INTELLIGENT TRANSPORTATION SOCIETY OF AMERICA
400 Virginia Ave., S.W., Suite 800
Washington, D.C. 20024-2730
(202) 484-4847 Fax (202) 484-3483
http://www.itsa.org

The document before you is draft 3 of what has heretofore been called the National ITS Deployment Strategy.

This draft responds to 62 sets of thoughtful comments. In response to specific concerns that were raised, it also now includes an "opportunities" section which will also be a stand-alone executive document targeted specifically to state and local officials and executives.

ITS America's role in deployment is to build bridges among and provide useful information to the organizations and institutions responsible for making ITS investments and operating ITS systems. ITS America is therefore developing an internal strategic plan to achieve those ends. Those stakeholder organizations who are responsible for deploying ITS will in turn need to develop their own strategic plans for deployment.

The document before you is intended to serve as a strategic tool and resource for those developing their own deployment plans. To avoid confusion, we have changed the title of the document to:

Saving Lives, Time and Money Using Intelligent Transportation Systems: Opportunities and Actions for Deployment

Interim Final Draft

July 1999

Prepared by ITS America

July 2, 1999

Table of Contents

1ST DRAFT

Saving Lives, Time and Money Using Intelligent Transportation Systems: Opportunities and Actions for Deployment

Section 1: Introduction

BACKGROUND

Advances in information technology provide local elected officials and policy makers across the United States a major opportunity to enhance the economic viability of their communities and improve the safety and quality of life for citizens. Communications and electronics are revolutionizing all aspects of our modern-day world: how we travel, what we do in our homes, how we run our businesses, how we educate in our schools, and how we spend our leisure time.

Applying technology to improving transportation is one important aspect of meeting these community goals. In major metropolitan areas, in cities and towns, and in rural communities, information technology is already changing how transportation services are being provided.

The latest advancements in computers, electronics, communications, and safety systems are being applied to the vast transportation infrastructure of highways, streets, and bridges, as well as to a growing number of cars, buses, trucks, and trains. *"Just-in-time" delivery of goods* has become the expected norm, reducing inventory and speeding the overall supply chain. The safety focus is shifting *to preventing crashes* rather than just mitigating their effects.

Intelligent Transportation Systems, the application of information technology to transportation, can assist local officials in achieving these important community objectives.

Intelligent Transportation Systems **(**ITS) represents the integrated application of advanced information, electronic, communications, and other technologies to surface transportation systems. Freeway monitoring and incident management, and transit fleet management are current examples of new innovations in transportation systems and services. Computerized traffic signals, variable message signs, and electronic "smart cards" for tolls and transit fares are current examples of new innovations in transportation

products. Cruise control, trip planning, emergency notification, and collision avoidance are current examples of in-vehicle systems.

In the last decade, *great progress has been made* in introducing ITS transportation systems across the United States. States, local communities, and public transportation agencies have made *substantial investments in new infrastructure* that incorporates many of the operational efficiencies of the new technologies. The private sector has invested in the *development of new products*. The U.S. Department of Transportation has invested in *substantial research and tes*ting of new technologies. A National ITS Architecture has been adopted, and many necessary standards are under development.

An integrated transportation system, enhanced by ITS technology, improves quality of life by *making travelers safer, promoting a strong and growing economy, and enhancing and protecting environmental quality.*

Benefits in terms of savings lives, time, and money are now being clearly documented. Incident management systems can *reduce travel time by 10% - 45%*. Enhanced transit applications can *foster smart growth policies* by encouraging transit oriented development and encouraging modal shifts. Ramp metering systems *improve safety by reducing crashes from 10% - 50%***.** Transit management systems have enabled dramatic cost savings and between *10% – 30% performance improvement***.** ITS *accelerates economic development* through the provision of tourist information systems in rural areas and by supplying a multitude of information on transportation investments.

While significant *progress can be recorded* in the last decade, the transportation industry is in the infancy of the new information era. Realizing the potential benefits of ITS in addressing these challenges will be predicated upon a *multitude of individual decisions* made by public officials, product suppliers, manufacturers, and consumers across the country. However, it will depend heavily upon the *formulation of new collaborative relationships* among public institutions, the private sector, and universities and research establishments. It reflects the need for *new ways of doing business* and an understanding of both the opportunities and difficulties of doing so.

THE DOCUMENT

This document is part of a cooperative effort between the U.S. Department of Transportation and The Intelligent Transportation Society of

America to facilitate the continued deployment of ITS systems across the United States. It contains a set of individual plans of action for local officials at all levels of government as well as other public and private stakeholders who have roles in improving transportation systems and products.

This document is one of two that have been produced to help local elected officials focus on the opportunities of using ITS enhanced transportation systems to achieve community goals. The first is an *executive-level document* that outlines the benefits of ITS deployment in terms of current experiences. The second, this document, is a more comprehensive document which both explains the benefits and provides a cooperative, *action-oriented framework* for deploying ITS technology over the next century to both improve the nation's transportation systems and enhance the livability of our communities. This document *bridges the* g*ap* between where we are today and where we can be in the future.

The document is *targeted at public officials, opinion leaders, and agency executives* who collectively strive to ensure that the state and community objectives will be achieved through improvements to the nation's transportation system. The actions of these officials then become a framework and point of leverage for companies to develop and sell commercial services and products. This document provides a vision of how transportation officials can *meet the transportation challenges of the future utilizing ITS technology*. It describes future opportunities in terms of current examples of what has already been achieved. It outlines desired actions by elected officials and other key stakeholders and the collaboration that will be necessary between and among stakeholders. It is not a technical document; nor is it a strategic plan. It provides an *institutional framework for collaborative activity.*

This Document is organized in four sections.

Section 1: Introduction sets the focus and defines the intended audiences. It provides an overview of the new era in which today's community and transportation decisions are made and outlines known benefits. Section 2: Opportunities describes ITS enhanced future transportation systems and examples of current ITS experiences across the nation. It focuses on benefits important to *public leaders* responsible for community well being and for incorporating ITS technology in the nation's future transportation systems.

Section 3: Stakeholder Actions identifies major stakeholder groups who have roles in providing transportation services and identifies a set of desired

actions for each group to ensure that potential community benefits can be realized through the implementation of ITS as part of future transportation systems. Section 4: Areas for Collaboration takes the stakeholder actions from Section 3 and organizes them according to themes. It reflects the collaboration necessary by concerned stakeholders involved in the deployment of ITS systems and products.

Section 2: The Opportunities

This section outlines what the transportation systems can be in the future with the introduction of ITS technology. Through examples of current experiences across the nation, it shows that the future can quickly become a reality if proper decisions are made. It focuses on the perspectives of *public leaders* who are responsible for community well being and for incorporating the benefits of ITS technology in the nation's future transportation systems.

Saving Lives, Time and Money Using Intelligent Transportation Systems: Opportunities for Deployment

It is the year 2020. Information technology is the backbone of doing business, getting to work, and selling and transporting goods. Information technology drives the changes in intelligent transportation, which has matured since the turn of the century. Tasks that were once impossible are now routine.

The stress levels of the past are gone, replaced by a sense of satisfaction in drivers of cars, trucks, buses, and trains that they now have far greater control of their vehicles than ever before. On-board computers sense danger and react far faster than a human. These collision avoidance systems have helped cut the number of traffic accidents dramatically.

Once-frequent accidents caused by a driver's loss of control on ice or gravel and in evasive maneuvers have all but disappeared, thanks to the widespread use of stability systems that prevent accidents resulting from driver "overcontrol" in an emergency. Other technologies designed to improve driver control include adaptive cruise control to help cars travel to and from distant cities with greater safety.

Overall, surface transportation is a much safer proposition than before the time of collision avoidance and adaptive cruise control systems, infrared night sight, and motion detecting devices, in short, before the wide use of intelligent transportation systems.

Commuters traveling in vehicles that actually double as workstations have more time to call upon business associates, make appointments and complete stock trades electronically. They travel in special low-pollution hybrid electric cars and buses whose routes are made virtually non-stop, even to pay tolls.

The electronic fare cards used by these commuters speed fare collection and payment of parking fees. Increased efficiency, through electronics and reduced personnel needed to maintain these systems, has resulted in fare cuts.

When the rare crash occurs, emergency management teams have highly refined response plans to deal with everything from hazardous materials to spilled milk, reducing the number of lane closures to a third of the number at the turn of the century. Detouring delays have also been reduced. The time required to clean up a crash is also a fraction of what it

once was, thanks to quick identification of emergencies and dispatching of the right kind of response vehicles.

The speed, efficiency, lower cost, and convenience of public transit is up significantly, boosting ridership. Riders are getting better service and more alternatives to travel. Waiting time is far less of a barrier to public transportation now that travelers can find out exactly where their vehicle is and when it will arrive.

Traffic scofflaws like red light runners of yesteryear are far fewer on the landscape with the increase in traffic law compliance through use of the new technology.

Sophisticated traffic management systems instantaneously post current traffic information on specially located message signs throughout the region. The system sends a customized version of the same information to travelers to provide them with immediate route alternatives.

When highway congestion does occur, aggressive use of technological resources minimizes its effect on all other traffic and maximizes traffic flow throughout the region.

The close cooperation between traffic management, transit, commercial vehicle, and traffic analysis professionals - both in urban and rural transportation roles - results in a well organized, interdependent system of moving people and goods safely, carefully, and efficiently.

Heavy commercial trucks reach ever-higher levels of safety and efficiency because of their use of technology. Truckers have widely embraced collision avoidance technology because of the tremendous advantage it gives them in knowing when smaller vehicles are hiding in their "blind spots."

Transit time and costs have dropped for the trucker as states have added great sophistication to their safety and regulatory programs, including the efficiency of vehicle inspections.

Trucks seldom stop at weigh stations, and delays at international border crossings are much reduced, thanks to the wide use of transponders to send cargo, operating authority, registration, and fuel tax information automatically to roadside collection devices. Many truckers choose to automatically record transport operating time and driver service hours by installing devices tailored to these needs.

Since the largest of commercial vehicles travel only on limited-access Interstates, weigh-in-motion systems keep tabs of their weights as they travel across borders to their destinations. Increasing efficiencies in commercial transport through information technology have a significant and positive

effect on business development in communities nationwide and around the world.

Is this really possible?

Intelligent transportation systems in use now give us a very real idea of what to expect in the next decade. Already, ITS assists and improves public safety. . .reduces traffic congestion and improves personal mobility. . . . fosters economic development. . .enhances public works and utilities. . . and provides for more efficient management and movement of vehicle fleets.

Regardless, the purpose of intelligent transportation systems remains the same. Intelligent transportation systems are people using information and technology in transportation to save lives, time, and money and improve the quality of life.

Who in your community benefits from intelligent transportation?

Intelligent transportation systems have increased public safety, even improved the business climate, in cities and towns across America:

Greater Public Safety

* The Transit Way at the University of Minnesota is a bus-only route that intersects with other public roads. In 1992, it had an accident rate 30 percent higher than the state average. In 1997, after transportation authorities installed a transit priority signal control system at intersections, there were no accidents on the route.

* In several cities, including Houston, rail grade crossing safety is enhanced through systems that feed information to traffic signal control and emergency vehicle dispatch systems, through sensing devices that warn trains well in advance of obstructions on their tracks. Better rail crossing management can drastically reduce the number of the most deadly type of collision - that of a train and a highway vehicle.

Reduced Traffic Congestion and Improved Air Quality

* In Abilene, Texas, the new computer-coordinated traffic signal system on heavily used roads is credited with cutting delays 37 percent,

increasing travel speed 22 percent and reducing carbon monoxide emissions 12 percent.

* In Lewes, Delaware, a popular beach resort, city officials praised new data collection and traffic management systems with smoothing the flow of traffic when record crowds descended on the town for the Memorial Day weekend this year.

* In Houston, officials estimate the crash response element of a new traffic management system cut the time drivers wasted in backed-up traffic by 500,000 hours a year.

* The Navigator traffic management system in Atlanta saved highway travelers $44.6 million in 1997 by reducing the length of time lanes were blocked from crashes by 23 minutes each.

* Some 86 percent of drivers surveyed in San Antonio, Texas said they had greater confidence in the traffic information they received through that city's new traffic management system over what they once learned only from pre-trip television and radio reports. Many credited the information they learned and the way they learned it as factors in helping them avoid traffic hazards in their commutes.

* In Minneapolis, commuters using a special pager reported learning about incidents more than half the time via the pager, versus 15 percent of the time via radio or TV.

* Also in Minneapolis, volunteers have been providing real-time road information since November to the SmarTraveler information service. Most telephone their travel times and report on stalls, crashes, and road conditions to a central traffic management bureau. Volunteer Dale Schueffner, who signed up out of frustration with daily congestion and a lack of information on his route, said, "when I heard of this service, I thought maybe the commuters who are frustrated on a daily basis can help each other by contributing. It's got a lot of potential. I think it's a great idea, but it just needs a lot more participation."

Better Public Service

* On June 8, an overheight truck's cargo struck a pedestrian bridge over Baltimore's I-695 loop road, knocking the bridge to the pavement and stopping traffic in both directions. The event occurred "on camera" as operators at the statewide traffic management center watched the section of road as part of their regular duties. They responded immediately and reported the incident to appropriate emergency officials, the media, and highway advisory radio stations. Dynamic messaging signs changed accordingly to re-route traffic. Although the tragic event occurred during evening rush hour, authorities reported few delays. The entire bridge was removed and cleaned up in 11.5 hours.

* Winter snows pile so deep on a 17-mile stretch of U.S. 19 near Mankato, Minnesota that state snowplows have often in the past missed the roadbed completely. Newly installed magnetic tape in the highway pavement directs sensor-equipped plows into traffic lanes, helping keep the road clear and traffic moving.

* In Ventura County, California, bus riders can travel seamlessly throughout the county and between transit operators by using the Smartcard system. Riders can be billed or draw from a debit account.

Greater Economic Development

* Electronic commercial vehicle weight and paperwork clearance is serving to cut the time trucks must spend at weigh stations in several states. The wider use of transponders in commercial vehicles could cut the cost of simply verifying truck paperwork at weigh stations by up to $8.6 million a year per state.

* Motor carriers are now developing new fleet equipment rigged with electronic tags and enhanced communications, all designed to help commercial vehicles save time by bypassing weight stations when necessary paperwork and safety checks can be performed as the vehicle travels on the highway. A study of real-time diversion of truckload carriers predicted an additional productivity improvement of 6 percent as a result of the use of these technologies.

* For businesses concerned with just-in-time deliveries, the greater number of these systems will be of increasing commercial significance to communities everywhere. Communities have benefited from resulting "just-in-time" deliveries.

Improved Revenue Collection

* Travelers in Poughkeepsie, N.Y. use the new E-Z Pass system, which allows pass holders to pay tolls without stopping. Commuter Tom Ackerman told The Poughkeepsie *Journal* he once took 40 minutes to make the 11-mile trip from his home to work. Much of the trip was spent waiting in line to pay the toll at the Mid-Hudson Bridge, to cross from Ulster into Dutchess County over the Hudson River.

* On Virginia's Coleman Bridge over the York River, an amazing 80 percent of all users rely on the Smart Tag automated toll system. Smart Tag, which works with all electronic toll systems throughout the state, is so popular a way to speed through tollbooths that new electronic gates on Richmond's Downtown Expressway Boulevard Bridge and on two parkways already had 11,000 subscribers when they opened July 1, according to the state department of transportation.

Real Benefits Beyond the Imagination

Intelligent transportation systems even have significant unintended positive benefits sometimes beyond their intended design.

* A suspect in a Denver convenience store armed robbery thought he had escaped police when he hopped on a city bus in 1995. But by using data sent from the bus driver and global positioning satellite technology, transit officials were able to alert police of the bus' exact location without the suspect's knowledge. Normally used by the agency to track transit vehicles' on-time movement, the system allowed police to surprise the suspect as he alighted at a transit station. He gave police no resistance.

* In Dallas that same year, a fire department ambulance equipped with an automated vehicle locator system was dispatched to a major crash, arriving at the scene in 43 seconds. The patient had suffered chest trauma and might have died in minutes from a lack of air. The dispatched

ambulance was actually out of its jurisdiction, but authorities judged it the closest emergency vehicle to the crash based on its automatic global positioning locator device. The vehicle assigned to the area would not have arrived for five minutes after the dispatch call. Rescuers said they believe the patient survived without complications because of the speed of the ambulance response, made possible by the vehicle's advanced transportation technology equipment.

* In Tempe, Arizona, traffic cameras on Tempe-area freeways are normally used to view traffic flow. But one day, an alert observer in the city's traffic management center zoomed the lenses in on a man slumped over the steering wheel of a car on the shoulder. Dispatchers send aid to the man immediately.

How can public officials make it work?

Putting it all together requires the foresight of community leaders - leaders who recognize that the limitations of their current transportation infrastructure will only magnify as their suburbs, towns, and cities grow. We cannot simply build our way out of congestion.

Local officials, both elected and appointed, are the key decisionmakers who will determine whether intelligent transportation systems will be the boon to their communities in the manner they have become to more than 75 communities in the U.S.

State officials can make sure intelligent transportation systems receive proper consideration in planning program development. This role is important in breaking down the institutional barriers to development of advanced technology.

Public leaders know the critical need to bring their transportation systems to the highest level of operational efficiency and safety. The rapid increase in the number of vehicles on the nation's highways - doubling in some cases - means that traditional traffic safety and management programs must be augmented with real-time information and communications. These improvements are necessary not only for local traffic, but also on the entire 170,000-mile length of the National Highway System.

Public officials with a long view toward the preservation of the quality of life also realize the downside of unmanaged commercial and residential growth outward from cities. ITS systems can help provide the most valuable of qualities-- mobility -- to constituents, without having to add extensive new lanes to their highways or sacrificing precious parkland, greenspace, and farmland to surface transportation.

"The highest rate of return for an investment is when lives are saved. We know our AVL (advanced vehicle locator) and vehicle pre-emption systems have saved lives." - John Nelson, Phoenix (AZ) city councilman

What Public Officials Can Do NOW

As a public official, you can concentrate on four major areas to develop and assure safer and better roads in your community.

***Awareness** -- An awareness program gets the word out on how information technology in transportation can save lives, time, and money. ITS solves everyday problems in the commute to work, in personal business, in transportation for the elderly and disabled and in distribution of goods and services.

As a champion for the benefits of ITS, you can help create momentum for the funding needed to expand the system. A strong awareness program gives ITS manufacturers more exposure of their products' benefits to make their entry into this field profitable for themselves and their customers.

A good awareness program can educate the media, which needs a constant source of new examples to show how ITS saves lives, time, and tax money. And, it can bridge the gap in understanding about ITS even in the transportation communities.

* **Funding** -- The biggest role in putting ITS in place in public transportation systems is played by state and local transportation officials. They must know and show the creativity and flexibility of ITS as a solution to transportation problems.

The U.S. DOT's role is to coordinate deployment that works wherever people travel, through national architecture and standards. Federal law provides several alternative funding sources from mainstream programs that can be used for operations and maintenance. Private investors and operators can provide leverage through participation in public-private partnerships.

Eighty percent of that spent on intelligent transportation will help the consumer and commercial marketplaces. A large part of this will be linked directly to infrastructure investment.

* **Interagency Cooperation** -- ITS can be the common denominator for many jurisdictions. It crosses traditional city and state boundaries and allows coordination among public agencies. Emerging intermodal freight systems make up new and complex constituencies, like seaports and airports, that have invested in technology but have not been part of the ITS community.

* **Skills and Training** -- Future ITS success depends on upgrading the skills and knowledge of current and future transportation professionals. Schools need to offer new courses to keep professionals abreast of advances in state of the art technology.

At the top of any list of ITS development and deployment is the need for cooperative effort and initiative by government officials.

With that in mind, the following document addresses specific stakeholder issues that need to be resolved. This will help realize the full potential to use these systems to save lives, time, and money and improve the quality of life.

Section 3: Stakeholder Actions

This section identifies major stakeholder groups who impact the provision of transportation systems and services. It defines the primary roles, responsibilities, and motivation of each group. It outlines transportation concerns and how ITS can address these needs. Finally, it identifies a set of specific actions for each group, actions desired to ensure that potential community benefits can be realized through the implementation of ITS as part of future transportation systems. It represents a set of comprehensive and coordinated suggested "plans of action" for each stakeholder group.

States – Governance and Operations

Governors and Legislatures
Departments of Transportation, Public Safety, and Regulatory Agencies

Roles, Responsibilities, and Motivations

- Create safe, attractive, and prosperous environment for citizens and businesses.
- Lead, organize, facilitate, and initiate transportation systems and services and ITS infrastructure construction and management projects.
- Regulate commercial vehicle operations.
- Respond to natural disasters and other emergencies.
- Conduct statewide planning.
- Operate and maintain transportation systems and facilities.
- Fund and install ITS at highway-rail grade crossings.

Transportation Needs and Concerns

- Assuring economic viability.
- Reducing crashes and improving safety.
- Reducing congestion and improving mobility.
- Helping local agencies improve traffic monitoring and incident response.
- Improving operational efficiency of transportation systems and customer service and satisfaction.
- Enabling improved transportation access to the economically. disadvantaged as well as physical access to those with disabilities
- Maintaining ITS infrastructure.

How ITS Can Help

- Provide technology and information tools to assist with mobility and congestion through transportation management (closed-circuit television for monitoring, area-wide traffic information gathering and traveler information dissemination, automated incident response, models for traffic flow management).
- Provide technology and information tools to assist with public transportation access (systems that provide real-time transit arrival times, traffic signal preemption for transit to ensure more reliable travel time, automated stop/station announcements).
- Provide technology and tools to improve efficiency of internal operations and customer services (automated permitting, inspections, and licensing; electronic payment mechanisms for tolls and transit; facility records systems).

- Provide opportunities and models for coordination and cooperation among jurisdictions.
- Provide the national ITS architecture and associated standards for cost effective deployment of interoperable ITS infrastructure.
- Seamlessly link all modes of travel to provide real-time information to users of transportation systems.

Specific Actions

Awareness and Outreach

- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.

Benefits

- Document and convey the benefits and costs of ITS to responsible implementation agencies.
- Consider ITS as an alternative or complement to traditional transportation solutions.
- Establish performance measures and decision support systems.
- Actively participate with U.S. DOT in tests designed to demonstrate the benefits of the ITS infrastructure.

Funding for ITS Deployment

- Support model deployments in state to focus resources and demonstrate benefits.
- Ensure that there is a process in place that will allow federal and local transportation funds to be used for intelligent infrastructure improvement and general ITS deployment.
- Secure innovative revenue opportunities at state and local levels including partnerships with private sector participants.
- Seek legal and institutional authority to partner with the private sector to support ITS deployments.

Interagency Coordination/Cooperation

- Establish an institutional framework of relationships and a regional cooperative process based on the National ITS Architecture upon which additional ITS applications will be built.
- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with city/county governments, MPOs, regional ITS institutions, transit agencies, and toll authorities).
- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new “regional institutions” through co-locating facilities or through sharing information.

- Orchestrate communication among related agencies and information systems (licensing, enforcement, traffic records, and planning).
- Share data freely and coordinate projects closely to eliminate redundancy.
- Promote cooperation with adjoining states.
- Ensure that ITS solutions are mainstreamed into the planning and programming processes.
- Ensure that multimodal and interjurisdictional ITS technology deployment provides for the special needs of physically challenged individuals.
- Establish and maintain close working relationships with the emergency response community by proactively reaching out to formally recognize and solicit needs, issues, and recommendations.
- Link modes of travel with improved information to users.
- Promote use of relevant ITS technologies to improve transit system coordination and enable "smart growth" such as transit-oriented communities.

Skills and Training

- Assess changes needed in employee skill mix.
- Undertake employee recruitment and training programs.
- Partner with universities to promote professional training, continuing education, and distance learning programs.
- Ensure that the necessary staff is available to support processes to develop, operate, and maintain ITS systems.
- Improve and enhance existing courses based on lessons learned from deployment.

Regional Framework for Integration

- Develop a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

Standards and Architecture

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

- Seek global harmonization of such standards with input from the general public (with OEMs and suppliers, SDOs and U.S. DOT).

Public-Private Partnerships

- Formalize and expand roles in promoting public-private partnerships and remove barriers to private investment.
- Invite the private sector to develop projects paid for with private investments and repaid with tolls or user fees.
- Consider innovative private investment-driven approaches that include provision of basic facilities and related operational services and outsourcing.

Procurement

- Review and modify statutory and institutional provisions that constrain effective procurement.
- Consider cooperative or joint procurements with agencies with more flexible procurement procedures.
- Develop procurement guidelines that will facilitate technology acquisitions.
- Train staff in effective technology acquisition.
- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.
- Contract for technical skills that can not be hired.

Business Models/Product Development

- Make traffic and transportation related data available to private industry.
- Cooperatively conduct pre-competitive research to speed the introduction of technologies that provide convenience and safety enhancements for vehicle operators and travelers.
- Support business models that provide for consistency throughout a region or state.

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.
- Require establishment of information use and privacy policies.

Archiving and Value of Data

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.
- Establish cooperative archived data capabilities and use them to support transportation planning and analysis.

Research, Development, and Testing

- Establish and encourage development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Pursue pooled fund research studies to maximize scarce resources and maintain an open, cooperative dialogue.

Vehicle/Infrastructure Interface

- Work with vehicle manufacturers on the requirements for interfacing with the infrastructure and be prepared to deploy required infrastructure and conduct evaluations of implemented systems.
- Work toward the establishment of extensions to the National ITS Architecture and open standards for advanced vehicle control and safety systems that are integrated with the infrastructure.

Supporting National Organizations

- American Association of Motor Vehicle Administrators (AAMVA) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents, support national ITS deployment.
- American Association of State Highway and Transportation Officials (AASHTO) – Facilitate development of standards, communicate benefits to constituents, develop and provide training, develop model procurement procedures.
- American Auto Association (AAA) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents, support national ITS deployment.
- American Legislative Exchange Council (ALEC) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents, support national ITS deployment.
- American Public Works Association (APWA) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents, support national ITS deployment.
- Institute of Transportation Engineers (ITE) – Facilitate development of standards, communicate benefits to constituents, develop and provide training.
- National Conference of State Legislators (NCSL) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents, support national ITS deployment.
- National Governors' Association (NGA) – Raise awareness of ITS opportunities among membership, support national ITS deployment, address intra- and inter-state institutional barriers which delay integration of ITS systems.

City/County - Governance and Operations

Executive and Legislative Branches of General Government
Special Purpose Authorities, Boards, and Commissions

Roles, Responsibilities, and Motivations

- Create a safe, attractive, prosperous environment for citizens and businesses.
- Assure neighborhood and community livability.
- Manage local and regional growth and economic development.
- Provide enforcement, traffic management, traveler information, incident response, and emergency medical services.
- Operate transit systems.

Transportation Needs and Concerns

- Reducing traffic congestion.
- Increasing public safety (curtailing road rage, encouraging adherence to traffic laws, providing fast and effective emergency response, enforcing traffic laws).
- Responding to growth in demand that is not matched by growth in available funds or right-of-way for infrastructure.
- Reconciling competing needs of diverse constituencies.

How ITS Can Help

- Provide services and policy models for reducing travel and increasing productivity of transportation systems.
- Enhance integration and interoperability between transportation management and public safety agencies.
- Provide tools for enforcement, incident response, and security.
- Maximize use of public services and facilities such as public transit (improved performance and passenger information) and parking (improved management and fee collection).
- Provide tools and technologies to support planning and congestion/air quality monitoring.
- Provide information tools to serve all constituencies, improve access to jobs, provide universal access to services, etc.
- Provide systems that more effectively manage traffic and reduce congestion.
- Enable cost effective ITS planning and deployment using the national ITS architecture and standards.

Specific Actions

Awareness and Public Education

- Understand the strategies, tools, approaches, benefits, and funding opportunities represented by ITS for addressing local needs and concerns, especially for system management and operations.
- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.
- Build the political consensus for acceptance and promotion of ITS.

Benefits

- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.
- Actively participate with federal and state DOTs in tests designed to demonstrate the benefits of the ITS infrastructure.

Funding

- Consider ITS improvements and opportunities along with other transportation projects as federal and local transportation funds are allocated.
- Ensure that resources are programmed and provided to operate and maintain ITS and related systems.
- Use federal funds for system and program development.
- Seek and deploy innovative funding mechanisms that leverage public funding for implementation of ITS technology including the maximum use of public-private partnerships.
- Seek legal and institutional authority to partner with the private sector to support ITS deployments.

Interagency Coordination/Cooperation

- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with state governments, MPOs, regional ITS institutions, transit agencies, and toll authorities).
- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new “regional institutions” through co-locating facilities or through sharing information.
- Partner with other agencies, both within and across jurisdictions, to share costs and multiply benefits.
- Ensure that the public - particularly low-income and minority residents, the disabled, and senior citizens - participate in decision making so that their unique concerns are acknowledged and addressed.

- Facilitate the use of multimodal transfer stations (such as park-and-ride facilities adjacent to freeway interchanges) through the application of ITS technologies.

Skills and Training

- Assess changes needed in employee skill mix.
- Undertake employee recruitment and training programs.
- Partner with universities to promote professional training, continuing education, and distance learning programs.

Regional Framework for Integration

- Participate with metropolitan planning organizations (MPOs) to make sure local needs are addressed in a regional ITS framework based on the National ITS Architecture and included in regional plans and improvement programs.
- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

Standards and Architecture

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

Public-Private Partnerships

- Make transportation network monitoring and measurement information collected by public agencies available in real-time, over open standard interfaces, to stimulate innovative ITS information products by a competitive private sector.
- Partner with private sector participants to deploy services earlier and spread costs.
- Encourage innovative proposals from the private sector through use of broad solicitations.
- Formalize and expand roles in promoting public-private partnerships and remove barriers to private investment.
- Invite the private sector to develop new facilities paid for with private investments and repaid with tolls or user fees.

- Consider innovative private investment-driven approaches that include provision of basic facilities and related operational services and outsourcing.

Procurement

- Review and revise procurement procedures to facilitate ITS deployment.
- Consider cooperative or joint procurements with agencies with more flexible procurement procedures.
- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.
- Contract for technical skills that can not be hired.

Business Models/Product Development

- Make traffic and transportation related data available to private industry.
- Support business models that provide for consistency throughout a region or state.

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Archiving and Value of Data

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.
- Establish cooperative archived data capabilities and use them to support transportation planning and analysis.

Research, Development, and Testing

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Vehicle/Infrastructure Interface

- Participate in definition of the system that best meets local needs.
- Be prepared to deploy required infrastructure and conduct evaluations.

Supporting National Organizations

- American Association of People with Disabilities (AAPD) – Represent voices of transportation users with special needs (both drivers and non-drivers).
- American Association of Retired People (AARP) – Represent voices of senior population including both drivers and non-drivers.
- American Automobile Association (AAA) – Represent the driver community.

- Association for Commuter Transportation (ACT) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents.
- Institute of Transportation Engineers (ITE) – Facilitate development of standards, communicate benefits to constituents, develop and provide training.
- International City/County Management Association – Raise awareness of ITS opportunities among membership, communicate benefits to constituents.
- Local Chamber of Commerce– Raise awareness of ITS opportunities among membership, communicate benefits to constituents.
- National Association of City Transportation Officials (NACTO)– Coordinate development plans for major cities, incorporate ITS elements as part of implementation programs and communicate implementation experience with other cities.
- National Association of County Officials (NACO) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents.
- National Association of Towns & Townships (NATaT) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents.
- National League of Cities (NLC) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents.
- Public Technology Inc (PTI) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents, develop guidelines to facilitate ITS implementation.
- U.S. Conference of Mayors (USCM) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents.

Rural Communities

Levels of government with jurisdictions and responsibilities for areas with less than 50,000 residents (states, counties, towns, townships)

Roles, Responsibilities, and Motivations

- Provide mobility and services to dispersed population traveling great distances.
- Equitably support broad and varied needs: individuals, local industry, agriculture, and tourism.

Transportation Needs and Concerns

- Less regular, less intensively maintained roadway infrastructure.
- Higher frequency of accidents per vehicle mile traveled and more severe accidents than found in urban areas.
- Greater difficulty in detecting crashes and incidents, longer distances and times to respond.
- Few traveler information services for recreational travelers and commercial operators.
- Cost of providing transportation services is a very high portion of a township's budget.
- Limited or non-existent public transportation services.
- Many rural attractions and activity centers, such as National parks, are choking from too many vehicles on limited roadways.
- Limited ability to access transportation related technical assistance and information.
- Disproportionate number of accidents at highway-rail intersections.
- More "hostile" and unpredictable travel environment.
- Higher speed on irregular road alignments and surfaces.
- Wild animal hazards.

How ITS Can Help

- Disseminate pre-trip and en-route travel information on wide-area basis.
- Provide information services such as electronic yellow pages, road and weather information, and routing services at highly-trafficked locations (hotels, rest areas, modal transfer stations, etc.).
- Provide site-specific safety and weather advisories and warnings.
- Enable advanced driver assistance systems to reduce crashes on rural roads and summon assistance quickly and accurately when incidents occur.
- Support long distance transit and paratransit services through dynamic dispatch and advanced communication.

Specific Actions

Awareness and Outreach

- Assure that rural needs are well communicated to regional, state, and national decisionmakers and funding authorities.
- Disseminate information on opportunities and benefits to all stakeholders.

Benefits

- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.

Funding for ITS Deployment

- Consider ITS improvements and opportunities along with other transportation projects as federal and local transportation funds are allocated.
- Seek and deploy innovative funding mechanisms that leverage public funding for implementation of ITS technology including the maximum use of public-private partnerships.

Interagency Coordination/Cooperation

- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new "regional institutions" through co-locating facilities or through sharing information.
- Initiate pilot projects that address immediate needs and opportunities and which foster institutional cooperation of multiple stakeholders.
- Encourage programs covering larger, interconnected regions that can provide better services at lower cost than localized programs (state governments).

Skills and Training

- Assess changes needed in employee skill mix.
- Undertake employee training programs.
- Ensure that the necessary staff is available to support processes to develop, operate, and maintain ITS systems.
- Partner with universities to promote professional training, continuing education, and distance learning programs.

Regional Framework for Integration

- Develop a regional vision for long term ITS decision making.
- Participate in developing a regional ITS framework derived from the National ITS architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).

- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

Standards and Architecture

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

Public-Private Partnerships

- Consider innovative private investment-driven approaches that include provision of basic facilities and related operational services and outsourcing.

Business Models/Product Development

- Support business models that provide for consistency throughout a region or state.

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Research, Development, and Testing

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Supporting National Organizations

- National Association of Counties (NACO) – Promote awareness of ITS opportunities among membership, communicate benefits to constituents.
- National Association of County Engineers (NACE) – Promote awareness of ITS opportunities among membership, communicate benefits to constituents.
- National Association of Towns and Townships (NATaT) – Promote awareness of ITS opportunities among membership, communicate benefits to constituents.

Metropolitan Planning Organizations

Policy Boards of State, Regional, and Local Elected/Appointed Officials
Transportation Planning Agencies

Roles, Responsibilities, and Motivations

- Conduct regional planning, coordination, and information sharing and consensus-based transportation decisionmaking.
- Build consensus for establishing and setting priorities for the use of federal funds for constituent members.
- Approve regional Transportation Improvement Programs (TIPs) and Long Range Plans (LRPs).
- Develop systems management component of overall transportation plan.

Transportation Needs and Concerns

- Improving region-wide mobility, economic viability and quality of life.
- Planning for multi-modal transportation system improvements for roadways, transitways, walkways, bike lanes, railroads, and airports.
- Addressing fiscal constraints.
- Maintaining and improving air quality.
- Planning and promoting a wide range of integrated transportation alternatives such as ride sharing and demand management programs.
- Helping constituent members meet their transportation related responsibilities in a cost-effective, equitable manner by coordinating efforts and facilitating innovation.
- Broadening outreach programs to include public safety specialists, commercial vehicle operators, telecommunications specialists, and other non-traditional planning participants.

How ITS Can Help

- Expand effective capacity without requiring expansion of physical infrastructure.
- Integrate operational components of transportation systems into an interconnected network; monitor system performance; and track effectiveness of transportation investment (providing a sound basis for further investment).
- Enable demand management, congestion mitigation, and air quality improvements.

Specific Actions

Awareness and Outreach

- Understand the strategies, tools, approaches, benefits, and funding opportunities represented by ITS for addressing local needs and concerns, especially for system management and operations.
- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.

Benefits

- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.
- Raise awareness of the capabilities of ITS technologies and encourage public-sector officials to embrace and build locally applied ITS infrastructure.

Funding for ITS Deployment

- Consider ITS improvements and opportunities along with other transportation projects as federal and local transportation funds are allocated.
- Ensure effective planning and use of all federal programs and other public and private funding sources.
- Seek and deploy innovative funding mechanisms that leverage federal funding for implementation of ITS technology including the maximum use of public-private partnerships.
- Fund model deployments that focus resources and funds to demonstrate the benefits of ITS.

Interagency Coordination/Cooperation

- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with state governments, city/county governments, regional ITS institutions, transit agencies, and toll authorities).
- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new “regional institutions” through co-locating facilities or through sharing information.
- Convene discussions that lead to interagency cooperation and the creation of new regional institutions, where needed, for operation and management of ITS programs.
- Promote the implementation and ongoing administration of traffic incident management programs.
- Develop and incorporate ITS elements in Long Range Transportation Plans and Transportation Improvement Programs (TIPs).

- Promote and facilitate consideration of ITS plans, planning studies, and project design.

Skills and Training

- Train staff to understand ITS systems and benefits and the use of analytical tools to evaluate ITS within the planning process.

Regional Framework for Integration

- Develop a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Incorporate customer preferences/requirements into the ITS framework.
- Encourage use of the regional ITS framework.

Standards and Architecture

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

Public-Private Partnerships

- Promote public-private partnerships and remove barriers to private investment.
- Provide forums and work regionally to identify and bring together private and public partners to deploy ITS.
- Assess opportunities for innovative financing techniques and public-private partnerships to pay for ITS infrastructure.

Business Models/Product Development

- Make transportation related data available to private industry.
- Support business models that provide for consistency throughout a region or state.

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Archiving and Value of Data

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.
- Provide leadership in obtaining and archiving transportation data.

Research, Development, and Testing

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Support the development of ITS analytical tools including ITS evaluation modeling capabilities within the existing planning framework.

Supporting National Organizations

- American Planning Association (APA) – Raise awareness of ITS opportunities among membership, provide training and tools to ensure that ITS is considered in the planning process.
- Association of Metropolitan Planning Organizations (AMPO) – Communicate benefits to constituents, develop guidance documents to ensure that ITS is considered in the planning process.

Regional ITS Institutions

Coalitions of multiple government agencies and private sector parties for ITS development in a region or corridor (e.g., TransCom, I-95 Corridor Coalition, TranStar, HELP, Inc.)

Roles, Responsibilities, and Motivations

- Build, operate, and maintain ITS facilities.
- Facilitate interagency cooperation by serving as a forum for multiple agencies to work together toward a common goal.
- Engage all relevant public and private sector entities in the development of a regional ITS program.
- Promote ITS in the community.
- Utilize innovative procurement and funding mechanisms.

Transportation Needs and Concerns

- Solving multi-jurisdictional transportation related problems.
- Integrating and building upon existing ITS programs.
- Creating and promoting a regional framework for ITS coordination that conforms to the National ITS Architecture.
- Building interagency coalitions and partnerships to provide superior public services.

How ITS Can Help

- Provide a means for improving transportation safety and reducing congestion affecting multiple jurisdictions.
- Provide a focus and mechanism to bring together many public and private partners.

Specific Actions

Awareness and Outreach

- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.
- Build the political consensus for acceptance and promotion of ITS.

Benefits

- Actively participate with federal and state DOTs in tests designed to demonstrate the benefits of the ITS infrastructure.

Funding for ITS Deployment

- Seek and deploy innovative funding mechanisms that leverage public funding for implementation of ITS technology including the maximum use of public-private partnerships.

Interagency Coordination/Cooperation

- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with state governments, city/county governments, MPOs, transit agencies, and toll authorities).
- Identify and deploy specific projects, with realistic implementation schedules, that meet local needs.
- Coordinate and build linkages (institutional, physical, and electronic) to become part of the larger transportation community and information industry framework.

Regional Framework for Integration

- Develop a regional vision for long term ITS decision making.
- Develop a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS deployment (with appropriate public and private sector participants).

Standards and Architecture

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

Public-Private Partnerships

- Create legal and institutional mechanisms to partner with the private sector to support ITS deployments.

Procurement

- Provide leadership in developing innovative procurement procedures to facilitate ITS deployment.

Business Models/Product Development

- Make traffic and transportation related data available to private industry.
- Support business models that provide for consistency throughout a region or state.

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Archiving and Value of Data

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.
- Make effective use of archived data.

Research, Development, and Testing

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Transit Agencies

Policy Boards and Managers of Transit Agencies

Roles, Responsibilities, and Motivations

- Efficiently plan and manage integrated public transportation resources and services.
- Be a leader in seamless, regional, multi-modal transportation planning and implementation.
- Provide convenient alternatives to single-occupancy vehicles.
- Improve air quality.

Transportation Needs and Concerns

- Creating transit systems that flexibly adapt to changing demographics and travel demands.
- Meeting more demanding customer expectations by enhancing and improving transit service.
- Meeting social needs (i.e. needs of transit dependent) and environmental needs.
- Maximizing cost effective, safe, and secure transit operations.

How ITS Can Help

- Add value by improving planning, resource allocation, fleet management, capacity, safety, and daily decisionmaking through better information.
- Improve operation of intermodal regional transportation system by coordinating schedules, routes, signal systems, and congestion. information and by linking adjourning and cooperating transit systems.
- Provide seamless multi-modal transportation and purchase of goods and service through use of electronic payment systems.
- Deliver responsive information to travelers at home, work, transit station, and transit stop.

Specific Actions

<u>Awareness and Public Education</u>

- Identify, educate, and involve the full range of stakeholders on ITS services and benefits and secure commitments that will support transit.
- Create ways to cultivate champions and leaders.
- Educate staffs to become familiar with the ITS opportunities.

<u>Benefits</u>

- Evaluate completed projects and publish results explaining how specific ITS tools enhance or provide more cost-effective service or decisionmaking.

- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.
- Actively participate with federal and state DOTs in tests designed to demonstrate the benefits of the ITS infrastructure.

Funding

- Identify local, regional, state, federal and private funding sources.

Interagency Coordination/Cooperation

- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with state governments, city/county governments, MPOs, regional ITS institutions, and toll authorities).
- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new "regional institutions" through co-locating facilities or through sharing information.
- Identify and deploy specific projects, with realistic implementation schedules, that meet local needs.
- Coordinate and build linkages (institutional, physical, and electronic) to become part of the larger transportation community and information industry framework.

Skills and Training

- Assess changes needed in employee skill mix.
- Undertake employee training and continuing education programs.

Regional Framework for Integration

- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).

Standards and Architecture

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

Procurement

- Review and revise procurement practices to facilitate ITS deployment.
- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.

Business Models/Product Development

- Make transit data available to private industry.

- Support business models that provide for consistency throughout a region or state.

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Archiving and Value of Data

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.

Research, Development, and Testing

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Supporting National Organizations

- American Public Transit Association (APTA) – Dissemination of information on benefits and opportunities, provide training, provide procurement policy guidance.
- Community Transportation Association of America (CTAA) – Raise awareness of ITS opportunities among membership, communicate benefits to constituents, promote interagency, and intermodal cooperation and integration.
- Conference of Minority Transportation Officials (COMTO) – Promote awareness of ITS opportunities among membership, communicate benefits to constituents.

Toll Authorities/Agencies

State and Regional Toll Authorities
Private Toll Operators

Roles, Responsibilities, and Motivations

- Build, operate, and maintain toll facilities.
- Issue revenue anticipation bonds to fund the construction and operation of toll facilities.
- Provide a superior level of service compared to non-toll alternatives.
- Process electronic payments in a timely and efficient manner.

Transportation Needs and Concerns

- Providing a high level of service to customers through the latest technology and efficient operation.
- Achieving sufficient rate of return for private operations.
- Timely payment and retirement of debt obligations.

How ITS Can Help

- Reduce congestion and improve customer service at lower cost.
- Increase reliability and accuracy of collections through electronic toll collection.
- Provide the foundation for flexible, time-dependent and demand-dependent payments and reduction or elimination of toll plazas through electronic toll collection.
- Assist incident detection and traffic management through monitoring techniques based on toll tag detection.
- Accelerate retirement of debt, allowing more money for maintenance.

Specific Actions

Awareness and Outreach

- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.

Benefits

- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.
- Participate with federal and state DOTs in tests designed to demonstrate the benefits of the ITS infrastructure.

Funding for ITS Deployment

- Show creativity and flexibility in partnering for ITS deployment projects.

- Seek and deploy innovative funding mechanisms that leverage public funding for implementation of ITS technology including the maximum use of public-private partnerships.
- Seek legal and institutional authority to partner with the private sector to support ITS deployments.

Interagency Coordination/Cooperation

- Collaboratively identify opportunities where information sharing and using interoperable toll tags will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with state governments, city/county governments, MPOs, regional ITS institutions, and transit agencies).
- Make sure that needs are recognized and accommodated and that operational rules and concepts can work effectively with related transportation and financial industries.

Skills and Training

- Assess changes needed in employee skill mix.
- Undertake employee training and continuing education programs.

Regional Framework for Integration

- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Work with other stakeholders to overcome barriers to establish open standards based interfaces for toll tags and toll administration reciprocity following the National ITS Architecture.

Standards and Architecture

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.
- Develop transitional technical and institutional strategies to accept third-party transponders enabling national interoperability.

Public-Private Partnerships

- Develop formal relationships with financial companies to augment existing electronic payment systems applications.
- Work individually and nationally with the motor carrier industry to enhance the motor carriers' electronic linkages with tolled facilities.

Procurement

- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.

Business Models/Product Development

- Support business models that provide for consistency throughout a region or state.
- Better understand the new ways of doing business that ITS makes possible, such as value pricing designed to mitigate congestion.

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.
- Address privacy concerns by favoring deployment of transponder systems that do not require the submittal of personal identity information by supporting debits through anonymous (not identity specific) "smart cards."

Archiving and Value of Data

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.

Research, Development, and Testing

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Supporting National Organizations

- International Bridge, Toll and Tunnel Association (IBTTA) – Communicate benefits to constituents, identify user services to enhance satisfaction, promote benefits.

Emergency Management Service Providers

Police, Fire, Rescue, and Wreckers Services

Roles, Responsibilities, and Motivations

- Respond swiftly and effectively to emergency situations and transportation related incidents.
- Establish and maintain processes and procedures for handling incidents.
- Develop guidance to enhance safety.

Transportation Needs and Concerns

- Managing the incident scene effectively.
- Communications interoperability among responding agencies is hampered by dissimilar communications infrastructure and multiple jurisdictional systems.
- Acquiring information on location and nature of the incident in the most timely and descriptive way.
- Mobilizing and routing response services effectively.
- Anticipating nature and extent of incidents as a reflection, for example of weather forecasts.

How ITS Can Help

- Improve quality of emergency response by coordinating emergency responders and enhancing capabilities for selecting, dispatching, and routing appropriate response units.
- Providing updated status as incidents unfold and coordinating emergency responders.
- Expand cross-functional cooperation among public safety, emergency management, and transportation management agencies and reduce incident response and clearance times across jurisdictional boundaries through the efficient sharing of information and facilities in traffic incident management programs.
- Reduce response time by providing direct connections between vehicles and emergency response organizations through enhanced 911 systems that automatically locate the cell phone from which a call is made or through vehicle systems that automatically send a message when an incident occurs.
- Minimize response time through traffic management capabilities such as creating green waves of traffic signals for emergency vehicles.
- Utilize mobile public safety and emergency service resources more effectively and reduce incident response times using automated vehicle location (AVL) technology.

- Improve the effectiveness of incident response by determining the nature and severity of an incident with real-time video images which can be shared between transportation management and public safety agencies in office, field, and mobile settings.
- Assist first responders to an incident to get information needed to safely deal with hazardous materials through enhanced communication and improved incident detection capabilities.
- Improve the speed and quality of emergency medical treatment before and after reaching the hospital through real-time two-way communications and video images between dispatched medical crews and a trauma center.
- Automate the flow of information among various public safety agencies and between public safety and transportation management agencies while safeguarding the value of commercial or proprietary information with enhanced data and information sharing capabilities, including interagency computer aided dispatch (InterCAD).
- Enhance interjurisdictional communications and operational coordination through more efficient regional radio and other wireless communications capabilities.

Specific Actions

Awareness and Outreach

- Educate the public on ITS availability and capability of response agencies.
- Communicate ITS use and effectiveness during and subsequent to major incidents.

Funding

- Identify and capture potential sources of funding to support integrated communications and information sharing.

Interagency Coordination/Cooperation

- Work closely with other agencies involved in responding to transportation incidents and emergencies to determine roles, responsibilities, and procedures before an emergency occurs.
- Establish a framework for interjurisdictional cooperation and minimize jurisdictional conflicts through training, education, and cooperation of all agencies.
- Participate nationally toward the creation of a seamless, consistent capability for incident detection and response.
- Aggressively promote local and national partnerships between public safety and transportation organizations and agencies.

- Work closely with Federal Emergency Management agency and ITS state partners to coordinate major emergency incidents such fires and storms.

Regional Framework for Integration

- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

Standards and Architecture

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.
- Standardize protocols between incident management and emergency responders.

Business Models/Product Development

- Support business models that provide for consistency throughout a region or state.
- Work with vendors to improve reliability and effectiveness of automatic incident detection technology.
- Work with vendors to ensure that data can be received, used, and sent by public service answering points (PSAPs).

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Supporting National Associations

- Association of Chief Of Police (ACOP) – Communicate benefits to constituents, identify user services to enhance satisfaction and promote benefits.
- Association of Public Safety Communications Officials International (APCO) – Promote awareness to members, supporting governmental agencies and members which will facilitate the integration of ITS technologies with public safety communications systems.
- Communications for Coordinated Assistance and Response to Emergencies (ComCARE Alliance) - Communicate benefits to

constituents, identify user services to enhance satisfaction and promote benefits, support national ITS deployment.

- International Association of Chiefs of Police (IACP) – Communicate benefits to constituents, identify user services to enhance satisfaction and promote benefits.
- National Fire Protection Association (NFPA) – Communicate benefits to constituents, identify user services to enhance satisfaction and promote benefits.
- National Volunteer Fire Council (NVFC) – Communicate benefits to constituents, identify user services to enhance satisfaction and promote benefits.

Commercial Vehicle Regulators

State Departments of Transportation, Motor Vehicles, State, Revenue, and Public Safety
Public Utility or Public Commerce Commissions State Police

Roles, Responsibilities, and Motivations

- Ensure highway safety.
- Ensure compliance with regulations regarding safety, credentials, size, cargo, and weight.
- Preserve the public highway and transportation infrastructure.
- Collect highway taxes and license fees.

Transportation Needs and Concerns

- Reducing the number of crashes involving commercial vehicles and other vehicles.
- Supporting national, local, regional and international trade and economic growth.
- Providing for freight safety, mobility, and efficiency through the collection and investment of highway taxes and license fees for the construction and maintenance of roadway infrastructure.
- Streamlining and uniformity of compliance and enforcement activities.
- Increasing efficiency and effectiveness of roadside enforcement personnel.
- Reducing driver stress and fatigue.
- Improving customer service.
- Reducing administrative and operating costs and handling a growing number of CVO transactions under constraints on staff size.

How ITS Can Help

- Reduce the administrative cost of administering CVO registration, permitting, and fuel tax programs through electronic credentialing systems.
- Facilitate public-private relationships for shared responsibility in motor carrier compliance.
- Facilitate process re-engineering within and between jurisdictions.
- Enable states to track and share information on carrier safety records and credentials status, allowing roadside personnel to focus on higher-risk carriers, vehicles, or drivers through safety information exchange systems.
- Increase the efficiency of fixed weigh stations, and facilitate mobile enforcement with electronic screening systems.

- Coordinate safety management across states.
- Enforce safety regulations through dockside activities such as denying registration to unsafe carriers.

Specific Actions

Awareness and Outreach

- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.
- Build the political consensus for acceptance and promotion of ITS.

Funding for ITS Deployment

- Show creativity and flexibility in partnering for ITS deployment projects.
- Seek legal and institutional authority to partner with the private sector to support ITS deployments.

Interagency Coordination/Cooperation

- Work nationally toward an integrated, seamless network of state information systems, linked to local multi-state or national databases.
- Work cooperatively to develop agreements regarding responsibilities and funding.
- Work toward statutory and regulatory changes to support electronic issuance of credentials and electronic payment of fees and taxes.
- Facilitate or serve as catalyst for effective intermodal freight networks.

Skills and Training

- Lead in increasing staff expertise through training or hiring, and designate full-time CVO project and technical managers.
- Promote professional training and continuing education programs.

Public-Private Partnerships

- Recruit carriers to participate in programs.

Business Models/Product Development

- Reengineer credentials business processes and safety management strategies to take advantage of new technologies.

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Archiving and Value of Data

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.
- Make effective use of archived data to assist in achievement of agency missions.

Research, Development, and Testing

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Supporting National Associations

- American Association of Motor Vehicle Administrators (AAMVA) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- Canada Commercial Motor Transport Associations (CCMTA) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- Commercial Vehicle Safety Alliance (CVSA) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- International Association Chiefs Of Police (IACP) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- Secretaria De Comunicaciones y Transportes (SCT) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- Transport Canada - Educate members on benefits, promote deployment activities, support public-private dialogues.

Parking Operators

Municipal, Campus, Airport, and Hospital Parking Agencies
Parking Authorities
Commercial Parking Management Service Providers

Roles, Responsibilities, and Motivations

- Plan, establish, and control on-street and off-street parking.
- Build, operate, and maintain parking facilities.
- Provide contracted parking services for facility owner.

Transportation Needs and Concerns

- Providing a high level of service to customers while meeting more demanding customer expectations.
- Operating within the budgetary constraints imposed by governing municipalities, universities/colleges, airports, or hospitals.
- Timely payment and retirement of debt obligations.
- Achieving an appropriate cost/benefit return for public operations.
- Achieving a sufficient rate of return for private operations.

How ITS can Help

- Improve customer service and facilitate pricing adjustments.
- Enhance management of facilities and inventory through electronic payment systems.
- Increase reliability, accuracy, and security of collections with electronic payment systems.
- Guide patrons to facilities that have available parking spaces through the use of transponders and smart cards or other identification devices in conjunction with traveler information systems.
- Promote increased use of park-and-ride facilities by combining parking fee and transit fare collection services via transponders and/or smart cards.
- Promote increased use of park-and-ride facilities by providing transit vehicle estimated time of arrival, pick up point, and seat reservations.
- Assist enforcement of dedicated HOV parking policies and employee trip reduction programs using smart cards containing biometric identification information either directly or through transponders to verify the number of occupants in a vehicle.

Specific Actions

Awareness and Outreach

- Elevate the visibility of ITS in the industry and of the industry within the ITS community.

Benefits

- Promote the benefits of ITS to the industry.

Interagency Coordination/Cooperation

- Build institutional and technological linkages to other regional transportation organizations.

Skills and Training

- Establish greater industry-based expertise on the uses of ITS.

Regional Framework for Integration

- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).

Standards and Architecture

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.
- Ensure inclusion of parking applications in the National ITS Architecture.

Public-Private Partnerships

- Develop formal relationships with financial institutions to augment existing electronic payment system applications.

Procurement

- Update procurement practices to support industry-specific technology acquisitions.

Business Models/Product Development

- Support business models that provide for consistency of electronic payment systems throughout a region or state.

Supporting National Organizations

- International Parking Institute (IPI) - Promote benefits, promote interagency and intermodal integration, identify opportunities, provide training, and provide procurement guidance.
- National Parking Association (NPA) - Raise awareness of ITS developments and promote opportunities for customer service benefits and improved profitability.

Commercial Vehicle Operators (CVO)

For-Hire Trucking Companies
Private Trucking Fleets, Owner-Operators, Shippers
Motor Coach Operators

Roles, Responsibilities, and Motivations

- Primary role in moving freight and passengers locally, regionally, nationally and internationally.
- Provide service to customers.
- Increase market share and profitability.

Transportation Needs and Concerns

- Meeting customer demands for reliable, on-time service.
- Reducing operating costs, including administrative and regulatory costs.
- Ensuring safety of drivers, vehicles, cargo and general traveling public
- Minimizing damage to infrastructure.
- Operating within a reliable and responsive transportation infrastructure.

How ITS Can Help

- Facilitate public-private partnerships for leveraging technology investments and deployment.
- Increase productivity by allowing carriers to track vehicles and shipments and optimize routings and fleet utilization through use of fleet management systems and identification technologies.
- Automate driver record keeping, monitor mechanical performance, and provide navigational and other support to the driver and dispatcher with on-board computers.
- Improve traffic management and real-time traffic information to enable motor carriers to avoid congestion and meet delivery windows.
- Coordinate traffic management systems at multimodal terminals with ship/barge/train arrival/departure schedules to enable rapid influx/outflux of freight-carrying trucks.
- Reduce administrative costs through electronic credentialing systems.
- Reduce the time and administrative cost associated with the payment of tolls, taxes, fees and other commercial services through electronic payment systems.
- Reduce the time that carriers spend in roadside weight or safety inspections and enable carriers with good safety records to bypass many inspections through use of electronic screening systems.
- Provide specific weather information in support of decision making.

- Provide information to emergency responders by establishing and maintaining databases, electronic linkages, training, and emergency procedures that speed vital information to on-scene first responders and incident commanders.
- Provide opportunities for better management of fleet safety performance by linking on-board information services to driver assistance systems.
- Improve safety through collision warning and avoidance systems.
- Optimize load matching and equipment use with internet applications.

Specific Actions

Awareness and Outreach

- Promote ITS products and services, particularly those that advance integration and interoperability.
- Leverage the value of carrier internal systems by linking to intermodal, traveler information, and credentials administration systems.
- Actively participate in electronic toll processing systems.

Benefits

- Cooperate with government to facilitate the timely, objective evaluation of new systems and products.

Funding for ITS Deployment

- Encourage public sector investment that will benefit CVO by participating in public sector deployment activities, advocating funding for state and regional ITS/CVO programs, and supporting efforts to develop interoperability agreements for state and regional ITS/CVO programs.

Standards and Architecture

- Actively participate in the standards development process.
- Work with standards community on transponder interoperability.
- Work with the U.S. DOT to develop enhancements to the National ITS Architecture and subsequent standards that support coordination between traffic management and CVO intermodal and border crossing port activities.

Public-Private Partnerships

- Develop divisions within organizations that are committed to working with public agencies in developing and deploying ITS.

Privacy and Data Security

- Establish policies on information use and privacy.
- Work cooperatively with public sector interests.

Research, Development, and Testing

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Supporting National Organizations

- American Bus Association (ABA) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- American Trucking Associations (ATA) – Represent members' interests in ITS deployment and deployment projects.
- Commercial Vehicle Safety Alliance (CVSA) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- Independent Truck Drivers Association (ITDA) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- Intermodal Association of North America (IANA) – Educate members on benefits, promote deployment activities, support public-private dialogues.
- International Brotherhood of Teamsters - Educate members on benefits, promote deployment activities, support public-private dialogues.
- Motor Freight Carriers Association (MFCA) - Educate members on benefits, promote deployment activities, and support public-private dialogues.
- National Association of Truck Stop Operators (NATSO) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- National Industrial Transportation League (NITL) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- National Private Truck Council (NPTC) – Educate members on benefits, promote deployment activities, support public-private dialogues.
- Owner Operator Independent Drivers Association (OOIDA) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- United Motorcoach Association (UMA) - Educate members on benefits, promote deployment activities, support public-private dialogues.

Vehicle Original Equipment Manufacturers (OEMs) and Suppliers

Vehicle Manufacturers, Vehicle Suppliers, Product Manufacturers

Roles, Responsibilities, and Motivations

- Design, manufacture, and sell vehicles and automotive devices that are safe, comfortable, efficient, and convenient, conform with all relevant regulations, and are appealing to consumers.
- Connect and incorporate non-automotive information networks to the vehicle environment.
- Educate and inform customers regarding proper use and limitations of on-board systems.
- Secure and maintain return on investment and return to shareholders, and expand market share.
- Fulfill responsibilities as corporate citizen.

Transportation Needs and Concerns

- Differentiating products by features, appearance, and price while satisfying regulatory compliance.
- Regulatory directives to stimulate product innovation may disrupt the industry.
- Managing the pace and content of product innovation in light of liability risks.
- Reconciling an automotive product planning horizon that does not synchronize with consumer electronics product planning horizon.

How ITS Can Help

- Create a new generation of products and services to promote safety, comfort, productivity, and convenience.
- Provide the foundation to forge new relationships based on enhanced information exchange between automotive manufacturers, electronics suppliers, service providers, infrastructure operators, and regulatory and public safety agencies.
- Provide new opportunities for product differentiation with enhanced value-added features and for greater customer satisfaction.
- Provide new opportunities for manufacturers having developed products for one market, to diversify into new areas.
- Solve the product liability problems of advanced vehicle control systems by developing uniform standards, regulations or guidelines.

Specific Actions

Awareness and Outreach

- Promote ITS products and services.
- Understand the impacts and implications of ITS and wireless communications and their confluence with motor vehicles.
- Educate dealers and sales force regarding the benefits and use of ITS systems in vehicles.
- Provide training materials and instruct consumers in effective and safe use of ITS devices.

Benefits

- Cooperate with government to facilitate the timely, objective evaluation of new products.

Skills and Training

- Provide training materials on new ITS devices to state agencies and driver education institutions for driver education and licensing.

Regional Framework for Integration

- Work with local agencies to ensure that products are consistent with the regional ITS framework.
- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

Standards and Architecture

- Actively participate in the standards development process.
- Define industry interface standards and communication protocols to ensure an open, innovative and competitive marketplace.
- Form consortia to rapidly develop the standards needed for new information technology applications.
- Define driver information needs under various driving situations and develop industry wide standards or guidelines on vehicle-human interface design.
- Collaborate with public infrastructure interests and the U.S. DOT regarding National Architecture enhancements and standards for the vehicle/infrastructure interface.

Public-Private Partnerships

- Collaborate with public regulatory authorities regarding in-vehicle safety system development.
- Work with government agencies toward an environment in which the benefits made possible by ITS technologies are not unduly delayed by unreasonable regulatory or liability concerns.

Procurement

- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.

Business Models/Product Development

- Explore new opportunities for manufacturers to provide services and for service providers to influence product design and development.
- Establish consortia to advance technology and spread risk, including interface for incorporating ITS products in vehicles.
- Work closely with suppliers and public safety interests in order to bring the latest ITS advanced vehicle control and safety systems to market quickly and efficiently.

Research, Development, and Testing

- Develop and implement a program of research and development that applies collaborative funding and guidance from industry and U.S. DOT.
- Initiate research programs within organizations and develop mechanisms for sharing of key research findings, data and needs, and increase internal funding of existing research and development programs.
- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Cooperatively conduct pre-competitive research to speed the introduction of technologies that provide convenience and safety enhancements for vehicle operators and travelers.
- Determine the capabilities and performance of drivers, and use this information in design of ITS information/control devices.

Vehicle/Infrastructure Interface

- Collaborate with public infrastructure owners and operators regarding the linkage to vehicles for optimum advanced vehicle control and safety systems.
- Collaborate with communication companies for solutions that require communicating large amounts of data.

Supporting National Organizations

- Alliance of Automobile Manufacturers (AAM) – Serve as advocate on behalf of constituents, communicate benefits to general public.
- American Highway Users Alliance (AHUA) – Serve as advocate on behalf of constituents, communicate benefits to constituents.
- APTA Business Members Board of Governors (BMBG) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- Association of International Automotive Manufacturers (AIAM) – Serve as advocate on behalf of constituents, communicate benefits to general public.
- Society of Automotive Engineers (SAE) – Facilitate development of standards, communicate benefits to constituents, develop and provide training.
- Truck Manufacturer Association (TMA) - Educate members on benefits, promote deployment activities, and support public-private dialogues.
- Truck Trailer Manufacturers Association (TTMA) - Educate members on benefits, promote deployment activities, and support public-private dialogues.

Communications Companies

Equipment Manufacturers and Telecommunications Carriers

Roles, Responsibilities, and Motivations

- Design, develop, and manufacture wired and wireless networks, switching equipment, and user devices.
- Provide communications services to fixed and mobile users in urban and rural areas.
- Secure and maintain return on investment and return to shareholders, and expand market share.
- Fulfill responsibilities as corporate citizen.

Transportation Needs and Concerns

- Travelers represent a major, largely untapped customer group for the global information infrastructure.
- Relatively little interest in transportation related information per se, but enormous interest in transportation users as customers for all communications-enabled services.
- Differentiating products and services by features, appearance, and price while remaining marketplace competitive and in regulatory compliance.
- Accommodating lack of uniform standards for ITS spectrum and for cellular Dedicated Short Range Communications (DSRC).
- Developing high-speed FM sub-carrier protocols which interact with ITS and global information infrastructure.
- Focusing on innovation in response to a rapidly changing, technology-intensive industry without strong customer loyalty.

How ITS Can Help

- Pave the way for broader use of communications and communication devices for toll payment, credentials checking, traveler services, general information services, entertainment, and productivity enhancement.

Specific Actions

<u>Awareness and Outreach</u>

- Promote ITS products and services.
- Educate and inform the ITS community of communications capabilities within a context far broader than ITS.
- Better understand the needs and constraints of mobile users.
- Educate public sector transportation agencies on communication issues.
- Educate the public on safety issues surrounding the use of communications equipment while driving.

Benefits
- Cooperate with government to facilitate the timely, objective evaluation of new products.

Funding for ITS Deployment
- Show creativity and flexibility in partnering for ITS deployment projects including shared resource opportunities.

Interagency Coordination/Cooperation
- Collaborate with ITS interests in applying to the FCC for spectrum and approval of new devices.
- Operate within public and private travel information interests in establishing a uniform traveler information access number (N11) and enhanced 911 systems.

Regional Framework for Integration
- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).
- Build consensus with vehicle manufacturers and other end user product manufacturers to develop necessary specifications for interoperability.
- Provide some type of cellular coverage in remote rural areas and mountainous areas popular with tourists.

Standards and Architecture
- Actively participate in the standards development process.
- Form consortia to rapidly develop the standards needed for new information technology applications.
- Accelerate development of standards - both regulatory standards to allocate spectrum and industry standards to harmonize protocols and create national seamless communications architectures.

Public-Private Partnerships
- Collaborate in establishing models for effective partnerships with public agencies in developing and deploying ITS, including using public rights-of-way.

Procurement
- Collaborate with public sector interests to establish more effective models for communication technology acquisitions.

Archiving and Value of Data
- Develop new technology applications for acquiring, processing, storing, and retrieving data.

Research, Development, and Testing

- Initiate research programs within organizations and develop mechanisms for sharing of key research findings, data, and needs, and increase internal funding of existing research and development programs.
- Participate with the U.S. DOT to rapidly develop and implement the best technologies and practices.
- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Collaborate with ITS interests regarding use of communications devices as data probes in the context of enhanced 911 geolocation regulatory requirements.
- Cooperate with government, industry and academia on research to better understand driver behavior and performance of driving while operating communication devices.

Supporting National Organizations

- Association of Public Safety Communication Officials International (APCO) – as a FCC frequency coordinator, assist with spectrum management and other communication related technical issues.
- Cellular Telecommunications Industry Association (CTIA) – Communicate benefits to constituents, identify user services to enhance satisfaction and promote benefits.
- Personal Communications Industry Association (PCIA) - Communicate benefits to constituents, identify user services to enhance satisfaction and promote benefits.

Contractors, System Integrators, Consultants

Roles, Responsibilities, and Motivations

- Provide wide-ranging expertise and flexible human resources for the development, deployment, and integration of ITS on a large scale.
- Secure and maintain return on investment and return to shareholders, and expand market share.
- Work on high visibility, leading edge projects.

Transportation Needs and Concerns

- Staying current in an increasingly interdisciplinary, rapidly evolving industry.
- Having a better understanding of customer policies and regulations.
- Non-uniformity in practices and regulations across the industry.
- Purchasers having a better understanding of operation and maintenance of new ITS technology.
- Procurement processes, common to most public agencies, need to be revise to permit effective design and implementation of ITS systems and services.

How ITS Can Help

- Create a new generation of products and services to promote safety, comfort, productivity, and convenience.
- Provide new opportunities for product differentiation with enhanced value-added features and for greater customer satisfaction.
- Provide new opportunities for manufacturers having developed products for one market, to diversify into new areas.
- Solve the product liability problems of advanced vehicle control systems by developing uniform standards, regulations or guidelines.

Specific Actions

<u>Awareness and Outreach</u>

- Promote ITS products and services.
- Document and provide public agencies current examples of success stories and examples of local practices that have worked effectively.
- Instruct customer agencies on effective ways to acquire and use ITS technology.
- Provide training materials and instruct consumers in effective and safe use of ITS devices.

Benefits
- Cooperate with government to facilitate the timely, objective evaluation of new products.

Skills and Training
- Become familiar with and use the National Architecture.
- Attract and retain knowledgeable, skilled staff.

Regional Framework for Integration
- Work with local agencies to ensure that products are consistent with the regional ITS framework.

Standards and Architecture
- Actively participate in the standards development process.
- Fully understand and utilize National ITS Architecture and related standards.
- Form consortia to rapidly develop the standards needed for new information technology applications.

Public-Private Partnerships
- Be open to creative partnerships with public agencies that will encourage effective ITS implementation.

Procurement
- Work with public sector agencies to develop effective procurement practices that maximize the use of ITS technology.

Business Models/Product Development
- Provide for integration of equipment with after-market product add-ons.

Archiving and Value of Data
- Develop new technology applications for acquiring, processing, storing, and retrieving data.

Research, Development, and Testing
- Initiate research programs within organizations and develop mechanisms for sharing of key research findings, data, and needs, and increase internal funding of existing research and development programs.
- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Supporting National Organizations

- Security Industry Association (SIA) - Serve as advocate on behalf of constituents.

Traveler Information Service Providers and Resellers

Advanced Traveler Information Service Providers
Value-Added Resellers

Roles, Responsibilities, and Motivations

- Develop and operate software and services for gathering, enhancing, integrating, fusing, and disseminating travel-related data (traffic conditions, local events, weather, hotels and restaurants, other commercial facilities, etc.) for use by public, including persons with disabilities, and private customers.
- Improve travel safety, efficiency, convenience through timely delivery of relevant travel-related information.
- Balance securing and maintain return on investment with interest in building the industry.

Transportation Needs and Concerns

- Uncertainties in the size of the market are slowing development and deployment, (e.g., are customers willing to pay).
- Information delivery involves coordination of a number of agencies who have not traditionally worked together, including product manufacturers, communications carriers and public agencies.

How ITS Can Help

- Make publicly collected monitoring information broadly and openly available.
- Facilitate institutional arrangements needed to effectively implement Advanced Traveler Information Systems (ATIS) working such as broad-based ITS consortiums and industry associations (like ITS America).
- Provide more detailed information such as weather information to travelers in rural areas.

Specific Actions

Awareness and Outreach

- Promote availability and use of integrated and interoperable ITS data.
- Educate public agencies and other organizations collecting data on the true value of the data and means by which they can enhance that value.

Benefits

- Cooperate with government to facilitate the timely, objective evaluation of new systems.

Regional Framework for Integration

- Work with local agencies to ensure that data collected for traveler information are consistent with the regional ITS framework.

Standards and Architecture

- Actively participate in the standards development process.
- Form consortia to develop the standards needed for ensuring that data collected from multiple sources can be used in an integrated information system.
- Create common sets of icons and phrases for advanced traveler information systems (ATIS) interfaces.

Public-Private Partnerships

- Work collaboratively to build and strengthen industry consortia and alliances between public sector providers who collect necessary data.
- Work with public agencies regarding the benefits of effective use of transportation data by the general public and the need to make the data available through public-private partnerships.

Business Models

- Develop viable business models for public-private partnerships that will encourage public participation and maximize private sector opportunities to utilize data.

Archiving Data

- Support arrangements that maintain the open availability of public agency collected monitoring and measurement information.

Research, Development, and Testing

- Initiate research programs within organizations and develop mechanisms for sharing of key research findings, data, and needs.
- Participate with the U.S. DOT to rapidly develop and implement the best technologies and practices.
- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Assist public agencies in the development of, and participate in, effective operational tests.

Standards Development Organizations (SDOs)

Roles, Responsibilities, and Motivations

- Oversee the development of industry consensus standards based on the National ITS Architecture in a manner which is open, inclusive, and which arrives fairly at consensus.
- Provide member opportunities for continuing professional education and information exchange.
- Foster cooperative research programs.

Transportation Needs and Concerns

- Many participants from the transportation community, including the non-federal public sector and small private sector entrants, face financial obstacles to active participation in standards development, which may produce standards that are not fully responsive to community needs for deployment and maintenance.
- ITS is often multidisciplinary, making allocation of responsibility for standards development difficult.
- Some of the requirements in current federal legislation have created some special challenges and opportunities for SDOs.

How ITS Can Help

- Represents a new and vibrant area for standards.
- Provides a new opportunity for development and integration of standards.
- Provides challenges and opportunities for integration of systems involving multiple stakeholders and standards development organizations.

Specific Actions

Awareness and Outreach

- Reach out to all levels of government to educate them about the importance of cooperation and adoption of a National ITS Architecture and open standards to achieve ITS national deployment.
- Educate Congress and congressional staff on how industry consensus standards can be most effectively developed in cooperation with ITS America and U.S. DOT.

Funding for ITS Deployment

- Seek creative funding mechanisms for standards development work to promote the participation of a broad community of interested parties, including representatives of state, regional, and local public agencies.
- Make effective use of federal standards development funding.

Interagency Coordination/Cooperation

- Encourage and support U.S. participation in international architecture and standards forums, where such participation will help to advance high priority domestic goals.
- Participate actively in the ITS America Council of Standards Organizations.
- Involve and engage the public safety community through a sustained and formal role in standards development, testing, and deployment process.

Standards and Architecture

- Encourage the continuation of federal management of the National ITS Architecture development as a basis for standards, working with ITS America.

Archiving and Value of Data

- Ensure that current and ongoing standards development take into consideration needs for processing, storing, and retrieving ITS data.

Research, Development, and Testing

- Support research programs that are specifically tailored to meeting empirical needs of specific standard development efforts.
- Participate in standards testing programs.

Supporting National Organizations

- Council of Standards Organizations (CSO) – work with SDOs to develop standards consistent with National ITS Architecture.
- Institute of Electrical and Electronics Engineers (IEEE) – Communicate benefits to constituents, identify user services to enhance satisfaction and promote benefits.
- Institute of Transportation Engineers (ITE) - Communicate benefits to constituents, identify user services to enhance satisfaction and promote benefits.
- National Electrical Manufacturers Association (NEMA) - work with SDOs to develop standards consistent with National ITS Architecture.
- Society of Automotive Engineers (SAE) - Communicate benefits to constituents, identify user services to enhance satisfaction and promote benefits.

Academia

Colleges, Universities
Community Colleges, Other Institutions of Higher Learning

Roles, Responsibilities, and Motivations

- Educate the transportation professionals of the future through degree, certificate, and continuing education programs.
- Develop education programs that make students aware of new technologies and approaches, including information technologies.
- Conduct basic and applied research to advance the art and practice of transportation and to enrich education programs.
- Facilitate technology transfer among transportation and other stakeholders.
- Collaborate with research institutes and researchers in other countries to promulgate U.S. ideas and technologies and to incorporate foreign ideas to advance American technologies.
- Create a national program to educate school children about transportation systems and ITS solutions.
- Provide expert technical advice to the transportation industry.

Transportation Needs and Concerns

- At present, ITS courses are dispersed, divided among multiple schools, centers, and departments within a university.
- Many transportation curricula still focus on roadway geometry and construction rather than on how to leverage systems and software to meet the transportation needs of the future.
- Educators need up-to-date training on the latest technologies and systems.
- Advanced ITS technologies require increased levels of information processing and computer-based skills and a greater understanding of systems engineering concepts.
- The existing work force is generally not equipped to operate and maintain new advanced technology.
- Demand for technically competent individuals is much larger than the available supply.
- Long range research and development is not adequately recognized by U.S. DOT and most state DOTs.

How ITS Can Help

- Provide development and offering of compelling undergraduate programs to attract students to transportation professions.

- Provide opportunities to develop exciting K-12 programs that will introduce transportation careers early in the education system.
- Provide focus for new academic and research programs that cross multiple disciplines.
- Provide exciting new career opportunities in transportation and related areas.
- Provide new opportunities in the workforce for displaced persons, including persons with disabilities.
- Provide opportunities for faculty and student workshops, and intern and fellows programs.

Specific Actions

Awareness and Outreach

- Utilize aggressive recruitment methods to attract more students to transportation degrees.
- Include ITS elements in appropriate courses in engineering, planning, and other transportation related elements.
- Conduct outreach courses for transportation planners and government agency transportation managers and technicians.

Benefits

- Establish performance measures and decision support systems and conduct education and outreach campaigns.

Interagency Coordination/Cooperation

- Link academic departments of criminal justice, police science, traffic and transportation engineering, and systems engineering.
- Establish and encourage development of a cooperative ITS research and demonstration agenda with government and the private sector.

Skills and Training

- Incorporate ITS in the regular curricula and initiate actions to develop relevant distance-based educational courses.
- Develop a national consortium for the purpose of providing ITS based education and training.
- Develop continuing education programs to reeducate operating agency personnel to meet the immediate demands of the rapidly changing technology environment.
- Provide education and training to entry-level and mid-career staff to broaden their knowledge bases.
- Develop new curricula that focus on systems engineering concepts, communications and information management, and computer skills.
- Take advantage of advanced technology devices and learning technology capabilities to more effectively deliver learning programs in a more

timely and effective manner, taking into consideration differences in skills, experience, and level of planning and operational responsibilities.
- Provide practical hands-on opportunities for training at both the undergraduate and graduate levels.
- Develop program management curricula addressing leadership skills required to effectively mange cross-functional team operations and multi-disciplinary skills and knowledge required to specify, acquire, deploy, operate, and maintain advanced technology systems.

Public-Private Partnerships
- Create opportunities for students and faculty to work as interns, fellows, etc.

Research, Development, and Testing
- Create formal departments specifically designed to accelerate the research and testing of ITS technologies.
- Conducted Research, Development, and Testing within the framework of the National ITS Architecture and standards in order to accelerate deployment.
- Conduct appropriate research and technology transfer activities.
- Undertake studies and demonstration to select most appropriate interfaces independent of special interests.

Supporting National Organizations
- Council of University Transportation Centers (CUTC) - Educate members on benefits, promote deployment activities, support public-private dialogues.
- Transportation Research Board (TRB) - Committee on Education and Training - Educate members on benefits, promote deployment activities, support public-private dialogues, work on research agenda.
- ITS America – Education and Training Committee – Coordinate curriculum needs and gap identification for ITS professional education and training programs.

U.S. Department of Transportation (U.S. DOT)

Office of the Secretary of Transportation,
ITS Joint Program Office (JPO),
Federal Highway Administration (FHWA),
Federal Railroad Administration (FRA),
Federal Transit Administration (FTA), and
National Highway Traffic Safety Administration (NHTSA)

Roles, Responsibilities, and Motivations

- Enhance and ensure a safe and efficient surface transportation system that provides mobility and accessibility and enhances productivity.
- Facilitate funding expenditures and accelerate deployment of transportation infrastructure and services.
- Promote a robust and competitive transportation industry in the U.S.
- Promote intermodal approaches to addressing freight and passenger transportation needs.
- Articulate a clear direction for the ITS program and provide leadership for ITS deployment.
- Lead and coordinate national ITS research and technology activities.
- Provide technical guidance and assistance to state and local partners on implementing transportation and ITS policies and plans.
- Promote technical and institutional integration through the use of the National ITS Architecture and ITS standards.

Transportation Needs and Concerns

- Lack of technical and institutional integration among legacy systems at the state, regional, and local levels.
- Lack of critical stakeholder participation and involvement in planning, developing, implementing, and operating ITS.
- Difficulty in having ITS projects be considered in Transportation Improvement Programs (TIPs) on equal footing with construction projects.
- Influence of Congressionally earmarked funds for projects to ensure they meet the goals of TEA-21 and the ITS program.

How ITS Can Help

- Primary enabler of transportation management and operations.
- National ITS Architecture is sound framework for national, statewide, regional, and local ITS deployment.
- ITS standards promote a competitive marketplace for products and services.

Specific Actions

Awareness and Outreach

- Educate congressional, state, regional, and local officials about the benefits of ITS products and services.
- Provide point-of-contact for states, local governments, transportation agencies, and the general public to answer questions and address concerns about ITS.
- Provide leadership encouraging public sector deployment of ITS.

Benefits

- Continue collecting information on the benefits and costs of designing, developing, and deploying ITS.
- Provide current information about ITS benefits, evaluations, and costs in a timely manner.

Funding for ITS Deployment

- Encourage the expanded use of dedicated federal transportation funding for ITS program implementation; integration; and research, development, and testing.
- Issue clear and timely guidelines for expanded eligibility of federal funding for ITS projects.
- Encourage and enable continued and expanded use of federal transportation funding by state and local governments for ITS programs.

Interagency Coordination/Cooperation

- Forge cooperative relationships with other federal agencies, such as the Departments of Commerce, Justice, Agriculture and Energy, the Environmental Protection Agency, and the Federal Communications Commission.
- Encourage institutional coordination, cooperation, and integration at the regional and local levels.
- Facilitate the development of new markets abroad and support U.S. trade through intergovernmental cooperative agreements, international technology information exchange, and coordinated trade missions.
- Continue to facilitate the process of coordinating with intermodal freight stakeholders that are industry leaders, such as the Intermodal Association of North America and the Associations of American Railroads and Port Authorities.
- Seek national organization partners from the public safety community to form a coalition for national transportation and public safety.
- Give further consideration to joint programs for cross-border dispatch and sharing of information and resources to mitigate the effects of incidents at border crossing.

Skills and Training

- Provide aggressive training programs to meet the needs of the evolving transportation profession (architecture, standards, lessons learned, telecommunications, procurement).
- Deliver targeted training to practitioners where and when they need it using innovative mechanisms (distance learning, the Internet).
- Develop and distribute training materials for adaptation by other training institutions.
- Provide increased technical guidance and assistance, including scanning tours, peer-to-peer exchange, how-to demonstrations, manuals, etc.

Regional Framework for Integration

- Promulgate guidance for conformance with the National ITS Architecture and standards.
- Encourage communities to develop regional frameworks for integrating ITS services based on the National ITS Architecture.

Standards and Architecture

- Continue to accelerate development of ITS national standards based on the National ITS Architecture.
- Work with standards development organizations to demonstrate and test newly developed standards and maintain the entire suite of standards in the ITS national standards program.
- Educate state and local practitioners about the importance of buying products and systems using open non-proprietary ITS standards in accordance with the National ITS Architecture.
- Encourage and support U.S. participation in international standards forums.
- Comply with congressional requirements for identification of critical standards and for standards conformity.
- Continue to enhance the National ITS Architecture.
- Continue to make the National ITS Architecture broadly available and accessible through electronic media and training.
- Extend the National ITS Architecture by developing new user services (such as emergency management services, law enforcement, advanced construction and maintenance) and addressing them in the architecture.
- Consider establishment of a traffic and transportation law enforcement user service which incorporates privacy considerations, working in cooperation with appropriate stakeholder representatives.

Public-Private Partnerships

- Promote public-private partnerships, particularly in telecommunications, information technologies, and traveler information.

Procurement

- Encourage innovative procurement methods and develop guidance that recognize the special requirements associated with technical and system integration acquisition.

Business Models/Product Development

- Encourage vehicle technologies and products that enhance vehicle safety.

Privacy and Data Security

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.
- Encourage practitioners to establish information use and privacy policies.
- Undertake case studies documenting experience and lessons learned regarding data security and privacy in model deployments and operational tests.

Archiving and Value of Data

- Develop guidelines and tools necessary to ensure data quality and completeness and outline the various business models that could be followed in collecting data.
- Take steps to train and educate transportation professionals on the value and challenges related to archiving ITS data.
- Fund a field operational test demonstrating a model for performing system development, as well as using ITS data, and document the value of increased information to local decisionmaking and operations.
- Explore the utility of archival databases already collected.
- Foster institutional arrangements necessary in deployment of systems involved in the processing, storing, and retrieving ITS data.

Research, Development, and Testing

- Establish and encourage development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Administer a comprehensive program of ITS research, development, and testing, including but not limited to evaluation of safety impacts, benefits, and planning models.
- Continue to fund operational test partnerships designed to bring together public, private, and academic partners to research and develop new ITS technologies.

Vehicle/Infrastructure Interface

- Initiate demonstrations of technical feasibility and benefits through a combination of field operational tests and analysis in both metropolitan and rural settings.

ITS America

Roles, Responsibilities, and Motivations

- Facilitate and accelerate ITS development and deployment in the U.S. through an inclusive public-private partnership involving all interested stakeholders.
- Promote awareness of and support for the use of intelligent transportation systems.
- Promote the development and effective deployment of ITS systems that work together.
- Provide leadership in solving critical problems in the ITS arena.
- Deliver highly-valued benefits to its members: information helpful in achieving their ITS related objectives.
- Guide and coordinate the complex research and development activities of ITS.
- Encourage public-private dialog and cooperation on ITS matters.
- Serve as a utilized Federal Advisory Committee to the U.S. Department of Transportation.
- Serve as a scientific and educational public interest organization dedicated to advancing ITS benefits to the public.
- Serve as an industry trade association representing the interests of manufacturers and providers of ITS products ad services.
- Serve as the interface to the international ITS community.
- Serve as the clearinghouse for ITS information.
- Promote national integration and interoperability.

Transportation Needs and Concerns

- Advancing the general interests of a new industry to enhance mobility and safety along with the specific interests of its diverse membership.
- Striking the proper balance between public and private interests to maximize the contributions of both.
- Promoting international interests of U.S. industry involved with the manufacturing and delivery of ITS products and services.

Specific Actions

<u>Awareness and Outreach</u>

- Conduct an awareness program to various media outlets for the purposes of reaching the general public with the ITS message.
- Continue to issue news releases and features, arrange media briefings and press conferences, conduct broadcast and print media interviews, produce

videotapes, and maintain the Access ITS America web site to promote overall ITS awareness.
- Encourage transportation user groups (AAA, AARP, AAPD) to become members and or participants in the National Associations Working Group.
- Educate state and local officials and locally based private interests about ITS.

Benefits
- Identify, package, and disseminate information on ITS benefits, challenges, and opportunities.

Funding for ITS Deployment
- Develop and disseminate information on ITS funding eligibility under federal law.
- Develop and disseminate information on innovative finance, public-private partnership, and pay-as-you-go projects.
- Develop and disseminate information describing real-world experiences and models for deployment funding.
- Explore creative private sector financing incentives such as “tax credits” for those participating in deployment programs.

Interagency Coordination/Cooperation
- Provide a forum for the ITS industry to set its directions, both short and long term, and to build coalitions on critical technical and institutional issues.
- Provide policy and technical advice to U.S. DOT.
- Continue to facilitate the process of coordinating with intermodal freight stakeholders that are industry leaders, such as the Intermodal Association of North America and the Associations of American Railroads and Port Authorities.
- Seek national organization partners from the public safety community to form a coalition of national transportation and public safety.
- Take the lead in promoting international ITS cooperation and alliances.
- Represent interests of ITS operators on telecommunications matters before the Federal Communications Committee.
- Explore innovative means of ensuring that all areas of the country have access to the benefits of ITS such as creating a National ITS System.
- Engage in a partnership with the Institute of Transportation Engineers to administer a national traffic incident management network to support knowledge management for traffic incident management professionals in the public safety and transportation communities.

Skills and Training

- Institute a Certificate Program for technical and professional skills areas.
- Develop a web page for ITS professionals that provides a "virtual learning environment" and serves as a clearinghouse for appropriate courses of study.
- Improve and enhance existing courses including lessons learned from deployment.
- Continue to develop and deliver new courses that contain job-relevant knowledge and skills content.
- Provide educational opportunities to government officials and private-sector leaders of prospective ITS countries through internship or fellowship programs.
- Operate electronic and hard copy clearing houses for ITS information.

Regional Framework for Integration

- Coordinate the identification and consolidation of emergency service user requirements and work closely with various stakeholder associations.
- Convene regional ITS summits to establish relationships among organizations to develop regional visions and deployment plans.
- Develop and maintain a comprehensive list of standards necessary for ITS integration and interoperability and track progress for such standards.

Standards and Architecture

- Work with standards development organizations to demonstrate and test newly developed standards and maintain the entire suite of standards in the ITS national standards program.
- Reach out to all levels of government to educate them about the importance of cooperation and adoption of a National ITS Architecture and open standards to achieve ITS national deployment.
- Encourage and support U.S. participation in international architecture forums.
- Convene forums on interconnectivity and interoperability (public and private, suppliers and customers) to provide policy guidance and prioritization for technical standards development activities.
- Promote and support the use of the National ITS Architecture and standards.
- Develop and maintain a comprehensive list of standards necessary for ITS integration and interoperability; track progress for such standards; and respond to congressional requirements for identification of critical standards and for standards conformity.
- Seek international harmonization of ITS standards.

- Convene stakeholders to identify user requirements in support of development of new user services (such as emergency management services, law enforcement, advanced construction and maintenance) to be incorporated in the National ITS Architecture.
- Consider establishment of a traffic and transportation law enforcement user service, which incorporates privacy considerations, working in cooperation with appropriate stakeholder representatives.

Public-Private Partnerships

- Provide assistance for fostering public-private partnerships in ITS infrastructure, services, and financial markets.
- Serve as a catalyst for industry consortia and public-private alliances in areas such as intermodal freight, international border crossings, and electronic payment systems.

Procurement

- Develop forums for public and private sector entities to share best practices as they relate to procurement for ITS.
- Explore collective technology purchasing or acquisition consortia along with supporting national organizations.
- Collectively develop ITS procurement codes and guides and model procurement specifications along with supporting national organizations.

Business Models/Product Development

- Bring together members of the advanced transportation and information technology communities, such as the automotive and motorcycle industries, telecommunications, infrastructure, information service providers, etc., in order to speed the introduction of technologies and products that enhance the safety and convenience of the transportation system.
- Work with private sector stakeholders to determine the extent to which liability concerns are constraining introduction of ITS products into the marketplace; facilitate development of appropriate standards regulations and/or legislation to address liability concerns.

Privacy and Data Security

- Make the ITS America Fair Information and Privacy Principles available to all parties interested in deployment, and periodically update these principles.
- Develop data-use and privacy guidelines applicable to specific application areas (e.g., commercial vehicle operations) working with U.S. DOT, appropriate national associations, and stakeholders.

Archiving and Value of Data

- Develop guidelines and tools necessary to ensure data quality and completeness and outline the various business models that could be followed in collecting data.
- Take steps to train and educate transportation professionals on the value and challenges related to archiving ITS data.
- Provide leadership in developing policies to govern use and archiving of data.

Research, Development, and Testing

- Continue to lead the effort to find innovative ways to bring public and private interests together in an optimal ITS research, development, and testing initiative, including resolution of intellectual property rights issues.
- Provide the forum for research, development, and testing discussion and recommendation by ITS stakeholders and the public using the ITS America committee structure.
- Organize an ITS Industry/U.S. DOT working group designed to share ideas and exchange information about ITS research, development, and testing.
- Provide advice to U.S. DOT concerning enabling and operational research, development, and testing priorities in its capacity as a utilized Federal Advisory Committee.

Vehicle/Infrastructure Interface

- Serve as a forum for discussion among the stakeholders helping to define roles and forge partnerships to facilitate deployment.
- Conduct outreach to stakeholder communities that must support or participate in vehicle to infrastructure linkages for the benefits to be realized.

ITS America State and Regional Chapters

Roles, Responsibilities, and Motivations

- Work to accelerate the development and deployment of ITS within their areas.
- Educate state and local officials, stakeholders, and opinion leaders regarding ITS.
- Create alliances with other groups and organizations with interests in ITS.
- Serve as forum for public/private information exchange and consensus building.
- Provide state and regional perspectives to the national ITS program.
- Encourage interagency and private dialog, cooperation and coordination at the state and regional level.
- Serve as a scientific and educational public interest organization dedicated to advancing ITS benefits to the public.

Transportation Needs and Concerns

- Advancing regional interests of a new industry to enhance mobility and safety along with the specific interests of its membership.
- Striking a balance between public and private interests.

Specific Actions

Awareness and Outreach

- Insure that awareness information is disseminated to those who can help deployment, including the news media, opinion leaders, and the public.
- Educate state and local officials, grass roots industry, and organizations responsible for deployment about ITS benefits and means of deployment.
- Recruit as members the stakeholders affecting deployment in their states and provide ongoing information necessary for effective action.
- Communicate ITS benefits.

Interagency Coordination/Cooperation

- Provide a forum for members to become better informed on ITS and to take part in setting regional directions.
- Provide advice to state, regional, and local governments.
- Build coalitions for statewide planning; conduct outreach and consensus building; educate public officials, private industry, and the general public; facilitate public-private partnerships; pursue funding; and promote economic development.

Regional Framework for Integration

- Convene regional ITS summits to establish relationships between organizations to develop regional visions and deployment plans.
- Provide a forum for interagency dialog leading to regional integration and implementation.

Standards and Architecture

- Reach out to all levels of government to educate them about the importance of cooperation and adoption of a National ITS Architecture and open standards to achieve ITS national deployment.

Public-Private Partnerships

- Serve as a home for regional public-private relationship enhancement and alliances.

Section 4: Areas for Collaboration

This section reflects the collaboration necessary by concerned stakeholders involved in the deployment of ITS systems and products. It takes the stakeholder actions from Section 3 and organizes them by particular issues, services, investments, and opportunities. It outlines the crosscutting activities that involve multiple stakeholders. It describes the dimensions of the specific focus area and how it impacts individual stakeholders. It suggests the specific actions for each stakeholder group working in a collaborative environment.

Awareness and Outreach

Many key decisionmakers in the transportation community – including elected officials, planning and operating managers, and technical staff – are generally unaware of the benefits of ITS. Moreover, the general public is not aware that ITS technologies are being used to solve real transportation and social problems. To create a favorable climate for ITS products and services, consumers and decisionmakers need to be aware and educated about the benefits of ITS.

Background

While some individual members of ITS America conduct advertising and public relations activities, surveys show that the members want an increased overall level of ITS public awareness and educational activities nationwide. The central message: *ITS is people using information technology in transportation to save lives, time, and money*. Supporting messages are that ITS technologies offer alternatives to congested travel. They are solving everyday problems in the commute to work, in everyday trips for personal business, in transportation services for the elderly and disabled, in vacation and leisure travel, in the distribution of goods and services, and in medical emergencies. These problems exist in both metropolitan and rural areas.

Stakeholder Impacts

ITS advocates note that members of Congress rarely hear from their constituents regarding the need for ITS solutions to surface transportation problems.

Manufacturers of ITS products and providers of ITS services want more promotion of the benefits of ITS among consumers and the general public for marketing purposes.

Public agencies are concerned that the news media does not understand ITS and how it can save taxpayer revenues over more expensive alternatives.

State DOTs are concerned that ignorance of ITS is widespread even within the transportation related disciplines.

Actions

State Governments

- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.

City/County Governments
- Understand the strategies, tools, approaches, benefits, and funding opportunities represented by ITS for addressing local needs and concerns, especially for system management and operations.
- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.
- Build the political consensus for acceptance and promotion of ITS.

Rural Communities
- Assure that rural needs are well communicated to regional, state, and national decisionmakers and funding authorities.
- Disseminate information on opportunities and benefits to all stakeholders.

Metropolitan Planning Organizations
- Understand the strategies, tools, approaches, benefits, and funding opportunities represented by ITS for addressing local needs and concerns, especially for system management and operations.
- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.

Regional ITS Institutions
- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.
- Build the political consensus for acceptance and promotion of ITS.

Transit Agencies
- Identify, educate, and involve the full range of stakeholders on ITS services and benefits and secure commitments that will support transit.
- Create ways to cultivate champions and leaders.
- Educate staffs to become familiar with the ITS opportunities.

Toll Authorities/Agencies
- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.

Emergency Management Service Providers
- Educate the public on ITS availability and capability of response agencies.
- Communicate ITS use and effectiveness during and subsequent to major incidents.

Commercial Vehicle Regulators
- Champion ITS services and benefits and relate this information within agencies and to constituents and congressional representatives.
- Build the political consensus for acceptance and promotion of ITS.

Parking Operators

- Elevate the visibility of ITS in the industry and of the industry within the ITS community.

Commercial Vehicle Operators

- Promote ITS products and services, particularly those that advance integration and interoperability.
- Leverage the value of carrier internal systems by linking to intermodal, traveler information, and credentials administration systems.
- Actively participate in electronic toll processing systems.

Vehicle Original Equipment Manufacturers and Suppliers

- Promote ITS products and services.
- Understand the impacts and implications of ITS and wireless communications and their confluence with motor vehicles.
- Educate dealers and sales force regarding the benefits and use of ITS systems in vehicles.
- Provide training materials and instruct consumers in effective and safe use of ITS devices.

Communications Companies

- Promote ITS products and services.
- Educate and inform the ITS community of communications capabilities within a context far broader than ITS.
- Better understand the needs and constraints of mobile users.
- Educate public sector transportation agencies on communication issues.
- Educate the public on safety issues surrounding the use of communications equipment while driving.

Contractors, System Integrators, Consultants

- Promote ITS products and services.
- Document and provide public agencies current examples of success stories and examples of local practices that have worked effectively.
- Instruct customer agencies on effective ways to acquire and use ITS technology.
- Provide training materials and instruct consumers in effective and safe use of ITS devices.

Traveler Information Service Providers and Resellers

- Promote availability and use of integrated and interoperable ITS data.
- Educate public agencies and other organizations collecting data on the true value of the data and means by which they can enhance that value.

Standards Development Organizations

- Reach out to all levels of government to educate them about the importance of cooperation and adoption of a National ITS Architecture and open standards to achieve ITS national deployment.
- Educate Congress and congressional staff on how industry consensus standards can be most effectively developed in cooperation with ITS America and U.S. DOT.

Academia

- Utilize aggressive recruitment methods to attract more students to transportation degrees.
- Include ITS elements in appropriate courses in engineering, planning, and other transportation related elements.
- Conduct outreach courses for transportation planners and government agency transportation managers and technicians.

U.S. Department of Transportation

- Educate congressional, state, regional, and local officials about the benefits of ITS products and services.
- Provide point-of-contact for states, local governments, transportation agencies, and the general public to answer questions and address concerns about ITS.
- Provide leadership encouraging public sector deployment of ITS.

ITS America

- Conduct an awareness program to various media outlets for the purposes of reaching the general public with the ITS message.
- Continue to issue news releases and features, arrange media briefings and press conferences, conduct broadcast and print media interviews, produce videotapes, and maintain the Access ITS America web site to promote overall ITS awareness.
- Encourage transportation user groups (AAA, AARP, AAPD) to become members and or participants in the National Associations Working Group.
- Educate state and local officials and locally based private interests about ITS.

ITS America State and Regional Chapters

- Insure that awareness information is disseminated to those who can help deployment, including the news media, opinion leaders, and the public.
- Educate state and local officials, grass roots industry, and organizations responsible for deployment about ITS benefits and means of deployment.
- Recruit as members the stakeholders affecting deployment in their states and provide ongoing information necessary for effective action.

- Communicate ITS benefits.

National Transportation Associations

- Proactively outreach to member organizations directly and through use of peers.

Benefits

Many stakeholders are hesitant to invest in ITS technology without having easy access to quantifiable assessment of likely benefits.

Background

Since the initiation of the national ITS program in 1991, ITS has been lauded as an effective, relatively low-cost solution to the nation's transportation problems. However, despite many successful tests, deployments, and private sector initiatives of such systems, information about the benefits of ITS does not exist for all program areas. The information that does exist does not appear to be reaching decisionmakers on every level. Such information needs to be more accessible in order for public sector agencies to decide whether or not to spend scarce resources on ITS, and for private sector firms to enter and invest in the ITS market.

Stakeholder Impacts

Public agencies need to make well-informed decisions about where to allocate diminishing funds in order to provide the greatest benefit to users.

Private entities would like to see more positive information on ITS products and services for both the infrastructure and consumers in order to promote sales of their products and services.

All entities are concerned about lifecycle benefits of ITS.

Public agencies need analytical tools that are easy to use to model the effectiveness of ITS strategies in the transportation planning process.

Actions:

State Governments

- Document and convey the benefits and costs of ITS to responsible implementation agencies.
- Consider ITS as an alternative or complement to traditional transportation solutions.
- Establish performance measures and decision support systems.
- Actively participate with U.S. DOT in tests designed to demonstrate the benefits of the ITS infrastructure.

City/County Governments

- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.

- Actively participate with federal and state DOTs in tests designed to demonstrate the benefits of the ITS infrastructure.

Rural Communities

- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.

Metropolitan Planning Organizations

- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.
- Raise awareness of the capabilities of ITS technologies and encourage public-sector officials to embrace and build locally applied ITS infrastructure.

Regional ITS Institutions

- Actively participate with federal and state DOTs in tests designed to demonstrate the benefits of the ITS infrastructure.

Transit Agencies

- Evaluate completed projects and publish results explaining how specific ITS tools enhance or provide more cost-effective service or decisionmaking.
- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.
- Actively participate with federal and state DOTs in tests designed to demonstrate the benefits of the ITS infrastructure.

Toll Authorities/Agencies

- Assimilate information regarding the benefits of ITS.
- Consider ITS as an alternative or complement to traditional transportation solutions.
- Actively participate with federal and state DOTs in tests designed to demonstrate the benefits of the ITS infrastructure.

Parking Operators

- Promote the benefits of ITS to the industry.

Commercial Vehicle Operators

- Cooperate with government to facilitate the timely, objective evaluation of new systems and products.

Vehicle Original Equipment Manufacturers and Suppliers

- Cooperate with government to facilitate the timely, objective evaluation of new products.

Communications Companies

- Cooperate with government to facilitate the timely, objective evaluation of new products.

Contractors, System Integrators, Consultants

- Cooperate with government to facilitate the timely, objective evaluation of new products.

Traveler Information Service Providers

- Cooperate with government to facilitate the timely, objective evaluation of new systems.

Academia

- Establish performance measures and decision support systems and conduct education and outreach campaigns.

U.S. Department of Transportation

- Continue collecting information on the benefits and costs of designing, developing, and deploying ITS.
- Provide current information about ITS benefits, evaluations, and costs in a timely manner.

ITS America

- Identify, package, and disseminate information on ITS benefits, challenges, and opportunities.

National Transportation Associations

- Develop programs to have ready access to ITS benefits information and institute a dissemination plan to facilitate the exchange of such information.

Funding for ITS Deployment

State, regional, and local governments now have a broad range of options for funding ITS deployment. The private sector is also investing large sums of internal resources which are shaping ITS development and deployment.

Background

Although 80 percent of the money ultimately spent for intelligent transportation systems will be in the consumer and commercial marketplace, these expenditures will be linked in many instances to investments in the public infrastructure.

State and local public officials who are responsible for funding, establishing, and operating the public ITS infrastructure have a number of sources and methods to pay for the improvements and encourage public-private infrastructure. Recognizing the opportunities for immediate benefit, many communities are funding transportation management, operations, and traveler information activities from locally appropriated funds.

Many applications of information technology bring about operational savings that more than pay for their purchase and use. Some applications can generate revenue streams by which the agency can pay for the applications. These revenue streams may also become the basis for public-private partnerships or innovative finance arrangements.

Stakeholder Impacts

State and local transportation officials have perhaps the most important role in ITS deployment. They show the creativity and flexibility to see and use ITS as a solution to their transportation problems. A very real concern for this group is how to pay for the continued operating and maintenance costs associated with many ITS applications.

The U.S. Department of Transportation's role is of leading rather than directing. It provides guidance – both pushing and pulling – to ensure that ITS is deployed in a coordinated manner, using the National ITS Architecture and related standards, giving the ultimate user access to a seamless system of information and convenience offered by ITS across the nation.

Current federal legislation provides a number of alternative funding sources from mainstream programs, many of which cover costs for operations and maintenance. Although there have been significant increases in federal dollars to states for transportation spending, ITS projects compete with other, more traditional, spending categories. Private investors and

operators can provide leverage for infrastructure development through public-private partnerships.

Actions

State Governments

- Support model deployments in state to focus resources and demonstrate benefits.
- Ensure that there is a process in place that will allow federal and local transportation funds to be used for intelligent infrastructure improvement and general ITS deployment.
- Secure innovative revenue opportunities at state and local levels including partnerships with private sector participants.
- Seek legal and institutional authority to partner with the private sector to support ITS deployments.

City/County Governments

- Consider ITS improvements and opportunities along with other transportation projects as federal and local transportation funds are allocated.
- Ensure that resources are programmed and provided to operate and maintain ITS and related systems.
- Use federal funds for system and program development.
- Seek and deploy innovative funding mechanisms that leverage public funding for implementation of ITS technology including the maximum use of public-private partnerships.
- Seek legal and institutional authority to partner with the private sector to support ITS deployments.

Rural Communities

- Consider ITS improvements and opportunities along with other transportation projects as federal and local transportation funds are allocated.
- Seek and deploy innovative funding mechanisms that leverage public funding for implementation of ITS technology including the maximum use of public-private partnerships.

Metropolitan Planning Organizations

- Consider ITS improvements and opportunities along with other transportation projects as federal and local transportation funds are allocated.
- Ensure effective planning and use of all federal programs and other public and private funding sources.

- Seek and deploy innovative funding mechanisms that leverage public funding for implementation of ITS technology including the maximum use of public-private partnerships.
- Fund model deployments that focus resources and funds to demonstrate the benefits of ITS.

Regional ITS Institutions

- Seek and deploy innovative funding mechanisms that leverage public funding for implementation of ITS technology including the maximum use of public-private partnerships.

Transit Agencies

- Identify local, regional, state, federal and private funding sources.

Toll Authorities/Agencies

- Show creativity and flexibility in partnering for ITS deployment projects.
- Seek and deploy innovative funding mechanisms that leverage public funding for implementation of ITS technology including the maximum use of public-private partnerships.
- Seek legal and institutional authority to partner with the private sector to support ITS deployments.

Emergency Management Service Providers

- Identify and capture potential sources of funding to support integrated communications and information sharing.

Commercial Vehicle Regulators

- Show creativity and flexibility in partnering for ITS deployment projects.
- Seek legal and institutional authority to partner with the private sector to support ITS deployments.

Commercial Vehicle Operators

- Encourage public sector investment that will benefit CVO by participating in public sector deployment activities, advocating funding for state and regional ITS/CVO programs, and supporting efforts to develop interoperability agreements for state and regional ITS/CVO programs.

Communications Companies

- Show creativity and flexibility in partnering for ITS deployment projects including shared resource opportunities.

Standards Development Organizations

- Seek creative funding mechanisms for standards development work to promote the participation of a broad community of interested parties, including representatives of state, regional, and local public agencies.
- Make effective use of federal standards development funding.

U.S. Department of Transportation

- Encourage the expanded use of dedicated federal transportation funding for ITS program implementation; integration; and research, development, and testing.
- Issue clear and timely guidelines for expanded eligibility of federal funding for ITS projects.
- Encourage and enable continued and expanded use of federal transportation funding by state and local governments for ITS programs.

ITS America

- Develop and disseminate information on ITS funding eligibility under federal law.
- Develop and disseminate information on innovative finance, public-private partnership, and pay-as-you-go projects.
- Develop and disseminate information describing real-world experiences and models for deployment funding.
- Explore creative private sector financing incentives such as “tax credits” for those participating in deployment programs.

Interagency Coordination/Cooperation

All too often there is a lack of coordination and cooperation among transportation agencies. This deficiency can limit the effectiveness of the transportation network and reduce the potential for substantive solutions. The most successful ITS projects are closely coordinated.

Background

The multi-layered set of agencies responsible for transportation generally reflect the separation of responsibility and authority among and between different political jurisdictions at the local, regional, state, and federal levels. Although in the past ITS-related programs and projects were devised and able to function in this environment, it is not the most efficient method, nor is it conducive to future ITS mainstreaming of operations and management.

Stakeholder Impacts

Regional ITS deployment projects affect the larger transportation network and typically cross jurisdictional and modal boundaries. They may be metropolitan-wide, statewide, corridor-wide, or multi-state in nature and often affect multiple government agencies.

Successful ITS deployment requires coordination among public agencies that traditionally have not been partners and raises questions about the ownership and control of data, as well as the eventual joint use of field devices.

State and regional involvement in transportation and land use planning requires significant intergovernmental cooperation.

Deployment of intermodal freight systems will involve a new and complex set of constituencies (seaports and airports; terminal operators; rail, drayage, and freight companies) that traditionally have been investing in technology but have not been part of the ITS community.

ITS can be the catalyst for engaging in productive interjurisdictional dialogue that can have benefits beyond ITS deployment.

Actions:

<u>State Governments</u>

- Establish an institutional framework of relationships and a regional cooperative process based on the National ITS Architecture upon which additional ITS applications will be built.
- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to

achieve success (with city/county governments, MPOs, regional ITS institutions, transit agencies, and toll authorities).
- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new "regional institutions" through co-locating facilities or through sharing information.
- Orchestrate communication among related agencies and information systems (licensing, enforcement, traffic records, and planning).
- Share data freely and coordinate projects closely to eliminate redundancy.
- Promote cooperation with adjoining states.
- Ensure that ITS solutions are mainstreamed into the planning and programming processes.
- Ensure that multimodal and interjurisdictional ITS technology deployment provides for the special needs of physically challenged individuals.
- Establish and maintain close working relationships with the emergency response community by proactively reaching out to formally recognize and solicit needs, issues, and recommendations.
- Link modes of travel with improved information to users.
- Promote use of relevant ITS technologies to improve transit system coordination and enable "smart growth" such as transit-oriented communities.

<u>City/County Governments</u>
- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with state governments, MPOs, regional ITS institutions, transit agencies, and toll authorities).
- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new "regional institutions" through co-locating facilities or through sharing information.
- Partner with other agencies, both within and across jurisdictions, to share costs and multiply benefits.
- Ensure that the public - particularly low-income and minority residents, the disabled, and senior citizens - participate in decision making so that their unique concerns are acknowledged and addressed.
- Facilitate the use of multimodal transfer stations (such as park-and-ride facilities adjacent to freeway interchanges) through the application of ITS technologies.

Rural Communities

- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new "regional institutions" through co-locating facilities or through sharing information.
- Initiate pilot projects that address immediate needs and opportunities and which foster institutional cooperation of multiple stakeholders.
- Encourage programs covering larger, interconnected regions that can provide better services at lower cost than localized programs (state governments).

Metropolitan Planning Organizations

- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with state governments, city/county governments, regional ITS institutions, transit agencies, and toll authorities).
- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new "regional institutions" through co-locating facilities or through sharing information.
- Convene discussions that lead to interagency cooperation and the creation of new regional institutions, where needed, for operation and management of ITS programs.
- Promote the implementation and ongoing administration of traffic incident management programs.
- Develop and incorporate ITS elements in Long Range Transportation Plans and Transportation Improvement Programs (TIPs).
- Promote and facilitate consideration of ITS plans, planning studies, and project design.

Regional ITS Institutions

- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with state governments, city/county governments, MPOs, transit agencies, and toll authorities).
- Identify and deploy specific projects, with realistic implementation schedules, that meet local needs.
- Coordinate and build linkages (institutional, physical, and electronic) to become part of the larger transportation community and information industry framework.

Transit Agencies

- Collaboratively identify opportunities where information sharing will yield immediate, measurable, beneficial results and work cooperatively to

achieve success (with state governments, city/county governments, MPOs, regional ITS institutions, and toll authorities).
- Establish the institutional mechanisms to facilitate regional coordination and cooperation and create new "regional institutions" through co-locating facilities or through sharing information.
- Identify and deploy specific projects, with realistic implementation schedules, that meet local needs.
- Coordinate and build linkages (institutional, physical, and electronic) to become part of the larger transportation community and information industry framework.

Toll Authorities/Agencies
- Collaboratively identify opportunities where information sharing and using interoperable toll tags will yield immediate, measurable, beneficial results and work cooperatively to achieve success (with state governments, city/county governments, MPOs, regional ITS institutions, and transit agencies).
- Make sure that needs are recognized and accommodated and that operational rules and concepts can work effectively with related transportation and financial industries.

Emergency Management Service Providers
- Work closely with other agencies involved in responding to transportation incidents and emergencies to determine roles, responsibilities, and procedures before an emergency occurs.
- Establish a framework for interjurisdictional cooperation and minimize jurisdictional conflicts through training, education, and cooperation of all agencies.
- Participate nationally toward the creation of a seamless, consistent capability for incident detection and response.
- Aggressively promote local and national partnerships between public safety and transportation organizations and agencies.
- Work closely with Federal Emergency Management agency and ITS state partners to coordinate major emergency incidents such fires and storms.

Commercial Vehicle Regulators
- Work nationally toward an integrated, seamless network of state information systems, linked to local multi-state or national databases.
- Work cooperatively to develop agreements regarding responsibilities and funding.
- Work toward statutory and regulatory changes to support electronic issuance of credentials and electronic payment of fees and taxes.
- Facilitate or serve as catalyst for effective intermodal freight networks.

Parking Operators

- Build institutional and technological linkages to other regional transportation organizations.

Communications Companies

- Collaborate with ITS interests in applying to the FCC for spectrum and approval of new devices.
- Operate within public and private travel information interests in establishing a uniform traveler information access number (N11) and enhanced 911 systems.

Standards Development Organizations

- Encourage and support U.S. participation in international architecture and standards forums, where such participation will help to advance high priority domestic goals.
- Participate actively in the ITS America Council of Standards Organizations.
- Involve and engage the public safety community through a sustained and formal role in standards development, testing, and deployment process.

Academia

- Link academic departments of criminal justice, police science, traffic and transportation engineering, and systems engineering.
- Establish and encourage development of a cooperative ITS research and demonstration agenda with government and the private sector.

U.S. Department of Transportation

- Forge cooperative relationships with other federal agencies, such as the Departments of Commerce, Justice, Agriculture and Energy, the Environmental Protection Agency, and the Federal Communications Commission.
- Encourage institutional coordination, cooperation, and integration at the regional and local levels.
- Facilitate the development of new markets abroad and support U.S. trade through intergovernmental cooperative agreements, international technology information exchange, and coordinated trade missions.
- Continue to facilitate the process of coordinating with intermodal freight stakeholders that are industry leaders, such as the Intermodal Association of North America and the Associations of American Railroads and Port Authorities.
- Seek national organization partners from the public safety community to form a coalition for national transportation and public safety.

- Give further consideration to joint programs for cross-border dispatch and sharing of information and resources to mitigate the effects of incidents at border crossing.

ITS America

- Provide a forum for the ITS industry to set its directions, both short and long term, and to build coalitions on critical technical and institutional issues.
- Provide policy and technical advice to U.S. DOT.
- Continue to facilitate the process of coordinating with intermodal freight stakeholders that are industry leaders, such as the Intermodal Association of North America and the Associations of American Railroads and Port Authorities.
- Seek national organization partners from the public safety community to form a coalition of national transportation and public safety.
- Take the lead in promoting international ITS cooperation and alliances.
- Represent interests of ITS operators on telecommunications matters before the Federal Communications Committee.
- Explore innovative means of ensuring that all areas of the country have access to the benefits of ITS such as creating a National ITS System.
- Engage in a partnership with the Institute of Transportation Engineers to administer a national traffic incident management network to support knowledge management for traffic incident management professionals in the public safety and transportation communities.

ITS America State and Regional Chapters

- Provide a forum for members to become better informed on ITS and to take part in setting regional directions.
- Provide advice to state, regional, and local governments.
- Build coalitions for statewide planning; conduct outreach and consensus building; educate public officials, private industry, and the general public; facilitate public-private partnerships; pursue funding; and promote economic development.

Skills and Training

Future ITS deployment success will rely on the skills and knowledge obtained by current and future transportation professionals, public officials, and the private sector. Education and training initiatives should be delivered by the public sector, private sector and the academic community to these stakeholders in order to achieve mutually beneficial goals and objectives.

Background

Intelligent transportation systems are as diverse as the transportation professionals that implement them. Future ITS deployment will rely on the skills and training provided to current and future transportation professionals in addition to the demands of the users. Training provided needs to be relevant to the stakeholders, include future ITS costs and benefits, and concentrate on "state of the art" technologies and beneficial applications. New courses need to be developed that address the top ten needs, as identified in *"Building Professional Capacity in ITS: Documentation and Analysis of ITS Training and Education Needs in Support of ITS Deployment," U.S. DOT PCB Program, April 1999.*

Stakeholder Impacts

All users of ITS need to have complete knowledge of and skills that address the deployment, operations, and management of ITS systems.

Various stakeholders should correctly classify needs and requirements to assure that education and training is tailored in content and targeted to meet the needs of the audience. In addition, training should be accessible in a cost-effective manner and delivered in a "just-in-time" and place method.

Effective forms of delivery should be instituted to meet the education and training needs of the ITS community in both metropolitan and rural areas. Various forms of delivery should be used including conventional classroom education and training, distance learning, on site technical assistance, information warehousing and dissemination via the Internet, and private sector training for deployed products and systems.

The program selected should be comprehensive and multi-modal and should include all stakeholders at all levels of government, academia, and public and private sectors. The program should reflect programs currently available through University Transportation Centers and the Local and Rural Technical Assistance Programs.

To support the skills and training needs, ITS America has launched the ITS America learning institute. The learning institute will be providing training programs and developing curriculum to meet training needs.

Actions

State Governments

- Assess changes needed in employee skill mix.
- Undertake employee recruitment and training programs.
- Partner with universities to promote professional training, continuing education, and distance learning programs.
- Ensure that the necessary staff is available to support processes to develop, operate, and maintain ITS systems.
- Improve and enhance existing courses based on lessons learned from deployment.

City/County Governments

- Assess changes needed in employee skill mix.
- Undertake employee recruitment and training programs.
- Partner with universities to promote professional training, continuing education, and distance learning programs.

Rural Communities

- Assess changes needed in employee skill mix.
- Undertake employee training programs.
- Ensure that the necessary staff is available to support processes to develop, operate, and maintain ITS systems.
- Partner with universities to promote professional training, continuing education, and distance learning programs.

Metropolitan Planning Organizations

- Train staff to understand ITS systems and benefits and the use of analytical tools to evaluate ITS within the planning process.

Transit Agencies

- Assess changes needed in employee skill mix.
- Undertake employee training and continuing education programs.

Toll Authorities/Agencies

- Assess changes needed in employee skill mix.
- Undertake employee training and continuing education programs.

Commercial Vehicle Regulators

- Lead in increasing staff expertise through training or hiring, and designate full-time CVO project and technical managers.
- Promote professional training and continuing education programs.

Parking Operators

- Establish greater industry-based expertise on the uses of ITS.

Vehicle Original Equipment Manufacturers and Suppliers

- Provide training materials on new ITS devices to state agencies and driver education institutions for driver education and licensing.

Contractors, System Integrators, Consultants

- Become familiar with and use the National ITS Architecture.
- Attract and retain knowledgeable, skilled staff.

Academia

- Incorporate ITS in the regular curricula and initiate actions to develop relevant distance-based educational courses.
- Develop a national consortium for the purpose of providing ITS based education and training.
- Develop continuing education programs to reeducate operating agency personnel to meet the immediate demands of the rapidly changing technology environment.
- Provide education and training to entry-level and mid-career staff to broaden their knowledge bases.
- Develop new curricula that focus on systems engineering concepts, communications and information management, and computer skills.
- Take advantage of advanced technology devices and learning technology capabilities to more effectively deliver learning programs in a more timely and effective manner, taking into consideration differences in skills, experience, and level of planning and operational responsibilities.
- Provide practical hands-on opportunities for training at both the undergraduate and graduate levels.
- Develop program management curricula addressing leadership skills required to effectively mange cross-functional team operations and multi-disciplinary skills and knowledge required to specify, acquire, deploy, operate, and maintain advanced technology systems.

U.S. Department of Transportation

- Provide aggressive training program to meet the needs of the evolving transportation profession (architecture, standards, lessons learned, telecommunications, procurement).
- Deliver targeted training to practitioners where and when they need it using innovative mechanisms (distance learning, the Internet).
- Develop and distribute training materials for adaptation by other training institutions.
- Provide increased technical guidance and assistance, including scanning tours, peer-to-peer exchange, how-to demonstrations, manuals, etc.

ITS America

- Institute a Certificate Program for technical and professional skills areas.
- Develop a web page for ITS professionals that provides a "virtual learning environment" and serves as a clearinghouse for appropriate courses of study.
- Improve and enhance existing courses including lessons learned from deployment.
- Continue to develop and deliver new courses that contain job-relevant knowledge and skills content.
- Provide educational opportunities to government officials and private-sector leaders of prospective ITS countries through internship or fellowship programs.
- Operate electronic and hard copy clearing houses for ITS information.

Regional Framework for Integration

The development and successful implementation of a regional framework (architecture) for the deployment and integration of ITS user services is essential to achieve the full benefits of ITS.

Background

In the early days of ITS deployment, system requirements were identified with little regard to the relationship with neighboring systems. Further, system design (architecture) did not include provisions for integration with other systems. This created a less than optimal environment for the traveler because trips were not seamless and decisionmaking was difficult. However, the regional deployment, operation, and maintenance of ITS will be common practice in 20 years. The tools necessary to make this happen (the National ITS Architecture and open standards) are now (or in the case of open standards soon to be) readily available. Travel and ITS deployment supporting it will be considerably more efficient because of integration.

Stakeholder Impacts

Transportation users will experience an overall improvement in regional mobility and safety.

Motor carriers can be assured that state and regional ITS systems will be interoperable. This implies a single device capable of being used for multiple electronic screening systems and functions.

Emergency services dispatchers and response agencies will receive the seamless implementation and benefits of automated systems, and the flow of information to emergency-care personnel for more effective handling of emergency situations.

State and city/county government agencies' ITS systems will become more effective and efficient as various functions are addressed comprehensively.

Information service providers will have access to comprehensive transportation information to provide their customers with accurate transportation services.

Electronic toll facilities will be able to coordinate with emergency services and other traffic management facilities to improve service and response to incidents.

Actions

State Governments

- Develop a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

City/County Governments

- Participate with metropolitan planning organizations (MPOs) to make sure local needs are addressed in a regional ITS framework based on the National ITS Architecture and included in regional plans and improvement programs.
- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

Rural Communities

- Develop a regional vision for long term ITS decision making.
- Participate in developing a regional ITS framework derived from the National ITS architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

Metropolitan Planning Organizations

- Develop a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Incorporate customer preferences/requirements into the ITS framework.
- Encourage use of the regional ITS framework.

Regional ITS Institutions
- Develop a regional vision for long term ITS decision making.
- Develop a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS deployment (with appropriate public and private sector participants).

Transit Agencies
- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).

Toll Authorities/Agencies
- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Work with other stakeholders to overcome barriers to establish open standards based interfaces for toll tags and toll administration reciprocity following the National ITS Architecture.

Emergency Management Service Providers
- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).
- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

Parking Operators
- Participate in developing a regional ITS framework derived from the National ITS Architecture that identifies the functions that are required for ITS and the physical entities where these functions fit together into an integrated system (with appropriate public and private sector participants).

Vehicle Original Equipment Manufacturers and Suppliers
- Work with local agencies to ensure that products are consistent with the regional ITS framework.

- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).

Communications Companies

- Cooperatively determine appropriate interface between public and private organizations involved in emergency response (emergency response providers and public safety answering points (PSAPs)).
- Build consensus with vehicle manufacturers and other end user product manufacturers to develop necessary specifications for interoperability.
- Provide some type of cellular coverage in remote rural areas and mountainous areas popular with tourists.

Contractors, System Integrators, Consultants

- Work with local agencies to ensure that products are consistent with the regional ITS framework.

Traveler Information Service Providers and Resellers

- Work with local agencies to ensure that data collected for traveler information are consistent with the regional ITS framework.

U.S. Department of Transportation

- Promulgate guidance for conformance with the National ITS Architecture and standards.
- Encourage communities to develop regional frameworks for integrating ITS services based on the National ITS Architecture.

ITS America

- Coordinate the identification and consolidation of emergency service user requirements and work closely with various stakeholder associations.
- Convene regional ITS summits to establish relationships among organizations to develop regional visions and deployment plans.
- Develop and maintain a comprehensive list of standards necessary for ITS integration and interoperability and track progress for such standards.

ITS America State and Regional Chapters

- Convene regional ITS summits to establish relationships between organizations to develop regional visions and deployment plans.
- Provide a forum for interagency dialog leading to regional integration and implementation.

Standards and Architecture

The ITS industry is built on the requirement to transfer information from one transportation entity to another. More than most other industries, ITS depends upon those two entities agreeing on what the sender sends and how the receiver interprets what is received. Without this agreement there is no ITS industry.

Background

The very nature of intelligent transportation demands agreement among communicating parties. An entrepreneur can define a communication technique for a local area and sell a product. However, before products can be marketed across the country, a national architecture and standards are required for a mobile user to receive a basic level of ITS communication services nationwide.

Stakeholder Impacts

National ITS deployment projects and services affect the national transportation network and cross technical, jurisdictional, and modal boundaries. They are across metropolitan areas, states, corridors, regions, and international boundaries.

Standard Developing Organizations (SDOs) have traditionally been at the center of standards development in the United States. Electronic commerce and electronic distribution of documents in the Information Age challenge the SDO institutions to apply new techniques in their traditional business.

Vehicle original equipment manufacturers, infrastructure managers, and communication companies should work together in nimble, new alliances to develop standards that respond to the rapid change environment of the intelligent transportation and communication marketplaces.

Actions:

State Governments

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.
- Seek global harmonization of standards with input from the general public.

City/County Governments

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.

- Use ITS products and services that are consistent with standards and protocols.

Rural Communities

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

Metropolitan Planning Organizations

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

Regional ITS Institutions

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

Transit Agencies

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.

Toll Authorities/Agencies

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.
- Develop transitional technical and institutional strategies to accept third-party transponders enabling national interoperability.

Emergency Management Service Providers

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.
- Use ITS products and services that are consistent with standards and protocols.
- Standardize protocols between incident management and emergency responders.

Parking Operators

- Pursue development of standards and protocols that promote and support interoperability and interconnectivity of systems and services.

- Use ITS products and services that are consistent with standards and protocols.
- Ensure inclusion of parking applications in the National ITS Architecture.

Commercial Vehicle Operators

- Actively participate in the standards development process.
- Work with standards community on transponder interoperability.
- Work with the U.S. DOT to develop enhancements to the National ITS Architecture and subsequent standards that support coordination between traffic management and CVO intermodal and border crossing port activities.

Vehicle Original Equipment Manufacturers and Suppliers

- Actively participate in the standards development process.
- Define industry interface standards and communication protocols to ensure an open, innovative, and competitive marketplace.
- Form consortia to rapidly develop the standards needed for new information technology applications.
- Define driver information needs under various driving situations and develop industry-wide standards or guidelines on vehicle-human interface design.
- Collaborate with public infrastructure interests and the U.S. DOT regarding National Architecture enhancements and standards for the vehicle/infrastructure interface.

Communications Companies

- Actively participate in the standards development process.
- Form consortia to rapidly develop the standards needed for new information technology applications.
- Accelerate development of standards - both regulatory standards to allocate spectrum and industry standards to harmonize protocols and create national seamless communications architectures.

Contractors, System Integrators, Consultants

- Actively participate in the standards development process.
- Fully understand and utilize National ITS Architecture and related standards.
- Form consortia to rapidly develop the standards needed for new information technology applications.

Traveler Information Service Providers and Resellers

- Actively participate in the standards development process.

- Form consortia to develop the standards needed for ensuring that data collected from multiple sources can be used in an integrated information system.
- Create common sets of icons and phrases for advanced traveler information systems (ATIS) interfaces.

Standards Development Organizations

- Encourage the continuation of federal management of the National ITS Architecture development as a basis for standards, working with ITS America.

U.S. Department of Transportation

- Continue to accelerate development of ITS national standards based on the National ITS Architecture.
- Work with standards development organizations to demonstrate and test newly developed standards and maintain the entire suite of standards in the ITS national standards program.
- Educate state and local practitioners about the importance of buying products and systems using open non-proprietary ITS standards in accordance with the National ITS Architecture.
- Encourage and support U.S. participation in international standards forums.
- Comply with congressional requirements for identification of critical standards and for standards conformity.
- Continue to enhance the National ITS Architecture.
- Continue to make the National ITS Architecture broadly available and accessible through electronic media and training.
- Extend the National ITS Architecture by developing new user services (such as emergency management services, law enforcement, advanced construction and maintenance) and addressing them in the architecture.
- Consider establishment of a traffic and transportation law enforcement user service, which incorporates privacy considerations, working in cooperation with appropriate stakeholder representatives.

ITS America

- Work with standards development organizations to demonstrate and test newly developed standards and maintain the entire suite of standards in the ITS national standards program.
- Reach out to all levels of government to educate them about the importance of cooperation and adoption of a National ITS Architecture and open standards to achieve ITS national deployment.
- Encourage and support U.S. participation in international architecture forums.

- Convene forums on interconnectivity and interoperability (public and private, suppliers and customers) to provide policy guidance and prioritization for technical standards development activities.
- Promote and support the use of the National ITS Architecture and standards.
- Develop and maintain a comprehensive list of standards necessary for ITS integration and interoperability; track progress for such standards; and respond to congressional requirements for identification of critical standards and for standards conformity.
- Seek international harmonization of ITS standards.
- Convene stakeholders to identify user requirements in support of development of new user services (such as emergency management services, law enforcement, advanced construction and maintenance) to be incorporated in the National ITS Architecture.
- Consider establishment of a traffic and transportation law enforcement user service, which incorporates privacy considerations, working in cooperation with appropriate stakeholder representatives.

ITS America State and Regional Chapters

- Reach out to all levels of government to educate them about the importance of cooperation and adoption of a National ITS Architecture and open standards to achieve ITS national deployment.

Public-Private Partnerships

Due to dramatic changes in transportation practice and policy, innovative relationships between the public and private sectors are necessary to facilitate and ensure the financial success of ITS deployment.

Background

Transportation systems throughout the nation are experiencing a number of competing pressures and demands; public agencies are being asked to do more with less. Demands on the transportation network are increasing; at the same time, funding levels are remaining static or shrinking. Public agencies can no longer follow traditional contracting methods for procuring transportation products and services. ITS by their very nature require public-private partnerships and can bridge the gap between the needs and goals of the public sector (mobility, safety, and economic development) and private sector (expand business and make a profit). Good models/case studies of true partnerships are needed and are difficult to find.

Stakeholder Impacts

Successful ITS deployment requires innovative coordination among the public and private sectors. They must understand the factors that influence each other's decisionmaking and achieve a balance between each of their needs and goals, which are often mutually exclusive.

Private industry will make by far the largest investment in ITS, but only given the promise of profits. The public sector is concerned with public welfare and management of public risk. The future transportation provider will create partnerships that encourage strategic and tactical alliances with the private community to develop, deploy, and operate ITS.

Actions

State Government

- Formalize and expand roles in promoting public-private partnerships and remove barriers to private investment.
- Invite the private sector to develop projects paid for with private investments and repaid with tolls or user fees.
- Consider innovative private investment-driven approaches that include provision of basic facilities and related operational services and outsourcing.

City/County Governments

- Make transportation network monitoring and measurement information collected by public agencies available in real-time, over open standard

interfaces, to stimulate innovative ITS information products by a competitive private sector.
- Partner with private sector participants to deploy services earlier and spread costs.
- Encourage innovative proposals from the private sector through use of broad solicitations.
- Formalize and expand roles in promoting public-private partnerships and remove barriers to private investment.
- Invite the private sector to develop new facilities paid for with private investments and repaid with tolls or user fees.
- Consider innovative private investment-driven approaches that include provision of basic facilities and related operational services and outsourcing.

Rural Communities
- Consider innovative private investment-driven approaches that include provision of basic facilities and related operational services and outsourcing.

Metropolitan Planning Organizations
- Promote public-private partnerships and remove barriers to private investment.
- Provide forums and work regionally to identify and bring together private and public partners to deploy ITS.
- Assess opportunities for innovative financing techniques and public-private partnerships to pay for ITS infrastructure.

Regional ITS Institutions
- Create legal and institutional mechanisms to partner with the private sector to support ITS deployments.

Toll Authorities/Agencies
- Develop formal relationships with financial companies to augment existing electronic payment systems applications.
- Work individually and nationally with the motor carrier industry to enhance the motor carriers' electronic linkages with tolled facilities.

Commercial Vehicle Regulators
- Recruit carriers to participate in programs.

Parking Operators
- Develop formal relationships with financial institutions to augment existing electronic payment system applications.

Commercial Vehicle Operators
- Develop divisions within organizations that are committed to working with public agencies in developing and deploying ITS.

Vehicle Original Equipment Manufacturers and Suppliers

- Collaborate with public regulatory authorities regarding in-vehicle safety system development.
- Work with government agencies toward an environment in which the benefits made possible by ITS technologies are not unduly delayed by unreasonable regulatory or liability concerns.

Communications Companies

- Collaborate in establishing models for effective partnerships with public agencies in developing and deploying ITS, including using public rights-of-way.

Contractors, System Integrators, Consultants

- Be open to creative partnerships with public agencies that will encourage effective ITS implementation.

Traveler Information Service Providers and Resellers

- Work collaboratively to build and strengthen industry consortia and alliances between public sector providers who collect necessary data.
- Work with public agencies regarding the benefits of effective use of transportation data by the general public and the need to make the data available through public-private partnerships.

Academia

- Create opportunities for students and faculty to work as interns, fellows, etc.

U.S. Department of Transportation

- Promote public-private partnerships, particularly in telecommunications, information technologies, and traveler information.

ITS America

- Provide assistance for fostering public-private partnerships in ITS infrastructure, services, and financial markets.
- Serve as a catalyst for industry consortia and public-private alliances in areas such as intermodal freight, international border crossings, and electronic payment systems.

ITS America State and Regional Chapters

- Serve as a home for regional public-private relationship enhancement and alliances.

Procurement

Public agencies need to develop innovative and easily understood procedures for the procurement of ITS products and services. ITS services include a blend of software and other technology and do not readily lend themselves to current procurement practices. New procurement mechanisms will make it easier and less costly for public agencies to partner with private sector contractors and service providers.

Background

Historically public agencies have used low bid procurement for concrete, asphalt, steel rebar, etc. However, the acquisition of hardware, software, communications technologies, and systems integration is generally not successful when design details are specified by one contractor and built by another. Procurement for ITS is often more successful when approached in terms of buying solutions instead of individual components. Hence, procuring ITS products and services requires a full range of procurement opportunities including sole source and competitive negotiation. Procuring ITS includes the acquisition of a system of technologies and capabilities. Acquiring the components of this system, whether they be software, telecommunications infrastructure or information technologies, and then putting it all together to realize a sum greater than its parts requires more than traditional low bid competition.

Procurement procedures for ITS need to be revised to include the full range of procurement options and allow use of “best business judgement.” These include “best bids” to allow innovative acquisitions to save money and use of design versus performance specifications. Other considerations should be mechanisms that allow for pre-bid communications between the agency and the private sector that accommodate the rapid changes in technology and that allow for contracts for long term maintenance by the supplier and/or be based on lifecycle costs.

Stakeholder Impacts

Public agencies often believe that they have very limited flexibility to stray from traditional, low bid procurement and usually have limited knowledge of innovative, nontraditional procurement mechanisms that are legally at their disposal. The agency may face several barriers: lack of statutory or regulatory tools, little or no institutional familiarity with ITS, funding limitations, and limited understanding of the needs of private sector partners.

For the private sector, there is a lack of understanding of the public sector's needs, abilities, and limitations. This is further complicated by the variability of requirements from one agency to another. This results in delay, frustration, added costs, and unrealized expectations for both the private and public partners.

Actions

State Governments

- Review and modify statutory and institutional provisions that constrain effective procurement.
- Consider cooperative or joint procurements with agencies with more flexible procurement procedures.
- Develop procurement guidelines that will facilitate technology acquisitions.
- Train staff in effective technology acquisition.
- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.
- Contract for technical skills that can not be hired.

City/County Governments

- Review and revise procurement procedures to facilitate ITS deployment.
- Consider cooperative or joint procurements with agencies with more flexible procurement procedures.
- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.
- Contract for technical skills that can not be hired.

Regional ITS Institutions

- Provide leadership in developing innovative procurement procedures to facilitate ITS deployment.

Transit Agencies

- Review and revise procurement practices to facilitate ITS deployment.
- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.

Toll Authorities/Agencies

- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.

Parking Operators

- Update procurement practices to support industry-specific technology acquisitions.

Vehicle Original Equipment Manufacturers and Suppliers

- Develop specifications that are clear, technically correct, enforceable, fair, and achievable.

Communications Companies

- Collaborate with public sector interests to establish more effective models for communication technology acquisitions.

Contractors, System Integrators, Consultants

- Work with public sector agencies to develop effective procurement practices that maximize the use of ITS technology.

U.S. Department of Transportation

- Encourage innovative procurement methods and develop guidance that recognize the special requirements associated with technical and system integration acquisition.

ITS America

- Develop forums for public and private sector entities to share best practices as they relate to procurement for ITS.
- Explore collective technology purchasing or acquisition consortia along with supporting national organizations.
- Collectively develop ITS procurement codes and guides and model procurement specifications along with supporting national organizations.

Business Models/Product Development

New product development is essential to the deployment of ITS. Entities in the consumer products and transportation industries that never worked closely together before must join forces and partner together in order to bring about a viable consumer market for ITS.

Background

Traditional product development has been at the initiative of individual companies. For example, in the past, motor vehicle companies typically had total control over the development and introduction of new products within vehicles and had access to in-house expertise and R&D resources to bring exciting new products to market. These products typically were self-standing and designed for the useful life of the vehicle. ITS is creating a new environment and introducing new opportunities in the area of product development. ITS products require closer alliances among motor vehicle OEMs; suppliers; telecommunication providers; and information services providing traffic, transportation, and entertainment services. R&D efforts and initiatives are increasingly being passed to suppliers. Numerous partnerships with private industry consortia and government are emerging.

Stakeholder Impacts

The consumer ultimately determines the success of ITS products in the marketplace. Effective product development that ensures safe operation of devices and proven value to the customer will speed the deployment of ITS.

Industry seeks new markets and products and will forge new relationships with government entities and other private sector partners.

Government seeks to spur the deployment of ITS technologies and products that help improve the safety and efficiency of the transportation system. Government supports vehicle technologies that offer the promise of reducing the number and severity of vehicle crashes and seeks to limit the use of those technologies that reduce vehicle operator attentiveness.

Actions

State Governments

- Make traffic and transportation related data available to private industry.
- Cooperatively conduct pre-competitive research to speed the introduction of technologies that provide convenience and safety enhancements for vehicle operators and travelers.
- Support business models that provide for consistency throughout a region or state.

City/County Governments
- Make traffic and transportation related data available to private industry.
- Support business models that provide for consistency throughout a region or state.

Rural Communities
- Support business models that provide for consistency throughout a region or state.

Metropolitan Planning Organizations
- Make transportation related data available to private industry.
- Support business models that provide for consistency throughout a region or state.

Regional ITS Institutions
- Make traffic and transportation related data available to private industry.
- Support business models that provide for consistency throughout a region or state.

Transit Agencies
- Make transit data available to private industry.
- Support business models that provide for consistency throughout a region or state.

Toll Authorities/Agencies
- Support business models that provide for consistency throughout a region or state.
- Better understand the new ways of doing business that ITS makes possible, such as value pricing designed to mitigate congestion.

Emergency Management Service Providers
- Support business models that provide for consistency throughout a region or state.
- Work with vendors to improve reliability and effectiveness of automatic incident detection technology.
- Work with vendors to ensure that data can be received, used, and sent by public service answering points (PSAPs).

Commercial Vehicle Regulators
- Reengineer credentials business processes and safety management strategies to take advantage of new technologies.

Parking Operators
- Support business models that provide for consistency of electronic payment systems throughout a region or state.

Vehicle Original Equipment Manufacturers and Suppliers
- Explore new opportunities for manufacturers to provide services and for service providers to influence product design and development.

- Establish consortia to advance technology and spread risk, including interface for incorporating ITS products in vehicles.
- Work closely with suppliers and public safety interests in order to bring the latest ITS advanced vehicle control and safety systems to market quickly and efficiently.

Contractors, System Integrators, Consultants

- Provide for integration of equipment with after-market product add-ons.

Traveler Information Service Providers and Resellers

- Develop viable business models for public-private partnerships that will encourage public participation and maximize private sector opportunities to utilize data.

U.S. Department of Transportation

- Encourage vehicle technologies and products that enhance vehicle safety.

ITS America

- Bring together members of the advanced transportation and information technology communities, such as the automotive and motorcycle industries, telecommunications, infrastructure, information service providers, etc., in order to speed the introduction of technologies and products that enhance the safety and convenience of the transportation system.
- Work with private sector stakeholders to determine the extent to which liability concerns are constraining introduction of ITS products into the marketplace; facilitate development of appropriate standards regulations and/or legislation to address liability concerns.

Privacy and Data Security

Policies for data access, control, and privacy must be developed and followed. The public are concerned about how the data developed by ITS systems will be used.

Background

Intelligent transportation systems have the technical capability to gather information about the location and operation of people and vehicles moving through the system. There are concerns that data collected through ITS systems will be used for secondary purposes (to issue speeding violations or create profiles of individuals for commercial and other purposes) or made available to competitors. Data that yield the identity of ITS users are particularly sensitive.

Stakeholder Impacts

Some individuals and organizations are concerned that using ITS will allow public and private parties to collect and use data in ways that are detrimental to them.

Travelers are concerned that using automated systems will lead to enforcement of small violations that would otherwise be ignored. For example, a truck driver who works only a small amount over the weekly limit might automatically be identified as a violator and be subject to penalties. Drivers could be automatically fined for slight violations of the speeding laws.

Motor carriers are concerned that data collected will be used in a counter productive manner by enforcement agencies.

For-profit companies are concerned that their competitors could obtain valuable data about traffic volumes using these systems.

Public agencies that gather traffic data are concerned that the data could lead them into litigation. For example, a camera tape that records an accident could be used in accident litigation.

Actions

State Government

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.
- Require establishment of information use and privacy policies.

City/County Governments
- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Rural Communities
- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Metropolitan Planning Organizations
- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Regional ITS Institutions
- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Transit Agencies
- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Toll Authorities/Agencies
- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.
- Address privacy concerns by favoring deployment of transponder systems that do not require the submittal of personal identity information by supporting debits through anonymous (not identity specific) “smart cards.”

Emergency Management Service Providers
- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Commercial Vehicle Regulators

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.

Commercial Vehicle Operators

- Establish policies on information use and privacy.
- Work cooperatively with public sector interests.

U.S. Department of Transportation

- Establish policies on information use and privacy.
- Develop and make publicly known protocols for data access, integrity, and security, particularly where personally identifiable information is gathered.
- Encourage practitioners to establish information use and privacy policies.
- Undertake case studies documenting experience and lessons learned regarding data security and privacy in model deployments and operational tests.

ITS America

- Make the ITS America Fair Information and Privacy Principles available to all parties interested in deployment, and periodically update these principles.
- Develop data-use and privacy guidelines applicable to specific application areas (e.g., commercial vehicle operations) working with U.S. DOT, appropriate national associations, and stakeholders.

Archiving and Value of Data

ITS data is used and needed in many ways - in turn, there are many contentious issues, whether or not to archive the data, its value in the marketplace, and ownership and access to the data.

Background

Intelligent transportation systems generate massive amounts of data during their normal operations. Value and ownership of that data and the need for a historical data archive are all important issues. There is some disagreement among ITS stakeholders concerning the processing, storage, retrieval, and quality of such data.

Stakeholder Impacts

Transportation professionals at all levels rely on many sources of data to feed planning models, simulations, and control strategies. The data are collected and used for policy analysis, management, operation, performance monitoring, lifecycle costing, and ITS investment analysis. ITS data provides a valuable supplement to existing resources.

Generally, public policy encourages giving data away to support traffic management efforts. This limits the market value of the data. Public and private sectors view the value of the data differently. These views must be honored within a constructive tension.

The ITS industry is attempting to standardize the data collected and used as a means of reducing the cost of manipulating, storing, and reporting the information contained in the data. This task is particularly important for private manufacturers of information reception devices.

Many parties are concerned about costs, privacy, and liability issues associated with the sanitation, storage, and management of archived data. Some parties are concerned that there will be an unfunded mandate for such data.

Data quality is a concern for those data elements that are aggregations of raw data. "Rules" for handling questionable or missing data in the aggregation process need to be established and documented.

Actions:

State Governments

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.

- Establish cooperative archived data capabilities and use them to support transportation planning and analysis (with MPOs and city/county governments).

City/County Governments

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.
- Establish cooperative archived data capabilities and use them to support transportation planning and analysis.

Metropolitan Planning Organizations

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.
- Provide leadership in obtaining and archiving transportation data.

Regional ITS Institutions

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.
- Make effective use of archived data.

Transit Agencies

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.

Toll Authorities/Agencies

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.

Commercial Vehicle Regulators

- Develop automated tools to facilitate quality control and editing of archived data based on the National ITS Architecture.
- Make effective use of archived data to assist in achievement of agency missions.

Communications Companies

- Develop new technology applications for acquiring, processing, storing, and retrieving data.

Contractors, System Integrators, and Consultants

- Develop new technology applications for acquiring, processing, storing, and retrieving data.

Traveler Information Service Providers and Resellers

- Support arrangements that maintain the open availability of public agency collected monitoring and measurement information.

Standards Development Organizations

- Ensure that current and ongoing standards development take into consideration needs for processing, storing, and retrieving ITS data.

U.S. Department of Transportation

- Develop guidelines and tools necessary to ensure data quality and completeness and outline the various business models that could be followed in collecting data.
- Take steps to train and educate transportation professionals on the value and challenges related to archiving ITS data.
- Fund a field operational test demonstrating a model for performing system development, as well as using ITS data, and document the value of increased information to local decisionmaking and operations.
- Explore the utility of archival databases already collected.
- Foster institutional arrangements necessary in deployment of systems involved in the processing, storing, and retrieving ITS data.

ITS America

- Develop guidelines and tools necessary to ensure data quality and completeness and outline the various business models that could be followed in collecting data.
- Take steps to train and educate transportation professionals on the value and challenges related to archiving ITS data.
- Provide leadership in developing policies to govern use and archiving of data.

Research, Development, and Testing

The mission of ITS Research, Development, and Testing (RD&T) is to accelerate deployment and availability of information and control technologies and driving assistance systems to reduce congestion, property damage, and societal and productivity losses that result from crashes and inefficiencies in our surface transportation system.

Background

ITS has been referred to as, "people using information technology in transportation to save lives, time, and money." ITS technology refers to a broad range of science and engineering disciplines applied to vehicle control, traveler assistance, infrastructure design and maintenance, and the collection, storage, and distribution of transportation information. The goal of ITS RD&T is to optimally invest resources and effectively employ incentives to rapidly bring effective technologies into common usage in the U.S. through government and industry cooperation.

Stakeholder Impacts

The national ITS RD&T program benefits travelers, drivers, and the entire national transportation network. The benefits cross technical, jurisdictional, and modal boundaries. Rapid implementation and deployment made possible by ITS RD&T will positively impact individual travelers and drivers, metropolitan areas, states, corridors, regions, and international border crossings.

States and local governments are working cooperatively in providing for RD&T of ITS infrastructure and services in their own communities. States provide the venues for operational tests and are investing directly in their own programs for RD&T (California PATH and Minnesota Guidestar).

Actions

State Governments

- Establish and encourage development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Pursue pooled-fund research studies to maximize scarce resources and maintain an open, cooperative dialogue.

City/County Governments

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Rural Communities

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Metropolitan Planning Organizations

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Support the development of ITS analytical tools including ITS evaluation modeling capabilities within the existing planning framework.

Regional ITS Institutions

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Transit Agencies

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Toll Authorities/Agencies

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Commercial Vehicle Regulators

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Commercial Vehicle Operators

- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Vehicle Original Equipment Manufacturers and Suppliers

- Develop and implement a program of research and development that applies collaborative funding and guidance from industry and U.S. DOT.
- Initiate research programs within organizations and develop mechanisms for sharing of key research findings, data and needs, and increase internal funding of existing RD&T programs.
- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

- Cooperatively conduct pre-competitive research to speed the introduction of technologies that provide convenience and safety enhancements for vehicle operators and travelers.
- Determine the capabilities and performance of drivers, and use this information in design of ITS information/control devices.

Communications Companies

- Initiate research programs within organizations and develop mechanisms for sharing of key research findings, data, and needs, and increase internal funding of existing RD&T programs.
- Participate with the U.S. DOT to rapidly develop and implement the best technologies and practices.
- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Collaborate with ITS interests regarding use of communications devices as data probes in the context of enhanced 911 geolocation regulatory requirements.
- Cooperate with government, industry and academia on research to better understand driver behavior and performance of driving while operating communication devices.

Contractors, System Integrators, Consultants

- Initiate research programs within organizations and develop mechanisms for sharing of key research findings, data, and needs, and increase internal funding of existing RD&T programs.
- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).

Traveler Information Service Providers and Resellers

- Initiate research programs within organizations and develop mechanisms for sharing of key research findings, data, and needs.
- Participate with the U.S. DOT to rapidly develop and implement the best technologies and practices.
- Support development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Assist public agencies in the development of, and participate in, effective operational tests.

Standards Development Organizations

- Support research programs that are specifically tailored to meeting empirical needs of specific standard development efforts.

- Participate in standards testing programs.

Academia

- Create formal departments specifically designed to accelerate the research and testing of ITS technologies.
- Conducted RD&T within the framework of the National ITS Architecture and standards in order to accelerate deployment.
- Conduct appropriate research and technology transfer activities.
- Undertake studies and demonstration to select most appropriate interfaces independent of special interests.

U.S. Department of Transportation

- Establish and encourage development of a cooperative ITS research agenda and participate in ITS research programs (with academia, public and private sectors).
- Administer a comprehensive program of ITS research, development, and testing, including but not limited to evaluation of safety impacts, benefits, and planning models.
- Continue to fund operational test partnerships designed to bring together public, private, and academic partners to research and develop new ITS technologies.

ITS America

- Continue to lead the effort to find innovative ways to bring public and private interests together in an optimal ITS RD&T initiative, including resolution of intellectual property rights issues.
- Provide the forum for research, development, and testing discussion and recommendation by ITS stakeholders and the public using the ITS America committee structure.
- Organize an ITS Industry/U.S. DOT working group designed to share ideas and exchange information about ITS research, development, and testing.
- Provide advice to U.S. DOT concerning enabling and operational RD&T priorities in its capacity as a utilized Federal Advisory Committee.

Vehicle/Infrastructure Interface

Advanced Vehicle Controls and Safety Systems (AVCSS), when deployed, will greatly improve safety, convenience, and mobility. To maximize the benefits of these services some may require both infrastructure and vehicle elements. Deployment will require agreement among private and public sector stakeholders and also require major commitments of resources.

Background

There are many alternative technology paths involving different degrees of infrastructure for delivering AVCSS services. Examples include multiple vehicle sensors (e.g., radar plus machine vision), high-precision road and vehicle location, embedded elements in the highway, communication between vehicles, the use of transponders to enhance radar ranging, and the universal placement of radar reflective pavement marking devices. Determining which combination of technologies makes the best sense from both commercial and effectiveness standpoints will require a broadly shared understanding of the technologies and their limitations. It will also require detailed, comprehensive, and quantitative systems analyses.

Stakeholder Impacts

To foster greater and more effective deployment, analysis and testing need to be conducted to define practicable and commercially attractive systems. All major stakeholders should agree upon goals for systems that move vehicles effectively using vehicle with AVCSS.

In order for vehicle and equipment manufacturers to devote limited resources to the development of systems that depend on infrastructure features and advanced traffic control, high levels of commitment of public resources would be required to ensure that public agencies will deploy the required infrastructure elements.

In order for the public agencies to deploy infrastructure, they should have a corresponding commitment from vehicle and equipment manufacturers that they will make the required vehicle systems available. Also, the infrastructure features should be compatible with, and to a substantial extent, benefit vehicles with and without AVCSS equipment.

A broad recognition of the potential benefits is necessary to get the process started. This general topic will likely be addressed in the Intelligent Vehicle Initiative (IVI) Program.

Actions

States Governments

- Work with vehicle manufacturers on the requirements for interfacing with the infrastructure and be prepared to deploy required infrastructure and conduct evaluations of implemented systems.
- Work toward establishment of extensions to the National ITS Architecture and open standards for advanced vehicle control and safety systems that are integrated with the infrastructure.

City/County Governments

- Participate in definition of the system that best meets local needs.
- Be prepared to deploy required infrastructure and conduct evaluations.

Vehicle Original Equipment Manufacturers and Suppliers

- Collaborate with public infrastructure owners and operators regarding the linkage to vehicles for optimum advanced vehicle control and safety systems.
- Collaborate with communication companies for solutions that require communicating large amounts of data.

U.S. Department of Transportation

- Initiate demonstrations of technical feasibility and benefits through a combination of field operational tests and analysis in both metropolitan and rural settings.

ITS America

- Serve as a forum for discussion among the stakeholders helping to define roles and forge partnerships to facilitate deployment.
- Conduct outreach to stakeholder communities that must support or participate in vehicle to infrastructure linkages for the benefits to be realized.