor, fuel consumption, and emmissions were reduced. These benefits were reached without any new construction providing a very efficient solution to a congested corridor. There are also many indirect cost savings as well, such as the time saved by not having to do frequent traffic studies to reevaluate signal timing.  FHWA has made Adaptive Signal Controls part of it's "Every Day Counts" initiative due to its effectiveness in signalized corridors. MoDOT has also received Deployment Funding from FHWA to host a workshop in Kansas City this November on the InSync system to invite other DOTs and local governments to come and see the benefits MoDOT has realized from using this technology. | | | | | |
| 14. Please describe the potential extent of implementation in terms of geography, organization type (including other branches of government and private industry) and size, or other relevant factors. How broadly might the technology be deployed?  One of the benefits of this technology is that it can "plug in" to most existing controllers and hardware which allows for making corridor improvements without an extensive retrofit of existing systems. This opens up the technology for not only larger DOTs but also for smaller cities and counties that cannot afford to make major improvements. This technology is also very effective at areas where there is a large fluctuation in traffic, such as near sports stadiums, conference centers and tourist areas. | | | | | |
| **Market Readiness (30 points)** | *The TIG selection process will favor technologies that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff potential.* | 15. What actions would another organization need to take to adopt this technology?  This technology is commercially available for purchase. | | | | | |
| 16. What is the estimated cost, effort, and length of time required to deploy the technology in another organization?  MoDOT purchased the system from the manufacturer at approximately $25,000 per signalized intersection. MoDOT made the decision to install the equipment with in-house forces to become familiar with the technology. Installation of the 9 signals at the most recent location took approximately 2 weeks. The manufacturer had staff on-site to provide training and assistance during the installation. The $25,000 includes all engineering time to deploy InSync and optimize the arterial, a two year warranty on all parts, and a two year software support agreement that includes software upgrades. The manufacturer does recommend that the system use fiber optic cables, at the Kansas City location this was an added expense to MoDOT prior to installation of the system. | | | | | |
| 17. What resources—such as technical specifications, training materials, and user guides—are already available to assist deployment?  Since this technolgy is already commerically available, technical specifications and training materials are available. A company representative was also on-site during MoDOT installations to verify the system was installed correctly and to answer any questions and concerns. InSync assisted MoDOT as the system became operational to help get the system up and running. InSync's website offers background information as well as informational videos and webinar opportunities. http://rhythmtraffic.com/index.php/insync/ | | | | | |
| 18. What organizations currently supply and provide technical support for the technology?  The InSync technology wad developed and is commercially available from Rhythm Engineering in Lenexa, Kansas. | | | | | |
| 19. Please describe any legal, environmental, social, intellectual property, or other barriers that might affect ease of implementation.  The InSync system is commercially available with patents pending. It is a proprietary product. | | | | | |
| ***Submit Completed form to*** | | [***http://transportation1.org/tig\_solicitation/Submit.aspx***](http://transportation1.org/tig_solicitation/Submit.aspx) | | | | | |