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INSIDE:

ITS Heartland Chapter

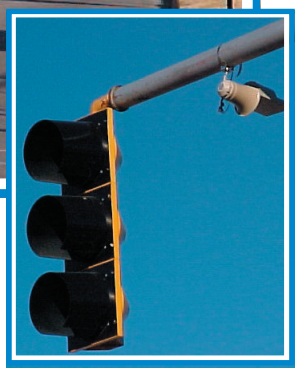
2003 Conference in Nebraska

Fall/Winter 2003

Implementing ITS - A Successful Learning Experience

In applying for and receiving a grant through KDOT's ITS Set-Aside Program for a traffic signal emergency preemption system, the Engineering Department of Junction City, Kansas learned a few important lessons.

Junction City 6th St. Corridor



Accoustical Preemption Detector

The Engineering Department of Junction City submitted a proposal for study, design and deployment of a signal preemption system. Junction City has experienced considerable growth on the western side of the city. Their proposal identified eight signals, located along the Sixth Street Corridor, from Washington Street to Eisenhower Street. Although the system is now successfully operational, several unexpected roadblocks were encountered that could have been avoided. As a result of the City's inexperience in the designing, cost estimating, and installation of ITS technology, the process from start to finish took more than two years. This project was selected by KDOT's ITS Steering Committee as an ITS Set-Aside Project for Fiscal Year 2001.

As part of the study and design portions of the project, two of the primary Traffic Preemption Systems that are used throughout the United States were evaluated. One system uses infrared emitters mounted in each emergency vehicle and detectors mounted at each intersection. The other system simply needs acoustical detectors at each intersection and uses the sirens installed as standard equipment on all emergency vehicles. While both systems have their advantages, the City of Junction City chose the acoustic, or siren activated system from Traffic Systems, LLC based in Scottsdale, Arizona. Junction City is the first city in the State of Kansas to use this system, but it has been widely used in other states. For example, Canton, Ohio has over 100 intersections with this system installed. Our engineering staff felt that this system is the most cost effective for a city of our size.

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Implementing ITS - A Successful Learning Experience

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Junction City found at least three major advantages of the acoustical system over the infrared emitting system. Because the infrared emitting system is manipulated from within the emergency vehicle and apart from the siren, it requires drivers to remember to turn the emitter on when needed and then off again when through the intersection. Also, the infrared system is subject to abuse by emergency personnel who are not on emergency runs, (i.e. to lunch or even traversing from one station to another); whereas, the siren activated system does not lend itself to this abuse. The third primary advantage dealt with maintenance. Obviously, the infrared detectors must be kept clean and cannot be obstructed in any way, meaning that they must be cleaned periodically - the acoustic detectors are not affected by dirt or bad weather. Also, with fewer components on the acoustical system (none in the emergency vehicles) replacement and maintenance on the system components will be considerably less time consuming and less expensive.

Overall, the most beneficial lesson learned was the value of having the companies selling the traffic preemption systems set up a demonstration intersection for a 90-day trial period. Through this process, two key issues were settled. First, the determination could be made of whether or not such a system would be beneficial for the given situation, in this case, for fire, police and emergency vehicles. The second issue is the extent of the installation process. Unfortunately, the City of Junction City did not learn these lessons until after cost estimating was complete and the project budget was set.

In detail, Junction City personnel discovered that two of the eight intersections to be preempted needed controller upgrades from Eagle DP2000 to Eagle EPAC300. These also needed D-panels added. They also learned that they had underestimated the value of thoroughly investigating the condition and remaining capacity of each conduit to be utilized in the hard-wiring of the preemption system. Discovery of these two problems indicated that there would be several thousand dollars of unexpected expenses.

Fortunately, through discussions with company representatives and KDOT's ITS division personnel, (who demonstrated utmost patience in working with Junction City during these discoveries), and employing help from a local electrical contractor and local Public Works traffic technicians, the City was able to work through the aforementioned problems without adding any cost to the project.

Thanks to KDOT's ITS group, their available grant money, and their patience, responders in the City of Junction City, (who ask when they can expect the other signalized intersections in town to be upgraded and preemption-capable,) now enjoy reliable, safe and less time-consuming travel to emergency situations.
Information provided by Greg Adams, Assistant City Engineer, City of Junction City.

2003 ITS Heartland Chapter Annual Meeting

ITS Heartland, the local chapter of ITS America that includes Iowa, Kansas, Missouri, and Nebraska, will hold its 4th Annual Meeting and Technology Showcase March 12-14 at the DoubleTree Hotel in downtown Omaha.

ITS Heartland's membership is comprised of ITS policy makers, engineers, technicians, local agency employees, academicians, consultants, manufacturers, and vendors. Anyone involved with ITS is encouraged to attend.

The program will have speakers from the national level as well as local representatives speaking on topics such as transportation security, commercial vehicle ITS, local agency ITS, ITS benefits, and ITS legal issues. In addition, over 35 companies will be showcasing their products and services in the exhibition hall.

Organizations or individuals interested in joining the ITS Heartland Chapter and/or attending the Annual Meeting should contact Kathy Glenn with the Mid-America Transportation Center at (402) 472-6363 or kglenn2@unl.edu
Registration and other chapter information can also be found at www.itsheartland.org

Participants and vendors should check the web page for registration deadlines. The reservation number for the DoubleTree Hotel is (402)-346-7600. Request the ITS Heartland conference rate.

Pilot Car Wait Time Notification System For Work Zones

Approved as part of the 2004 ITS program, this project investigates the use of technology to inform drivers of estimated wait time to the next pilot car in rural construction zones. This idea was originally brought up in Midwest Smart Work Zone Initiative (MwSWZI), a pooled fund project involving many mid-western states. After MwSWZI did not receive any acceptable responses to an RFP in 2001, KDOT began its current effort.

Two Kansas State University students, Kyle Grabill and Adriane Baer, in the Industrial Manufacturing and Systems Engineering (IMSE) department conducted a preliminary (unpaid) study as part of an honors research class in the fall of 2002 under the direction of Professor Malgorzata Rys. The results of the study were presented to the project' s steering committee in January of 2003.

The preliminary study focused on two aspects: assessing the need by interviewing drivers and contractors and, secondly, developing requirements and recommendations of the signing system.

Excerpts from the preliminary report …
The initial problem was to determine the driving public's desire to know the anticipated wait time when approaching a pilot car operation. If the driving public's desire to know the anticipated wait time is evident, the second part of the problem was to design a method for presenting that time to the driving public.

To get the driving public's input and ideas on a sign, construction zones were visited and the drivers waiting in line were surveyed. Drivers were asked to participate in a ten- question survey at four different construction zones. All construction zone visits occurred during October of 2002.

Ten drivers per work zone were surveyed for a total of 40 drivers. Their answers and opinions were recorded and analyzed in order to determine driver expectations and desires for knowing the anticipated wait time until the arrival of the pilot car. Seventy two percent of drivers said they would like to know the anticipated wait time. Eighty percent would shut off their vehicles if they knew that they would be waiting for an extended amount of time.
It was observed that there are three variables that affect wait time. These variables are

- *Length of work zone*
- *Length of queue*
- *Pace of pilot car*

Second, job rotation occurs between driving the pilot car and serving as the flagger that controls traffic at either end of the work zone. This seemed to create variations in the pace of the pilot car. In addition, the worker exiting the pilot car knew how long the wait time was running. However, the worker that had been performing the flagger duties and was about to enter the pilot car did not know the wait time unless informed by the worker just previously driving the pilot car.

Another observation made at the work zones visited was the distribution of vehicle types. In the event that a large truck or semi-trailer is at the front of the line, the view of the flagger and stop sign is obstructed for the remaining vehicles. While cars outnumber large trucks and semi-trailers, large trucks are a regular occurrence in the queue.

The preliminary study concluded by recommending the use of a sign on the approach of the work zone. The sign would be a diamond warning sign and would read **"[XX] Pilot Car Wait Time"**. The [XX] would be a countdown timer that could be controlled by the driver of the pilot car.

The project steering committee reviewed the students' findings in January of this year. The committee decided to approach the project in stages. KSU is currently preparing a proposal for stage one to include experiment design and sign prototyping. We would like to extend our appreciation to Kyle and Adriane for a job well done.

ITS Calendar

January 29 – 30	KDOT District 5 Meeting, ITS Presentation by Mike Floberg
February 12	KAUTC/IMSA Joint Meeting at the Holiday Inn, Lawrence
February 13 – 14	KDOT District 6 Meeting, ITS Presentation by Karen Gilbertson
March 12 – 13	ITS Heartland Annual Meeting, Omaha
March 26 – 27	IDAS (ITS Deployment Analysis System, planning software tool), NHI Course, Wichita area, location to be announced
April 15 – 16	Kansas State Transportation Conference, Manhattan (Several ITS topics are on the agenda.)
May 19 – 22	ITS America 13th Annual Meeting and Exhibition, Minneapolis Convention Center www.itsa.org
TBA	Computerized Traffic Signal Systems (NHI) Course, Wichita area

Kansas City Scout: Signs of Progress

The Kansas City Scout traffic management project is literally showing signs of progress. In December, Scout contractor Capital Electric placed the system's first dynamic message sign on westbound Interstate 435 just east of 103rd Street in Missouri. A few weeks later, on Tuesday, January 7, 2003, the first test message lit up during the morning rush hour. Commuters saw a 25-foot wide sign spanning the interstate that read: TEST MESSAGE. COMING SOON, KANSAS CITY SCOUT.

The entire 75-mile Scout system covers three major interstates and a handful of connected highways in the metro area. It soon will have a total of 36 dynamic message signs. The signs will alert drivers about traffic tie-ups ahead. Armed with this information, they can decide for themselves how to handle the situation. They may choose to exit the highway and go a different way or just slow down and prepare to wait in traffic.

The message signs are just one aspect of Scout that is visible to the public. Scout crews are also busy installing cameras along the highways. At least 15 cameras are already in place – many of them along I-435 in the Triangle area. The cameras will allow Scout staff in the Traffic Operations Center in Lee's Summit to view traffic conditions and alert others such as the public, the media, Motorist Assist, and emergency services to traffic problems.

Crews are also busy on pieces of the Scout operation that are not readily visible. Work continues underground as crews continue to trench and lay conduit for Scout's fiber-optic back bone. The project is expected to be completed by the end of this year and is a bi-state effort of the Kansas and Missouri departments of transportation.

For more information, please visit the Kansas City Scout website at www.kcscout.net

Traffic Operations Center theater.

Camera Installation -N. side of I-470.

Crews raise first overhead dynamic message sign.

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