

**APPENDIX A**  
GLOSSARY OF TERMS

## GLOSSARY OF TERMS

<b>AASHTO</b>	<b>American Association of State Highway and Transportation Officials.</b> Representing State transportation officials, AASHTO is one of five standards development organizations with which U.S. DOT is working to establish standards for integrated, interoperable ITS deployment.
<b>Advanced Collision Avoidance and Safety Systems Vehicle</b>	These systems employ mostly in-vehicle technologies to help drivers avoid collisions, monitor driver performance, and automatically signal for emergency aid immediately upon collision.
<b>Advantage I-75</b>	Demonstration project started in 1991 to facilitate motor carrier operations along I-75. The project allows transponder-equipped and properly documented trucks to travel any segment along I-75 at mainline speeds with minimal stopping at weigh/inspection stations. Uses AVI and transponder technology.
<b>AHAR</b>	<b>Automatic Highway Advisory Radio.</b> U.S. traffic information broadcasting system. Transmissions are received through car radios that automatically interrupt other radio reception and tune in to the correct station.
<b>AHS</b>	<b>Automated Highway System.</b> The AHS is a highly advanced system that will redefine the current vehicle-highway relationship by shifting many tasks from the vehicle operator to the roadway itself. The first demonstration of the AHS concept will be in San Diego in August 1997.
<b>APTS</b>	<b>Advanced Public Transportation Systems.</b> Collection of technologies to increase efficiency of public transportation systems and offer users greater access to information on system operation.
<b>Architecture</b>	An overarching framework that allows individual ITS services and technologies to work together, share information, and yield synergistic benefits. The national ITS architecture was released as a final document in June 1996.
<b>ARTS</b>	<b>Advanced Rural Transportation Systems.</b> ITS technologies aimed at addressing the specific needs of rural communities, particularly the issues of mobility and road safety.
<b>ASD</b>	<b>Aircraft Situation Display.</b> Technology applied to air traffic management in the 1970's to allow a clear overview of the entire airspace for every traffic manager.
<b>ASTM</b>	<b>American Society of Testing and Materials.</b> One of five standards development organizations with which U.S. DOT is working to establish standards for integrated, interoperable ITS deployment
<b>ATA</b>	<b>American Trucking Association.</b> ATA represents commercial users of the Nation's highways. The ATA Foundation is the organization's research foundation.

<b>ATIS</b>	<b>Advanced Traveler Information Systems.</b> ATIS technologies provide travelers and transportation professionals with the information they need to make decisions, from daily individual travel decisions to larger scale decisions that affect the entire system, such as those concerning incident management.
<b>ATMS</b>	<b>Advanced Traffic Management Systems.</b> ATMS technologies apply surveillance and control strategies to improve traffic flow on highways and streets.
<b>AVC</b>	<b>Automatic Vehicle Classification.</b> Used in commercial vehicle operations to identify vehicles by type to reduce the necessity for record keeping by drivers.
<b>AVI</b>	<b>Automatic Vehicle Identification.</b> A system that combines an onboard tag or transponder with a roadside receiver for the automated identification of vehicles. Used for electronic toll collection and stolen vehicle recovery, among other purposes.
<b>AVL</b>	<b>Automatic Vehicle Location.</b> The installation of devices on a fleet of vehicles (e.g., buses, trucks, or taxis) to enable the fleet manager to determine the level of congestion in the road network. AVL is also used to enable the fleet to function more efficiently by pinpointing the location of vehicles in real time.
<b>CDPD</b>	<b>Cellular Digital Packet Data.</b> Cellular networks that transmit data in digital format.
<b>CMAQ</b>	<b>Congestion Management and Air Quality program.</b> Funding category in the Intermodal Surface Transportation Efficiency Act that targets efforts to reduce metropolitan air pollution. ITS technologies that contribute to improving air quality are eligible for CMAQ funds.
<b>CMS</b>	<b>Changeable Message Signs.</b> Electronic road and transit station signs used to display information that can be updated, such as warnings of road incidents, hazardous weather conditions, or estimated arrival times of transit vehicles. Used in ATIS and ATMS. Also called Variable Message Signs (VMS).
<b>Commercial Vehicle Administrative Processes</b>	Systems that allow carriers to purchase credentials and collect and report fuel and mileage tax information electronically.
<b>CVISN</b>	<b>Commercial Vehicle Information Systems and Networks.</b> A network that connects existing Federal, State, and private sector information systems to improve commercial vehicle movement.
<b>CVO</b>	<b>Commercial Vehicle Operations.</b> ITS program to apply advanced technologies to commercial vehicle operations, including commercial vehicle electronic clearance; automated roadside safety inspection; electronic purchase of credentials; automated mileage and fuel reporting and auditing; safety status monitoring; communication between drivers, dispatchers, and intermodal transportation providers; and immediate notification of incidents and descriptions of hazardous materials involved.

<b>DASCAR</b>	<b>Data Acquisition System for Crash Avoidance Research.</b> A portable on-board-vehicle-data-gathering system that can monitor and record vehicle performance and the driver's physical reactions.
<b>Data Element</b>	The smallest consistent unit of information used to construct messages.
<b>DOT</b>	<b>Department of Transportation.</b> When used alone, indicates U.S. Department of Transportation. In conjunction with a place name, indicates a State, city, or county transportation agency (e.g., Illinois DOT, Los Angeles DOT).
<b>DSRC</b>	<b>Dedicated Short-Range Communications.</b> Wireless, short-range digital communications. Uses electronic readers, tags, and software.
<b>EDP</b>	<b>Early Deployment Plan.</b>
<b>Electronic Fare Payment Systems</b>	Systems that collect payments using an electronic transponder. Payment types include fees for transit fares, taxis, parking, and tolls. Electronic payment systems can also gather real-time transit information on travel demand for better planning and scheduling of services.
<b>Electronic Toll and Traffic Management</b>	Through the use of "tool tags," electronic sensor systems, and debit or credit transactions, ETTM technologies allow vehicles to pass through special toll plazas without slowing or stopping, dramatically increasing lane throughput.
<b>Emergency Management Systems</b>	Services designed to minimize response time to incidents.
<b>Enabling Research</b>	Applied research that advances existing technologies to enable them to support ITS applications. This research has refined technology for eventual field testing, developed evaluation methods to determine potential benefits and cost effectiveness, developed human factors guidelines, and established performance specifications and criteria.
<b>ETC</b>	<b>Electronic Toll Collection.</b> An electronic payment system that collects toll fees using an electronic vehicle tag. This allows the vehicle to pass through the toll without stopping, resulting in decreased delays and improved roadway throughput.
<b>FAA</b>	<b>Federal Aviation Administration.</b>
<b>FCC</b>	<b>Federal Communications Commission.</b>
<b>FHWA</b>	<b>Federal Highway Administration.</b>
<b>FMS</b>	<b>Freeway Management Systems.</b> Network systems that allow transportation managers the capability to monitor highway and environmental conditions on the freeway system, identify recurring and nonrecurring flow impediments, implement appropriate control and management strategies, and provide collection and dissemination of critical real-time information to travelers.
<b>FRA</b>	<b>Federal Railroad Administration.</b>
<b>FTA</b>	<b>Federal Transit Administration.</b>

<b>GCM</b>	<b>Gary-Chicago-Milwaukee corridor.</b> One of the ITS priority corridor projects defined by ISTEA to receive funding for applying ITS to assist in reducing extreme or severe ozone problems. The initial GCM priority is real-time data acquisition and sharing of information across the corridor that is useful to both multimodal system operators and travelers.
<b>Geographic Information Systems</b>	Computerized data management systems designed to capture, store, retrieve, analyze, and report on geographic and demographic data.
<b>GPS</b>	<b>Global Positioning System.</b> A method of determining the position of vehicles using communications with a satellite. The GPS is a Government owned system of 24 Earth-orbiting satellites. These satellites transmit data to ground-based receivers, rendering extremely accurate latitude/longitude ground positions in coordinates for the military Precise Positioning Service. Deliberate error (selective availability) is introduced into the civilian service (Standard Positioning Service) for defense purposes.
<b>HAR</b>	<b>Highway Advisory Radio.</b>
<b>HAZMAT</b>	<b>Hazardous Materials classification.</b>
<b>HELP</b>	<b>Heavy Vehicle Electronic License Plate program.</b> A multistate, multinational research effort to design and test an integrated heavy vehicle monitoring system using AVI, AVC, and W-I-M technology.
<b>Highway-Rail Intersection (HRI) User Services</b>	User services that integrate ITS technology into existing HRI warning systems to enhance their safety, effectiveness, and operational efficiency. At railroad-grade crossings, both in-vehicle and roadside HRI technologies ensure that train movements are coordinated with traffic signals and that drivers are alerted to approaching trains.
<b>HOV</b>	<b>High-Occupancy Vehicle.</b> Any vehicle containing more than one or two persons, such as a bus, carpool, or vanpool.
<b>Human Factors</b>	Research done to understand the impact of automated technology on human decisionmaking and driving behavior.
<b>IEEE</b>	<b>Institute of Electrical and Electronics Engineers.</b> One of five standards development organizations with which U.S. DOT is working to establish standards for integrated, interoperable ITS deployment.
<b>IMS</b>	<b>Incident Management Systems.</b> Monitoring and surveillance systems that identify incidents in real time so that they can be removed quickly.
<b>INFORM</b>	<b>Information for Motorists program.</b> A demonstration project on Long Island, NY, that found that motorist information, provided via variable message signs, can reduce delay caused by congestion and incidents.
<b>Intelligent Cruise Control</b>	A crash avoidance technology that automatically adjusts vehicle cruise speed to maintain safe following distances.

<b>Intelligent Transportation Infrastructure</b>	Core infrastructure that combines conventional and advanced technologies to integrate essential ITS services so that they are interoperable and intermodal.
<b>Intermodalism</b>	Seamless integration of multiple travel modes.
<b>Interoperability</b>	The ability to integrate the operation of diverse networks and systems. The vision of the intelligent transportation infrastructure is a seamless interoperable network from coast-to-coast that allows drivers and information to flow through the system without barriers.
<b>In-Vehicle Navigation</b>	Technology that gives drivers access to route guidance information while en route. Includes location-referencing technology, in-vehicle display units, map information, and audio/text delivery technology.
<b>ISTEA</b>	<b>Intermodal Surface Transportation Efficiency Act of 1991.</b> Federal law providing primary Federal funding for highway and other surface transportation programs in the United States through 1997. ISTEA contains the Intelligent Vehicle-Highway System Act. Directs the establishment of a National ITS program that is to include: a strategic plan for ITS in the United States, implementation and evaluation of ITS technologies, development of standards protocols, an information clearinghouse, the use of advisory committees (one of which is ITS America), and funding for ITS research, development, and testing in such efforts as the corridors program.
<b>ITE</b>	<b>Institute of Traffic Engineers.</b> One of five standards development organizations with which U.S. DOT is working to establish standards for integrated, interoperable ITS deployment.
<b>ITS</b>	<b>Intelligent Transportation System(s).</b> The application of advanced technologies to improve the efficiency and safety of transportation systems.
<b>ITS America</b>	<b>Intelligent Transportation Society of America.</b> A nonprofit, public/private scientific and educational corporation that works to advance a national program for safer, more economical, more energy efficient, and environmentally sound highway travel in the United States. Federal advisory committee used by U.S. Department of Transportation.
<b>IVHS</b>	<b>Intelligent Vehicle-Highway Systems.</b> Now known as intelligent transportation systems.
<b>JPO</b>	<b>Joint Program Office</b> for ITS.
<b>Location Referencing</b>	Technology that more precisely identifies locations of vehicles and travelers. Used with GPS and AVL technologies. Supports user services, such as Mayday, EMS, CVO, ATMS, ATIS, and collision avoidance systems.
<b>Mainstreaming</b>	The act of bringing ITS technology into everyday use by travelers and transportation professionals.
<b>Mayday</b>	An ITS program designed to offer a real-time link between travelers in trouble and transportation officials. Uses location-referencing technologies and communications systems.

<b>MCSAP</b>	<b>Motor Carrier Safety Assessment Program.</b> A program designed to equip vehicle inspection sites with pen-based systems and automated inspection selection technology to allow inspectors to single out unsafe carriers for inspection. Part of the SAFER program.
<b>MDI</b>	<b>Model Deployment Initiative.</b> A program designed to develop model sites demonstrating intelligent transportation infrastructure and successful jurisdictional and organizational working relationships. The program is also designed to demonstrate the benefits of integrated transportation management systems that feature strong regional, multimodal traveler information services.
<b>Message Set</b>	Structured sets of data used to convey information. Message sets are constructed of data elements based on the definitions found in the data dictionary (see Data Element and TMDD).
<b>MPO</b>	<b>Metropolitan Planning Organization.</b> Regional agencies representing local governments. MPOs have planning and programming authority under ISTEA.
<b>NADS</b>	<b>National Advanced Driving Simulator.</b> A testing device that will allow controlled risk-free studies of operator behavior in crash-imminent situations; it is expected to be completed by 1999.
<b>NAHSC</b>	<b>National Automated Highway Systems Consortium.</b>
<b>NATAP</b>	<b>North American Trade Automation Prototype.</b> The application of advanced communication technologies to facilitate the flow of commercial vehicles across borders. The prototype has developed common data elements and processes to process commercial cargo shipment data at borders.
<b>NHS</b>	<b>National Highway System.</b> A federally designated network of 255,803 km (160,995 miles) of roads, most of which already exist, that are eligible for priority Federal-aid funding under ISTEA, including the 45,000-mile Interstate system and major State highways.
<b>NHTSA</b>	<b>National Highway Traffic Safety Administration.</b>
<b>NII</b>	<b>National Information Infrastructure.</b> Originally funded as a Federal project, the NII initiative is now aimed at developing a coordinated, integrated set of systems for information exchange. ITS can benefit from these technologies and, equally important, from the lessons learned through the NII process, which has sparked a proliferation of public and private software developments and applications directed to private and public consumers.
<b>NTCIP</b>	<b>National Transportation Communications for ITS Protocol.</b> Required for traffic management operations. Allows for wireline communications between traffic management centers and field equipment.
<b>OMC</b>	<b>Office of Motor Carriers (of the Federal Highway Administration).</b> Manages CVO-related ITS projects.
<b>Operation Timesaver</b>	Federal initiative aimed at reducing congestion by building an intelligent transportation infrastructure in 75 of the Nation's largest metropolitan areas within 10 years. The goal is to reduce travel times by 15 percent by the year 2005.

<b>ORNL</b>	<b>Oak Ridge National Laboratory.</b>
<b>Priority Corridor</b>	One of the first “deployment” programs established by ISTEA. Originally designed to showcase technology and hardware, the program has created communication channels and organizational frameworks among the numerous agencies that must coordinate to successfully implement ITS.
<b>Protocol</b>	“Envelopes” used to package data for interoperable flow of ITS information. Protocols can include information on addressing, security, priority, and other data handling issues.
<b>Public-Private Partnerships</b>	Agreements with private sector companies to participate in the deployment of ITS through commitment of time, services, products, or capital investment. These partnerships are the foundation of the ITS strategic plan’s financial strategy for ITS deployment. The plan assumes that private sector companies will contribute up to 20 percent of testing and deployment costs.
<b>R&amp;D</b>	<b>Research and Development.</b>
<b>Radio Broadcast Data System</b>	An alternative broadcast technique that is appropriate for reporting congestion and incidents, but does not offer sufficient data throughput to meet anticipated needs for more detailed traveler information, such as travel time estimates. Testing and evaluation of specialized communication techniques, such as the subcarrier traffic information channel, are necessary to support the deployment of commercially viable traffic and traveler information systems.
<b>Ramp Metering</b>	Traffic-responsive regulation of vehicle entry to a freeway, typically via sensor-controlled freeway ramp stoplights.
<b>Refarming</b>	Process by which the FCC is reallocating spectrum use and auctioning off available space on the spectrum.
<b>RESCU</b>	Proprietary in-vehicle safety and security system manufactured by Ford Motor Company, which provides theft tracking/recovery, navigational assistance, and automated telephone contact of emergency services in the event of an accident.
<b>RF</b>	<b>Radio Frequency.</b>
<b>RSPA</b>	<b>Research and Special Programs Administration</b> of the U.S. Department of Transportation.
<b>RT-TRACS</b>	<b>Real-Time Traffic-Adaptive Control System.</b> Next-generation traffic and transit management system. An advanced dynamic traffic control strategy that uses state-of-the-art traffic signal control based on real-time demand.
<b>SAE</b>	<b>Society of Automotive Engineers.</b> One of five standards development organizations with which U.S. DOT is working to establish standards for integrated, interoperable ITS deployment.

<b>SAFER</b>	<b>Safety and Fitness Electronic Record system.</b> Currently undergoing an operational test through the ITS/CVO program, SAFER provides access to commercial vehicle and driver information, as well as historical safety information on interstate carriers across the Nation.
<b>SAVME</b>	<b>System for Assessing the Vehicle Motion Environment.</b> A roadside measurement system to quantify the movement of vehicles in real traffic.
<b>SDO</b>	<b>Standards Development Organization.</b> U.S. DOT is working with five organizations to develop standards in areas relevant to intelligent transportation: State-level participation and roadside infrastructure (AASHTO), dedicated short-range communication systems (ASTM), electronics and communication message sets and protocols (IEEE), traffic management and transportation planning systems (ITE), and in-vehicle and traveler information (SAE)
<b>Shared-Resource Agreements</b>	Innovative method of acquiring needed bandwidth, facilities, devices, and/or services to support ITS. Supplants traditional procurement processes and criteria as a way of involving the private sector in deploying intelligent transportation infrastructure.
<b>Smart Bus</b>	Transit vehicle equipped with ITS applications.
<b>SmarTraveler</b>	One of the first ITS field operational tests. Designed to demonstrate the value of traffic information to travelers of all types, including commuters, transit users, taxi drivers, and salespeople. SmarTraveler tested the user acceptance of, and potential market for, ATIS.
<b>Smart Traveler</b>	FTA-funded APTS projects in Bellevue, CA; Houston; and St. Paul. Focus is on providing information more conveniently to transit users. Technology being tested includes smart cards, ATIS, and mobile communications for HOV and ridesharing applications. Part of the California APTS.
<b>Standards</b>	Specifications that are established to address the need for various technologies, products, and components from different vendors to work together.
<b>TIP</b>	<b>Transportation Improvement Plan.</b> An MPO program for transportation projects, developed jointly with the State for a 3- to 7- year period.
<b>TMC</b>	<b>Traffic Management Center.</b>
<b>TMDD</b>	<b>Traffic Management Data Dictionary.</b> A source of standardized information that defines how information is exchanged and how it flows between ITS devices and systems. The TMDD standardizes message sets for national interoperability.
<b>Traffic Signal Control Systems</b>	Advanced systems that adjust the amount of “green time” for each street and coordinate operation between each signal to maximize traffic flow and minimize delay. Adjustments are based on real-time changes in demand.

<b>TravTek</b>	First demonstration project that provided traffic congestion information, motorist “yellow pages” service information, tourist information, and route guidance through an in-vehicle unit installed in 100 rental cars. The route guidance information reflected real-time traffic conditions.
<b>TRB</b>	<b>Transportation Research Board.</b> Part of the National Academy of Sciences, National Research Council, TRB serves to stimulate, correlate, and make known the findings of transportation research.
<b>User Services</b>	Services available to travelers on an ITS-equipped transportation system, as set forth by ITS America. The 30 services are arranged in 7 categories, as follows: (1) travel and transportation management, (2) travel demand management, (3) public transportation operations, (4) electronic payment, (5) commercial vehicle operations, (6) emergency management, and (7) advanced vehicle control and safety systems.
<b>Variable Dynamics Test Vehicle</b>	A test vehicle equipped with computer control of throttle, brake, and steering that can help determine how drivers will react to various proposed ITS crash avoidance designs.
<b>Vehicle Roadside Communications</b>	Used in electronic toll collection, AVI, CVO, and ATMS. Technologies include transponders, readers, cellular telephones, and beacons, among others.
<b>VMS</b>	<b>Variable Message Signs.</b> Used in ATMS and ATIS. Also called CMS .

## **APPENDIX B**

### LIST OF SELECTED PUBLICATIONS

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American Trucking Association's Foundation. *Assessment of intelligent Transportation Systems/Commercial Vehicle Operations User Services: ITS/CVO Qualitative Benefit/Cost Analysis*. Prepared for FHWA, June 1996.

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