



400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J2369

ISSUED MAR2000

Issued 2000-03

Submitted for recognition as an American National Standard

Standards for ATIS Message Sets Delivered over Reduced Bandwidth Media

Foreword—This document outlines the US standard for sending Advanced Traveler Information Services (ATIS) messages over reduced bandwidth media data streams. It specifies the “over the air” format and method for such data messages at a bit level within the structure of the host system. The methodology allows a cooperative sharing of the media’s total bandwidth with other non-ATIS data services. It allows for further expansion to other ATIS messages such as transit schedules and weather use. It uses a common directory of messages to divide out those messages which are the subject of this specification from others. It can be deployed upon multiple physical modulation types, typically wireless in nature.

TABLE OF CONTENTS

1.	Scope	6
2.	References	6
2.	Related Documents	6
3.	Definitions	7
4.	Overview	12
4.1	Message Types Supported	12
4.2	The Protocol Stack	15
4.3	Physical Modulation	15
4.4	The Network Layer	15
4.5	Data Tokens and Stream	16
4.6	The Examples Used in this Document	17
5.	Background Concepts	17
5.1	Stream Schemas – How the information streams work	17
5.2	Tokens and Tables – The Theory of Data Compression Used	21
5.3	Tiles and Grids – Efficient Representations of Latitude and Longitude Values	26
5.4	Traffic Models – Shared Models of Link Impedance Modeling	30
5.5	Forward Pointers – Indirection to Other Data Sources	36
5.6	Frame Bit Stuffing – Unused “Flea Bits” in the Message Frame	37
5.7	Frame Headers – The Concept of Context	37
5.8	Transit Scheduling – Unified Concepts of Multi Modal Scheduling Tables	37
6.	Network/Directory Messages	38

SAE Technical Standards Board Rules provide that: “This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user.”

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

TO PLACE A DOCUMENT ORDER; (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS <http://www.sae.org>

Copyright 2000 Society of Automotive Engineers, Inc.
All rights reserved.

Printed in U.S.A.

6.1	Overview of Structure & Stream Mapping	38
6.2	Message and Table Stream Numbering	38
7.	Message Frame Headers Elements (Context).....	38
7.1	Context Definition for: Binary Data	41
7.2	Context Definition for: Expansion Tables (General Table Use)	42
7.3	Context Definition for: Forward Referencing Tables.....	44
7.4	Context Definition for: Grid Array Tables	45
7.5	Context Definition for: Incident Flow Data	46
7.6	Context Definition for: Incident Modeling Tables	51
7.7	Context Definition for: Incident Numbering Tables	52
7.8	Context Definition for: Map Encoding (General Base Map Use).....	53
7.9	Context Definition for: Private Data	55
7.10	Context Definition for: RDS Incident Encoding Table	56
7.11	Context Definition for: Resource Availability (Parking Lot Availability, Ride Share)	56
7.12	Context Definition for: Textual Incident Encoding Table	57
7.13	Context Definition for: Transits Schedule	57
7.14	Context Definition for: Weather Data	58
7.15	Context Definition for: Vanity Maps	58
7.16	Context Definition for: Alternative Names Tables	59
7.17	Context Definition for: Table of Tables	59
8.	Message Specifications	60
8.1	Message Definition for: Binary Data	61
8.2	Message Definition for: Expansion Tables (General Table Use)	61
8.3	Message Definition for: Forward Referencing Tables.....	63
8.4	Message Definition for: Grid Array Tables	64
8.5	Message Definition for: Incident Flow Data	64
8.6	Message Definition for: Incident Modeling Tables	68
8.7	Message Definition for: Incident Numbering Tables	69
8.8	Message Definition for: Map Encoding (General Base Map Use)	69
8.9	Message Definition for: Private Data	72
8.10	Message Definition for: RDS Incident Encoding Table	72
8.11	Message Definition for: Resource Availability (Parking Lot Availability, Ride Share)	73
8.12	Message Definition for: Textual Incident Encoding Table	73
8.13	Message Definition for: Transits Schedule	73
8.14	Message Definition for: Weather Data	74
8.15	Message Definition for: Vanity Maps	74
8.16	Message Definition for: Alternative Names Tables	74
8.17	Message Definition for: Table of Tables	74
9.	Data Elements (DEs)	75
9.1	Name Fields.....	75
9.2	Flow Models (Flow Rates, Models, Preplanned Events)	76
9.3	Geographic Elements (Grid and Tile Points)	76
9.4	Data Element: Amp.....	77
9.5	Data Element: Attributes	78
9.6	Data Element: Bit_Count	78
9.7	Data Element: crc	78
9.8	Data Element: Day_of_Week	79
9.9	Data Element: Direction	79
9.10	Data Element: Envoke_Time	79
9.11	Data Element: Event_Type	79
9.12	Data Element: Fine_Time	80

9.13	Data Element: Flow	80
9.14	Data Element: Free_Flow_Rate	80
9.15	Data Element: Grid_Status	81
9.16	Data Element: Incident_Num	81
9.17	Data Element: Index	81
9.18	Data Element: Index_12	81
9.19	Data Element: Index_8	81
9.20	Data Element: InLine_Model	81
9.21	Data Element: Item_Byt_e_cnt	82
9.22	Data Element: Item_cnt	82
9.23	Data Element: Len_Time	82
9.24	Data Element: Issuing_Time	83
9.25	Data Element: Link_Speed	83
9.26	Data Element: Mapping_Seg	84
9.27	Data Element: Model_Shape	84
9.28	Data Element: Name_Field	84
9.29	Data Element: Occupancy	84
9.30	Data Element: Overlay	85
9.31	Data Element: Private	85
9.32	Data Element: Revision	85
9.33	Data Element: Scaling	86
9.34	Data Element: Start_Time	86
9.35	Data Element: T_F	86
9.36	Data Element: Technology	87
9.37	Data Element: The_Delta	87
9.38	Data Element: The_Grid	87
9.39	Data Element: The_LL	87
9.40	Data Element: The_Model	87
9.41	Data Element: The_Point	88
9.42	Data Element: The_String	88
9.43	Data Element: Vertical	88
9.44	Data Element: Way	88
9.45	Data Element: Zoom	89
9.46	Data Element: Byte[x]	89
10.	Aspects of Data Encoding (used in Transmission)	89
10.1	Practical Text Encoding Examples	90
10.2	Practical Text Letter Pair Encoding Examples	93
10.3	Local Table Encoding Considerations	94
10.4	Local Datum Encoding Considerations	96
11.	Aspects of Data Decoding (used in Receiving)	97
11.1	Grid Expansion Examples, Translating Out of the Grid Profile	97
11.2	Handling Incident Messages and Models	102
11.3	String Processing Examples	104
11.4	Letter Pair Expansion Examples	108
11.5	Examples of processing the CRC value for each packet	108
12.	Standardized National Tables Used in this Document	109
12.1	Modified ASCII Table	109
12.2	National Names Table	111
12.3	National Grid Table	123
12.4	Incident Modeling Shapes Definition Table	124
12.5	Incident-Event Table	126