ITS Strategic Research Plan, 2010-2014

On December 8, 2009, the United States Department of Transportation (USDOT) released the Intelligent Transportation Systems (ITS) Strategic Research Plan, 2010-2014. This plan defines the strategic direction for the USDOT's ITS research program for the next five years.

The ITS Strategic Research Plan is designed to achieve a vision of a national, multi-modal surface transportation system that features a connected transportation environment among vehicles, the infrastructure and passengers' portable devices. This connected environment will leverage technology to maximize safety, mobility and environmental performance.

The core of the program is IntelliDrive℠, a suite of technologies and applications that uses wireless communications to provide connectivity with and between vehicles; between vehicles and roadway infrastructure; and among vehicles, infrastructure and wireless consumer devices.

Safety: There are over 5.8 million crashes per year on U.S. roadways, resulting in 37,000 deaths annually. These crashes have a direct economic cost of $230.6 billion and are the leading cause of death for ages four to 34[1]. IntelliDrive℠ safety applications, using vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications technology based on Dedicated Short Range Communications (DSRC), are designed to increase drivers' situational awareness and reduce or eliminate crashes by advising or warning drivers of dangerous situations.

Mobility: Traffic congestion is an $87.2 billion annual drain on the U.S. economy, with 4.2 billion hours and 2.8 billion gallons of fuel spent sitting in traffic, the equivalent of one work week and three weeks worth of gas every year.[2] IntelliDrive℠, using V2I capabilities and anonymous information from passengers' wireless devices relayed through DSRC and other wireless transmission media, has the potential to provide transportation agencies with dramatically improved quality and quantity of real-time traffic, transit and parking data, making it easier to manage transportation systems for maximum efficiency and minimum congestion. IntelliDrive℠ could also enable travelers to change their route, time and mode of travel, based on up-to-the-minute conditions, to avoid traffic jams.

Environment: Tailpipe emissions from vehicles are the single largest human-made source of carbon dioxide (CO_2), nitrous oxides (NO_x) and methane. Vehicles that are stationary, idling and traveling in a stop-and-go pattern due to congestion, emit more than those traveling in free flow conditions. IntelliDrive℠ environmental research is designed to provide data that transportation managers can use to better understand the potential environmental impacts of transportation management decisions made in real time.

The ITS Research Strategic Plan assumes that the USDOT's ITS research program will receive the same level of funding as previous years: $100 million per year for five years. In 2010, up to $77 million will be dedicated to multimodal research and an additional $14 million to technology transfer and evaluation. IntelliDrive℠ research comprises $49 million of the multimodal research funds. The ITS Research Strategic Plan outlines the following multi-year research activities:

- **Vehicle-to-Vehicle (V2V) Communications for Safety**: This research will investigate key questions such as are vehicle based safety applications using V2V communications effective and do they have benefits. Research is designed to determine whether

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[1] *Traffic Safety Facts: 2008 Data – Overview* (National Highway Traffic Safety Administration, 2009) www-nrd.nhtsa.dot.gov/Pubs/811162.PDF.

[2] *2009 Urban Mobility Report* (Texas Transportation Institute, July 2009) mobility.tamu.edu/ums.

regulatory action by the National Highway Transportation Safety Administration is warranted to speed the adoption of these safety capabilities. The FY2010 investment will be up to $11.5 million.

- **Vehicle-to-Infrastructure (V2I) Communications for Safety**: This research will investigate similar questions about V2I communications, with an initial focus on applications based on the relay of traffic signal phase and timing information to vehicles. The purpose is to accelerate the next generation of safety applications through widespread adoption of V2I communications. The FY2010 investment will be up to $9.3 million.
- **Real-Time Data Capture and Management**: This research will assess what traffic, transit and freight data are available today from various sources, and consider how to integrate data from vehicles acting as "probes" in the system. The goal is to accelerate the adoption of transportation management systems that can be operated in the safest, most efficient and most environmentally friendly way possible. The FY2010 investment will be up to $1.995 million.
- **Dynamic Mobility Applications**: This research will examine what technologies can help people and goods effortlessly transfer from one mode of travel (car, bus, truck, train, etc.) or route to another for the fastest and most environmentally friendly trip. The research seeks to make cross-modal travel truly possible for people and goods, and enable agencies and companies to manage their systems in light of the fact that people and goods will be changing modes often. The FY2010 investment will be up to $8 million.
- **Road Weather Management**: This research will consider how vehicle-based data on current weather conditions can be used by travelers and transportation agencies to enable decision-making that takes current weather conditions and future weather forecasts into account. The FY2010 investment will be up to $4.6 million.
- **Applications for the Environment: Real-Time Information Synthesis (AERIS)**: This research will explore how anonymous data from tailpipe emissions can be combined with other environmental data. The goal is to enable transportation managers to manage the transportation network while accounting for environmental impact. The FY2010 investment will be up to $1.93 million.
- **Human Factors**: Additional technology in vehicles may have the potential to overload drivers and increase safety risks. This research will examine the extra burden that in-vehicle devices may put on drivers, with the goal of minimizing or eliminating distraction risks. The FY2010 investment will be up to $3.525 million.
- **Mode-Specific Research**: This research program includes active traffic management, international border crossing, roadside infrastructure, commercial vehicles, electronic payment and maritime applications. The FY2010 investment will be up to $6.35 million.
- **Exploratory Research**: This research program includes safety research for rail, technology scanning, and a solicitation for new research ideas. The FY2010 investment will be up to $2.5 million.
- **Cross-Cutting Activities**: This program includes architecture, standards, professional capacity building, technology transfer, and evaluation. The FY2010 investment is up to $14.1 million.

For more information about the ITS Strategic Research Plan, visit www.its.dot.gov/strat_plan.