Real-Time Data to Improve En Route Decision Making and Reduce Transportation Demand

Requested by
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The Caltrans Division of Research and Innovation (DRI) receives and evaluates numerous research problem statements for funding every year. DRI conducts Preliminary Investigations on these problem statements to better scope and prioritize the proposed research in light of existing work on the topics nationally and internationally. Online and print sources for Preliminary Investigations include the National Cooperative Highway Research Program (NCHRP) and other Transportation Research Board (TRB) programs, the American Association of State Highway and Transportation Officials (AASHTO), the research and practices of other transportation agencies, and related academic and industry research.

Executive Summary

Background

One approach to mitigating traffic and strains on the transportation system is to shift focus from supply to demand. When provided with good information and sufficient motivation, users of a transportation system can make decisions that will result in reduced demand on the system, decreased gridlock, increased transit ridership, and reduced need for additional lanes.

In order to meet the department's goals of reduced traveler delay and improved transportation system reliability, Caltrans wants to pursue the most effective real-time strategies to influence travel demand. We undertook this Preliminary Investigation to uncover best practices (within and outside of California) and identify the most promising research areas related to how information is collected, transmitted and used in real time, and what effect real-time en route information has on transportation demand. This investigation is a first, high-level look at available information on this topic; additional follow-up research on selected subtopics will yield much more depth and detail.

Summary of Findings

In doing a broad review of available information related to real-time travel demand management, we identified four key topic areas:

1. Quantification of benefits and justification of costs.
2. Information collection and coordination.
3. Multimodal integration.
4. Human processing and decision-making factors.

Within these areas, we have identified key research studies and research in progress. For some areas we have also indicated noteworthy practices in California, throughout the United States or internationally. The Preliminary Investigation concludes with a list of selected Internet resources related to real-time traveler information, intelligent transportation systems (ITS) and travel demand.

The four issues central to this Preliminary Investigation do not represent a comprehensive view of all topics and needs related to real-time traveler information, but they are highlights on the full landscape of issues of interest for transportation stakeholders. Within each issue, we touched on the most interesting and relevant practices or subtopics based on preliminary investigatory work.

Following is a summary of findings by topic area, along with identified outstanding needs and potential next steps. We based the needs and next steps on our research results as well as on the ideas shared in interviews with stakeholders in California and across the United States. These individuals presented their own opinions on what questions must be answered to best utilize real-time traveler information strategies.

Issue 1. Quantification of Benefits and Justification of Costs

- Two national reports present information on the potential benefits of real-time traveler information. A report by the U.S. Government Accountability Office calls for more research on the cost-effectiveness of such measures. A report by the Research and Innovative Technology Administration summarizes benefits, costs, deployments and lessons learned for traveler information intelligent transportation systems.
- TRB's Transportation Demand Management Committee issued a research need statement on the impacts of advance and in-vehicle information strategies.
- The participation of private enterprise in this area can have a major impact on the cost-benefit equation. The Federal Highway Administration (FHWA) published a State of the Practice Review on public-private partnerships.

Potential research needs and next steps:

- Advances in technology suggest that improvements to real-time data collection and en route information are attainable, but is there evidence for the need? Is it possible to measure and then justify the benefits of real-time traveler information?
- What are the comparative benefits of alternative en route communication tools? Methods to compare include onboard information systems, handheld mobile devices, and roadside variable message signs (VMS).
- What are the comparative benefits to the traveler and to the transportation system of pretrip information, near-trip information, and en route information? Is providing real-time information to travelers to make en route decisions the best way to affect transportation demand?
- How do private enterprise and public-private partnerships impact the cost-benefit analysis? Of the various public-private configurations, which best serve the public and the needs of transportation operators?

Issue 2. Information Collection and Coordination

- Regional networks of real-time transportation and transit information collection and sharing are in place in California. Two examples are those in the Los Angeles area (Regional Integration of Intelligent Transportation Systems) and the San Diego area (Intermodal Transportation Management System).
- The 511 Deployment Coalition and the U.S. Department of Transportation (U.S. DOT) are also addressing issues of regional data sharing.
- Work on real-time collection through cellular-based technology (floating car data, or FCD) is under way at the University of California, Berkeley; in Georgia; and elsewhere.

Potential research needs and next steps:

- There are several 511 systems in the state of California. How might the lessons and strategies of the national 511 Deployment Coalition or U.S. DOT be applied internally across California?
- How are different FCD projects being compared and assessed, particularly in light of rapidly changing cellular technology?
- The optimal time interval for collecting and updating data remains unknown, as does the maximum acceptable latency between the time of collection and delivery to the user. What are the costs and benefits of decreased intervals and decreased latency?

Issue 3. Multimodal Integration

- The 511 systems in the San Francisco Bay Area and in the San Diego area are viewed as national leaders in integrating real-time transit information.
- A pilot project in the Bay Area provides motorists with real-time information on variable message signs that give comparison times for driving versus rail. A similar program was successfully implemented in Cologne, Germany.
- Two projects—one sponsored by the Transit Cooperative Research Program and one by the California Center for Innovative Transportation—are helping small transit agencies participate in Google Transit's Web-based trip planning tool.
- A California-based portion of U.S. DOT's SafeTrip-21 initiative includes mobility applications that employ large-scale monitoring using handheld devices to help travelers view estimated trip times, identify congested areas, and find the fastest travel routes and modes.

Potential research needs and next steps:

- Message signs necessarily lack a key piece of information: each motorist's destination. Are message signs an ideal long-term strategy for providing modal choices, as compared to interactive onboard devices programmed with a motorist's destination?
- What are the measurable benefits, and how scalable are the benefits, of providing real-time information to encourage mode shifting?

Issue 4. Human Processing and Decision-Making Factors

- There is an abundance of national research on human processes and decision-making factors. Topics include information overload; subjective, linguistic and situational factors; and response to variable message signs.
- An area of interest within this topic is dynamic pricing for managed lanes based on real-time data. Research in this area also addresses anticipatory pricing based on historic data, real-time data and predicted use.

Potential research needs and next steps:

- Dynamic and anticipatory pricing might be effective methods of using real-time data to help affect transportation demand. Fundamental equity questions remain regarding tolling: What are the implications of charging a premium for public benefit?

Contacts

During the course of this Preliminary Investigation, we spoke with the following individuals:

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Issue 1: Quantification of Benefits and Justification of Costs

Discussions with stakeholders revealed a recurring question: What is the value of traveler information services? Can the value be quantified, and given limited transportation agency budgets, is the benefit of collecting, processing and sharing real-time data worth the cost? We found national research and guidance that has attempted to address the question of benefit. Within this topic we explored the question of public-private partnerships and the role the private sector can play in reducing costs.

National Reports and Research Needs

Intelligent Transportation Systems Benefits, Costs, Deployment, and Lessons Learned, 2008
http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/14412_files/print_es.htm
The Research and Innovative Technology Administration summarized findings on the benefits and costs of traveler information ITS in a chapter of this report. See http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/14412_files/its_bcdll_2008_11.pdf. Table 12 on page 3 shows that en route information yields "positive impacts" on mobility and "substantial positive impacts" on customer satisfaction. This report does not provide quantified benefits or a cost-benefit analysis.

Intelligent Transportation Systems' Promise for Managing Congestion Falls Short, and DOT Could Better Facilitate Their Strategic Use, 2005
http://www.gao.gov/new.items/d05943.pdf
The U.S. Government Accountability Office reviewed a number of ITS applications and determined that ITS deployment can have benefits such as relieving congestion and improving traffic throughput, safety and air quality. The review concluded that results from some studies suggest that ITS benefits depend on effectively operating ITS technologies to meet local conditions, but that few studies provided information about cost-effectiveness of the ITS deployments, which is essential for maximizing public investments.

Impacts of Advance/In-Vehicle Information Strategies (Web/PDA Based, 511)
Research need statement, TRB Transportation Demand Management Committee
http://www.trb-tdm.org/index.php?option=com_content&view=article&id=91:511&catid=35:abe50_research_needs&Itemid=63
This committee put forward the following research need statement: "Research is needed to evaluate if and by how much [advance and in-vehicle] strategies influence travel behavior and estimate the benefits or impacts that are generated by use of the services. This research would examine travelers' awareness and use of the services and estimate the extent of mode, route and time shifting that occurs. Because the impacts of advance and in-vehicle systems are likely to be different, research should explore both types of systems. Research on acceptability of various types of service delivery methods also could be useful."

The Private Sector and Public-Private Partnerships

Our discussions with interviewees regarding public investment in real-time traveler information often turned to the role of the private sector. Some interviewees showed interest in the various ways of involving the private sector to lower the public cost burden for real-time data collection and information delivery, and some held a firm stance that information should be available to the public for free.

Currently many private companies analyze freely available public data, repackage it and market it for profit. One individual we spoke with suggested the compromise of a publicly owned, privately operated data collection system where all data would have to be made available to the agency for public benefit.

Real-Time Traveler Information Services Business Models: State of the Practice Review, 2007
http://www.ops.fhwa.dot.gov/publications/rtis_busmodels/rtis_busmodels.pdf
According to the researchers, "This state of the practice review documents a range of business models for real-time traveler information services, and provides 'real world' examples of how states and regions are developing partnerships and business plans within the business model frameworks…. Included with this review is a summary of current prevalent business models, which include public-sector funded, franchise operations, private sector funded and business-to-business models."

Issue 2: Information Collection and Coordination

Relevant, up-to-date and complete information is a necessary input to provide travelers with the information they need to make useful choices to affect demand. It is informative to look at current and promising methods by which data is collected in real time and the processes through which it is shared. Our findings include practices and initiatives in California and nationally, as well as research in this area.

California Practices and Initiatives

Regional Integration of Intelligent Transportation Systems (RIITS), Los Angeles area
http://www.riits.net/
The Los Angeles County Metropolitan Transportation Authority (Metro) sponsors the RIITS network. Caltrans, the City of Los Angeles Department of Transportation, the California Highway Patrol and Metro all contribute information collected through their own ITS to the network using the Los Angeles County Regional ITS Architecture and National ITS Standards. The network supports information exchange in real time between freeway, traffic, transit and emergency service agencies and provides data to traveler information services.

Intermodal Transportation Management System (IMTMS), San Diego area
The San Diego Association of Governments' IMTMS network is structured very similarly to Metro's RIITS network described above, coordinating real-time traffic and transit data at the state and regional levels. Both the RIITS and IMTMS networks are provided by vendor Delcan.

Mobile Millennium
http://traffic.berkeley.edu/
The Mobile Millennium project is a floating car data (FCD) project with the goal of collecting traffic data from GPS-equipped mobile phones and estimating traffic conditions in real time. Its partners include the UC Berkeley College of Engineering, the California Center for Innovative Transportation, Caltrans, U.S. DOT, Nokia and NAVTEQ.

National Resources and Practices

TRB's Intelligent Transportation Systems Committee Workshop
April 15-17, 2009, Irvine, CA
http://guest.cvent.com/EVENTS/Info/Summary.aspx?e=899a95a3-507c-480b-adb9-07e2d0c972a7
TRB's Intelligent Transportation Systems Committee's "Workshop on Identifying Traveler Information Research Needs to Achieve All Roads-All Modes-All the Time" has the stated goal of leveraging current practitioner, research and industry expertise to suggest future directions for real-time traveler information research, demonstration and evaluation programs. The workshop is organized into four working groups addressing (1) data collection, (2) data fusion and processing, (3) information dissemination, and (4) network impacts.

Georgia FCD project
"Sensory Perceptions," *ITS Journal*, 13(5): 39-40, 2007
The Georgia Department of Transportation is testing systems for using cellular probe-based technology to monitor traffic flows and detect incidents in real time on the state's rural roads, where intensive investments in loops and other fixed detectors are not cost-effective. One technology vendor is Atlanta-based Cellint (http://www.cellint.com/), which provides the TrafficSense monitoring system.

511 Interoperability Task Force, 2006 status report
http://www.deploy511.org/docs/511%20WG%20Michigan%20Mar%202006/511%20Interoperability%20Task%20Force%20Update.ppt
This status report by the 511 Deployment Coalition presents a snapshot of the issues related to interoperability of different 511 systems across the United States. It addresses such issues as the value of a common 511 user interface and menu structure, the sharing of data in neighboring regions, and 511 web sites.

U.S. Department of Transportation Planning for Operations Initiative
http://plan4operations.dot.gov/data_coll.htm
This federal web site promotes data sharing at a regional level. From the "Data Collection and Sharing" web page, recommendations most relevant to real-time traveler information data include:

- Develop a regional data clearinghouse.
- Coordinate data resources with transit agencies.
- Use specific events to initiate new data partnerships.
- Use universities to help develop integrated databases.
- Use operations data to develop more effective performance measures.
- Use operations data to improve planning analysis tools.

Research

Congestion Management in a Rapidly Growing Economy: Optimizing Transportation Network Performance, 2008
http://transportation.northwestern.edu/mahmassani/presentations/Network_Congestion_Mgmt_MTTBR_Guwahati2.08.pdf
On pages 18-20 of this presentation, the author describes the implications of inexpensive wireless sensor networks (such as the California-based Mobile Millennium or Georgia's FCD program described above). The combination of mobile units and wireless Internet (which provide "particle" user-centric views of the system) with inexpensive wireless sensors (which give the perspective of infrastructure and fixed assets) provide true real-time information. This author states that such advancements call for:

- Methods geared for shorter-term engineering and business applications.
- Methodologies for real-time decision making under real-time information.
- Methods to extract knowledge from undifferentiated data.

Probe-Based Traffic Monitoring Systems with Wireless Location Technology: An Investigation of the Relationship Between System Design and Effectiveness, 2005
2005 TRB Annual Meeting
Citation at http://trb.metapress.com/content/e76gl231qn3w1276/
Wireless location technology (WLT) based monitoring anonymously samples the location of probes or drivers by using wireless devices such as cellular phones. This research explores the relationship between the design of a WLT-based monitoring system and the accuracy of speed estimates that it generates. A simulation-based approach was used to define general guidelines for different aspects of system design and roadway network characteristics.

Issue 3: Multimodal Integration

While having drivers choose alternative routes based on real-time information is one desired outcome in demand management, another is the selection of alternative transit options. Integrating multiple mode options for travelers while they are already en route is not a widespread practice, but pilot programs and implementations worldwide suggest its viability. Our findings in this area include highlighted practices in California and internationally.

California Research and Practices

San Francisco Bay Area, Metropolitan Transportation Commission (MTC)
MTC's 511 system in the San Francisco Bay Area was cited in interviews as displaying exemplary practices in incorporating real-time traffic and transit data and providing it to users. The 511 phone system and the web site at http://511.org/ include both real-time traffic and transit departure information.

A pilot project to integrate traveler information across highway and transit modes was undertaken in the area through the use of variable message signs (VMS). The pilot system calculates real-time highway driving time as well as train trip time for predefined trip itineraries and displays related messages on a network of VMS. During rush hours, a comparison of driving time versus station-to-station train travel time is displayed on specific signs.

Initial results of this pilot are detailed in the paper **Commuter Travel Time Information System: Displaying Transit Messages on Changeable Message Signs,** presented at the 2009 TRB Annual Meeting (see the citation at http://pubsindex.trb.org/document/view/default.asp?lbid=882385).

San Diego Area
The San Diego area 511 system was also cited in interviews as displaying exemplary practices in incorporating real-time traffic and transit data and providing it to users.

Google Transit Trip Planning Project, 2009
(Pending Caltrans Technical Agreement with the California Center for Innovative Transporation (CCIT))
The proposed work will select a handful of small urban or rural transit agencies and provide them with the resources and the technical skills to organize their schedule data and convert it to the Google Transit format. These agencies will be selected by choosing a corridor and working with transit agencies along this corridor (e.g., I-80 corridor between the Bay Area and Sacramento). CCIT will develop a set of guidelines and list available resources that can be applied by other agencies statewide.

SafeTrip-21: California Connected Traveler Field Test Bed
http://www.intellidriveusa.org/safetrip21/
This project brings a focus on multi-device and multi-communications link mobility and safety applications to U.S. DOT's SafeTrip-21 initiative. The mobility applications will involve larger-scale monitoring using handheld devices to integrate the traveler in his or her regional travel environment; for example, to find the fastest travel routes via road or rail, to view estimated trip times, and to understand the extent of traffic congestion. The system will alert drivers of traffic jams and accidents ahead, pointing them to the best choices of transportation mode and route.

National Research

Google Transit Data Tool for Small Transit Agencies, Transit Cooperative Research Program, Transit IDEA Program, 2009
http://www.trb.org/TRBNet/ProjectDisplay.asp?ProjectID=2695
This project will develop a tool to enter, export and host the transit data needed to participate in Google Transit, to allow small transit agencies to input their transit data. While mid- to large-sized transit agencies often have the resources to provide Google Transit data feeds in accordance with the Google Transit Feed Specification, many small transit agencies do not have the resources to enter, export and host the required transit data feed or do not have their data in the required format. This tool will be made available in the form of a web application and released under an open source software license.

International Practices

Cologne, Germany
International Technology Scan Reports: Managing Travel Demand in Europe, 2006
http://international.fhwa.dot.gov/traveldemand/
This FHWA scan of travel demand management in Europe describes an integrated multimodal en route traveler information system in the city of Cologne, Germany. A park-and-ride system was established along key arterials feeding into the city center where travelers can park and transfer to streetcars. There are five integrated park-and-ride facilities at tram stations, including 2,300 spaces. The system provides drivers with real-time travel time comparisons. When approaching a park-and-ride lot and tram station, drivers can read a dynamic display panel that shows the current travel time into the city center, the equivalent travel time by public transportation, and how soon the next tram will arrive. This enables drivers to make informed choices about staying on the road or transferring to public transportation.

Issue 4: Human Processing and Decision-Making Factors

Driver behavior, response to information, and subsequent decision making play a role in the effectiveness of real-time traveler information strategies. A better understanding of how humans process information may impact new strategies on how, when and where to provide real-time information. Our findings related to this issue encompass a variety of research studies. This portion of the Preliminary Investigation concludes with a subsection on research into managed lane pricing and real-time decision-making factors.

Research on Decision-Making Factors

Estimation of Message Reading Time for Variable Message Signs, 2009
TRB 2009 Annual Meeting
Citation at http://pubsindex.trb.org/document/view/default.asp?lbid=881996
This research was motivated by the need to design messages on variable message signs, including such factors as message phase and duration, with consideration of drivers' message reading time. The analysis depended on various factors, such as the number and length of VMS messages, drivers' travel speed, and driver characteristics. In this study, extensive field experiments were conducted using specially manufactured portable VMS to obtain drivers' message reading time with respect to these causal factors. Researchers developed an estimation model for drivers' message reading time.

Drivers' En Route Diversion Decisions Under Influence of Variable Message Sign Information: Empirical Analysis, 2007
TRB 2007 Annual Meeting
Citation at http://pubsindex.trb.org/document/view/default.asp?lbid=847521
This paper undertook a quantitative assessment of the potential effects of travel time information provided by VMS on en route diversion behavior of Shanghai urban freeway drivers. The findings have implications for the operation of VMS-based advanced traveler information systems.

A Hybrid Model for Driver Route Choice Incorporating En-Route Attributes and Real-Time Information Effects, 2005
Networks and Spatial Economics, 5(1): 21-40
Citation at http://www.springerlink.com/content/k62x05p85g515786/
In this study, researchers characterize en route driver behavior with subjective and linguistic variables, as well as situational factors. Researchers developed a hybrid en route choice model that combines quantitative and fuzzy variables to more robustly predict driver routing decisions under information provision.

Additional Investigations on Driver Information Overload, 2003
NCHRP Report 488
http://www.trb.org/news/blurb_detail.asp?id=1324
This research continued NCHRP efforts to develop and validate a driver information overload model for freeways and to translate the model into a practical tool for traffic and safety professionals to use in analyzing driver information loadings.

Research Related to Managed Lanes

A subset of this research focuses specifically on driver decision-making behavior regarding managed lanes: What are the factors that affect en route decisions when lanes are variably and dynamically priced?

Dynamic Tolling Strategies for Managed Lanes, 2009
Journal of Transportation Engineering, 135(2): 45-52.
Citation at http://ntlsearch.bts.gov/tris/record/tris/01121634.html
This paper proposes approaches to determine pricing strategies for operating managed toll lanes. Based on the researchers' methodology, tolls vary dynamically in response to real-time traffic conditions in order to provide a superior free-flow travel service to the users of the toll lanes while maximizing the freeway's throughput. Simulation experiments were conducted to validate and compare the proposed approaches.

Congestion Management in a Rapidly Growing Economy: Optimizing Transportation Network Performance, 2008
http://transportation.northwestern.edu/mahmassani/presentations/Network_Congestion_Mgmt_MTTBR_Guwahati2.08.pdf
On page 25 of this document, the author describes the next step in using real-time data in managed lanes. Rather than dynamic pricing that reacts to real-time data, an anticipatory pricing system would be based on real-time data as well as predicted traffic and expected driver response to the dynamic toll values.

Identification of Traveler Information and Decision-Making Needs for Managed Lane Users, 2004
FHWA Report 0-4160-13
http://tti.tamu.edu/documents/0-4160-13.pdf
In this study, researchers conducted focus groups in Dallas, Houston and San Antonio to better determine what information drivers believe they need and how well they understand current and proposed message formats. The research team developed a conceptualized driver decision-making model to help managed lane designers understand the type of information that drivers need in order to make informed decisions about whether to use the managed lane facility.

Resources

Real-Time Traveler Information

FHWA Real-Time Traveler Information Program, News page
http://www.ops.fhwa.dot.gov/travelinfo/tinews.htm
FHWA has collected news items on real-time traveler information deployments around the United States, plus other related stories and updates.

AASHTO Subcommittee on Systems Operations and Management, ITS in Work Zones, web page on real-time travel information resources
http://www.transportation.org/?siteid=42&pageid=2762
For real-time travel information specifically related to work zones, this AASHTO subcommittee web page provides links to evaluations of various systems; standards and specifications; guides, case studies and examples; and articles, reports and presentations.

511 Deployment Map
http://www.fhwa.dot.gov/trafficinfo/511.htm
This map shows current and planned 511 system deployments nationwide. The web page also provides direct links to state and regional 511 web sites.

511 Deployment Coalition
http://www.deploy511.org/
The 511 Deployment Coalition includes more than 30 public agencies, industry groups, industry associations, and private companies. Its web site provides 511 deployment status information, marketing ideas, implementation guidelines and usage statistics.

Vehicle Traffic Information Coalition (VTIC)
http://www.real-timetraffic.com/
VTIC consists of auto manufacturers and technology companies leading in the real-time traffic industry. Its goals include educating federal, state and local governments, fostering growth of technologies and the market, and supporting development of real-time traffic policies and programs.

Congestion Management in a Rapidly Growing Economy: Optimizing Transportation Network Performance, 2008
http://transportation.northwestern.edu/mahmassani/presentations/Network_Congestion_Mgmt_MTTBR_Guwahati2.08.pdf
We referenced this document in two major sections of this Preliminary Investigation: **Information Collection and Coordination** and **Human Processing and Decision-Making Factors**. The document goes well beyond these two issues to address other important advances and trends in travel information systems.

Transportation Demand

TRB Transportation Demand Management Committee
http://www.trb-tdm.org/
This committee "identifies, stimulates, reviews and reports research related to social, economic, public policy, psychological and management aspects of transportation demand management."

Managing Demand Through Travel Information Services
http://www.ops.fhwa.dot.gov/publications/manag_demand_tis/travelinfo.htm
This FHWA overview of travel demand management using information services addresses the following topics:

- The many dimensions of traveler information.
- The types of travel situations where traveler information can make a difference.
- Examples of state-of-the-art traveler information systems.
- The benefits that traveler information offers.
- Lessons learned from past successes and failures.
- Future directions for traveler information systems.
- Resources for more information.

Intelligent Transportation Systems

Research and Innovative Technology Administration, Intelligent Transportation Systems
http://www.itsoverview.its.dot.gov/TI.asp
This page links to searchable databases of benefits, costs, lessons learned and deployment information on different traveler information ITS applications.

TRB Intelligent Transportation Systems Committee
http://sites.google.com/site/trbitscommittee/
This committee is concerned with "systems-level issues, including conceptual system planning and design, integration of technologies and approaches from various subdisciplines within ITS, applications to all modes of ground transportation and to facilitate intermodal integration, and evaluation of the overall impacts of ITS on the developers, users, and operators of all parts of the ground transportation system."

ITS America (ITSA)
http://www.itsa.org/
ITSA advocates for technologies that improve the safety, security and efficiency of the nation's surface transportation system. Its members include private corporations, public agencies and academic institutions involved in the research, development and design of ITS technologies that enhance safety, increase mobility and sustain the environment.

ITS World Congress
http://www.itsworldcongress.com/
ITS World Congresses gather some 5,000 participants from around the world looking to share experiences, build networks, and learn how ITS can improve operational efficiency. The conferences include executive, special interest, technical/scientific, and interactive sessions. The 2009 World Congress will be held in Stockholm from September 21 to 25. Information on the 2008 World Congress is available at http://www.itsworldcongress.org/.