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CTRE's mission is to develop and implement innovative methods, materials, and technologies for improving transportation efficiency, safety, and reliability while improving the learning environment of students, faculty, and staff in transportation-related fields.

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## CTRE Director's message

CTRE's mission is research, education, and outreach. That mission is embodied in supporting existing programs, like the Bridge Engineering Center, and helping launch new ones, like construction information technology outreach.

### Bridge Engineering Center

The Bridge Engineering Center (BEC) was created in 1986 in the College of Engineering. In 2001 it moved administratively to CTRE to take advantage of support services including faculty office space, professional staff support, and publication services. Faculty in the College of Engineering still work through the BEC. Terry Wipf maintains an office at CTRE, and Brent Phares recently joined the staff to work with the BEC faculty. Projects include use of non-destructive evaluation techniques to evaluate the capacity of embargoed bridges and assistance with the bridge "launch" over the Iowa River on US 20.

### Construction information technology

Construction engineering faculty are working with CTRE staff to develop a research and technology transfer program in construction information technology. Ed Jaselskis notes that new technologies like laser scanning, virtual reality, 4-D CAD, and GPS equipment control (stakeless grading) are available, but have not been adopted into engineering practice. Laser scanning, for instance, can create an "as-built," scale image of an existing structure in about 15 minutes.

Virtual reality takes technology one step further. An engineer can "walk through" the virtual

image, which may be useful for some complicated design problems. Virtual reality software can also incorporate the mathematics governing structural behavior so that stresses can be displayed visually.

Advanced CAD technology makes it possible to manage spatial data. Click on the plans, and any pertinent specification or design document can be instantly retrieved.

GPS control of grading equipment is here, but this technology places a premium on the accuracy of the plans. Visual examination of grading plans is possible using these techniques. Potential problems are spotted electronically rather than in the field.

While not all of these technologies will be adopted, they have potential, and the construction engineering faculty are examining these issues with CTRE support.

In a related initiative, CTRE hosted a geotechnical engineering and construction technology focus group in January 2002. About 60 representatives of the construction industry attended to identify the research and technology transfer needs in these areas. Top issues included subbase and subgrade materials and application of new construction technologies. Research problem statements were developed to guide research in these topic areas.

As CTRE continues to evolve new programs and support existing ones, it acts as a business unit, helping to make the faculty and staff resources of the university more accessible to business, industry, and government, and ultimately supporting the state's economic development.

## Teaching award goes to . . .

CTRE Associate Director for Policy David Plazak received an award for excellence in planning education from the Iowa Chapter of the American Planning Association. David is also an adjunct associate professor in Iowa State University's Department of Community and Regional Planning.

The award, which is new, was voted on by students majoring in planning at Iowa State University. The fact that students made the selection "makes it an especially nice award to win," David said.



David Plazak (front) surrounded by several of his students. From left to right, back row: Dan Smith, David Veneziano, Sheldon Harrison, Sitansu Pattnaik, Turhan Yerdelen. Middle row: Deb Smith, Kevin Triggs, Jamie Tunnell Luedtke, Reggie Sinhaa.

## Videoconferences a popular option

CTRE's videoconference classroom has seen more use than originally anticipated when it opened its doors in February 2000. Since then, CTRE has logged 459 video sessions for a total of 142 hours and 20 minutes. This works out to over 70 hours of videoconferences per year and just under 20 minutes for the average session.

CTRE's planned, "core" use for the facility was the ISU spring Transportation 691 seminar—about 30 total hours of two-hour long classes held each year. Uses that CTRE had not anticipated, e.g., short meetings and remote job interviews, now account for

over half the use of the facility. This is a positive development because these other uses help defray the capital cost of the facility and its operating costs.

The videoconferencing system has also proved much more reliable than CTRE originally anticipated. Sessions using ISDN technology (digital signals over dedicated copper telephone lines) have been remarkably stable and clear. The Internet-based sessions have been a little more problematic at times, including a few audio glitches and network congestion problems from time to time. However, since there are no telecommunications charges with H.323 technology, a little drop-off in performance has to be expected.