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"Driver Assist Technology: Deploying Bus Rapid Transit along a Narrow Lane or Road Shoulder"

Thursday – May 5, 2011  
4:00 - 5:00 pm  
Refreshments available at 3:30 pm

Abstract: Minneapolis/St. Paul area transit vehicles have been using bus-only shoulders to improve transit system performance on close to 300 route miles. The width of buses relative to the road shoulder width has made it difficult for bus operators to use these during inclement weather. The number one complaint received by the transit agencies in fact comes from passengers calling about the bus driver not using the shoulder to bypass the congested lanes of traffic.

A system developed by the University of Minnesota allows for lane-specific vehicle guidance and driver feedback mechanisms to enable more consistent use of these road shoulders. This type of driver assist system requires no new infrastructure and is based on a decimeter level map encoding the shoulder lane boundaries. Besides providing visual cues through a head up display, the DGPS-based system uses a suite of sensors to improve the driver’s situation awareness for lanekeeping through haptic feedback in the steering wheel and in the seat, and through a virtual mirror that reduces blind zones around the vehicle.

In late 2010, the above was put into passenger service on ten Minnesota Valley Transit Authority (MVTA) buses, operating along the Cedar Ave corridor between the southeastern suburbs and downtown Minneapolis.

Buses operating on the shoulders not only provide transit with an advantage over the use of personal cars, but also contribute to reducing the congestion on the other lanes of traffic. The technology is expected to facilitate more reliable service and provides the potential for higher speeds as well. The system enables the use of narrower lanes for BRT service thus reducing the cost of right-of-way and construction. Benefits would particularly accrue during bad weather. By helping a bus driver navigate a bus in a narrow lane, the technology allows BRT and express bus routes to be squeezed in where they were not possible before.

Bio: Max Donath is Professor of Mechanical Engineering and Director of the Intelligent Transportation Systems Institute at the University of Minnesota. The ITS Institute, under his direction since 1997, pursues research in the areas of driving behavior, human machine interfaces, sensors, vehicle and traffic controls, and traffic science and engineering – developing new approaches for confronting the complex transportation issues of the day.

Dr. Donath's own recent research efforts have focused on reducing driver error and the resulting road fatalities and life changing crashes. His current research includes: (a) driver assistive technologies and collision avoidance systems, (b) human machine interfaces for the driver, and (c) emerging sensor technologies. He is working to develop systems that reduce teen driver fatalities and crashes associated with intersections and lane departure. Dr. Donath has been on the faculty at the University of Minnesota since he received his Ph.D. at MIT in 1978.