A report released in May 2006, titled National Strategy to Reduce Congestion on America’s Transportation Network, describes the USDOT’s recent initiatives. At the ITS Institute we are, in fact, already pursuing research in many of the identified areas. For example, we have developed, and continue to develop, new technologies that facilitate novel road-pricing strategies and that facilitate additional use of inexpensive and ubiquitous road shoulders as busways for bus rapid transit service.

This USDOT report states that approximately 25 percent of all traffic congestion is “non-recurring” and can be traced to traffic incidents. The 2004 Texas Transportation Institute mobility report indicates that non-recurring congestion continues to increase nationally, exceeding 2.9 million hours annually. A current FHWA report on traffic incident management estimates that, on average, every minute during which a freeway crash is not cleared generates five minutes of delay for motorists. Consider then the impact on congestion of the nearly 11,000 crashes that occurred on Twin Cities metro area freeways in 2004.

**Secondary Causes of Highway Congestion**

- **Bottlenecks**: 40%
- **Traffic Incidents**: 25%
- **Work Zones**: 10%
- **Weather (snow, ice, fog)**: 15%
- **Other Non-Recurring (e.g., special events)**: 5%
- **Poor Signal Timing**: 5%

*Source: USDOT (2006), National Strategy to Reduce Congestion on America’s Transportation Network*
Our researchers have studied extensively the nature of freeway crashes. John Hourdos, Panos Michalopoulos, and Gary Davis have identified specific crash types and causal factors associated with such crashes, using the new Beholder tool developed by Ted Morris and John Hourdos and deployed at a number of sites along the I-94/I-35W “commons” area (pictured at left). In a separate study, Davis determined that many drivers exhibit reaction times longer than their following headways. As a result, relatively small individual differences in following distances, reaction times, speeds, and decelerations determine whether or not a stopping shock wave results in a collision. This is exacerbated by driver distraction. Furthermore, drivers often maintain relatively short following distances in order to discourage others from merging in front of them. Because short following headways translate into higher traffic flows, one could argue that short headways make more effective use of limited freeway capacity. Unfortunately, Davis’s findings also suggest that short headways often lead to a disproportionate number of crashes for the drivers following upstream.

As Davis says, “Reducing the frequency of such collisions—for example, by improving the competency of drivers or deploying in-vehicle collision-avoidance technology—could help reduce travel delays without resorting to expensive additions to highway capacity.”

We continue to work on such efforts. We believe that our research will make a difference.

Although Institute research takes many varied approaches, its goal is always the same: to improve the safety and mobility of transportation through a focus on human-centered technology. We will continue to support our multidisciplinary researchers as they explore new ideas and connect with students and practitioners to inform and educate them about what is discovered. All our activities are described in the pages of this annual report.

We have many partners in the operations of the Institute. I would like to thank the people on our board who have given their time to help us make decisions and fulfill our obligations. This past year, Al Steger, Barbara Sisson, Anthony Strauss, and Bob Winters stepped down as their responsibilities took them in different directions; we are grateful for their service.

Finally, I would like to express sincere thanks for the vital efforts of the members of our research selection and review panels; our Institute staff, researchers, and students; the Minnesota Department of Transportation; the USDOT’s University Transportation Center Program in the Research and Innovative Technology Administration (RITA); and the taxpayers and their legislative representatives. Without them, we would not have made any progress, and their belief in our mission and support of our work is deeply appreciated.

Max Donath, Director
ITS Institute