Driving on rural roads has its dangers—something engineers at the Olmsted County Public Works Department know all too well. In 2008, 8 fatality crashes and 949 injury crashes occurred on the county’s primarily rural roadways. While the county’s rate of one fatality crash per million vehicle miles travelled (2007) is below the national average for rural roadways of 2.25 fatality crashes per million vehicle miles, highway safety is still a top concern of the county’s public works department.

“Over the years, we have become increasingly involved in improving safety,” says Olmsted County design engineer Kaye Bieniek. “The fact is that even though the metro areas have larger populations, there are proportionately more serious injuries and fatalities occurring on rural two-lane roadways, and a large proportion of our roadways fit that description.”

With the goal of improving traffic safety, in 2006 Olmsted County conducted a road safety audit of 13 intersections experiencing the county’s highest crash rates. When the road safety audit recommendations came back, eight of the intersections were identified as candidates for possible intelligent transportation systems (ITS) technologies. However, the audit supplied few specifics about the cost and type of ITS applications that should be deployed. The county public works department would need more details in order to effectively implement ITS intersection safety solutions.

A Helping Hand
When Bieniek learned about the Minnesota ITS Pilot Safety Program in 2007, she realized it would be the perfect answer to her county’s ITS questions. The program was a joint venture funded by the Minnesota Department of Transportation (Mn/DOT) State Aid for Local Transportation, the Mn/DOT Office of Traffic Safety and Operation, the Minnesota Local Road Research Board, and ITS Minnesota. Under the program local public agencies could apply for funding to hire an ITS consultant. The consultant would then develop ITS solutions for specific traffic safety problems. The goal of the program was fostering interest in the development of ITS solutions for the local road system.
Olmsted County applied for ITS Pilot Safety Program funding, and was awarded $10,000 to hire ITS consultant for the task of evaluating the eight intersections identified in the county’s road safety audit. The process of hiring a consultant went smoothly—a request for proposals was sent out to several engineering firms with ITS consulting capabilities. Ultimately, the county chose St. Paul-based SEH Consulting to complete the project.

Identifying Intelligent Solutions

From the county’s standpoint, the project process was a simple one with a minimal time commitment—something the busy county engineers were thankful for. “We were able to hand the project off to our consultant and let them run with it,” says Bieniek. “We had an initial kick-off meeting to lay out the framework and identify what they were looking for, and the consultant was able to proceed with minimal coaching and questions.”

The report SEH Consulting created identified specific ITS applications for improving safety at each intersection. It also provided recommendations about where the devices should be placed and how much each would cost. The report recommended the following ITS applications to improve rural intersection safety in Olmsted County:

A Driver Behavior Evaluation (DBES) System
At several intersections where additional information was needed to determine the appropriate ITS solution, the consultant recommended using a driver behavior evaluation system (DBES). A DBES is a portable device that can be leased with a recommend data collection period of two weeks at each intersection. The estimated cost for a two-week data collection period is $3,500; this cost includes installation, monitoring, removal or relocation, and data services.

Lighting
The county’s road safety audit identified several intersections where adding lighting might improve highway safety. The ITS consultant’s recommendations call for lighting to be installed at these intersections, with a photo cell to turn the lights on and a timer to turn them off before daylight.

Activated LED Signs
The report recommends activated LED warning signs at several of the evaluated intersections. In the past, flashers were often added to warning signs, especially on rural roadways. However, when flashers are constantly “on,” drivers often fail to recognize them. With activated LED signs, the flashers are activated only when the conditions indicated on the sign exist. Activated warning signs were shown to improve motorists’ recognition of the warning in a Mn/DOT Intersection Warning System test. As a further improvement, the recommendations call for LED signs with lighted borders rather than the typical warning flasher. The types of recommended activated LED signs include:

• Stop Sign—A stop sign that flashes when drivers approach for added emphasis. Estimated cost of $12,000.
• Advance Intersection Warning Sign—A warning sign that flashes to alert mainline traffic when traffic is approaching on the side road. Estimated cost of $22,000.
• Advance Speed Advisory Warning Sign—A speed advisory sign that flashes a pre-determined advisory speed based on sight distances, cautioning mainline traffic when traffic is approaching on the side road. Estimated cost of $18,500.
• Advance Stop Sign Warning Sign—A warning sign that flashes when traffic approaches to notify drivers of a stop sign ahead. Estimated cost of $6,000.
• Intersection Warning System—An intersection warning sign that flashes to caution drivers at a stop sign of approaching mainline traffic, along with the approaching traffic detection system. Estimated cost of $38,000 plus a $4,500 annual service contract (fee would be less with multiple systems).

Valuable ITS Insights
At the Olmsted County Public Works Department, the reaction to the ITS consultant’s recommendations has been extremely positive. “It was very helpful to see concrete details of the application and the cost associated with it,” says Bieniek. “It’s going to be valuable in budgeting, presenting these ideas to the county board, and explaining what we’re doing to the public.”

The report—currently in draft stage—will be finalized by fall 2009. Then, the county will begin to pursue the report’s recommendations. “Once the report is finalized, we’ll do a short presentation on the findings for our county leaders and let them know that these projects will start showing up in our capital improvement program,” says Bieniek. “Our county board has been very supportive of all the safety improvements we’ve been making, so I’m sure their reaction to this report will be positive.”

When the recommended ITS safety improvements are complete, Bieniek expects they’ll help prevent crashes and possibly even save lives on Olmsted County highways—helping the county meet its goal of a safer transportation system and a healthier community.

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