



# Appendix L: ITS Standards List

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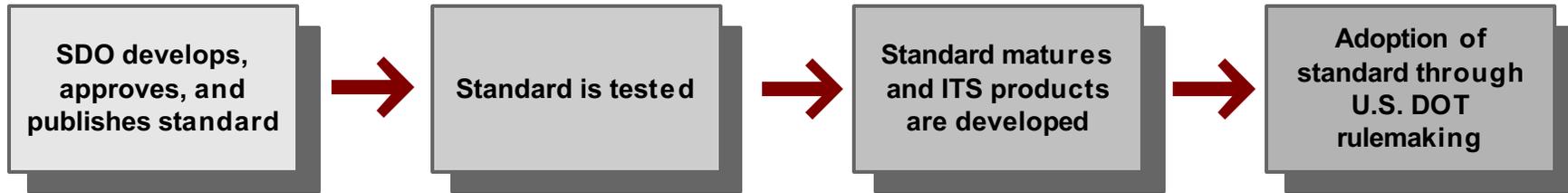
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# Life Cycle of ITS Standards

## From Initial Development to U.S. DOT Adoption



Standards development organizations (SDOs) coordinate the development of standards:

- 1) During **development**, an SDO committee writes and documents the technical aspects of standards.
- 2) Standards then go through a **balloting** process, where committee or working group members review the technical merits of the standards. A standard may or may not pass balloting.
- 3) Standards that have passed all necessary ballots are **approved**. At this stage the standard can be used but is not yet published.
- 4) Approved standards are **published** by the SDO and are available for purchase.

**Testing** measures the operation, correctness, and completeness of a standard under realistic transportation operating conditions. It also measures the degree of interoperability among standards as well as provides information about the performance of a standard to the ITS community.

As standards **mature**, competition develops among vendors to provide a range of equipment with differing levels of functionality. This gives transportation managers greater flexibility in choosing products that best suit their particular project requirements.

Standardized components lead to **interoperability** (the capacity of a device to communicate with different types of ITS devices) and **interchangeability** (the capacity to substitute one manufacturer's device for another).

ITS devices, based on open standards, lead to costs savings, as well as to easier and more efficient systems maintenance and operations.

*Not all ITS standards reach this stage.*  
 The U.S. DOT will only consider adopting an ITS standard through **rulemaking** if the standard meets, at a minimum, certain established criteria. These criteria are defined in the *Final Rule/Policy on the National ITS Architecture and ITS Standards* and are intended to produce technically and commercially viable ITS standards and equipment.



**Table L-1. Published Standards Documents - As of November 2003**

Document Title	Lead SDO	Doc #	Publish Date	Order Information
A Conceptual ITS Architecture: An ATIS Perspective	SAE	J1763	31-Jul-95	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Adaptive Cruise Control (ACC) Human Factors: Operating Characteristics and User Interface	SAE	J2399	15-Sep-03	Approved April 2002; awaiting publication.
Calculation of the Time to Complete In-Vehicle Navigation and Route Guidance Tasks	SAE	J2365	1-May-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Commercial Vehicle Credentials	ANSI	ANSI ASC X12 TS286	1-Oct-97	Order from <a href="http://www.disa.org">www.disa.org</a> or call 703-548-7005.
Commercial Vehicle Safety Reports	ANSI	ASC X12 TS284	1-Dec-98	Order from <a href="http://www.disa.org">www.disa.org</a> or call 703-548-7005.
Commercial Vehicle Safety and Credentials Information Exchange	ANSI	ANSI ASC X12 TS285	1-Dec-96	Order from <a href="http://www.disa.org">www.disa.org</a> or call 703-548-7005.
Comparison of GATS Messages to SAE ATIS Standards Information Report	SAE	J2539	28-Feb-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Data Dictionary for Advanced Traveler Information Systems (ATIS)	SAE	J2353	19-Oct-99	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Data Radio Channel (DARC) System	EIA/CEA	EIA-794	1-Jul-99	Order from <a href="http://www.global.ihs.com">www.global.ihs.com</a> or call 800-854-7179.
Definitions and Experimental Measures Related to the Specifications of Driver Visual Behavior Using Video Based Techniques	SAE	J2396	14-Jul-00	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Field Test Analysis Information Report	SAE	J2372	14-Dec-99	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Guide for Microwave Communications System Development	IEEE	Std 1404-1998	22-Jul-98	Order from <a href="http://standards.ieee.org/catalog/ordering.html">standards.ieee.org/catalog/ordering.html</a> or 800-678-IEEE.
Human Factors in Forward Collision Warning Systems: Operating Characteristics and User Interface Requirements	SAE	J2400	29-Aug-03	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
ISP-Vehicle Location Referencing Standard	SAE	J1746	15-Dec-99	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
ITIS Phrase Lists (International Traveler Information Systems)	SAE	J2540/2	1-Feb-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970. Amendment 1 ballot will end in Oct. 2003.
ITS Data Bus - Low Impedance Stereo Audio	SAE	J2366/1L	1-Nov-01	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
ITS Data Bus Architecture Reference Model Information Report	SAE	J2355	1-Oct-97	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
ITS Data Bus Data Security Services Recommended Practice	SAE	J1760	30-Dec-01	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.

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Document Title	Lead SDO	Doc #	Publish Date	Order Information
ITS Data Bus Protocol - Application Layer Recommended Practice	SAE	J2366-7	30-Apr-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
ITS Data Bus Protocol - Link Layer Recommended Practice	SAE	J2366-2	28-Nov-01	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
ITS Data Bus Protocol - Physical Layer Recommended Practice	SAE	J2366-1	28-Nov-01	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
ITS Data Bus Protocol - Thin Transport Layer Recommended Practice	SAE	J2366-4	30-Mar-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
ITS In-Vehicle Message Priority	SAE	J2395	28-Feb-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Information Report on ITS Terms and Definitions	SAE	J1761	30-Apr-96	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Location Referencing Message Specification	SAE	J2374	23-Sep-99	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Mayday Industry Survey Information Report	SAE	J2352	1-Sep-98	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Message Set for Advanced Traveler Information Systems (ATIS)	SAE	J2354	27-Nov-99	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970. Version 2 ballot expected in Nov. 2003.
Messages for Handling Strings and Look -Up Tables in ATIS Standards	SAE	J2540	1-Feb-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
NTCIP - Point to Multi-Point Protocol using FSK Modems Subnetwork Profile	AASHTO	2102	1-Aug-03	Order from <a href="http://www.ntcip.org/order">www.ntcip.org/order</a> .
NTCIP - Application Profile for File Transfer Protocol (FTP)	AASHTO	2303	30-Mar-02	Order from <a href="http://www.ntcip.org/order">www.ntcip.org/order</a> .
NTCIP - Application Profile for Simple Transportation Management Framework (STMF)	AASHTO	2301	30-Mar-02	Order from <a href="http://www.ntcip.org/order">www.ntcip.org/order</a> . Version 2 is in a working group draft.
NTCIP - Application Profile for Trivial File Transfer Protocol	AASHTO	2302	27-Mar-02	Order from <a href="http://www.ntcip.org/order">www.ntcip.org/order</a> .
NTCIP - Class B Profile	AASHTO	2001	1-Mar-98	Order from <a href="http://www.ntcip.org/order">www.ntcip.org/order</a> .
NTCIP - Global Object Definitions	AASHTO	1201	15-Apr-97	Order from <a href="http://www.ntcip.org/order">www.ntcip.org/order</a> . Version 2 is in ballot, as of Oct. 2002.
NTCIP - Object Definitions for Actuated Traffic Signal Controller Units	AASHTO	1202	1-Apr-97	Order Version 1 standard from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Version 2 in "working group draft."
NTCIP - Object Definitions for Dynamic Message Signs	AASHTO	1203	1-Oct-97	Order Version 1 from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Version 2 in "user comment draft."

**Table L-1. Published Standards Documents - As of November 2003**

Document Title	Lead SDO	Doc #	Publish Date	Order Information
NTCIP - Object Definitions for Environmental Sensor Stations	AASHTO	1204	1-Oct-98	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 approved in 2001. A draft of version 2 is being reviewed.
NTCIP - Object Definitions for Ramp Meter Control (RMC)	AASHTO	1207	28-Apr-02	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> .
NTCIP - Objects for CCTV Camera Control	AASHTO	1205	24-Apr-02	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Admendent 1 in working group draft.
NTCIP - Point to Multi-Point Protocol using RS 232 Subnetwork Profile	AASHTO	2101	30-Mar-02	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> .
NTCIP - Profile - Framework and Classification of Profiles	AASHTO	8003	30-Mar-02	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> .
NTCIP - Simple Transportation Management Framework (STMF)	AASHTO	1101	1-Apr-97	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 approved.
NTCIP - Transport Profile for Internet (TCP/IP and UDP/IP)	AASHTO	2202	27-Mar-02	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> .
National Names Phrase List	SAE	J2540/3	1-Jan-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
On-Board Land Vehicle Mayday Reporting Interface	SAE	J2313	30-Sep-99	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
RDS (Radio Data System) Phrase Lists	SAE	J2540/1	1-Jul-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications	SAE	J1708	30-Jun-95	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Stakeholders Workshop Information Report	SAE	J2373	15-Apr-00	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Standard Guide for Archiving and Retrieving ITS-Generated Data	ASTM	E2259-03	1-Jun-03	Order from <a href="http://www.astm.org">www.astm.org</a> , search for E2259-03 or call 610-832-9585.
Standard Metrology for Vehicular Displays	SAE	J1757/1	1-Jul-02	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.
Standard Provisional Specification for Dedicated Short Range Communication (DSRC) Data Link Layer	ASTM	PS 105-99	3-Apr-00	Order from <a href="http://www.astm.org">www.astm.org</a> or call 610-832-9585.
Standard Specification for Telecommunications and Information Exchange between Roadside and Vehicle Systems: 5.9 GHz DSRC MAC and Physical Layer	ASTM	E2213-03	1-Oct-02	Order from <a href="http://www.astm.org">www.astm.org</a> or call 610-832-9585. Version 2 is in the ballot stage.
Standard for ATIS Message Sets Delivered Over Reduced Bandwidth Media	SAE	J2369	21-Feb-01	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.

**Table L-1. Published Standards Documents - As of November 2003**

Document Title	Lead SDO	Doc #	Publish Date	Order Information
Standard for Common Incident Management Message Sets for use by Emergency Management Centers	IEEE	Std 1512-2000	7-Jul-00	Order from <a href="http://standards.ieee.org/catalog/ordering.html">standards.ieee.org/catalog/ordering.html</a> or 800-678-IEEE.
Standard for Data Dictionaries for Intelligent Transportation Systems - Part 1 Functional Area Data Dictionaries	IEEE	Std 1489-1999	6-Dec-99	Order from <a href="http://standards.ieee.org/catalog/ordering.html">standards.ieee.org/catalog/ordering.html</a> or 800-678-IEEE. Version 2 in working group draft.
Standard for Hazardous Material Incident Management Message Sets for Use by Emergency Management Centers	IEEE	Std 1512.3-2002	29-Oct-02	Order from <a href="http://standards.ieee.org/catalog/ordering.html">standards.ieee.org/catalog/ordering.html</a> or 800-678-IEEE.
Standard for Message Set Template for Intelligent Transportation Systems	IEEE	Std 1488-2000	13-Jul-00	Order from <a href="http://standards.ieee.org/catalog/ordering.html">standards.ieee.org/catalog/ordering.html</a> or 800-678-IEEE. Version 2 in working group draft.
Standard for Message Sets for Vehicle/Roadside Communications	IEEE	Std 1455-1999	31-Jul-99	Order from <a href="http://standards.ieee.org/catalog/ordering.html">standards.ieee.org/catalog/ordering.html</a> or 800-678-IEEE.
Standard for Traffic Incident Management Message Sets for Use by EMCs	IEEE	P1512.1	30-Jun-03	Order from <a href="http://standards.ieee.org">http://standards.ieee.org</a> .
Standard for the Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection	IEEE	Std 1570-2002	18-Oct-02	Order from <a href="http://standards.ieee.org/catalog/ordering.html">standards.ieee.org/catalog/ordering.html</a> or 800-678-IEEE.
Std. Spec. for Ded Short Range Comm. (DSRC) Physical Layer Using Microwave in the 902-928 MHz Band	ASTM	E2158-01	5-Apr-99	Order from <a href="http://www.astm.org">www.astm.org</a> or call 610-832-9585.
Subcarrier Traffic Information Channel (STIC) System	EIA/CEA	EIA-795	13-Aug-99	Order from <a href="http://www.global.ihs.com">www.global.ihs.com</a> or call 800-854-7179.
TCIP - Framework Standard	NTCIP	1400	15-Jan-02	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 under development.
TCIP - Standard on Common Public Transportation (CPT) Objects	NTCIP	1401	27-Apr-01	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 under development.
TCIP - Standard on Control Center (CC) Objects	NTCIP	1407	14-Jan-02	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 under development.
TCIP - Standard on Fare Collection (FC) Objects	NTCIP	1408	14-Jan-02	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 under development.
TCIP - Standard on Incident Management (IM) Objects	NTCIP	1402	27-Apr-01	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 under development.
TCIP - Standard on On-Board (OB) Objects	NTCIP	1406	14-Jan-02	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 under development.
TCIP - Standard on Passenger Information (PI) Objects	NTCIP	1403	27-Apr-01	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 under development.
TCIP - Standard on Scheduling/Runcutting (SCH) Objects	NTCIP	1404	27-Apr-01	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 under development.
TCIP - Standard on Spatial Representation (SP) Objects	NTCIP	1405	27-Apr-01	Order from <a href="http://www.ntcip.org/order/">www.ntcip.org/order/</a> . Amendment 1 under development.

**Table L-1. Published Standards Documents - As of November 2003**

<b>Document Title</b>	<b>Lead SDO</b>	<b>Doc #</b>	<b>Publish Date</b>	<b>Order Information</b>
The Survey and Analysis of Existing Standards and those Under Development Applicable to the Needs of the ITS Communications Technologies	IEEE	Bks 1-6: SH94633-SH 94638	19-Jun-98	Order from <a href="http://standards.ieee.org/catalog/ordering.html">standards.ieee.org/catalog/ordering.html</a> or 800-678-IEEE.
Truth-in-Labeling Standard for Navigation Map Databases	SAE	J1663	30-Aug-95	Order from <a href="http://www.sae.org">www.sae.org</a> or call 724-776-4970.

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**Table L-2. Approved Standards Documents - As of November 2003**

<b>Document Title</b>	<b>Lead SDO</b>	<b>Doc #</b>	<b>Comments</b>
Advanced Transportation Controller (ATC) Standard Specification for the Type 2070 Controller	ITE	ATC 2070	In "Notice to Adopt" stage at ITE. Amendment 1 is in development.
Converting ATIS Message Standards from ASN.1 to XML	SAE	J2630	Passed ballot, awaiting publication.
Message Sets for External TMC Communication (MS/ETMCC)	ITE	TM 2.01	Approved; being amended.
NTCIP - Transportation Transport Profile	AASHTO	2201	Recommended standard, awaiting publication.
NTCIP - Application Profile for Data Exchange ASN.1 (DATEX)	AASHTO	2304	Approved August 2002; awaiting publication.
NTCIP - Ethernet Subnetwork Profile	AASHTO	2104	Approved, waiting publication.
NTCIP - Octet Encoding Rules (OER)	AASHTO	1102	Approved August 2002; awaiting publication.

**Table L-3. In Ballot Standards Documents - As of November 2003**

<b>Document Title</b>	<b>Lead SDO</b>	<b>Doc #</b>	<b>Comments</b>
Advanced Transportation Controller (ATC) Cabinet	ITE	9603-2	Entered balloting. Check <a href="http://www.ite.org">www.ite.org</a> for additional information and to download drafts.
Location Referencing Message Specification	SAE	J2266	Went to ballot August 2003. J2266 supersedes SAE standard J2374 .
NTCIP - Object Definitions for Transportation Sensor Systems	AASHTO	1209	Entered balloting. Version 2 in "working group draft."
NTCIP - Object Definitions for Video Switches	AASHTO	1208	Entered balloting.
NTCIP - Point-to-Point Protocol using RS232 Subnetwork Profile	AASHTO	2103	Version 1 entered balloting. Version 2 in "working group draft."

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**Table L-4. Under Development Standards Documents - As of November 2003**

Document Title	Lead SDO	Doc #	Comments
Advanced Transportation Controller (ATC)	ITE	9603-3	Check www.ite.org for additional information and to download drafts.
Application Program Interface (API) Standard for the Advance Transportation Controller (ATC)	ITE	9603-1	Check www.ite.org for additional information and to download drafts.
CORBA Specific Reference Model	AASHTO	1603	In "working draft" status.
Generic Reference Model for C2C Communications	AASHTO	1602	In "working draft" status.
NTCIP - Application Profile for Common Object Request Broker Architecture (CORBA)	AASHTO	2305	In "user comment draft."
NTCIP - CORBA Naming Convention Specification	AASHTO	1104	In "user comment draft."
NTCIP - CORBA Near Real-Time Data Service Specification	AASHTO	1106	On hold pending development of NTCIP 1603.
NTCIP - CORBA Security Service Specification	AASHTO	1105	In "user comment draft." On hold pending development of NTCIP 1603.
NTCIP - Object Definitions for Data Collection and Monitoring (DCM) Devices	AASHTO	1206	In "user comment draft."
NTCIP - Objects for Signal Control Prioritization	AASHTO	1211	In "user comment draft."
NTCIP - Objects for Signal Systems Masters	AASHTO	1210	In "working group draft."
NTCIP - Transportation Management Protocol (TMP)	AASHTO	1103	In "user comment draft." Expected to be available as a "recommended standard" in early 2004.
NTCIP - Weather Report Message Set for ESS	AASHTO	1301	In "working group draft."
NTCIP Object Definitions for Electrical Lighting Management Systems	AASHTO	1213	A proposed recommended standard will be available by year end 2004.
NTCIP SEP for Communications Profile	AASHTO	901x	Under developement.
NTCIP Structure and Identification of Management Information	AASHTO	8004	In working group/committe draft.
NTCIP Testing and Conformity Assessment Documentation within NTCIP Standards Publications	AASHTO	8007	AASHTO, ITE, and NEMA distributed 8007 for user comment, with comments due November 17, 2003.
NTCIP XML in ITS Center-to-Center Communications	AASHTO	9010	In "User Comment Draft".

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**Table L-4. Under Development Standards Documents - As of November 2003**

Document Title	Lead SDO	Doc #	Comments
Standard Specification for Archiving ITS-Related Traffic Monitoring Data	ASTM	E17.54.02.2	In development, draft expected late 2004.
Standard Specification for Metadata Content for ITS-Generated Data	ASTM	E17.54.02.1	In development, draft expected early 2004.
Standard for Data Dictionaries and Message Sets for Dedicated Short Range Communications (DSRC)	SAE	J2xx	Approved PAR.
Standard for Dedicated Short Range Communications (DSRC) Application Layer	IEEE	P1609.2	In working group/committe draft.
Standard for Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) Layer	IEEE	P1609.4	In working group/committe draft.
Standard for Dedicated Short Range Communications (DSRC) Resource Manager	IEEE	P1609.1	In working group/committee draft.
Standard for IP Interface for Dedicated Short Range Communications (DSRC)	IEEE	P1609.3	In working group/committe draft.
Standard for Public Safety Incident Management Message Sets for Use by EMCs	IEEE	P1512.2	Anticipating balloting in the winter 2003.
Standard for Security and Privacy of Vehicle/Roadside Communication Including Smart Card Communications	IEEE	P1556	Still under development.
TCIP Dialogs	APTA	TCIP-Dialogs	Under development, expected to ballot in December 2003.

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