Training Course: Intelligent Transportation Solutions

Instructors and contact information

Dr. Raj Bridgelall
448 Quentin Burdick Building
Email: raj.bridgelall@ndsu.edu

Dr. Denver Tolliver
444E Quentin Burdick Building
Email: denver.tolliver@ndsu.edu

Training description

This training introduces professionals from various backgrounds to transportation solutions that leverage technological advancements. Known as intelligent transportation solutions, a variety of information technologies help to mitigate congestion while improving highway safety. Traditional technological approaches such as advanced traveler information and dynamic message signs are now part of a broader landscape that features deployments of connected, automated, and autonomous vehicle technologies with limitless possibilities. The effective utilization of existing and emerging technologies, however, requires interdisciplinary knowledge of the benefits, operating characteristics, deployment considerations, and potential shortcomings. This training will teach operating fundamentals and application strategies. Topics will include hands-on field studies and discussion forums that encourage critical thinking to assess opportunities for the continuous improvement of deployed and new solutions, tailored to the regional context.

Training objectives

At the conclusion of this training, participants will have gained:

- A conceptual understanding of the most common intelligent transportation solutions deployed, their anticipated benefits, and their shortcomings
- A basic understanding of how emerging technological developments would transform the transportation system in the near future
- Knowledge to plan for the practical deployment of such solutions
- Insights into the vast potential of possible approaches to apply existing and emerging technologies in ways that would facilitate fruitful interactions between transportation supply, transportation demand, performance measures, planning, and policy making

Training Topics

- Traveler information and advisory systems (such as dynamic signage, onboard equipment, CCTV, smartphone applications)
- Traffic flow control (including adaptive signaling, ramp metering, variable speed limits/warnings, transit priority)
- Automatic electronic payments (such as toll tags, transit cards, RFID, smartphones)
- Pre-clearance systems (including vehicle classification, high-speed weigh-in-motion, roadside inspection, freight scanners)
- Technologies for managed facilities (such as HOV and other dedicated lanes)
- Smart parking solutions (occupancy sensors, parking reservation systems, metering technologies, etc.)
- Security and privacy impacts of technology deployments
- Connected vehicles technologies and architectures

- Major applications of connected vehicle technologies (information, ride sharing, crash avoidance, driver assist, platoons, etc.)
- Automated and autonomous vehicles
- Cloud computing (advisory systems: security threats, weather, work zones, incidents, detours, traffic)
- Big Data (travel time forecasting, maintenance decision-support, flow optimization, parking availability)
- Remote sensing (surveillance, satellites, UAS technology, emergency response, incident management)