

APPENDIX A

GLOSSARY OF TERMS

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AASHTO	American Association of State Highway and Transportation Officials. 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.
Advanced Collision Avoidance and Safety Systems Vehicle	These systems employ mostly in-vehicle technologies to help drivers avoid collisions, monitor driver performance, and automatically signal for emergency aid immediately upon collision.
Advantage I-75	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.
AHAR	Automatic Highway Advisory Radio. 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.
AHS	Automated Highway System. 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.
APTS	Advanced Public Transportation Systems. Collection of technologies to increase efficiency of public transportation systems and offer users greater access to information on system operation.
Architecture	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.
ARTS	Advanced Rural Transportation Systems. ITS technologies aimed at addressing the specific needs of rural communities, particularly the issues of mobility and road safety.
ASD	Aircraft Situation Display. Technology applied to air traffic management in the 1970's to allow a clear overview of the entire airspace for every traffic manager.
ASTM	American Society of Testing and Materials. One of five standards development organizations with which U.S. DOT is working to establish standards for integrated, interoperable ITS deployment
ATA	American Trucking Association. ATA represents commercial users of the Nation's highways. The ATA Foundation is the organization's research foundation.

ATIS	Advanced Traveler Information Systems. 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.
ATMS	Advanced Traffic Management Systems. ATMS technologies apply surveillance and control strategies to improve traffic flow on highways and streets.
AVC	Automatic Vehicle Classification. Used in commercial vehicle operations to identify vehicles by type to reduce the necessity for record keeping by drivers.
AVI	Automatic Vehicle Identification. 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.
AVL	Automatic Vehicle Location. 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.
CDPD	Cellular Digital Packet Data. Cellular networks that transmit data in digital format.
CMAQ	Congestion Management and Air Quality program. 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.
CMS	Changeable Message Signs. 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).
Commercial Vehicle Administrative Processes	Systems that allow carriers to purchase credentials and collect and report fuel and mileage tax information electronically.
CVISN	Commercial Vehicle Information Systems and Networks. A network that connects existing Federal, State, and private sector information systems to improve commercial vehicle movement.
CVO	Commercial Vehicle Operations. 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.

DASCAR	Data Acquisition System for Crash Avoidance Research. A portable on-board-vehicle-data-gathering system that can monitor and record vehicle performance and the driver's physical reactions.
Data Element	The smallest consistent unit of information used to construct messages.
DOT	Department of Transportation. 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).
DSRC	Dedicated Short-Range Communications. Wireless, short-range digital communications. Uses electronic readers, tags, and software.
EDP	Early Deployment Plan.
Electronic Fare Payment Systems	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.
Electronic Toll and Traffic Management	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.
Emergency Management Systems	Services designed to minimize response time to incidents.
Enabling Research	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.
ETC	Electronic Toll Collection. 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.
FAA	Federal Aviation Administration.
FCC	Federal Communications Commission.
FHWA	Federal Highway Administration.
FMS	Freeway Management Systems. 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.
FRA	Federal Railroad Administration.
FTA	Federal Transit Administration.

GCM	Gary-Chicago-Milwaukee corridor. 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.
Geographic Information Systems	Computerized data management systems designed to capture, store, retrieve, analyze, and report on geographic and demographic data.
GPS	Global Positioning System. 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.
HAR	Highway Advisory Radio.
HAZMAT	Hazardous Materials classification.
HELP	Heavy Vehicle Electronic License Plate program. A multistate, multinational research effort to design and test an integrated heavy vehicle monitoring system using AVI, AVC, and W-I-M technology.
Highway-Rail Intersection (HRI) User Services	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.
HOV	High-Occupancy Vehicle. Any vehicle containing more than one or two persons, such as a bus, carpool, or vanpool.
Human Factors	Research done to understand the impact of automated technology on human decisionmaking and driving behavior.
IEEE	Institute of Electrical and Electronics Engineers. One of five standards development organizations with which U.S. DOT is working to establish standards for integrated, interoperable ITS deployment.
IMS	Incident Management Systems. Monitoring and surveillance systems that identify incidents in real time so that they can be removed quickly.
INFORM	Information for Motorists program. 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.
Intelligent Cruise Control	A crash avoidance technology that automatically adjusts vehicle cruise speed to maintain safe following distances.

Intelligent Transportation Infrastructure	Core infrastructure that combines conventional and advanced technologies to integrate essential ITS services so that they are interoperable and intermodal.
Intermodalism	Seamless integration of multiple travel modes.
Interoperability	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.
In-Vehicle Navigation	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.
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991. 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.
ITE	Institute of Traffic Engineers. One of five standards development organizations with which U.S. DOT is working to establish standards for integrated, interoperable ITS deployment.
ITS	Intelligent Transportation System(s). The application of advanced technologies to improve the efficiency and safety of transportation systems.
ITS America	Intelligent Transportation Society of America. 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.
IVHS	Intelligent Vehicle-Highway Systems. Now known as intelligent transportation systems.
JPO	Joint Program Office for ITS.
Location Referencing	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.
Mainstreaming	The act of bringing ITS technology into everyday use by travelers and transportation professionals.
Mayday	An ITS program designed to offer a real-time link between travelers in trouble and transportation officials. Uses location-referencing technologies and communications systems.

MCSAP	Motor Carrier Safety Assessment Program. 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.
MD1	Model Deployment Initiative. 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.
Message Set	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).
MPO	Metropolitan Planning Organization. Regional agencies representing local governments. MPOs have planning and programming authority under ISTEA.
NADS	National Advanced Driving Simulator. 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.
NAHSC	National Automated Highway Systems Consortium.
NATAP	North American Trade Automation Prototype. 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.
NHS	National Highway System. 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.
NHTSA	National Highway Traffic Safety Administration.
NII	National Information Infrastructure. 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.
NTCIP	National Transportation Communications for ITS Protocol. Required for traffic management operations. Allows for wireline communications between traffic management centers and field equipment.
OMC	Office of Motor Carriers (of the Federal Highway Administration). Manages CVO-related ITS projects.
Operation Timesaver	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.

ORNL	Oak Ridge National Laboratory.
Priority Corridor	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.
Protocol	“Envelopes” used to package data for interoperable flow of ITS information. Protocols can include information on addressing, security, priority, and other data handling issues.
Public-Private Partnerships	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.
R&D	Research and Development.
Radio Broadcast Data System	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.
Ramp Metering	Traffic-responsive regulation of vehicle entry to a freeway, typically via sensor-controlled freeway ramp stoplights.
Refarming	Process by which the FCC is reallocating spectrum use and auctioning off available space on the spectrum.
RESCU	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.
RF	Radio Frequency.
RSPA	Research and Special Programs Administration of the U.S. Department of Transportation.
RT-TRACS	Real-Time Traffic-Adaptive Control System. 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.
SAE	Society of Automotive Engineers. One of five standards development organizations with which U.S. DOT is working to establish standards for integrated, interoperable ITS deployment.

SAFER	Safety and Fitness Electronic Record system. 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.
SAVME	System for Assessing the Vehicle Motion Environment. A roadside measurement system to quantify the movement of vehicles in real traffic.
SDO	Standards Development Organization. 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)
Shared-Resource Agreements	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.
Smart Bus	Transit vehicle equipped with ITS applications.
SmarTraveler	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.
Smart Traveler	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.
Standards	Specifications that are established to address the need for various technologies, products, and components from different vendors to work together.
TIP	Transportation Improvement Plan. An MPO program for transportation projects, developed jointly with the State for a 3- to 7- year period.
TMC	Traffic Management Center.
TMDD	Traffic Management Data Dictionary. 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.
Traffic Signal Control Systems	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.

TravTek	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.
TRB	Transportation Research Board. Part of the National Academy of Sciences, National Research Council, TRB serves to stimulate, correlate, and make known the findings of transportation research.
User Services	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.
Variable Dynamics Test Vehicle	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.
Vehicle Roadside Communications	Used in electronic toll collection, AVI, CVO, and ATMS. Technologies include transponders, readers, cellular telephones, and beacons, among others.
VMS	Variable Message Signs. Used in ATMS and ATIS. Also called CMS .

APPENDIX B

LIST OF SELECTED PUBLICATIONS

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