Metropolitan Intelligent Transportation Systems (ITS) Infrastructure 2004 Transit Management Survey

Preliminary Results

Prepared for:

ITS Joint Program Office
Federal Highway Administration
Washington, D.C.

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FLEET CHARACTERISTICS

Number of agencies: 220

1. Total number of vehicles used in revenue service:

	Total in 2004	Estimated total by 2005
Fixed Route Bus:	49,591	46,403
Heavy or Rapid Rail:	10,717	4,835
Light Rail:	1,784	1,960
Demand Responsive:	10,492	10,727
Commuter Rail:	5,557	5,933
Ferry Boat:	67	74

2. Total number of vehicles equipped with Automated Vehicle Location (AVL):

	Total in 2004	Estimated total by 2005
Fixed Route Bus:	23,425	32,090
Heavy or Rapid Rail:	1,941	2,266
Light Rail:	502	863
Demand Responsive:	3,473	5,152
Commuter Rail:	352	1,216
Ferry Boat:	29	38

3. Total number of vehicles with real-time monitoring of vehicle components:

	Total in 2004	Estimated total by 2005
Fixed Route Bus:	15,082	18,487
Heavy or Rapid Rail:	334	394
Light Rail:	216	356
Demand Responsive:	1,384	1,796
Commuter Rail:	637	1,041
Ferry Boat:	29	32

4. Total number of vehicles equipped with mobile data terminals:

	Total in 2004	Estimated total by 2005
Fixed Route Bus:	22,884	26,697
Heavy or Rapid Rail:	144	280
Light Rail:	259	422
Demand Responsive:	4,487	6,022
Commuter Rail:	49	47
Ferry Boat:	0	3

5. Total number of vehicles that have Automatic Passenger Counters (Do not include registering fareboxes):

	Total in 2004	Estimated total by 2005
Fixed Route Bus:	6,323	11,372
Heavy or Rapid Rail:	0	10
Light Rail:	134	405
Demand Responsive:	9	79
Commuter Rail:	100	401
Ferry Boat:	0	0

6. Total number of vehicles where automated dispatching or control software* is available:

	Total in 2004	Estimated total by 2005
Fixed Route Bus:	26,837	32,721
Heavy or Rapid Rail:	2,508	2,674
Light Rail:	664	1,112
Demand Responsive:	4,525	6,115
Commuter Rail:	1,696	1,994
Ferry Boat:	0	0

* Software that displays AVL-equipped vehicle locations, vehicle data, and operator data on dispatcher monitors, automated control software for light or heavy rail systems, or automated scheduling software for demand responsive service.

MOTOR VEHICLE OPERATED AS VEHICLE PROBES:

	Total in 2004	Estimated total by 2005
7. Motor buses used as probes to collect travel time, speed, and conditions on FREEWAYS:	2,039	3,119
8. Motor buses used as probes to collect travel time, speed, and conditions on ARTERIALS:	1,422	2,497

ORGANIZED REGIONAL INCIDENT MANAGEMENT PROGRAM:

		2004 Response	2005 Estimate
9. Does your agency's operators or dispatchers report traffic incidents (e.g., stalled vehicles, crashes)?	Yes	138	139
	No	73	70

10. Does your agency participate in a statewide disaster planning program?

Yes	119
No	69
Don't know	24

ADVANCED TRAVELER INFORMATION SYSTEM (ATIS):

		2004 Response	2005 Estimate
11. Does your agency have an Advanced Traveler Information System (ATIS)?	Yes	53	90
	No	157	117

12. Services the advanced traveler information system applies or will apply to:

	2004 Response	2005 Estimate
Fixed Route Bus:	59	87
Heavy of Rapid Rail:	11	12
Light Rail:	14	20
Demand Responsive:	23	35
Commuter Rail:	8	11
Ferry Boat:	4	5

		2004 Response	2005 Estimate
13. Is or will the ATIS be multi-carrier/multi-modal with other transit operators?	Yes	29	57
	No	165	139
14. Is or will the ATIS be multi-carrier/multi-modal with highway information?	Yes	18	35
	No	176	159

ADVANCED TRAVELER INFORMATION SYSTEM (ATIS) (Cont.):

15. Please check all the methods your agency uses, or will use, to disseminate information to the public:

	Methods used to disseminate Transit Routes, Schedules, and Fare Information to the public:		Methods used to disseminate Real-time Transit schedule adherence or Arrival and Departure Times to the public:	
	In 2004	by 2005	In 2004	by 2005
Dedicated cable TV:	23	28	1	3
Automated telephone system:	96	105	22	46
Internet Web sites	186	181	65	91
Pagers or personal data assistants:	18	34	11	25
Interactive TV:	4	7	2	5
Kiosks:	67	103	35	69
E-mail or other direct PC communication:	90	103	24	40
In-vehicle navigation systems:	7	19	6	15
Variable Message Signs (in vehicle):	46	59	19	37
Monitors/VMS (not in vehicles):	29	48	37	67
Audible Enunciators:	60	85	28	50
Facsimile:	42	42	9	7
511 Telephone System:	28	46	11	24
Automated web-based trip planner:	33	54	9	20
Other:	see Appendix A			

	Total locations in 2004	Estimated total locations by 2005
16. Total number of bus stops:	499,961	483,100
17. Number of bus stops that electronically display or will display automated and dynamic traveler information to the public:	1,654	5,509
18. Total number of rail stations:	2,860	2,899
19. Number of rail stations that electronically display or will display automated and dynamic traveler information to the public:	675	766

TRAFFIC SIGNAL PRIORITY:

	Total in 2004	Estimated total by 2005
20. Number of Fixed Route Buses that have or will have traffic signal priority capability:	3,708	6,332
21. Number of Light Rail vehicles that have or will have traffic signal priority capability:	894	1,115
22. Number of Demand Responsive vehicles that have or will have traffic signal priority capability:	0	0

RAMP METER SIGNAL PRIORITY:

	Total in 2004	Estimated total by 2005
23. Number of Fixed Route Buses with ramp meter signal priority capability:	1,544	1,597
24. Number of Demand Responsive vehicles with ramp meter signal priority capablity:	52	56

ELECTRONIC FARE PAYMENT:

	25. Vehicles/Stations equipped with Magnetic Stripe Readers		26. Vehicle/Stations equipped with Smart Card Readers (with embedded computer chip)	
	Total in 2004	Estimated total by 2005	Total in 2004	Estimated total by 2005
Fixed Route Buses:	27,531	26,427	10,370	18,272
Heavy or Rapid Rail Stations:	829	372	282	428
Light-Rail Stations:	115	158	56	122
Demand Responsive Vehicles:	1,457	1,904	33	225
Commuter Rail Stations:	11	12	1	13
Ferry Boat Landings:	3	3	2	6

		In 2004	2005 Estimate
27. Is the fare paid by electronic fare payment by monthly pass only?	Yes	15	16
	No	196	194
28. Does your agency electronically store collected fare payment data for use in route and service planning?	Yes	113	125
	No	95	81

29. Are there or will there be by 2005 any other Transit Agencies in your metropolitan area that use the same electronic fare payment system that can be used to pay for your transit fares?

	In 2004	2005 Estimate
Yes, please list them see Appendix B	59	79
No, there are no other Transit	30	28
No	116	96

30. Are there or will there be by 2005 any Toll Collection Operators in your metropolitan area that use the same electronic toll collection media (e.g. EZ PASS) that can be used to pay for your transit fares?

	In 2004	2005 Estimate
Yes, please list them see Appendix C	22	24
No, there is no Toll Collection	37	37
No	150	136

31. Does your agency coordinate billiing with social service agencies?

Yes	71
No	123

SECURITY:

32. How many of your BUSES are equipped, or will be equipped, with the following security devices?

	In 2004	2005 Estimate
Silent alarms:	37,165	38,155
Cameras:	16,067	19,296
Covert microphones:	23,130	25,873
Remote disabling system:	0	58
Other:	see Appendix D	

33. How many of your RAIL VEHICLES are equipped, or will be equipped, with the following security devices?

	In 2004	2005 Estimate
Silent alarms:	673	767
Cameras:	1,076	1,454
Covert microphones:	349	473
Other:	see Appendix E	

34. How many of your RAIL STATIONS are equipped, or will be equipped, with the following security devices?

	In 2004	2005 Estimate
Silent alarms:	126	132
Cameras:	459	1,075
Covert microphones:	49	59
Other:	see Appendix F	

35. Does your agency have electronic ID cards for employees?

Yes	84
No	116

COMMUNICATION TECHNOLOGY:

36. What type of radio system does your agency have?

	In 2004	2005 Estimate
Radio system is Digital:	66	93
Radio system is Analog:	128	95
Radio system is Regular	84	75
Radio system is Trunked:	94	98

37. If you are planning or need to update your mobile communications system,what alternative are you thinking about?

21	Updating your 150 or 450 MHz to a digital system
26	Converting to a dedicated 800 MHz system?
27	Joining an area wide 800 MHz system?
116	No updates planned at this time

38. How do you now communicate with public safety agencies?

40	Have a dedicated radio channel
110	No direct means of communicating via the mobile communications system
34	A partner in a joint interoperable system
17	Do not communicate with public safety agencies

COMMUNICATION TECHNOLOGY (Cont.):

39. Are you considering adding the capability of interoperability with public safety agencies?

14	By use of a communication switch (such as the ACU-1000 or other brand)
60	By becoming part of an area wide interoperable system
109	No

INTEGRATION:

40. Does your agency coordinate or will coordinate by 2005 travel requests and vehicle dispatching for multiple agencies (e.g., social service agencies, HHS, other transit agencies, etc.)?

41	Yes
137	No, and do not plan to do so 2005
32	No, but plan to do so by 2005

41. Is there technology in place to coordinate rail, bus, and demand response services?

143	No
6	Connection protection software
21	Technology to support using demand response assets to feed fixed route services
24	Don't know
	Other: see Appendix G

42. Is there or will there be by 2005 a Transportation Management Center (TMC) that controls transit and highway modes (e.g. rail operations, traffic signals, message signs, incident management, etc.) in your metropolitan area?

3	Yes, including rail operations
55	Yes, but it is primarily oriented to traffic
80	No, and do not plan to have a TMC by 2005
10	No, but plan to have a TMC by 2005
54	Don't know

43. Is there a regional ITS architecture for your region?

64	Yes, complete
76	In progress, to be completed in calendar year: see Appendix H
64	Not aware of an existing or planned regional architecture

WEATHER:

44. Does your agency receive weather products tailored to your particular requirements?

Yes	46
No	161

DATA COLLECTION AND ARCHIVING:

49. Does your agency have an archived data management system?

70	Yes, how long have you been archiving? see Appendix I
13	No, but we plan to begin archiving data in the next year
26	No, but we plan to begin archiving data within the next two years
36	No, but we plan to begin archiving data in the future (five to ten years)
51	No, we do not plan to begin archiving data

50. How are data archived? (Check all that apply)

63	Computer database - Store raw data. (e.g., sensor feed)
31	Computer database - Store processed data (e.g., traffic conditions)
	What is the size of the database? see Appendix J
78	Do not archive data
	Other (please specify) see Appendix K

51. Are you aware of the Standard Guide for Archiving and Retreiving Intelligent Transportation System - Generated Data (ASTM E2259-03)?

23		Yes, are you using it?
	8	Yes
	44	No
165		No

52. Please check all the methods your agency uses to make the archived data available.

26	On-Line (Web)
28	CD
78	Paper reports
82	Do not make archive data available/do not archive data
	Other (please specify) see Appendix L

DATA COLLECTION AND ARCHIVING (Cont.):

53. Please check the information your agency collects/archives in real-time

	Collect	Archive
Vehicle time and location	81	63
Passenger count	105	85
Trip itinerary planning records	46	35
Passenger information	64	52
Vehicle monitoring status	45	33
Road conditions (e.g. wet, icy, etc.)	19	10
Emergency vehicle signal preemption events	4	4
Transit vehicle signal priority events	11	12
Weather conditions (e.g., snow, fog, rain, etc.)	27	16
Incidents	83	63

54. Please check the information your agency collects/archives electronically

	Collect	Archive
Route designations (snow emergency, etc.)	22	14
Current road work zones for transit	29	12
Scheduled road work zones for transit	23	10
Intermodal (air, rail, water) connections	2	1
Emergency/evacuation routes and procedures	16	10
Highway operations coordination information	5	2
Transit operations coordination information	34	23
Do not collect/archive information	53	47
Other:	see Appendix M	

55. What are the data used for?

Do not know	7
Operation planning/analysis	105
Construction impact determination	14
Capital planning/analysis	58
Incident detection algorithm development	4
Roadway impact analysis	5
Accident prediction models	6
Dissemination to the public	45
Traffic Management	18
Measurement of performance	77
Safety analysis	52
Other:	see Appendix N

NATIONAL ITS STANDARDS:

List of standards to consider when deploying transit management projects:

Traffic Management

Number of agencies		
Using	Considering	
0	12	NTCIP 1202 - Object Definitions for Actuated Traffic Signal Controller Units
1	10	NTCIP 1210 - Objects for Signal Systems Master
2	20	NTCIP 1211 - Objects for Signal Control Priority

Freeway Management

Using	Considering	
0	9	NTCIP 1203 - Object Definitions for Dynamic Message Signs
0	3	NTCIP 1204 - Object Definitions for Environmental Sensor Stations
2	11	NTCIP 1205 - Objects for CCTV Camera Control
0	6	NTCIP 1206 - Object Definitions for Data Collection and Monitoring (DCM) Devices
0	2	NTCIP 1207 - Object Definitions for Ramp Meter Control
0	5	NTCIP 1208 - Object Definitions for Video Switches
0	9	NTCIP 1209 - Object Definitions for Transportation Sensor System
0	3	NTCIP 1213 - Electrical and Lighting Mgmt System Interoperability & Intercommunications Std
0	4	NTCIP 1301 - Weather Report Message Set for ESS

Advanced Transportation Controller

Using	Considering	
1	6	ITE 9603-1 - Application Programming Interface (API) Standard for the Advanced Transportation Controller (ATC)
0	5	ITE 9603-2 - Advanced Transportation Controller (ATC) Cabinet
1	6	ITE 9603-3 - Advanced Transportation Controller (ATC) Standard Specification for the Type 2070 Controller

Profiles and Base Standards

Using	Considering	
2	6	NTCIP 1201 - Global Object Definitions
1	2	NTCIP 1102 - Octet Encoding Rules (OER)
2	8	NTCIP 1103 - Transportation Management Protocol
0	3	NTCIP 1104 - CORBA Naming Convention Specification
0	3	NTCIP 1105 - CORBA Security Service Specification
0	5	NTCIP 1106 - CORBA Near-Real Time Data Service Specification
0	5	NTCIP 2101 - Point to Multi-Point Protocol Using RS-232 Subnetwork Profile
0	3	NTCIP 2102 - Subnetwork Profile for PMPP using FSK Modems
0	4	NTCIP 2103 - Subnet Profile for Point-to-Point Protocol using RS 232
3	5	NTCIP 2104 - Subnetwork Profile for Ethernet
2	4	NTCIP 2201 - Transportation Transport Profile
8	6	NTCIP 2202 - Transport Profile for Internet (TCP/IP and UDP)
0	4	NTCIP 2301 - Application Profile for Simple Transportation Management Framework (STMF)
1	3	NTCIP 2302 - Application Profile for Trivial File Transfer Protocol
5	10	NTCIP 2303 - Application Profile for File Transfer Protocol (FTP)
1	4	NTCIP 2304 - Application Profile for Data Exchange ASN.1 (DATEX)
0	2	NTCIP 2305 - Application Profile for Common Object Request Broker Architecture (CORBA)

Number of agencies

Using	Considering	
0	5	NTCIP 8003 - Profiles - Framework and Classification of Profiles
1	14	NTCIP 9010 - XML Standard for Center-to-Center Communications
1	9	IEEE P1488 - IEEE Standard for Message Set Template for Intelligent Transportation Systems
0	8	IEEE P1489 - IEEE Standard for Data Dictionaries for Intelligent Transportation Systems - Part 1 Functional Area Data Dictionaries

Center-to-Center Communications

Using	Considering	
1	9	ITE TM 1.03 - Standard for Functional Level Traffic Management Data Dictionary (TMDD)
1	6	ITE TM 2.01 - Message Sets for External TMC Communication (MS/ETMCC)
0	6	NTCIP 1602 - Generic Reference Model for C2C Communications

Incident Management

Using	Considering	
1	7	IEEE 1512-2000 Standard for Common Incident Management Message Sets for use by Emergency Management Centers
0	4	IEEE P1512.1 - Standard for Traffic Incident Management Message Sets for Use by EMCs
0	5	IEEE P1512.2 - Standard for Public Safety Incident Management Message Sets for Use by EMCs
0	3	IEEE 1512.3-2000 - Standard for Hazardous Material Incident Management Message Sets for Use by Emergency Management Centers
0	4	IEEE 1512.4 - Standard for Emergency Management to Emergency Vehicle Subsystems Use by Emergency Management Centers
0	5	IEEE P1556 - Standard for Security and Privacy of Vehicle/Roadside Communication Including Smart Card Comm.

Advanced Traveler Information System

Using	Considering	
2	15	SAE J2354 - Message Set for Advanced Traveler Information System (ATIS)
0	5	SAE J2540-2 - ITIS Phrase Lists (International Traveler Information Systems)
0	3	SAE J2630 - Converting ATIS Message Standards from ASN.1 to XML

Transit

Using	Considering	
4	19	APTA - TCIP Dialogs
2	14	NTCIP 1400 - TCIP - Framework Standard
3	13	NTCIP 1401 - TCIP - Common Public Transportation (CPT) Business Area Standard
1	17	NTCIP 1402 - TCIP - Incident Management (IM) Business Area Standard
4	24	NTCIP 1403 - TCIP - Passenger Information (PI) Business Area Standard
3	20	NTCIP 1404 - TCIP - Scheduling/Runcutting (SCH) Business Area Standard
2	14	NTCIP 1405 - TCIP - Spatial Representation (SP) Business Area Standard
2	14	NTCIP 1406 - TCIP - Onboard (OB) Business Area Standard
2	15	NTCIP 1407 - TCIP - Control Center (CC) Business Area Standard
4	24	NTCIP 1408 - TCIP - Fare Collection (FC) Business Area Standard

Commercial Vehicle Operations

Using	Considering	
1	4	ANSI TS284 - Commercial Vehicle Safety Reports
1	3	ANSI TS285 - Commercial Vehicle Safety and Credentials Information Exchange
1	3	ANSI TS286 - Commercial Vehicle Credentials

Dedicated Short Range Communications

Number of agencies: Using	Considering	
0	5	IEEE 1609.1 - Standard for Dedicated Short Range Communications (DSRC) Resource Manager
0	5	IEEE 1609-2 - Standard for Dedicated Short Range Communications (DSRC) Application Layer
0	3	IEEE 1609.3 - Standard for IP Interface for Dedicated Short Range Communications (DSRC)
0	4	IEEE 1609.4 - Standard for Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) Layer
0	3	E2213-02 Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems - 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications
0	4	SAE J2xxx - Standard for Data Dictionary and Message Sets for Dedicated Short Range Communications (DSRC)
0	3	E2158-01 Standard Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902 to 928 MHz Band
0	5	ASTM E17.54.00.1 - Standard Guidelines for Archiving ITS-Generated Data
0	2	PS 105-99: Standard Provisional Specification for Dedicated Short Range Communication (DSRC) Data Link Layer

Archived Data User Service (ADUS)

Using	Considering	
2	13	ASTM E2259-03 -Standard Guidelines for Archiving
1	8	ASTM E-17.54.02.1 Standard Specifications for Metadata Content for ITS-Generated Data
0	8	ASTM E-17.54.02.2 Standard Specifications for Archiving ITS-Related Traffic Monitoring Data

Location Referencing

Using	Considering	
0	8	SAE J2266 - Location Referencing Message Specification

51. What factors helped your agency decide to use ITS standards? Please pick top three factors, check only one item in each column.

Number of agencies: 1	2	3	
5	2	4	Options offered in the standards
5	4	6	Products employ standards
12	7	9	Regional architecture document requirements
4	8	4	Additional funding provided
11	15	5	Integration opportunities
3	5	4	Consultant or integrator’s recommendation
3	2	3	My agency's participation on standard committees
1	1	5	Training and Technical Assistance support provided by US DOT
6	6	8	Responding to the rule to use ITS Standards
1	1	1	Compliance testing is readily available

52. Do you feel that using the standards helped with the integration needs for your agency? Please list project name(s) next to each option.

Absolutely	see Appendix O
Somewhat	see Appendix P
Not exactly	see Appendix Q

53. If no ITS standards are currently used, what factors will ensure that your agency uses ITS standards? Please pick top three factors, check only one item in each column (if your are using standards, please move to the next question).

Number of agencies			
1	2	3	
33	6	5	We are already committed to using standards when they are complete
35	19	14	Vendors provide standard-compliant products
8	25	21	Standards being accepted by the ITS community and being used in deployments
7	10	19	Training and technical support being provided to my agency
11	21	4	Standards are developed that apply to my system
15	12	16	Additional funding being provided to use the standards
12	10	22	Standards use enables interoperability of systems
			Other see Appendix R

54. What tool, resource, or support mechanism was/would be most helpful for implementing the standards? Please pick top three, check only one item in each column.

Number of agencies			
1	2	3	
39	19	14	Training courses
21	16	10	Published standards provided for free
11	8	4	Published standards are easily available
10	18	15	Support documents (i.e. procurement and implementation guides) are available
11	25	9	Workshops
5	6	15	Standards Web site
1	3	5	Standards forum
14	8	7	Software tools to assist with correctly specifying and procuring the standard
1	1	2	E-mail bulletins
4	7	12	Resource documents (i.e., user guides and reference notebooks)
1	3	3	Testing tools
8	9	24	Case studies of other similar projects that used standards successfully
			Other see Appendix S

Appendix A: Other methods used to disseminate information to the public

Agency	Technology	in 2004	by 2005
Baltimore			
Howard Area Transit Service (HATS)	live agents	☑	☑
Chicago, Gary, Lake County			
Northwest Indiana Community Action Corporation	2-way radios	☑	☑
Cleveland, Akron, Lorain			
Lorain County Transit	Fairs, Festivals and Events	☐	☐
Knoxville			
Knoxville Transportation Authority	15a	☐	☐
New York, Northern New Jersey, Southwestern Connecticut			
Putnam County Transit	mail	☐	☐

Appendix B: Transit agencies that use the same electronic fare payment system

Agency	Agency
Atlanta	
Metropolitan Atlanta Rapid Transit Authority MARTA	Still in negotiations.
Baltimore	
Harford County Transportation	Baltimore City MTA
Howard Area Transit Service (HATS)	question is unclear. Other agencies use an EF payment system; we do not.
Maryland Department of Transportation	WMATA
Chicago, Gary, Lake County	
Chicago Transit Authority (CTA)	Pace Suburban Bus, Metra Rail
Northern Indiana Commuter	Metra, CTA, Pace
Cincinnati, Hamilton	
Southwest Ohio Regional Transit Authority (SORTA)	unknown at this time
Cleveland, Akron, Lorain	
Metro Regional Transit Authority	Greater Cleveland
Dallas, Fort Worth	
Dallas Area Rapid Transit (DART)	Fort Worth T
Fort Worth Transportation Authority (The T)	DART - Dallas Area Rapid Transit, Dallas, TX
Detroit, Ann Arbor	
SMART	Detroit Dept. of Transportation
Greensboro, Winston-Salem, High Point	
High Point Transit	Greensboro Transit Authority Winston-Salem Transit Authority Piedmont Authority for Regional Transportation (PART)
Winston-Salem Transit Authority	Highpoint, Greensboro
Hartford, New Britain, Middletown	
Connecticut Transit	NBT, DATTLO, MIDDLETOWN
Middletown Transit District	CT. Transit
Jacksonville	
Jacksonville Transportation Authority	St. Johns County, FL

Appendix B: Transit agencies that use the same electronic fare payment system

Agency	Agency
Los Angeles, Anaheim, Riverside	
Long Beach Transit	MTA Santa Monica Culver City Torrance Transit Foothill Tranist Montebello Transit LADOT Santa Clarita
Los Angeles City	LACMTA
South Coast Area Transit	Simi Valley Transit, Thousand Oaks Transit, Moorpark Transit, Camarillo Area Transit, VISTA (all Ventura County transit agencies except Ojai Trolley).
Southern California Regional Rail Authority	AMTRAK
Torrance City Transit System	LACMTA
Victor Valley Transit Authority	See Caltrans Fare Media taskforce
Miami, Fort Lauderdale	
Broward County Mass Transit	Miami-Dade Transit, PalmTran (Smartcards), Tri-Rail.
Milwaukee, Racine	
Waukesha City Metro Transit	Milwaukee County Transit System
Minneapolis, St. Paul	
Metro Transit	MVTA, SWMTC, Plymouth Metrolink, North Suburban, Maple Grove, Anoka Cty Traveler
New Haven, Meriden	
Connecticut Transit-New Haven	DATTLO, NBT, BRIDGEPORT
New Orleans	
Louisiana Transit Company, Incorporation	Regional Transit Authority, New Orleans, La.
Westside Transit Lines	Regional Transit Authority (RTA) New Orleans

Appendix B: Transit agencies that use the same electronic fare payment system

Agency	Agency
New York, Northern New Jersey, Southwestern Connecticut	
Connecticut Department of Transportation(CT)	CTTransit operations in eight urbanized areas use common system.
Connecticut Transit-Stamford(CT)	NORWALK, BRIDGEPORT
Huntington Area Rapid Transit (HART)	Suffolk County Transit MTA Long Island Bus MTA New York City Transit
Liberty Lines Express, Incorporation	MTA (New York City)/Private Bus Companies operating for NYCDOT
MTA Long Island Bus	New York City Transit Authority New York City Department of Transportation
New Jersey Transit Corporation(NJ)	Port Authority Trans-Hudson (PATH) subway and NJ TRANSIT share a dual mode card with one magnetic stripe on front and different stripe on back.
New York City DOT	MTA - NYCT
New York City Transit Authority (MTA)	long island rr, metro north rr,
Norwalk Transit District/Westport Transit Lines(CT)	Greater Bridgeport Transit Authority, Housatonic Area Regional Transit
Port Authority Trans-Hudson (PATH)	NJ Transit NYC Transit
Queens Surface Corporation	New York City Transit Other Franchise Bus Companies
Westchester County	MetroCard
Phoenix	
Glendale Dial-A-Ride	VALLEY METRO
Mesa City	Phoenix Tempe
Pittsburgh, Beaver Valley	
Beaver County Transit Authority	Pittsburgh - Port Authority
Raleigh-Durham	
Capital Area Transit	Triangle Transit Authority
Richmond, Petersburg	
Petersburg Area Transit	Greater Richmond Transit Company
San Diego	
North San Diego County Transit Development Board	San Diego Transit Corporation Poway, Chula Vista contract operators

Appendix B: Transit agencies that use the same electronic fare payment system

Agency	Agency
San Francisco, Oakland, San Jose	
AC Transit	TRANSLINK - by MTC; ACT; BART; VTA, GGT, MUNI, CalTran
Bay Area Rapid Transit District	See MTC - All operators use Translink
Central Contra Costa	Golden Gate Transit, BART, Muni, VTA, AC Transit, Cal Train
Golden Gate Bridge, Highway and Transportation	AC Transit, BART, San Francisco Municipal Railway, Caltrain, VTA
Santa Clara Valley Transportation Authority	Bay Area Rapid Transit
Seattle, Tacoma	
King County Metro	demo with other regional agencies in 2005
Kitsap Transit	King County Metro, Pierce Transit, Sound Transit, Community Transit, Everett Transit and Washington State Ferries
Pierce Transit	King County Metro Community Transit Kitsap Transit Washington State Ferrys Sound Transit Everret Transit
Sound Transit	The region is implementing a one regional card fare collection system using RF based smart card technology. 2005 will be beta with full roll-out in 2006. The system is in final design.
Washington State Ferries	Metro, Kitsap, community, pierce & everett transit agencies
Tampa, St. Petersburg, Clearwater	
Hillsborough Area Regional Transit Authority	PSTA
Washington	
Montgomery County - Ride On	WMATA
Potomac and Rappahannock Transportation Commission	All DC and Baltimore area bus and rail systems will share the same SmartCard system next year.
Washington Metropolitan Area Transit Authority	Maryland Transit Authority

Appendix C: Toll agencies that use the same electronic fare payment system

Agency	Toll agency
Baltimore	
Maryland Department of Transportation	MdTA
Chicago, Gary, Lake County	
Northwest Indiana Community Action Corporation	Indiana Toll Road
Greenville, Spartanburg	
Greenville Transit Authority (GTA)	Southern Connector
Los Angeles, Anaheim, Riverside	
Commerce City Municipal Buslines	we operate fare free
Orange County Transportation Authority	FastTrak
Torrance City Transit System	LACMTA and twenty other transit agencies.
New York, Northern New Jersey, Southwestern Connecticut	
Academy Lines Incorporated(NJ)	EZ Pass
Orlando	
LYNX Central Florida Regional Transit Authority	Orlando-Orange County Expressway Authority
Pittsburgh, Beaver Valley	
Port Authority of Allegheny County	Pa Turnpike
Richmond, Petersburg	
Greater Richmond Transit Company	Smart Tag
Petersburg Area Transit	Richmond Metropolitan Authority, VDOT, Greater Richmond Transit Company
Sarasota-Bradenton	
Manatee County Transit	Sunshine Bridge - Manatee to Pinellas Counties
Syracuse	
Central New York Regional Transit Authority	New York State Thruway Authority

Appendix D: Other security devices on buses

Agency	Device	Number of buses In 2004	Number of buses By 2005
Los Angeles, Anaheim, Riverside			
Commerce City Municipal Buslines	2-way radio	9	12
Nashville			
Metropolitan Transit Authority	Transmission Lock out Key	161	161
New York, Northern New Jersey, Southwestern Connecticut			
Academy Lines Incorporated(NJ)	GPS / Data mess.	140	300
San Juan			
Puerto Rico Highway and Transportation Authority (MetroBus)	did not specify	275	315
Washington			
Potomac and Rappahannock Transportation Commission	Emergency button to change head sign	46	51
San Francisco, Oakland, San Jose			
Golden Gate Bridge, Highway and Transportation	remote wireless viewing of security cameras	80	80

Appendix E: Other security devices on rail vehicles

Agency	Device	Rail vehicles	
		In 2004	By 2005
Los Angeles, Anaheim, Riverside			
Arcadia Transit	N/A	0	0
Raleigh-Durham			
Capital Area Transit	N/A	0	0
West Palm Beach, Boca Raton, Delray			
Palm Tran operated by Florida Transit Management Incorporated	N/A	0	0

Appendix F: Other security devices at rail stations

Agency	Device	Rail stations	
		In 2004	By 2005
Chicago, Gary, Lake County			
Chicago Transit Authority (CTA)	motion/object detection, intrusion alarms	0	200
Cleveland, Akron, Lorain			
Greater Cleveland Regional Transit	Emergency call boxes, electronic access control, electronic door surveilance & key control..apx. 200 units in 04 and apx. 250 in o5	0	0
Los Angeles, Anaheim, Riverside			
Arcadia Transit	N/A	0	0
Los Angeles City	GUARDS	5	5
New York, Northern New Jersey, Southwestern Connecticut			
New Jersey Transit Corporation(NJ)	automatic incidenet detection	1	2
Portland, Vancouver			
Tri-Met	Tunnel intrusion detection system	1	1
Raleigh-Durham			
Capital Area Transit	N/A	0	0
Seattle, Tacoma			
Sound Transit	emergency stations	0	7
West Palm Beach, Boca Raton, Delray			
Palm Tran operated by Florida Transit Management Incorporated	N/A	0	0

Appendix G: Other technologies in place to coordinate rail, bus, and demand response services

Agency	Technologies
Cleveland, Akron, Lorain	
Greater Cleveland Regional Transit	Currently in process of implementing new Trapeze scheduling and dispatch system for paratransit that will utilize the fixed route (bus and rail) schedule system (HASTUS)to coordinate services. The Trapeze system also includes new IVR and trip planning software that will be brought on-line in late 2004.
Dallas, Fort Worth	
Fort Worth Transportation Authority (The T)	radio and cell phone
Los Angeles, Anaheim, Riverside	
Orange County Transportation Authority	Define coordinate, does that mean trip planning for passengers, or tracking all of the different modes of transporation so that vehicle are in place to meet passengers when they arrive?
Minneapolis, St. Paul	
Metro Transit	View-only access to LRT location/control system in bus comm. ctr.. Also, plan is to provide view-only access of bus AVL location system in LRT comm. ctr.
New York, Northern New Jersey, Southwestern Connecticut	
Westchester County	TRIPS123 - Full Participants
Sacramento	
Sacramento Regional Transit District (RT)	Scheduling and vehicle dispatching software implementation in process; estimated time of completion is approximately one year (Fall 2005)
San Francisco, Oakland, San Jose	
AC Transit	Demand response services are currently under study. Existing CAD/AVL may be used to deploy demand response services.
Bay Area Rapid Transit District	511

Appendix H: Calendar year when ITS architectures in progess will be completed

Agency	Calendar year
Allentown, Bethlehem, Easton	
Lehigh and Northampton	2005
Atlanta	
Douglas County Rideshare	Don't know
Metropolitan Atlanta Rapid Transit Authority MARTA	2008
Cleveland, Akron, Lorain	
Greater Cleveland Regional Transit	?
Dallas, Fort Worth	
Dallas Area Rapid Transit (DART)	2005
Denton City Manager	2025
Fort Worth Transportation Authority (The T)	April 2005
Harrisburg, Lebanon, Carlisle	
Cumberland-Dauphin-Harrisburg Transit Authority	unknown
Hartford, New Britain, Middletown	
Connecticut Transit	2004
Greater Hartford Transit District	2004
Middletown Transit District	? next meeting is 7/16/04
Jacksonville	
Jacksonville Transportation Authority	2005
Las Vegas	
Regional Transportation Commission/Citizens Area Transit	2006
Los Angeles, Anaheim, Riverside	
Access Services Incorporated	2005
Antelope Valley Transit Authority	Unknown
Arcadia Transit	2006
Commerce City Municipal Buslines	2007
La Mirada City Transit	05
Santa Monica Municipal Bus Lines	?
Torrance City Transit System	unknown
Louisville	
Transit Authority of River City (TARC)	2004

Appendix H: Calendar year when ITS architectures in progess will be completed

Agency	Calendar year
Miami, Fort Lauderdale	
Broward County Mass Transit	Dont know
New Haven, Meriden	
Connecticut Transit-New Haven	2004
New Orleans	
Regional Transit Authority	2005
New York, Northern New Jersey, Southwestern Connecticut	
Connecticut Department of Transportation(CT)	2005
Connecticut Transit-Stamford(CT)	2004
Metro-North Railroad MTA	2005
MTA Long Island Bus	2005
New Jersey Transit Corporation(NJ)	2004
Westchester County	2005
Oklahoma City	
Central Oklahoma Transit	Unknown
Omaha	
Omaha Transit Authority	April 2005
Phoenix	
Mesa City	2006
Pittsburgh, Beaver Valley	
Beaver County Transit Authority	2004
Richmond, Petersburg	
Greater Richmond Transit Company	2004
Petersburg Area Transit	2008
San Diego	
North San Diego County Transit Development Board	?
San Francisco, Oakland, San Jose	
AC Transit	2004
San Mateo County Transit District (SamTrans)	2005
Sonoma County Transit	?

Appendix H: Calendar year when ITS architectures in progess will be completed

Agency	Calendar year
San Juan	
Puerto Rico Highway and Transportation Authority (MetroBus)	2005
Sarasota-Bradenton	
Manatee County Transit	unknown
Scranton, Wilkes-Barre	
Lackawanna County Transit System (COLTS)	2005
Luzerne County Transportation	2006
Springfield	
Pioneer Valley Transit Authority	2005
Tampa, St. Petersburg, Clearwater	
Hillsborough Area Regional Transit Authority	2004
Washington	
Washington Metropolitan Area Transit Authority	2005

Appendix I: Length of time agencies have been archiving information

Agency	Time
Atlanta	
Metropolitan Atlanta Rapid Transit Authority MARTA	1.5
Austin	
Austin Capital Metropolitan Transportation Authority	2 years
Charlotte, Gastonia, Rock Hill	
Charlotte Area Transit System (CATS) (Charlotte DOT)	2 years
Chicago, Gary, Lake County	
Chicago Transit Authority (CTA)	depends on the system
East Chicago Transit	10 YEARS
Northern Indiana Commuter	13 years
Cincinnati, Hamilton	
Southwest Ohio Regional Transit Authority (SORTA)	unknown if any
Cleveland, Akron, Lorain	
Greater Cleveland Regional Transit	some data is archived (e.g. radio communications)..plan to expand archiving over next several years, also archive equipment data
Metro Regional Transit Authority	2 YEARS
Columbus	
COTA	1 year
Dallas, Fort Worth	
Dallas Area Rapid Transit (DART)	See note below
Fresno	
Fresno Area Express	2 years
Hartford, New Britain, Middletown	
Greater Hartford Transit District	5 years
Honolulu	
Oahu Transit Services (The Bus)	One Year
Jacksonville	
Jacksonville Transportation Authority	1999

Appendix I: Length of time agencies have been archiving information

Agency	Time
Los Angeles, Anaheim, Riverside	
Access Services Incorporated	2001
La Mirada City Transit	3 years
Long Beach Transit	4 years
Los Angeles City	25 Years
Los Angeles County Metropolitan Transp. Authority/MTA	one year
Norwalk Transit System	4-5 years
Orange County Transportation Authority	6 Years +
Torrance City Transit System	unknown
McAllen	
McAllen Express	9 Years
Miami, Fort Lauderdale	
Advanced Transportation Solutions	Always
Broward County Mass Transit	@ 5 years
Milwaukee, Racine	
Waukesha City Metro Transit	2 years
Minneapolis, St. Paul	
Metro Transit	1 year
New Orleans	
Regional Transit Authority	2 years
St. Bernard Parish Government	1990
New York, Northern New Jersey, Southwestern Connecticut	
Long Island Rail Road	5
New Jersey Transit Corporation(NJ)	4 years
Port Authority Trans-Hudson (PATH)	5 years
Village of Spring Valley Bus	10 Years
Philadelphia, Wilmington, Trenton	
Southeastern Pennsylvania Transportation Authority (SEPTA)	System Dependent
Phoenix	
Glendale Dial-A-Ride	3 years

Appendix I: Length of time agencies have been archiving information

Agency	Time
Portland, Vancouver	
Tri-Met	Since 1998
Providence, Pawtucket, Fall River	
Rhode Island Public Transit Authority	3 years
Richmond, Petersburg	
Greater Richmond Transit Company	1999
San Antonio	
VIA Metropolitan Transit	3 Years
San Francisco, Oakland, San Jose	
AC Transit	1984
Bay Area Rapid Transit District	?
Livermore/Amador Valley Transit	3 years
San Mateo County Transit District (SamTrans)	6 mos
Santa Cruz Metropolitan Transit	1 year
San Juan	
Puerto Rico Highway and Transportation Authority (MetroBus)	3 years
Seattle, Tacoma	
King County Metro	10+ years, for some datasets
Seattle Monorail Transit	since 1998
Snohomish County Public Transportation	6 years
Syracuse	
Central New York Regional Transit Authority	6 MONTHS
Tampa, St. Petersburg, Clearwater	
Pasco County Public Transportation (PCPT)	5 years
Tucson	
Sun Tran	1999
VanTran	2000
Washington	
Potomac and Rappahannock Transportation Commission	10 months
Washington Metropolitan Area Transit Authority	25 years

Appendix J: Sizes of the data archive databases

Agency	Database size
Atlanta	
Metropolitan Atlanta Rapid Transit Authority MARTA	20GB
Austin	
Austin Capital Metropolitan Transportation Authority	unknown
Cleveland, Akron, Lorain	
Greater Cleveland Regional Transit	?
Columbus	
COTA	5GB
Los Angeles, Anaheim, Riverside	
Los Angeles City	100+ G
Torrance City Transit System	unknown
Miami, Fort Lauderdale	
Advanced Transportation Solutions	15 Gigs
Broward County Mass Transit	@ 30 GB
New York, Northern New Jersey, Southwestern Connecticut	
New Jersey Transit Corporation(NJ)	1TB
Philadelphia, Wilmington, Trenton	
Southeastern Pennsylvania Transportation Authority (SEPTA)	System Dependent
Salt Lake City, Ogden	
Utah Transit Authority	2 Gig so far
Seattle, Tacoma	
King County Metro	200+ GB
Seattle Monorail Transit	unknown
Washington	
Washington Metropolitan Area Transit Authority	100 GB

Appendix K: Other methods used for archiving data

Agency	Method
Austin	
Austin Capital Metropolitan Transportation Authority	flat ASCII file from APC units.
Chicago, Gary, Lake County	
Chicago Transit Authority (CTA)	various databases of different types
East Chicago Transit	Written reports and files.
Cincinnati, Hamilton	
Southwest Ohio Regional Transit Authority (SORTA)	unknown
Dallas, Fort Worth	
Fort Worth Transportation Authority (The T)	records management
Greensboro, Winston-Salem, High Point	
High Point Transit	Paper copies kept and filed in boxes.
Indianapolis	
Indianapolis Public Transportation	Ride checks on Transit are largely hand checked and filed
Los Angeles, Anaheim, Riverside	
Antelope Valley Transit Authority	Currently we have past paper data. This is stored in a storage area on site.
McAllen	
McAllen Express	(NTD) National Transit Database
Minneapolis, St. Paul	
Metro Transit	With new system, archiving process still in development
New Orleans	
St. Bernard Parish Government	Process data into computer manually.
New York, Northern New Jersey, Southwestern Connecticut	
New York City Transit Authority (MTA)	voice phone tapes; incident reports on paper. computerized sytem for trains in 2005.
Village of Spring Valley Bus	Paper records
Providence, Pawtucket, Fall River	
Rhode Island Public Transit Authority	Electronically in ASCII Format
San Diego	
San Diego Trolley Incorporated	Do not archive data - manually archive data
San Francisco, Oakland, San Jose	
AC Transit	DLT

Appendix K: Other methods used for archiving data

Agency	Method
Seattle, Tacoma	
Everett Transit	SMALL EXCEL FILES
Pierce County Ferry Operations	Scanned,micrefilmed,and off-site storage.
Tucson	
Sun Tran	Daily Log database zipped and offloaded to CD.
Washington	
Washington Metropolitan Area Transit Authority	Data is archived in multiple tables or databases. Figure noted above is aggregated.
Wichita	
Wichita Metropolitan Transit Authority	Will be stored on database - not sure of size.

Appendix L: Other methods used to make archived data available

Agency	Method
Cincinnati, Hamilton	
Southwest Ohio Regional Transit Authority (SORTA)	unknown
Dallas, Fort Worth	
Dallas Area Rapid Transit (DART)	DART has Oracale data base for normal operating system. This data base will expand to include data collected in the future from vehicles.
Detroit, Ann Arbor	
Ann Arbor Transportation Authority	Tape backup
Jacksonville	
Jacksonville Transportation Authority	Access database with menu-driven report. ArcGIS shape files.
Los Angeles, Anaheim, Riverside	
Orange County Transportation Authority	We use backup tapes for archiving data and tapes are available to end users upon request.
Santa Monica Municipal Bus Lines	Tape libraries
McAllen	
McAllen Express	Route Surveys
Minneapolis, St. Paul	
Metro Transit	With new system, archiving process still in development
New Orleans	
Regional Transit Authority	Monthly via intranet in report format comparing to previous year.
New York, Northern New Jersey, Southwestern Connecticut	
New Jersey Transit Corporation(NJ)	On-line (internal network) Manual file export (sneakernet)
Philadelphia, Wilmington, Trenton	
Southeastern Pennsylvania Transportation Authority (SEPTA)	Tape
Pittsburgh, Beaver Valley	
Port Authority of Allegheny County	tape
Salt Lake City, Ogden	
Utah Transit Authority	management software and intranet
San Diego	
North San Diego County Transit Development Board	Archiving not yet implemented

Appendix L: Other methods used to make archived data available

Agency	Method
San Francisco, Oakland, San Jose	
Golden Gate Bridge, Highway and Transportation	Intranet via customized programs.
Santa Clara Valley Transportation Authority	Business Warehouse
Seattle, Tacoma	
Pierce County Ferry Operations	Digital Image & micro-filming
Sound Transit	Server data is always bcked up to 30 days prior
Tucson	
Sun Tran	By Request
Washington	
Washington Metropolitan Area Transit Authority	Internal network and IBM mainframe.
Wichita	
Wichita Metropolitan Transit Authority	Once enter into data archiving and mining, will generate through CD and paper format. possibly adapt to web application.

Appendix M: Other information being collected/archived electronically

Agency	Information	In 2004	By 2005
Chicago, Gary, Lake County			
Northwest Indiana Community Action Corporation	National Transit Database	☑	☑
Harrisburg, Lebanon, Carlisle			
Cumberland-Dauphin-Harrisburg Transit Authority	Ridership & Fare Revenue info	☑	☑
New York, Northern New Jersey, Southwestern Connecticut			
New Jersey Transit Corporation(NJ)	fare transaction data, schedule data	☐	☐
Providence, Pawtucket, Fall River			
Rhode Island Public Transit Authority	Vehicle Time and Location, Passenger Count.	☑	☑
San Francisco, Oakland, San Jose			
AC Transit	collected by CalTrans	☐	☐
Seattle, Tacoma			
Pierce County Ferry Operations	ferry records, reports, etc.	☐	☐
Washington			
Fairfax Connector Bus System	Transit Ops	☑	☐

Appendix N: Other uses for data

Agency	Use
Austin	
Austin Capital Metropolitan Transportation Authority	Incident tracking
New York, Northern New Jersey, Southwestern Connecticut	
New Jersey Transit Corporation(NJ)	Maintenance Management
Village of Spring Valley Bus	Daily opertating costs
Providence, Pawtucket, Fall River	
Rhode Island Public Transit Authority	NTD Reports

Appendix O: Projects where using standards absolutely helped with the integration needs

Agency	Project
Dallas, Fort Worth	
Dallas Area Rapid Transit (DART)	When the standards are available and mature that makes our job easier. We are trying to implement the new standads on DMS and CCTV procurement.
Houston, Galveston, Brazoria	
Metro Transit Authority	IVOMS
Jacksonville	
Jacksonville Transportation Authority	Stop annunciators, APCs, and coming AVL
New Orleans	
Regional Transit Authority	a
New York, Northern New Jersey, Southwestern Connecticut	
New Jersey Transit Corporation(NJ)	Runcutter/Bus Stop Inventory Automatic Passenger Counting and Data Management System
Orlando	
LYNX Central Florida Regional Transit Authority	ORANGES - Smart Card Electronic Payment
Portland, Vancouver	
Tri-Met	Automatic Passenger Counters Transit Signal Priority Automatic Stop Announcements (future project)
San Juan	
Puerto Rico Highway and Transportation Authority (MetroBus)	Rehabilitation of the Communications Center
Seattle, Tacoma	
Snohomish County Public Transportation	Transit Signal Priority (in implementing phase)

Appendix P: Projects where using standards somewhat helped with the integration needs

Agency	Project
Cincinnati, Hamilton	
Southwest Ohio Regional Transit Authority (SORTA)	we are not integrated with other agencies, however we do work closely with them and hope in the future to be integrated with them
Portland, Vancouver	
Tri-Met	Automatic Vehicle Location Real Time Customer Information
Seattle, Tacoma	
Pierce Transit	Signal Priority Communications Projects Smart Bus Regional Fare Card (smart card)
Washington	
Fairfax Connector Bus System	They may, but all standards are only under consideration as part of our AVL project.

Appendix Q: Projects where using standards not exactly helped with the integration needs

Agency	Project
Detroit, Ann Arbor	
SMART	ITS installations pre-date the standards adoptions
Hampton Roads	
Hampton Roads Transit	Coordination issues and timing conflicts with the outside stakeholder for the interface to be implemented. Also, standards not yet well defined nor are there any readily available compliance testing processes that can be employed.
Los Angeles, Anaheim, Riverside	
Victor Valley Transit Authority	Not there yet
Raleigh-Durham	
Chapel Hill Transit	Real-Time Passenger Information and Automatic Vehicle Locator will be included in fixed-route buses at a future date.
Richmond, Petersburg	
Greater Richmond Transit Company	I think it is to early to make a determination
Seattle, Tacoma	
King County Metro	King County has been actively involved in TCIP standards development. However TCIP has not reached a level of maturity yet to help with integration needs.

Appendix R: Other factors that will ensure agency uses ITS standards

Agency	First	Second	Third
Hampton Roads			
Hampton Roads Transit	Compliance Testing is available	Vendors provide standard-compliant products	Additional funding being provided to use the standards
Los Angeles, Anaheim, Riverside			
Los Angeles City	Provide free software for simulation and testing	Vendors provide standard-compliant products	Training and technical support being provided to my agency
Victor Valley Transit Authority	Training and technical support being provided to my agency	Hiring a consultant	We are already committed to using standards when they are complete

Appendix S: Other tools helpful for implementing ITS standards

Agency	First	Second	Third