Intelligent Transportation is Transforming Highway Travel

By Tom Kuennen

The journey to Intelligent Highways has just begun; the coming Vehicle-Infrastructure Initiative (VII) opens the door to safer highways, vehicles, and real-time information

Long a fantasy of science fiction or pulp science magazines, in our post-Interstate era, Intelligent Transportation Systems (ITS) technologies are transforming automobile and truck travel, already making it faster, safer, and more efficient, and helping optimize the traffic-carrying capacity of our congested highway infrastructure.

But the immediate future promises much, much more.

As defined by ITS America – established in 1991 to coordinate development and deployment of ITS in the United States – ITS is the application of computers, communications, and sensor technology to surface transportation.

While costly in terms of public and private dollars, ITS is a pathway to entirely new ways of using, designing, operating, expanding, and optimizing our softwheel transportation system. Since the public and private sectors joined together to establish ITS in 1991,

AAA Foundation for Traffic Safety photo

Today's in-dash navigation systems are only the beginning of the ITS revolution.

billions of dollars have been invested in ITS research and development and in initial deployment of ITS products and services.

But federal policy always maintained that the private sector be the main driver of ITS adoption. And as public-sector involvement in getting ITS on a common architecture stabilizes, private-sector interests are picking up the pace and providing exciting new products that will further metamorphose how drivers will relate to their cars and trucks, and how cars and trucks will relate to the roadway.

"ITS means powerful benefits in managing congestion, reducing crashes, and improving the efficiency of the trucking and transit industries," said Secretary of Transportation Norm Mineta in April 2001. "Intelligent Transportation Systems have already demonstrated their value in improving mobility and safety, not only in North America, but in Europe and Asia as well."

Intelligent Transportation Systems are happening today. As implemented in the early 21st century, ITS technologies are increasing travel predictability and reliability, making toll-paying easier, and decreasing the stress of travel. Right now, Internet-based travel time information derived from road sensors is assisting pre-trip planning, including daily commuting, local business travel, shopping trips, child dropoff and pickup, and leisure travel.

"Intelligent transportation systems can contribute to the lessening of dependence on foreign oil, as called for by the president, by helping to reduce congestion in major cities, and providing travel- and weather-related real-time information to consumers and businesses in order for them to arrive at their destination in the shortest amount of time," said Neil Schuster, president and CEO of ITS America, following the State of the Union Address in January.

Increasingly familiar in-vehicle and infrastructure-based information and guidance systems are getting automobile travelers to their destinations safely and efficiently, connecting them with local services wherever they are, and summoning assistance if a problem occurs.

But ITS technologies are about more than automobiles. They allow transit users to locate the nearest access points, determine costs, and predict travel times.

And the impacts of the explosion of freight volume and numbers of trucks on the streets will be blunted by ITS. Shippers will be able to operate just-in-time and quick-response manufacturing and distribution systems with confidence that delivery windows will be met. Freight carriers will make extensive use of freight management systems to identify and track shipments and adjust routing, destinations, or mode in real-time.

ITS technologies – when fully integrated into our road system – will comprise an electronic information infrastructure that will work in concert with the physical infrastructure, optimizing the efficiency and usefulness of the system. It will be a secure system that can both detect and respond to regional crises.

It will be more than efficient; it will be safe, with far fewer and less severe crashes for all types of vehicles, and far faster response and recovery when crashes do occur.

Instead of today's in-dashboard map display linked to a global positioning satellite, ITS will provide real-time information on current congestion, encouraging alternative routes in real time and increasing the effective capacity of the system while reducing the need for new construction. This information now is available online for expressways in some metro regions; it's just a matter of time before it will be available on the dash as well.

Ultimately, ITS will result in a road system that reduces energy consumption and lessens negative environmental impact, and provides a vital domestic ITS industry that competes effectively at home and in the international marketplace as ITS spreads to other countries.

Today's ITS Dates to 1991

While ITS had been investigated in bits and pieces for decades, the first federal funding act of the post-Interstate era, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) launched a federal program to research, develop, and operationally test ITS, and to promote their implementation. The idea was to enhance the efficiency, safety, and convenience of surface transportation, resulting in improved access, saved lives and time, and increased productivity.

Under ISTEA, the program encouraged basic research and development, operational tests that served as the bridge between that basic research and full deployment, and support of integrated ITS technologies. Through 1997, the federal government provided $1.2 billion for ITS. The subsequent Transportation Efficiency Act for the 21st Century (TEA-21) authorized another $1.3 billion through fiscal year 2003.

An early milestone was establishment of a national ITS architecture, to set a national framework in which national and regional IT systems could be created. Even as it continually evolves, the national architecture compels regional systems to conform to a national framework, so systems would not change fundamentally as a driver travels from state to state.

Driven by ITS stakeholders, the national architecture development process solicited public and private input, and today the U.S. national architecture serves as a model for many other countries. The architecture defines the functions (for example, gathering traffic information or requesting a route) that are required for ITS, the physical entities or subsystems where these functions reside (for example, in the field or the vehicle), and the information flows and data flows that connect these elements into an integrated system.

While critics may question the federal government's involvement in establishing a national architecture – demanding a strictly open or market-based solution to a national system – the result has been national consistency in terms of subsystems, centers, information flows, and external interfaces, so ITS in one region can be compatible with another region.

Alternatively, a strict market-based solution might have meant a repeat of the Betamax-VHS struggle, in which acceptance of VCRs was compromised by competing formats, or that of 1970s quadraphonic sound, in which competing four-channel

BARRIER SYSTEMS, INC. PHOTOS

audio formats confused the consumer and killed the format altogether.

Federal rules are in place mandating the development and use of regional architectures based on the national ITS architecture, in order to draw on Highway Trust Funds for ITS projects through 2005's Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). This act ended the ITS deployment program at the close of fiscal year 2005, but continued ITS research at $110 million annually through fiscal year 2009. In addition to authorized ITS funding, ITS projects are eligible for regular federal-aid highway funding.

Of SAFETEA-LU funds provided, $20 million is directed to a new comprehensive road weather program, $35 million is earmarked to the I-95 Corridor Coalition, and $3 million is set aside for a Rural and Interstate Corridor Communications Study. SAFETEA also supports establishment of an ITS advisory committee and the development of a new five-year program plan.

SAFETEA-LU "mainstreams" ITS deployment throughout the federal-aid program, including high-priority projects, clarifying eligibility and referencing ITS in a number of different areas. It also makes clear that ITS projects are eligible for funding under National Highway System (NHS), Surface Transportation Program (STP, for eligible state and urban roads), and Congestion Mitigation and Air Quality (CMAQ) funds, with a categorical National Environmental Policy Act (NEPA) exclusion of ITS projects, meaning they can move forward without having to meet NEPA review requirements.

"This marks a successful graduation from TEA-21, where ITS was found primarily in Title V (research)," ITS America's Schuster said. "ITS is no longer a special niche program, rather [it] is part of the 'mainstream' of transportation funding."

SAFETEA-LU also establishes a new freight program to fund the deployment of the Commercial Vehicle Information Systems and Networks at $100 million over four years, and calls for development of a nationwide capability to monitor, in real-time, the traffic and travel conditions of America's major highways and share that information.

Top and above: The I-15 FasTrack lanes in the San Diego area combine many aspects of intelligent highways and congestion management. HOV lanes in the median of I-15 implement automated dynamic pricing, in which per-trip fees are debited from established driver accounts via windshield-mount transponders, allowing the flexibility of varying charges with the level of congestion. In 2007 a concrete, hinged permanent movable barrier will be installed in the HOV lanes, permitting dynamic, on-demand reconfiguration of the HOV four-lane width from one and three lanes either way, to two and two, or to all four lanes in either direction, to better serve drivers under peak demand conditions.

Through this period, ITS America has played an essential role in coordinating public and private activity in ITS. ITS America members include federal, state, local, and even foreign government agencies; national and international companies involved in the development of ITS; universities, independent research organizations, public interest groups; and many others with a stake in ITS, so it's truly a public/private undertaking. In fact, ITS America was originally formed as a utilized federal advisory committee; today ITS America works closely with the U.S.

DOT on projects and programs in support of the national ITS program.

AASHTO: Optimize the System

The American Association of State Highway & Transportation Officials (AASHTO) sees IT as a means of optimizing the highway system so it can better accommodate the crushing traffic volumes of today and the future.

The most recent traffic surveys show that despite slow growth in jobs and travel up to 2003, bad traffic congestion has gotten worse, now costing Americans $63.1 billion a year. And if 2005's higher fuel prices are factored in, the cost jumps another $1.7 billion, say Tim Lomax, research engineer, and David Schrank, associate research scientist, Texas Transportation Institute (TTI), in the "2005 Urban Mobility Report." The report – updated each year – is released to the national media just ahead of the Memorial Day travel period.

The "2005 Urban Mobility Report" – the most recent available at writing – measured traffic congestion trends from 1982 to 2003, reflecting the most recent data available. The TTI study found:

- Annual delay per peak period (rush hour) traveler grew from 16 hours to 47 hours since 1982.
- The number of urban areas with more than 20 hours of annual delay per peak traveler has grown from only five in 1982 to 51 in 2003.
- The total amount of delay reached 3.7 billion hours in 2003.
- Wasted fuel in 2003 totaled 2.3 billion gallons lost to engines idling in traffic jams.

TTI put a price tag on the value of extra travel time (or delay), and the extra fuel consumed by vehicles traveling at slower speeds. Travel time has a value of $13.75 per person-hour and $72.65 per truck-hour in 2003. Fuel cost per gallon is the average price for each state.

In addition to the costs of delays and wasted fuel caused by congestion, AASHTO notes the cost in human life – an average of 43,000 lives on American roads each year – due to system performance.

While capacity increases are possible, they are becoming more expensive and politically difficult than ever before, and on average are not keeping pace with growing demand. Little wonder, then, that AASHTO seeks to "optimize" the system; that is, revamp the existing infrastructure so it can handle more traffic in a safer manner.

PHOTO COURTESY OF TOM KUENNEN

Ramp metering – shown here on Calif. 91 in Buena Park, Calif. – optimizes the rush-hour capacity of existing highways by inserting more space between entering vehicles.

Capacity vs. Operations Improvements

Congestion relief can be divided into two main types; operations improvements, which attempt to optimize the traffic-carrying capacity of existing lanes without added capacity, and capacity improvements.

In its 2004 publication, "Optimizing the System: Saving Lives, Saving Time," AASHTO defines optimizing as "improving or developing to the greatest extent possible."

"Optimizing the System" describes the mission embraced by most state departments of transportation as they seek the ultimate in the safe and efficient operation of the transportation network we have today, AASHTO says. "The need to optimize our transportation system springs from the recognition that growth in demand has far outstripped our ability to provide adequate new capacity," AASHTO adds.

The goal must be to make the system work better, safer, and smarter, to both save lives and save time for our citizens, AASHTO maintains. "There is no single solution to this challenge, there are many, from the rapid clearing of traffic accidents, to advising motorists of traffic tie-ups or weather delays, to improving highway work zones for the safety of both drivers and workers," the nation's state DOTs said. "There is a tremendous amount of technology that can be deployed, and models that can be used."

ITS Offers Congestion Relief

The ITS technologies of today and the future offer promise for congestion relief through optimization of the road system, AASHTO says. "These utilize the latest in computer and communications technologies

1/3 pg ad
MG Square.
Must be opposite it's
full page on pg 188

to improve traffic flow and reduce the incidence of crashes and disabled vehicles," the state DOTs say. "Some ITS technologies are easy to spot: Those closed circuit television cameras you see along the highway, for example, are ITS components. Ditto for dynamic message signs that warn you about hazards up the road. But there's plenty about ITS that you don't see: high-tech sensors embedded in the highway, for example. Computers that run mathematical algorithms to pinpoint traffic tie-ups. And a rapidly expanding wireless communications network that disseminates critical traffic and weather information among transportation officials, emergency responders, and the general public alike."

ITS technologies such as these are being deployed around the country, and they're doing much to reduce congestion and save lives, AASHTO says. In Colorado, the installation of a downhill speed-warning system along a mountainous stretch of I-70 led to a 13 percent drop in tractor-trailer accidents. In Arizona, the synchronization of traffic signals along a major commuting corridor in the Phoenix area boosted travel speeds and decreased crash risk by nearly 7 percent. In California, signal-synchronization projects undertaken along 76 travel corridors across the state decreased the number of "vehicle-hours" of delay by 25 percent. In Texas, the deployment of dynamic message signs, closed-circuit television cameras, and other ITS technologies along 29 miles of highways near San Antonio eased congestion and reduced the number of traffic accidents by nearly 3 percent.

In New Jersey, the implementation of the E-ZPass electronic toll-collection system reduced delay at toll plazas by 85 percent, saving motorists an estimated $19 million in otherwise lost productivity time and $1.5 million in fuel costs every year, AASHTO reported. In New Mexico, the deployment of variable message signs, automated traffic sensors, and other ITS technologies at a freeway construction project in Albuquerque reduced the average clearance time for traffic incidents by 44 percent.

Ramp Metering and Signal Coordination

Today, ITS is leveraging operational changes in traffic handling in other ways. Among these operational improvements is freeway ramp metering. Entrance ramp meters on freeways regulate the flow of traffic into an expressway by using traffic signals. They insert more space between entering vehicles, so those merging vehicles don't overwhelm and slow the main lane traffic flow, especially after entering traffic is released by an upstream traffic signal. They also reduce the number of entering vehicles on short trips by encouraging them to use parallel or surface streets to avoid the ramp wait time.

Freeway ramp metering works only if the signals are obeyed, in which the steady drip-drip of traffic entering the main "pipe" never bogs down the flow. Further, metering of individual ramps on their own won't work; an entire system, or at least one freeway, must be metered and working in cohesion to get the pattern of traffic ingress that optimizes capacity.

In TTI's report, 25 of the urban areas reported ramp metering on some portion of their freeway system in 2003, for a total of 33 percent of the freeway miles. The effect was to reduce delay by 102 million person-hours, approximately 5 percent of the freeway delay in those areas.

An older application, traffic signal coordination, also enhances traffic flow by eliminating redundant red lights. Traffic lights that aren't synchronized can lead to teeth-gnashing frustration among drivers, unneeded delays on the surface street system, and dangerous red light-running.

"Signal coordination projects have the highest percentage treatment within the urban areas studied because the technology has been proven, the cost is relatively low and the government institutions are familiar with the implementation methods," the TTI researchers wrote. "The effect of the signal coordination projects was to reduce delay by 11 million person hours, approximately 1 percent of the street delay. While the total effect is relatively modest, the cost is relatively low."

Outdoor Advertising Association of America photos

Reliability of Commute Time

ITS has a big role to play in easing drivers through their daily commute, optimizing system performance. One aspect of time spent commuting – and thus the costs of congestion to individuals and society – is the "reliability" of the commute.

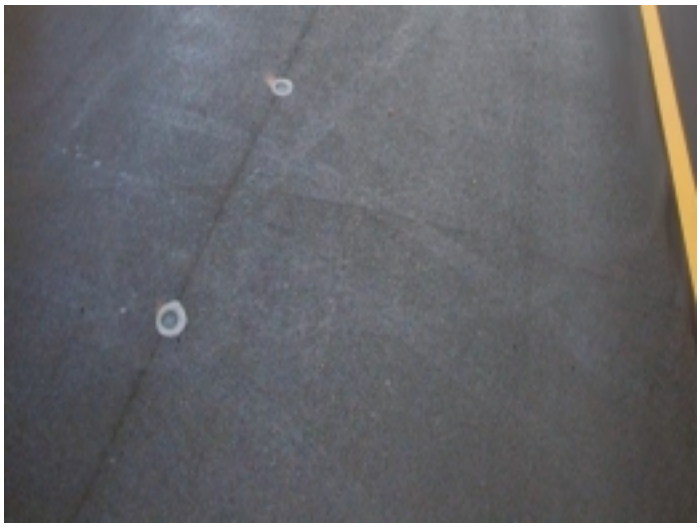
For many trips in congested areas, a commute can be made in a number of minutes, but the driver must allow as much as twice that much time for the trip, just in case congestion is encountered.

How operational technologies can mitigate this "wasted" time due to the unreliability of travel times is described in a September 2005 report by Cambridge Systematics Inc. for the Federal Highway Administration (FHWA), "Traffic Congestion and Reliability: Trends and Advanced Strategies for Congestion Mitigation."

AASHTO observes that at the beginning of the decade, some 39,000 miles of highways were routinely congested, based on FHWA figures. Major surface streets were just as congested. About half of the congestion was recurring, stemming from factors that exist daily, such as deficient roadway capacity for the motorists wishing to use it.

The other half was nonrecurring, that is, stemming from temporary disruptions such as traffic accidents, construction zones, and bad weather. Unreliability of travel time is the result of non-recurring congestion, and is the product of seven root causes, which often interact with one another, this new report says. These are physical bottlenecks, traffic incidents, work zones, weather, traffic control devices, special events, and fluctuations in normal traffic.

Digital billboards, shown here in Cleveland, rotate commercial messages (top) with public service announcements (above), and also can transmit emergency information.



NU-METRICS, INC. PHOTO

Wireless in-pavement permanent traffic analyzers such as the Groundhog units seen here are another facet of ITS technology. They provide real-time vehicle volume counts; information on vehicle speed, length, and classification, as well as whether the road surface is wet or dry; and a chemical index of anti-icing materials used.

"Travel time reliability is defined as how much travel times vary over the course of time," the FHWA report said. "This variability in travel times from one day to the next is due to the fact that underlying conditions vary widely. The seven sources of congestion – especially traffic-influencing 'events' such as traffic incidents, weather, and work zones – that contribute to total congestion also conspire to produce unreliable travel times, because these are never the same from day-to-day."

Cambridge says that a multi-layered approach can mitigate congestion: adding more base capacity, operating the existing system more efficiently, and encouraging alternate travel and land use patterns.

"All of these strategies can lead to a reduction in congestion, but it is operations strategies that have the most dramatic effect on reliability, because they target the sources of unreliable travel directly," Cambridge says in the FHWA report. "Operations strategies focus on the traffic-influencing events that both raise the general level of congestion and increase unreliable travel."

ITS technologies already are working, the FHWA report said. For example, in Michigan, the Road Commission of Oakland County's FAST-TRAC (Faster and Safer Travel through Traffic Routing and Advanced Controls) system was launched in 1992. The key element of FAST-TRAC is the Sydney Coordinated Adaptive Traffic System (SCATS), an advanced adaptive signal system with the capability to adjust signals on an individual intersection, corridor, and area-wide basis. "The system detects real-time demand on the highways and continuously adjusts signal timing to meet the demand," Cambridge said. "The result is that FAST-TRAC reduces congestion by eliminating unnecessary stops and providing green phases where the demand is highest."

In the megacity located between Milwaukee, Wis., and Gary, Ind., including all of Chicago, a real-time freeway monitoring system is operational and can be accessed via the Internet. The program is coordinated with WisDOT's statewide SmartWays program, where the ramp meters keep the freeway operating at steady flow for longer periods of time than otherwise could be expected, and where service patrols and cameras allow for quicker identification of and response to incidents, a major source of unreliable travel. In the meantime, real-time traffic times and color-coded congestion are displayed on the Web site of the Gary-Chicago-Milwaukee Corridor Coalition (GCM). View the GCM Web site at http://www.gcmtravel.com/.

The September 2005 report contains other examples of operational solutions, in Maryland, Washington State, and the new Katy Freeway expansion in Houston. Download the report at http://ops.fhwa.dot.gov/congestion_report.

VII: The Next Revolution

Now, a new focus of ITS implementation just gathering steam soon may affect vehicle operation in relation to the roadway on which it is traveling. The new focus on Vehicle-Infrastructure Integration (VII) will make roads safer by deploying advanced vehicle-vehicle and vehicle-infrastructure communications that could keep vehicles from leaving the road and enhance their safe movement through intersections.

Some 21,000 of the 43,000 deaths annually on America's highways are caused by roadway departure and intersection-related incidents, AASHTO reports. Now the automobile industry, the U.S. DOT, ITS America, and AASHTO have joined forces to explore the feasibility of a far more ambitious vision: equipping all new cars and trucks with mobility- and safety-enhancing "intelligent vehicle" technologies, while at the same time outfitting roadways and intersections throughout America with ITS technologies.

Essentially, the "smart" vehicles would be linked to the "smart" highway infrastructure (as well as each other) via a nationwide, wireless communications network, with enormous potential for reducing crashes and enhancing the mobility of the roadway system.

For nearly 15 years, the ITS movement has hypothesized that applications such as intersection collision avoidance could best be accomplished through sophisticated vehicle-infrastructure and vehicle-vehicle communication. During the past two years, this vision has been under intense exploration as part of the U.S. DOT's VII major initiative.

The aim of the VII initiative is to deploy and enable a communications infrastructure that supports vehicle-to-infrastructure, as well as vehicle-to-vehicle, communications for a variety of vehicle safety applications and transportation operations. Additionally, VII will enable the deployment of a variety of applications that support private interests, including those of vehicle manufacturers.

A public-private VII Coalition has been formed and will determine if the infrastructure deployment can be synchronized with the vehicle integration. Based on its planned development and exploration, the VII Coalition will not render its final decision for a nationwide rollout until the 2008 timeframe.

[MG]2 Inc. photo

TV monitoring of highways provides instant traffic information. Here, workers in Providence, R.I., service a camera on a pylon using an integral raising/lowering device.

Saving Lives and Time: VII Applications

If two vehicles are approaching an intersection at a right angle, they can communicate with the infrastructure – and each other – to presumably stop themselves from potentially crashing. But so many other potential benefits are possible by opening up this channel of communications. Here are a few examples from ITS:

- Curve Speed Warning and Lane Departure Warning are currently being done with sensors on the vehicle only, but could be improved with high-quality maps made possible by a significant increase in vehicle probe data.
- The ability to transmit dynamic work zone signage directly into the vehicle (known as in-vehicle signing) can improve the driver's awareness of work zones and prevent accidents, or even provide variable speed limits to smooth out congestion.
- Detection of roadway hazards such as potholes, road weather problems, or even sight distance and design problems can all be potentially identified by vehicle sensors and shared with managers of the roadway faster than is possible today.
- Traffic flow through signals could be made more efficient through the use of probe data that would allow more frequent or improved re-timing of the signal, or dynamic control of the signal based on real-time traffic counts or queues at the intersection.

VII: How It Would Work

The U.S. DOT describes how Vehicle-Infrastructure Integration would work to improve highway safety through crash prevention, and envisions how VII would enable more effective operation of the state and local transportation systems through collection of valuable information about the real-time status of the roadways.

Vehicles would be equipped with a global positioning system (GPS) unit and a dedicated short range communications (DSRC) transceiver, called the on board unit (OBU), DOT says. Vehicles already have a large array of sensors that are necessary for operation and maintenance; these vehicles have been measuring the outside air temperature near the surface of the roadway; they know when traction control or antilock braking (ABS) is activated; they know when it is raining; they even know when the road is rough.

These data, when coupled with additional information provided by GPS – the vehicle's exact position, speed, acceleration, and direction – would be an invaluable resource to state and local transportation operations, DOT says. Data collected by vehicles can be called probe data.

Data collected via VII would be completely anonymous. There would be no vehicle or other personal identification associated with the data. To gain access to this anonymous data, the roadway infrastructure would have to be equipped with DSRC transceivers, called roadside units (RSU).

Perhaps a major portion of – or maybe all – signalized intersections in America would be equipped with an RSU, DOT says. In addition, urban freeways would have RSUs frequently spaced to enable the gathering of this probe data. Similarly, the rural Interstate system would be equipped, but probably at less frequent intervals, such as at interchanges.

The operational concept would have vehicles communicating with intersections and with each other to prevent crashes. In addition, a vehicle would be transmitting the anonymous on-board sensor data to an RSU every time it passed an RSU. Since RSUs are not contiguous, a vehicle would store time samples of the data it collected between RSUs and then transmit these data samples as it passed the RSU hot spot.

The anonymous data received at an RSU would be sent to an aggregation point from which it would then be forwarded to authorized subscribers. Each aggregation point would receive data from several thousand RSUs. All data would be organized and ordered by the geographic coordinates from the vehicles and would be available to authorized subscribers.

Thus, in the end, a state or local DOT could subscribe and receive anonymous data from virtually every vehicle operating within its purview, whether it is on a freeway or an arterial road.

In the next few years leading up to the 2008 decision on whether or not to roll out a nationwide VII system, we will see test bed activities throughout the country that will be evaluating a number of different types of communication systems, applications, and approaches to integration.

In the meantime, ITS America is expanding its VII activities to assist members in better understanding the extraordinary opportunities VII will create, and to help identify current and emerging VII applications within the ITS sector. ITS America is developing a series of "white papers" on VII applications, and they can be viewed at http://www.itsa.org.

Our Transportation Future – the Next 50 Years

By Neil Schuster

This year, as we celebrate the 50th anniversary of our Interstate highway system, transportation professionals are working on what could become our mobility and safety vision for the next 50 years. A broad range of intelligent transportation systems will enable us to envision and achieve a bold future that will bring us unprecedented safety, mobility, and connectivity.

The Interstate system connected America physically, and now, ITS technologies allow us to connect America virtually so that while we travel, we will be connected to virtually anyone in America. We will come to expect that we are fully protected at the same time that we are fully connected, and it will take champions, legislators, and policy makers to articulate that vision and make it happen. Joining ITS technologies – information collection and distribution, telecommunications, advanced driving systems, location-based services and electronics – to our transportation system will enable us to transform transportation, how we finance it, develop it, manage and price it, and consume it. Through ITS, we will be able to achieve ITS America's vision – a future with zero fatalities and zero delays.

Fulfilling the need for a national ITS system that is both economically sound and environmentally efficient requires a new way of looking at – and solving – our transportation problems. The decades-old panacea of simply building more and more pavement neither solves our transportation problems nor meets Congress' broad vision of an efficient transportation system.

Traffic accidents and congestion take a heavy toll in lives, lost productivity, and wasted energy. According to government statistics, the drain on our economy is $300 billion a year. ITS enables people and goods to move more safely and efficiently through a state-of-the-art, intermodal transportation system. For literally pennies on the dollar, ITS investments help us reduce that $300 billion cost.

At the same time, intelligent transportation systems can contribute to the lessening of dependence on foreign oil, as called for by President Bush in his January 2006 State of the Union address, by helping to reduce congestion in major cities, and providing travel- and weather-related real-time information to consumers and businesses in order for them to arrive at their destination in the shortest amount of time.

With the passage last year of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy For Users (SAFETEA-LU) legislation, ITS is no longer a "niche" program; instead, it has become a part of the mainstream in transportation funding, with over $20 billion in special projects dedicated to, or that include, ITS.

We at the Intelligent Transportation Society of America, better known as ITS America, wholeheartedly applaud SAFETEA-LU's expanded eligibility for ITS deployment under existing programs. This marks a successful graduation from TEA-21, where ITS was found primarily in Title V (research).

In the meantime, an exciting new ITS program – the Vehicle Infrastructure Integration (VII) – is taking shape, and ITS America is at the forefront.

For nearly 15 years, the U.S. Department of Transportation and ITS America have hypothesized that applications such as intersection collision avoidance could be best accomplished through sophisticated vehicle-infrastructure and vehicle-vehicle communication.

The aim of the VII initiative is to deploy and enable a communications infrastructure that supports vehicle-to-infrastructure, as well as vehicle-to-vehicle, communications for a variety of vehicle-safety applications and transportation operations. Additionally, VII will enable the deployment of a variety of applications that support private interests, including those of vehicle manufacturers.

Last fall, ITS America and its members successfully demonstrated VII applications – vehicles and the roadside communicating with each other to deliver mobility and safety applications – on the streets of San Francisco and in an off-street setting. The demonstration, a $25 million product of the efforts of 40 private- and public-sector partners, took place during our 2005 World Congress. More than 7,100 attendees had an opportunity to experience VII applications and the future of transportation.

ITS America's role in the VII major initiative continues to gain stature as we bring the application providers to the VII table, and provide ITS business interests a voice in the further development of VII. We are conducting research into VII issues for our members, to assist them in understanding how and when VII will develop. And, we are providing a place for a wide variety of stakeholders not currently engaged in VII to gain knowledge while also being able to submit feedback.

ITS America marks its 15th anniversary in 2006. I invite you to learn more about ITS and ITS America by visiting our newly-designed Web site, www.itsa.org, and see what ITS can do for America and for you.

Neil Schuster is president and CEO of the Intelligent Transportation Society of America.