Scalable AZTech™ Data Server
Enhancements for Planning and Operations:

User Services Requirements Study

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Maricopa County Department of Transportation

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1.0 INTRODUCTION

1.1 Description of the User Services Requirements Study

In 1996, the Federal Highway Administration awarded a Model Deployment Initiative grant to the Phoenix Metropolitan Area to assist in the deployment and integration of a model Intelligent Transportation System (ITS). Using funding from both the federal grant and the project partners, a joint public and private partnership worked together under the name AZTech™ to deploy and integrate ITS and provide real time travel information to the public.

The AZTech™ project, in addition to the Arizona Department of Transportation (ADOT) Freeway Management System, local cities, fire, police, emergency management and city development services, has been generating data that are relevant to the transportation community. Not all of these data are currently being archived nor are they readily available to planners and many other potential end users.

Realizing the need to capture data available though ITS infrastructure, the Maricopa County Department of Transportation (MCDOT) developed the Scalable AZTech™ Data Server Enhancements for Planning and Operations Project. The enhancements will allow data that is currently collected on the AZTech™ data server to be archived. The archived data will then be made available to local agencies for such uses as planning, modeling, or any other need that exists. For the purpose of this study, the enhancements planned for the AZTech™ data server will be referred to as the Regional Archived ITS Data Server (RADS). The long-term goal of the RADS project is to implement hardware and software for storing both AZTech™ and other data as they come on-line, and allow for the data to be accessed, shared, and utilized. All work completed as part of this project will be consistent with the National ITS Architecture. The implementation phase of this project was recommended by the Maricopa Association of Governments (MAG) ITS Committee for inclusion in the region's Transportation Improvement Program and is currently programmed for FY 2000 with federal CMAQ funds.

In order to properly plan for and design the data server, MCDOT contracted with the firm of Kimley-Horn and Associates, Inc. to conduct a User Services Requirements Study to determine the need for archived data in Maricopa County. The study solicited input from a variety of stakeholders throughout Maricopa County to determine the usefulness of the AZTech™ data to their agencies, as well as their need for additional data not currently available through the AZTech™ server. The data that stakeholders currently archive and the need for additional archived data was documented. The results of the study include comprehensive lists of all archived ITS data needs of the stakeholders in Maricopa County, ranked by various categories. These lists can be used to as a tool to help define the inputs, size, and architecture for the RADS.

The User Services Requirements Study is the first phase in a multi-phase project to design, build, and deploy the RADS.

2.2 Project Approach

The existing data elements available through the AZTech™ data server were reviewed and documented. These elements along with additional data elements not currently collected through AZTech™ were presented to stakeholders to determine their need for the data. Stakeholders were selected by working with the AZTech™ Data Server User Services Requirements Sub-committee. The selected stakeholders

represented a broad range of both public and private data users, including traffic engineers, planners, emergency service providers, airports, universities, and private sector participants.

To solicit input from as many stakeholders as possible, a four-part input process was developed. Input was gathered through the use of a detailed survey, focus groups, presentations at existing meetings, and one-on-one interviews. Part one of the stakeholder input process consisted of a detailed survey that was developed to allow stakeholders to select exactly the data types they desire as well as provide input on the data format and time increments preferred. The survey included data categories and data elements as defined in the National ITS Architecture Archived Data User Service.

Part two consisted of six focus groups used to discuss the data needs of stakeholders. The focus groups allowed interaction between stakeholders to discuss issues concerning the archived data server as well as a chance for stakeholders to express opinions and suggestions for the RADS. Part three of the input process involved presenting the RADS project at existing meetings to stakeholder groups throughout Maricopa County. These groups included the MAG ITS Committee, Valley Metro Operations Meeting, and the AZTech™ Public Safety Communications Committee.

Finally, to reach key stakeholders or those that were not able to provide feedback through other methods, direct one-on-one interviews were conducted. This method allowed each interviewed stakeholder to provide a very detailed response to the needs of his or her agency.

The finding from these various methods of input have been summarized in **Section 4.0** of this report.

2.0 REVIEW OF EXISTING AZTECH™ DATA

2.1 Existing Data Available Through AZTech™

The enhancements to the AZTech™ Server will allow transportation data to be pulled directly from the server and archived for planning, modeling, and other purposes as needed. The existing data available through the AZTech™ Data Server was reviewed to determine what data stakeholders will have access to initially through the RADS.

Existing AZTech™ data is comprised of three primary data categories:

- ADOT Freeway Management System Data;
- Local Jurisdiction Traffic Signal Data; and
- Transit Advanced Automated Vehicle Location Data.

Data in these three categories will be made available to stakeholders initially. Future AZTech™ projects will implement additional data collection capability to the AZTech™ Server that could be integrated into the RADS as well. The existing AZTech™ data available on the AZTech™ Server is summarized in **Table 2-1**.

The AZTech™ data was considered in the stakeholder input process to determine user service requirements for archived data. Stakeholders were given an opportunity to comment on the usefulness of this data; their ability to archive and retrieve similar data at the present time, and the time increments and format in which they would like the data archived.

2.2 Potential Gaps in AZTech™ Server Data

Although the initial concept of the RADS is to archive only existing AZTech™ data, new data elements will be added to the AZTech™ Server over time that could be incorporated into the RADS. To ensure that proper consideration was given to potential data elements that could be included in the RADS, all currently foreseeable data elements were included in the surveys and interviews of stakeholders.

The following data categories not currently being collected by the AZTech™ Server were included in the survey:

- Arterial Data;
- Parking Management Data;
- Commercial Vehicle Operation Data; and
- Weather Data.

Stakeholder feedback on the desirability of these data elements will assist MCDOT in prioritizing the types of data collected for future use in the RADS.

Table 2-1
Existing AZTech™ Server Data Elements

Data Owner /Provider	Source Equipment	Data Item	Format/Units	Data Freq.	Store Freq.	Item Description
ADOT FMS	Variable Message Sign		Table	20 seconds	1 min	
		Snapshot count	Count			Number of snapshots in table
		Sign ID	Numeric			Snapshot/state of 1 sign
		Status	Multiple			Sign status, multiple parameters
		Message	Character			Message displayed on sign
		Operator	Character			Name of message loader
		Time-changed	Numeric			Time message was loaded
ADOT FMS	Freeway Ramp Meter Signal		Table	20 seconds	1 min	
		Snapshot count	Count			Number of snapshots in table
		Ramp ID	Numeric			Snapshot
		State	Enabled/failed			Meter on/off state
		Minimum level	Numeric			Sets metering level of ramp
		Maximum level	Numeric			from full green to full red
		Mode	Multiple			Controls various operating modes
		Meter rate	Numeric			Vehicles/minute setting of meter
		Status	Multiple			Status of meter subsystems
		Norm volume	Numeric			Normal lane volume
		HOV volume	Numeric			Carpool lane volume
ADOT FMS	Traffic Intersection Controller		Table	20 seconds	1 min	
		Snapshot count	Count			Number of snapshots in table
		Intersection ID	Numeric			Snapshot/state of 1 intersection
		Status	Multiple			State & timing plan of intersection
		Volume	Numeric			Vehicle count for this 20 sec frame
		Occupancy	Numeric			Detector occupancy time / 20 sec
ADOT FMS	Traffic Detector Loop		Table	20 seconds	1 min	Table of link segment reports
		Snapshot count	Numeric			Number of links in report
		Detector ID	Numeric			Snapshot of 1 link/segment
		Flow level	A thru E			Average flow of all lanes
		VPH average	Numeric			Vehicle per hr - average
		Occupancy avg.	Numeric			Loop occupancy - average
		Speed average	Numeric			Speed average all lanes
		Lanes [8]	Table			Table of per-lane data
		Flow level (lane)	Numeric			Flow for this lane
		VPH (lane)	Numeric			Vehicles per hour this lane
		Occupancy (lane)	Numeric			Percent time vehicle on detector
		Speed (lane)	Numeric			Speed of this lane
ADOT FMS	Incident Management		Structure	As Occurs	As Occurs	
		Incident ID	Numeric			Incident number
		Description	Character			Description of incident
		Time sent	Timestamp			Time of incident
		Incident info	Structure			Specifics of incident
		Initiator	Structure			Agency & agent reporting incident
		Responder count	Count			Number of responding agencies
		Responders	Mult structure			Agencies responding to incident
		Characterization	Code			Incident character code
		Freeway name	Character			Freeway of incident
		Cross street	Character			Nearest cross street
		Add location	Character			Additional location information
		Severity level	1 thru 4			Severity of incident
		Lanes blocked	Bit mask			Detail of blocked lanes
		Operator	Character			Reporting operator name
		Agency	Character			Reporting agency name
		Time changed	Timestamp			Time change made
		Agency name	Character			Changing agency
		Device ID	Numeric			ID number of device
		Timing plan	Numeric			ID number of device timing plan
		TP name	Character			Name of device timing plan
		Action	Accept/decline			Acceptance by device's agency
Local Jurisdictions	Traffic Signals		Table	20 seconds	1 min	
		Snapshot count	Count			Number of snapshots in table
		Traffic Signal ID	Numeric			Snapshot/state of 1 intersection
		Status	Multiple			State & timing plan of intersection
		Volume	Numeric			Vehicle count for this 20 sec frame
		Occupancy	Numeric			Detector occupancy time/20 sec
Transit AVL	AVL		Table	1-2 minutes		
		Timestamp	Character			Table time/date stamp
		Bus stops	Count			Number of stops in table
		Stop ID	Numeric			Unique bus stop ID number
		Route	Numeric			Route number
		Bus ID	Numeric			Bus number
		Arrival	Numeric			Time to anticipated arrival
		Scheduled Arrival	Character			Scheduled arrival time
		Message ID	Numeric			Unique ID of this bus tracking table
		Bus Records	Count			Number of Busses in table
		Record Type	Status/alarm			Selects status or alarm message
		Location	Lat./Long.			Location of bus

3.0 STAKEHOLDER INPUT-APPROACH

3.1 Stakeholder Identification

The RADS was initially conceptualized as having a role of archiving only local and regional data. However, it is conceivable that the data server could expand beyond a regional function and serve as a statewide data repository at some time in the future. With that in mind, it was decided that stakeholder input should be gathered primarily from the Maricopa County Region but input from areas outside of the County should also be considered.

Eleven initial groups were identified for providing input into user needs. These included the following:

- ADOT;
- Municipal Metropolitan Planning Organizations;
- MCDOT;
- Federal Government;
- City ITS/Traffic;
- City Planning;
- Transit;
- Emergency Management;
- Airports;
- Universities; and
- Private Sector.

From the above eleven stakeholder groups, a total of 88 stakeholders were identified representing both the Maricopa County Region and other areas of Arizona. For example, the ADOT stakeholders included traffic engineers and planners from Phoenix, as well as a member of the Motor Vehicle Division from southern Arizona and a researcher working on statewide data collection. Municipal Metropolitan Planning Organizations included input from members of both the Maricopa and Pima Associations of Governments. City ITS/Traffic and Planning input came from large cities in Maricopa County as well as small cities such as El Mirage and Avondale. Private sector input came from both AZTech™ partners involved in privatized traffic information dissemination and the American Automobile Association.

A complete list of all stakeholders that provided input is included in **Appendix A**.

3.2 Survey Instrument

To allow an analytical analysis of the data needs of the stakeholders, a survey questionnaire was developed and sent to the 88 identified stakeholders. The purpose of the survey was to determine the need for archived transportation data in Maricopa County. Three levels of AZTech™ data were identified: Data Areas, Data Categories, and Data Elements. These are shown in **Table 3-1**.

Table 3-1
Survey Data Area, Categories, and Elements

Data Area	Data Category	Data Elements
Freeway Data	Freeway Traffic Flow Surveillance Data	avg. veh. per hour, avg. speed, etc.
	Freeway Variable Message Sign	sign status, message, etc.
	Freeway Ramp Meters	ramp ID no., metering rate, etc.
Arterial Data	Arterial Traffic Flow Surveillance Data	volume, occupancy, etc.
	Arterial Traffic Signal Phasing	no. of phases, cycle length, etc.
	Arterial Variable Message Sign	sign status, message, etc.
Parking Management Data	Parking Management	time, available spaces, etc.
Transit Data	Transit Usage	route no., vehicle boardings, etc.
	Transit Route Deviations	route no., location (lat./long), etc.
	Transit Schedule Adherence	transit route, actual arrival time at station, etc.
Incident Management and Safety Data	Incident Logs	incident location, type of incident, etc.
	Emergency Vehicle Dispatch Records	dispatch time, arrival time, etc.
	Emergency Vehicle Locations	vehicle ID no., location
	Train Arrivals at Hwy. Rail Intersections	intersection location, arrival time, etc.
	Construction and Work Zone ID	work zone location, lanes blocked, etc.
Commercial Vehicle Operations Data	Weigh-In-Motion	WIM location, vehicle weights, etc.
	HazMat Cargo Identifiers	type of hazmat, route, etc.
	Fleet Activity Reports	motor carrier, citations, etc.
	Cargo Identification	cargo type, origin/destination, etc.
	Border Crossings	motor carrier name, cargo type, etc.
	On-Board Safety Data	driver log, subsystem status (e.g. brakes), etc.
Weather Data	Weather Data	precipitation, temperature, etc.

The data areas, categories, and elements were determined from the existing data collected by the AZTech™ Data Server and the National ITS Architecture Archived Data User Service specifications.

Survey participants were asked to answer five questions for each data element:

- Importance of data to your agency? (Ranked 1 to 5, 1-Not Important, 5-Critical)
- Is data available to you from your jurisdiction? (Yes/No)
- Would you like data from other jurisdictions? (Yes/No)
- Desired time increments of data? (30 sec, 1 min., daily, etc.)
- Desired format of data? (ASCII, dbase, spreadsheet, etc.)

In addition, space was provided to give a ranking of the overall importance of the data category that summarizes the cumulative importance of the data elements. A section was also provided for additional comments regarding the data elements or categories.

An example of the Stakeholder Survey instrument is provided in **Appendix B**.

3.3 Stakeholder Interviews

In addition to the surveys, input was also solicited from stakeholders through focus groups, presentations at exiting (regularly scheduled) meetings, and one-on-one interviews. Six focus groups were set up and each stakeholder that received a survey was invited to attend. The focus groups were scheduled at various times over a three-week period and held at the offices of MAG, MCDOT, and the ADOT Traffic Operations Center. A brief presentation was provided to explain the User Services Requirements Study and the vision for the RADS. After the presentation and an open question and answer period, feedback was solicited from stakeholders regarding such topics as desired data, methods for disseminating data, other sources of archived data, and value of data to each stakeholder's agency.

In additional to the focus groups, several presentations were made at existing meetings within the Maricopa Region to reach stakeholders that were not planning to attend the focus groups. Presentations were given at the following meetings:

- MAG ITS Committee;
- Valley Metro Operations Meeting (Transit Providers); and
- AZTech™ Public Safety Communications Committee.

Finally, one-on-one interviews were conducted with key stakeholders that were not able to attend focus groups or existing meetings. These interviews provided an opportunity for the stakeholders to give a more detailed response then the survey allowed, as well as make suggestions on how they would like the RADS to be designed and the interface they would like to use to access the archived data.

The findings of the surveys, focus groups, existing meetings and one-on-one interviews are discussed in **Section 4.0** of this report.

4.0 RESULTS AND FINDINGS

4.1 Survey Results

A total of 37 survey responses were completed through the stakeholder involvement process. Many of the surveys represented the views of multiple personnel or departments at a single agency. In some cases, Kimley-Horn and Associates completed survey questionnaires, based on interviews conducted with stakeholders. The surveys were compiled to determine which data categories and data elements are most critical to stakeholders. The existing availability of data, desired time increments, and data format were also reviewed to ensure that the RADS provides data that is useful to the stakeholders.

Appendix C presents four detailed reports from the survey questionnaire. These reports include:

- Data Importance By Category Report;
- Data Availability By Category Report;
- Data Storage Time Increment Report; and
- Desired Data Storage Format by Category Report.

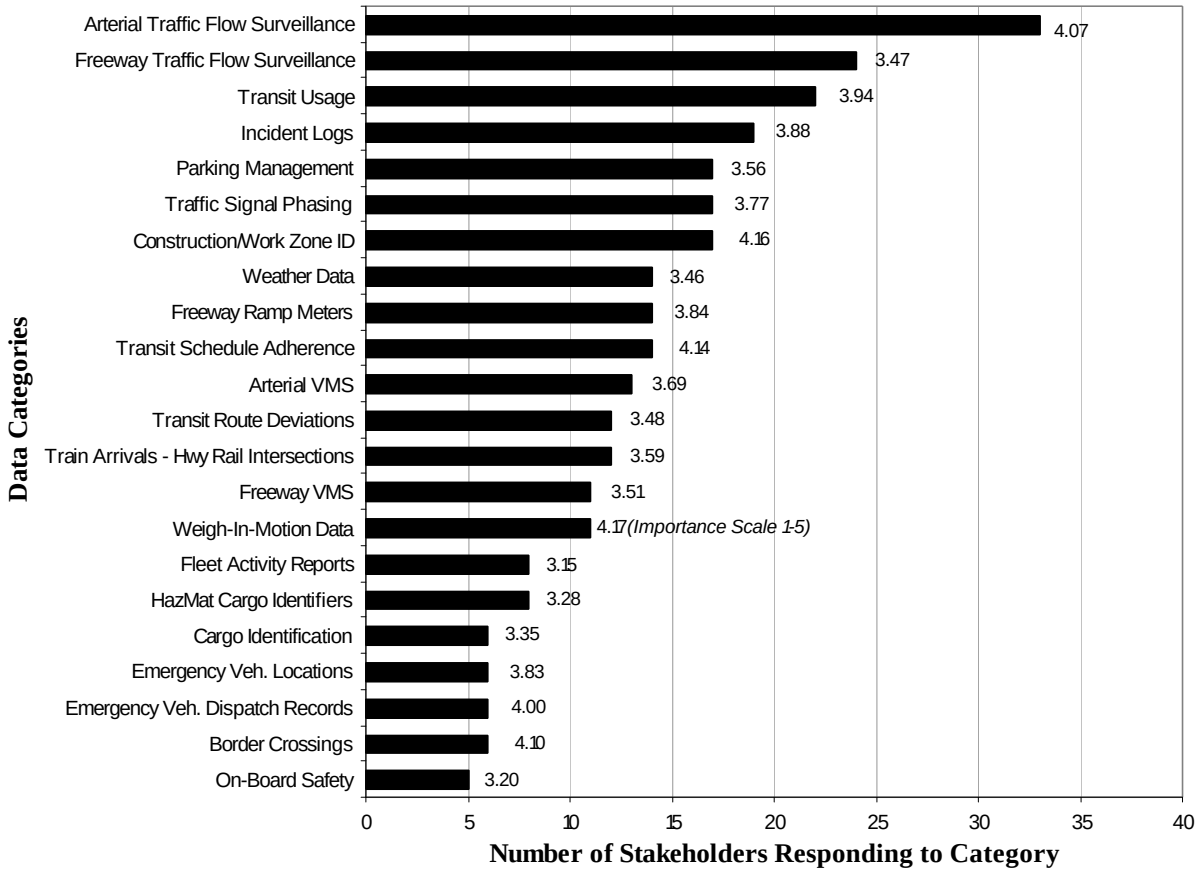
Data Importance By Category

Data importance to the stakeholders can be measured through two methods. In **Appendix C**, the Data Importance By Category Report provides both the number of stakeholders selecting each data element, as well as the average score each data element received based on the 1 to 5 scale presented in the survey.

The results of the Data Importance By Category Report are displayed in **Figure 4-1**. The horizontal bar represents the number of stakeholders selecting at least one data element in the data category (median = 12.5). The number to the right of the horizontal bar represents the average importance score of the data category on a scale of 1 to 5, with 5 representing the highest possible score. Based on the number of stakeholders selecting the data category, Arterial Traffic Flow Surveillance data is the most important data element for the stakeholders. This ranking is consistent with the feedback that was received through the focus groups and interviews. Other critical data categories include Freeway Traffic Flow Surveillance, Transit Usage, and Incident Logs.

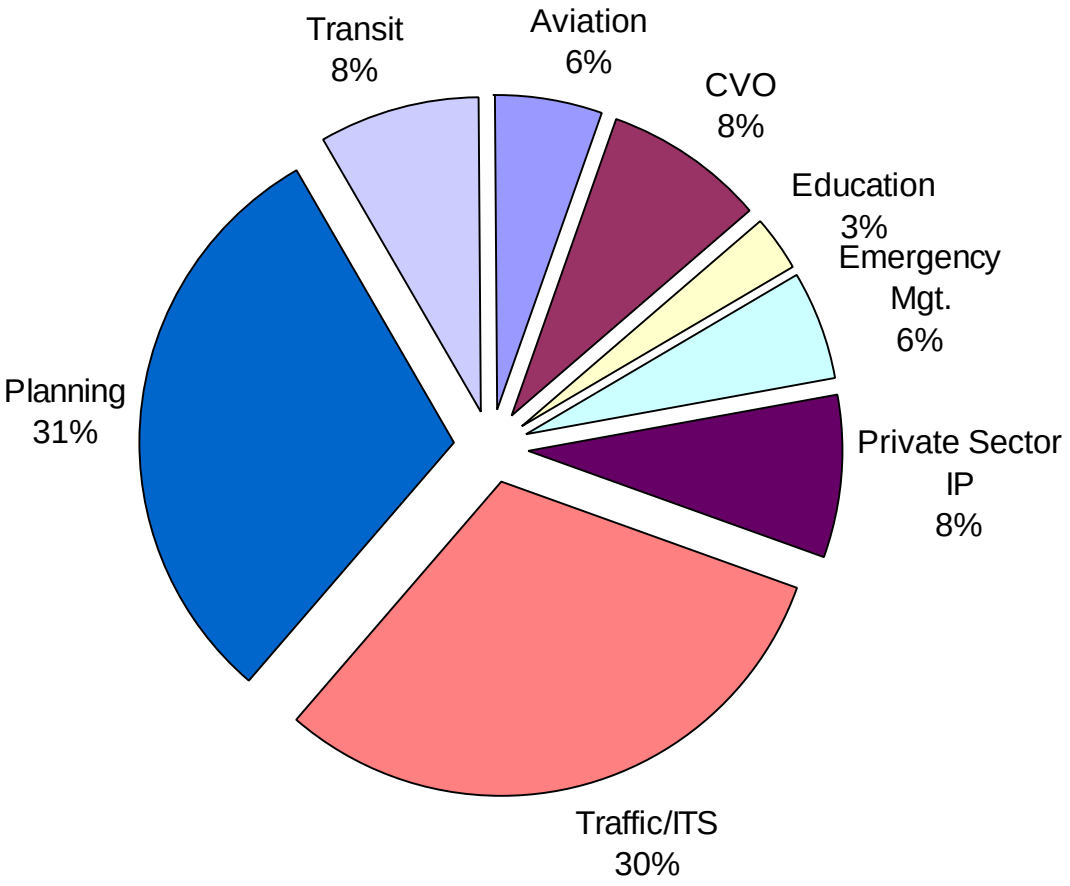
However, the importance scores of the data categories are different from the category rankings based on the total number of stakeholders selecting data elements in each category. Based on the importance score rankings, Weigh-In-Motion Data, Transit Schedule Adherence, Construction/Work Zone Data, and Border Crossing Data are the most important. These data categories represent data that has been ranked very important by a select number of stakeholders, however there are a smaller number of stakeholders that desire this data compared to the highest ranked data categories by number of stakeholders selecting the category.

Figure 4-1
Data Category Rankings



To assist in evaluating survey results, **Figure 4-2** presents a profile of the type of stakeholders responding to the survey. Stakeholders have been divided into eight categories: Planning, Traffic/ITS, Transit, Aviation, Commercial Vehicle Operations (CVO), Education, Emergency Management, and Private Sector Information Provider. While the large number of transportation planners and traffic/ITS stakeholders responding to the survey may present a bias towards data that is most related to their functions, it should be noted that the people that responded to the survey are also most likely the stakeholders that will eventually be users of the data. By the same token, the low response from the non-traditional stakeholders may indicate that these stakeholders would also be less likely to use the data that will be available from the RADS.

Figure 4-2
Stakeholder Categories Responding



The previously introduced **Figure 4-1** shows the data categories that were selected the most often. To provide a more detailed analysis of the data, **Table 4-1** lists the individual data elements that were most often selected by stakeholders as having value to their agencies. In most instances, the data elements that were most selected correspond closely to the most popular data categories. These are the data elements that the stakeholders showed the most interest in obtaining in archived form. The Data Importance By Category Report in **Appendix C** provides a complete listing of every data element, the number of stakeholders selecting the data element, and the average score of the data element on the 1 to 5 scale.

Table 4-1
Data Elements Ranked Highest By Stakeholders

Data Categories	Data Elements	Stakeholders Responding To Data Element	Average Score
Arterial Traffic Flow Surveillance Data	Volume	32	4.13
	Speed	27	4.15
	Occupancy	25	3.84
	Location of detection stations	25	4.16
Freeway Traffic Flow Surveillance Data	Average vehicles per hour	24	3.92
	Average speed	21	3.62
	Individual vehicles per hour	20	3.60
	Vehicle classification	20	3.60
	Average occupancy	20	3.55
	Vehicle weight	19	2.63
	Detector identification number	18	3.61
	Individual lane occupancy	18	3.28
	Individual lane speed	18	3.22
Incident Logs	Severity level	19	4.16
	Type of incident	18	4.17
	Lanes blocked	18	3.83
	Cause	17	3.94
	Hazmat involved	17	3.59
	Clearance time	16	4.19
	Incident begin time	16	4.19
	Initiator	16	4.25
	Police accident report reference	16	3.69
Transit Usage	Origin and destination numbers	21	3.86
	Route number	21	4.00
	Vehicle boardings	20	4.10
Construction and Work Zone Identification	Construction/work zone location	17	4.24
	Lanes/shoulders blocked	17	4.06
	Time/date construction	17	4.18
Parking Management	Lot location	17	3.65
	Lot size	16	3.56
Traffic Signal Phasing	Signal location	17	4.24
	Left turn treatment	16	3.75
	Cycle length/green time	16	3.94

Data Availability By Category

The Data Availability By Category Report in **Appendix C** provides a detailed description of the availability of each data element to stakeholders. In many cases, it was found that stakeholders had access to certain types of data from within their own jurisdictions but did not have access to data from surrounding jurisdictions.

Data Storage Time Increments/Desired Data Storage Format by Category

Appendix C also includes reports on the Data Storage Time Increments and the Desired Data Storage Format by Category. These reports indicate by each data element the desired time increments and the preferred format for storing the data. **Table 4-2** summarizes the desired data storage time increments and format for each data category. The most common time increments and data formats are indicated.

Data storage time increments ranged from 30 seconds to daily to 6-months. Typically, it is recommended that data be stored in as small a time increment as practical. Those that desire data in larger increments, such as daily traffic counts instead of 5-minute counts, will be able to easily manipulate the 5-minute data to obtain daily counts.

Data formats selected included Microsoft Access, ASCII, spreadsheets, GIS, and Uniform Traffic Database Format (UTDF2). In many cases, stakeholders indicated that they would like the archived data in a database format but did not specify a specific type. This is indicated in **Table 4-2** as DBMS - Database Management System.

Table 4-2
Preferred Data Storage Time Increments and Formats

Data Category	Most Common Time Increments Selected in Survey	Recommended Time Increment	Most Common Data Format Selected in Survey
Arterial Traffic Flow Surveillance Data	1 min/5 min/ 15 min/daily	1 or 5 min increments	ASCII/DBMS
Arterial Variable Message Sign	5 min/daily	Status by 5 minute increments or message information as needed	ASCII/DBMS
Border Crossings	No survey responses	No suggested increments	Spreadsheet
Cargo Identification	Daily/Monthly	Daily or monthly	ASCII
Construction and Work Zone Identification	Daily	Daily	ASCII/DBMS/ Spreadsheet
Emergency Vehicle Dispatch Records	5 min	5 minute increments or record per dispatch	Spreadsheet
Emergency Vehicle Locations	5 min	5 min	Spreadsheet
Fleet Activity Reports	Daily/annual	Update records consistent with time interval new data is entered	Spreadsheet
Freeway Ramp Meters	1 min/15 min/weekly	1 to 15 min increments	ASCII/DBMS
Freeway Traffic Flow Surveillance Data	5 min/15 min/ hourly/daily	5 or 15 min increments	ASCII/DBMS
Freeway Variable Message Sign	5 min/daily	Status by 5 minute increments or message information as needed	ASCII/DBMS
HazMat Cargo Identifiers	30 min/daily	30 min to daily	Spreadsheet
Incident Logs	5 min/10 min/1 day	Update per incident logged	Spreadsheet
On-board Safety Data	daily	daily	Spreadsheet
Parking Management	10 min/hourly	5 to 15 min increments	ASCII/DBMS
Traffic Signal Phasing	15 min/30 min/hourly	15 min increments	ASCII/DBMS
Train Arrivals at Highway Rail Intersections	5 min/1 hour	5 min	DBMS
Transit Route Deviations	30 sec/3 min/5 min	30 sec to 5 min	ASCII/DBMS
Transit Schedule Adherence	3 min/5 min	3 to 5 min	ASCII/DBMS
Transit Usage	3 min/15 min/daily	3 to 15 min	ASCII/DBMS
Weather Data	10 min/daily	10 to 15 min	ASCII
Weigh-in-Motion (WIM) Data	10 min/daily	10 min to hourly	ASCII/Spreadsheet

DBMS - Unspecified Database Management System

4.2 Focus Groups/Existing Meetings/Interviews

Focus groups, interviews, and presentations at existing meetings were used in addition to the surveys to gather input to determine user services requirements. The following issues were common among the various stakeholders:

- Adequate methods for ensuring the integrity of the data that is fed into the RADS must be developed to ensure that the data available to stakeholders is usable.

- A decision needs to be made early on whether the public will have access to the data as it may affect the way data is formatted on the RADS.

- A graphical interface to the data would be useful, especially for obtaining traffic counts and signal phasing.

- It was generally agreed that an interface through the Internet would be most useful. As the amount of data grows, storing older data on a medium such as a CD-ROM would be feasible.

- There is a desire to archive not only existing traffic counts, but traffic projections for future years. Many stakeholders were interested in finding a method for storing past traffic projections that they could refer back to and check the accuracy of past models.

- There are cases where the data from one agency may conflict with data from another agency. There is concern that the RADS, by archiving one agency's data, may be endorsing that data.

- Many stakeholders felt that they needed to check their data and make adjustments to account for anomalies, such as loop detectors that fail. There was concern that making this raw data available through the RADS may mean a loss of credibility for those agencies.

- The ALISS database, maintained by ADOT, provides much of the incident crash data that Emergency Services personnel require. In general, many of the stakeholders expressed that they were comfortable with the ALISS database and did not see a need to archive incident data that is available through this system.

- Storage of existing roadway features would add usefulness to the data stored.

- Stakeholders liked the idea of linking a RADS web page to other web pages of data providers in the region. Even if the RADS can not provide all archived transportation data, using the data server as a means for directing people to the correct location to retrieve data will be very useful.

- Some local jurisdictions expressed a desire to make the RADS open to the public so that citizens could obtain traffic volumes directly from the RADS. Many cities spend time gathering traffic data at the request of citizens and would like to be able to direct them to a location on the Internet where this information can be obtained.

- A record of past special events that may have affected traffic, such as sporting events or severe weather, may help stakeholders interpret data from the RADS more accurately.

- There is a common concern among stakeholders over who will operate and maintain the RADS. Questions often arose regarding whether there would be a cost to access data from the RADS.

4.3 Summary of Findings

The following presents a brief summary of the stakeholders' responses gathered through this study. Supporting detailed information is provided in the Appendices. As a high-level overview, **Table 4-3** lists the highest-scoring data categories based on four different selection criteria.

The data storage time increments were summarized previously in **Table 4-2**. It should be noted again that archiving data in the smallest time increment practical for that data element (as is usually determined by the agency collecting the data) may be the lowest maintenance approach that would also accommodate the largest group of archived data users. Data stored in small time increments can be post-processed by the end user to the desired level of aggregation, thus reducing the burden of additional data processing from the RADS.

Table 4-3
Highest Scoring Data Categories

CRITERIA	RANK	DATA CATEGORY
Most Desired Data Category, based on total number of stakeholders responding within the category (above the median total of 12.5 stakeholders responding within the category)	1	Arterial Traffic Flow Surveillance
	2	Freeway Traffic Flow Surveillance
	3	Transit Usage
	4	Incident Logs
	5	Construction/Work Zone ID
	6	Traffic Signal Phasing
	7	Parking Management
	8	Transit Schedule Adherence
	9	Freeway Ramp Meters
	10	Weather Data
	11	Arterial VMS
Most Important Data Category, based on the total score of data elements within the category (above the median score of 3.73)	1	Weigh-In-Motion Data
	2	Construction/Work Zone ID
	3	Transit Schedule Adherence
	4	Border Crossings
	5	Arterial Traffic Flow Surveillance
	6	Emergency Veh. Dispatch Records
	7	Transit Usage
	8	Incident Logs
	9	Freeway Ramp Meters
	10	Emergency Veh. Locations
	11	Traffic Signal Phasing
Data Availability from Stakeholders' Jurisdition (above the median score of 16 votes within a category)	1	Traffic Signal Phasing
	2	Incident Logs
	3	Arterial Traffic Flow Surveillance Data
	4	Freeway Traffic Flow Surveillance Data
	5	Transit Usage
	6	Transit Schedule Adherence
	7	Construction and Work Zone Identification
	8	Freeway Ramp Meters
	9	Freeway Variable Message Sign
	10	Weather Data
	11	Weigh-in-Motion (WIM) Data
Data Most Desired from Other Agencies (above median score of 26 votes within a category)	1	Incident Logs
	2	Freeway Traffic Flow Surveillance Data
	3	Traffic Signal Phasing
	4	Arterial Traffic Flow Surveillance Data
	5	Freeway Ramp Meters
	6	Transit Usage
	7	Freeway Variable Message Sign
	8	Transit Schedule Adherence
	9	Arterial Variable Message Sign
	10	Parking Management
	11	Weigh-in-Motion (WIM) Data

The responses indicating the most desired archived data storage formats converge on three primary formats: ASCII, DBMS, and spreadsheet. It is highly recommended that no spreadsheet data be stored on the RADS as the management of such format is highly difficult and prone to error. It is envisioned that the storage format will be dictated to the large degree by the system software and will be a DBMS-based; however, many of data elements that are now or will be in the future collected by the AZTech™ server, are provided natively in ASCII format and should be made available to the end user in the same format. As a result, ASCII and DBMS appear to be the preferred storage formats.

It should be noted that a number of users expressed interest in geo-referenced data, i.e., data elements that can retried and located by their geographic coordinates. It is reasonable to expect that such requirements can be accommodated by the RADS, if not initially then as a the future enhancement. Many of today's DBMS used in data warehousing, such as Oracle™ database, can easily accommodate non-visual and visual spacial queries on properly attributed data and thus should be considered as an option in the development of the RADS.

5.0 CONCLUSIONS

5.1 Lessons Learned

Stakeholder Participation

This study once again put into perspective the difficulties one faces when attempting to conduct a survey of a representative sample of stakeholder population. One major difficulty lied in enticing a sufficient number of stakeholders to participate in focus groups specially organized for this study. It was found that it is much easier to obtain stakeholder participation and input through regularly scheduled meetings which they were already scheduled to attend and through one-on-one interviews.

Data Desired through RADS

As the summary reports indicate, there is a need to include data elements outside of what is currently available through the AZTech™ server in the RADS archived data distribution. In addition, as the RADS is put into use, it would be worthwhile to include end user feedback forms within the data access interface to allow for further input on what additional data elements may become desirable in the future.

While each data element was scored based directly on the stakeholders' scores, it is clear that further attention should be directed towards the number of stakeholder "votes" for each data element and data category. This will help to develop a better understanding about the total end user population that is likely to be looking for those data types once the RADS system comes on-line.

Data Formats

The survey responses clearly indicate that a significant number of end users do not fully understand the issues related to available and practical data storage formats. This should be taken into consideration when making archived data available to the end users, to minimize the level of difficultly associated with accessing and post-processing of the archived data.

Agency Participation

A data distribution system is only as good as the data that it makes available to the user. A number of the stakeholders interviewed indicated that there may be perceived or real issues of liability and credibility associated with the data that the various agencies in Maricopa County would end up providing to the RADS system. These issues should be addressed by the RADS project.

Access to RADS

Most stakeholders who expressed their opinion on this subject indicated that the RADS system should be accessible to the public at large, primarily to alleviate the agencies' burden associated with data distribution on individual basis.

5.2 Next Steps

The results and recommendations of this study should be incorporated into the conceptual design of the RADS system to the degree practical. Any long-term recommendations should be taken into account in the system expansion planning process.

APPENDIX A - Stakeholder Input List

Regional Archived ITS Data Server
Stakeholder Input Status

STAKEHOLDERS				DATA COLLECTION METHOD		
Agency	**Department**	**First Name**	**Last Name**	**Focus Group or Existing Mtg**	**Personal Interview**	**Survey**
State						
ADOT	Planning	Bob	Pike		✔	
ADOT	ATRC	Estomih	Kombe		✔	
ADOT	Motor Vehicle Division	George	Bays		✔	
ADOT	Traffic Operations Center	Dottie	Shoup		✔	
ADOT	Transportation Tech. Group	Tim	Wolfe	✔		✔
ADOT	Traffic Engineering	Tom	Parlante	✔		✔
ADOT	Traffic Engineering	Mohamed	Youssef	✔		✔
MPO						
MAG	Modeling	Mark	Schlappi	✔		✔
MAG	GIS	Rita	Walton	✔		
MAG	ITS	Sarath	Joshua	✔		✔
PAG	ITS	Paul	Casertano			✔
PAG	Planning	Charles	Hodges			✔
PAG	Planning	Richard	Corbett			✔
County						
MCDOT	Planning	Chris	Plumb			✔
MCDOT	Engineering Division	Dave	Wolfson		✔	
MCDOT	ITS/Traffic	Bob	Steele			✔
MCDOT	ITS	Scott	Nodes		✔	
MCDOT	Planning	Ed	Fritz			✔
MCDOT	Planning	Amy	Carathers			✔
MCDOT	Planning	Bob	Woodring			✔
Cities (ITS/Traffic)						
City of Chandler	ITS/Traffic	Ty	Hofflander			✔
City of Chandler	ITS/Traffic	Brian	Latte	✔		✔
City of Glendale	ITS/Traffic	Richard	Janke			✔
City of Mesa	ITS/Traffic	Jerry	O'Farrell			✔
City of Scottsdale	ITS/Traffic	Michelle	Kogl			✔
City of Tempe	ITS/Traffic	Jim	Decker	✔		✔
City of Tucson	Traffic	Richard	Nassi			✔
Cities (Planning/Public Works)						
City of Peoria	Planning	Chad	Daines			✔
City of Scottsdale	Planning	Jorie	Bresnahan	✔		✔
City of Tempe	Planning	Robert	Yabes			✔
Town of Gilbert	Planning	Scott	Anderson			✔
City of Phoenix	Street Transportation	Don	Herps		✔	
City of El Mirage	Department of Public Works	Marty	Nana			✔
City of Avondale	Department of Public Works	Bill	Bates			✔
Federal						
FHWA	Office of Motor Carriers	Eric	Ice			✔
US Customs	Tucson	John	O'Reilly			✔

STAKEHOLDERS				DATA COLLECTION METHOD		
Agency	**Department**	**First Name**	**Last Name**	**Focus Group or Existing Mtg**	**Personal Interview**	**Survey**
Transit						
Valley Metro	Planning	Scott	Miller	✔		✔
Phoenix Transit	Planning	Dale	Hardy	✔		✔
RPTA	Director of Grants and Contracting	Bryan	Jungwirth	✔		
RPTA	Planning	Paul	Hodgins	✔		
ADOT Transit	Transit Coordinator	Thalia	Pratt	✔		✔
Emergency Management						
Chandler Fire	Planning	Gordon	Barton	✔		✔
MCDOT	Incident Management Coordinator	Chuck	Manuel		✔	✔
Airports						
Phoenix Sky Harbor Airport	Planning	Richard	Traill		✔	
Williams Gateway Airport	Planning	Art	Allen		✔	
Universities						
Arizona State University	Planning Dept.	Mary	Kihl	✔		✔
Private Sector						
AAA	Planning	David	Cowley	✔		✔
ECOTEK	Project Manger	John	Reimers	✔		✔
Computran (HCRS, RCRS)	Project Manager	Tomas	Guerra	✔		
ETAK	Vice President/Project Mgr.	Larry	Sweeney			✔
TranSmart	Project Manager	Connie	Li			✔
Total Number of People			**51**	**19**	**10**	**38**

APPENDIX B - Example Survey

Stakeholder Survey - Regional Archived ITS Data Server

Sponsored by the Maricopa County Department of Transportation

Introduction

The AZTech™ Model Deployment Initiative Project has been putting features in place that are generating considerable amounts of transportation data. In addition, the ADOT Freeway Manageme System, local cities, fire, police, emergency management and city development services also generate data that are relevant to the transportation community. These data are not currently being archived and are not readily available to planners and other potential end users. The purpose of this survey is to determine the need for data from potential stakeholders. The long-term goal of this project is to implement hardware and software for storing both AZTech™ and other data as they come on-line, and allow for it to be accessed and put to use. All work completed on this assignment will be consistent with the National Intelligent Transportation System Architecture.

Instructions

Thank you for participating in this survey to determine the need for data to be archived in the region. In order to understand the data needs of stakeholders, we ask that you complete the attached survey. For each category of data listed, please rank the overall importance of the data to the function your agency performs. In addition to general data categories, specific data elements are also listed. Please indicate the importance of these data elements as well as current availability of the data, desired time increments of the data, desired format of the data, and any other comments you may have. Space is provided at the end of each data category to add additional data elements. If a data category has not been included in this form that would be important to your agency, please provide the data category and data elements in the space at the end of the survey.

Please return completed surveys to Tom Fowler by fax at 602-944-7423, or mail to Kimley-Horn and Associates, Inc., 7600 N. 15th Street, Suite 250, Phoenix, Arizona 85020 no later than July 23, 1999.

Stakeholder Information

Name _____

Title _____

Agency _____

Address _____

_____

Telephone _____

Fax _____

E-mail _____

Which of the following best describes the area in which you are primarily involved

___ Transportation Planning

___ Air Quality

___ Transit

___ Commercial Vehicles

___ Emergency Response

___ Aviation

___ Traffic Engineering

___ Intelligent Transportation Systems

___ Private Sector Information Provider

Other _____

Please describe your position and the function of your agency: _____

_____

Please indicate the name of anyone else in your agency that you feel may be interested in completing this survey

Name_____ Title_____ Telephone_____

Address_____

Survey Questions
Regional Archived Data Server

Data Element	Importance of data to your agency? Not Needed 1	2	Desirable 3	4	Critical 5	Is data available to you from your jurisdiction? Yes/No	Would you like data from other jurisdictions? Yes/No	Desired time increments of data? (e.g., 30 sec, 1 min, daily, etc.)	Desired format? (e.g., ASCII, dbase, spreadsheet, etc.)	Other comments?
FREEWAY DATA										
Freeway Traffic Flow Surveillance Data (possible uses: AADT, volumes and speeds for traffic forecasting models, congestion monitoring)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
detector identification number	1	2	3	4	5	__Yes __No	__Yes __No			
average vehicles per hour	1	2	3	4	5	__Yes __No	__Yes __No			
average occupancy	1	2	3	4	5	__Yes __No	__Yes __No			
average speed	1	2	3	4	5	__Yes __No	__Yes __No			
individual lane vehicles per hour	1	2	3	4	5	__Yes __No	__Yes __No			
individual lane occupancy	1	2	3	4	5	__Yes __No	__Yes __No			
individual lane speed	1	2	3	4	5	__Yes __No	__Yes __No			
vehicle classification	1	2	3	4	5	__Yes __No	__Yes __No			
vehicle weight	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Freeway Variable Message Sign (possible uses: record of sign usage, review of incident response actions)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
sign identification number/location	1	2	3	4	5	__Yes __No	__Yes __No			
sign status	1	2	3	4	5	__Yes __No	__Yes __No			
message	1	2	3	4	5	__Yes __No	__Yes __No			
name of message initiator	1	2	3	4	5	__Yes __No	__Yes __No			
time message was initiated	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Freeway Ramp Meters (possible uses: volumes and ramp metering rates for microscopic traffic simulation models)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
ramp identification number	1	2	3	4	5	__Yes __No	__Yes __No			
ramp metering begin time	1	2	3	4	5	__Yes __No	__Yes __No			
ramp metering end time	1	2	3	4	5	__Yes __No	__Yes __No			
metering rate	1	2	3	4	5	__Yes __No	__Yes __No			
normal lane volume	1	2	3	4	5	__Yes __No	__Yes __No			
HOV lane volume	1	2	3	4	5	__Yes __No	__Yes __No			
ramp metering pre-emption time	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										

Data Element	Importance of data to your agency? Not Needed 1	2	3 Desirable	4	5 Critical	Is data available to you from your jurisdiction? Yes/No	Would you like data from other jurisdictions? Yes/No	Desired time increments of data? (e.g., 30 sec, 1 min, daily, etc.)	Desired format? (e.g., ASCII, dbase, spreadsheet, etc.)	Other comments?
ARTERIAL DATA										
Arterial Traffic Flow Surveillance Data (possible uses: AADT, volumes and speeds for traffic forecasting models)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
location of detection station	1	2	3	4	5	__Yes __No	__Yes __No			
volume	1	2	3	4	5	__Yes __No	__Yes __No			
occupancy	1	2	3	4	5	__Yes __No	__Yes __No			
speed	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Traffic Signal Phasing (possible uses: data for traffic simulation models)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
signal location	1	2	3	4	5	__Yes __No	__Yes __No			
number of phases	1	2	3	4	5	__Yes __No	__Yes __No			
cycle length/green time	1	2	3	4	5	__Yes __No	__Yes __No			
signal coordination settings	1	2	3	4	5	__Yes __No	__Yes __No			
signal pre-emption settings	1	2	3	4	5	__Yes __No	__Yes __No			
left turn treatment	1	2	3	4	5	__Yes __No	__Yes __No			
delay settings	1	2	3	4	5	__Yes __No	__Yes __No			
actuated/pretimed settings	1	2	3	4	5	__Yes __No	__Yes __No			
minimum pedestrian green	1	2	3	4	5	__Yes __No	__Yes __No			
clearance interval	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Arterial Variable Message Sign (possible uses: record of sign usage and review of incident response actions)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
sign identification number/location	1	2	3	4	5	__Yes __No	__Yes __No			
sign status	1	2	3	4	5	__Yes __No	__Yes __No			
message	1	2	3	4	5	__Yes __No	__Yes __No			
name of message initiator	1	2	3	4	5	__Yes __No	__Yes __No			
time message was initiated	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
PARKING MANAGEMENT DATA										
Parking Management (possible uses: parking utilization and needs studies)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
time of data collection	1	2	3	4	5	__Yes __No	__Yes __No			
lot location	1	2	3	4	5	__Yes __No	__Yes __No			
lot size	1	2	3	4	5	__Yes __No	__Yes __No			
available spaces	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										

Data Element	Importance of data to your agency? Not Needed 1	2	3 Desirable	4	5 Critical	Is data available to you from your jurisdiction? Yes/No	Would you like data from other jurisdictions? Yes/No	Desired time increments of data? (e.g., 30 sec, 1 min, daily, etc.)	Desired format? (e.g., ASCII, dbase, spreadsheet, etc.)	Other comments?
TRANSIT										
Transit Usage (possible uses: route planning, ridership reporting)										
Overall	**1**	**2**	**3**	**4**	**5**	__**Yes** __**No**	__**Yes** __**No**			
bus identification number	1	2	3	4	5	__Yes __No	__Yes __No			
route number	1	2	3	4	5	__Yes __No	__Yes __No			
vehicle boardings	1	2	3	4	5	__Yes __No	__Yes __No			
origin and destination numbers	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Transit Route Deviations (possible uses: transit route planning, review of incidents which cause route deviations)										
Overall	**1**	**2**	**3**	**4**	**5**	__**Yes** __**No**	__**Yes** __**No**			
time of data collection	1	2	3	4	5	__Yes __No	__Yes __No			
bus identification number	1	2	3	4	5	__Yes __No	__Yes __No			
route number	1	2	3	4	5	__Yes __No	__Yes __No			
location (latitude/longitude)	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Transit Schedule Adherence (possible uses: transit schedule planning)										
Overall	**1**	**2**	**3**	**4**	**5**	__**Yes** __**No**	__**Yes** __**No**			
bus stop id number	1	2	3	4	5	__Yes __No	__Yes __No			
bus identification number	1	2	3	4	5	__Yes __No	__Yes __No			
transit route	1	2	3	4	5	__Yes __No	__Yes __No			
scheduled arrival time at station	1	2	3	4	5	__Yes __No	__Yes __No			
actual arrival time at station	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										

Data Element	Importance of data to your agency? Not Needed 1	2	3 Desirable	4	5 Critical	Is data available to you from your jurisdiction? Yes/No	Would you like data from other jurisdictions? Yes/No	Desired time increments of data? (e.g., 30 sec, 1 min, daily, etc.)	Desired format? (e.g., ASCII, dbase, spreadsheet, etc.)	Other comments?
INCIDENT MANAGEMENT AND SAFETY										
Incident Logs (possible uses: incident response evaluations, safety reviews, change in incident rates)										
Overall	**1**	**2**	**3**	**4**	**5**	__**Yes** __**No**	__**Yes** __**No**			
incident location	1	2	3	4	5	__Yes __No	__Yes __No			
incident begin time	1	2	3	4	5	__Yes __No	__Yes __No			
dispatch time	1	2	3	4	5	__Yes __No	__Yes __No			
arrival time	1	2	3	4	5	__Yes __No	__Yes __No			
clearance time	1	2	3	4	5	__Yes __No	__Yes __No			
departure time	1	2	3	4	5	__Yes __No	__Yes __No			
initiator (agency/person reporting incident)	1	2	3	4	5	__Yes __No	__Yes __No			
responder (agency responding to incident)	1	2	3	4	5	__Yes __No	__Yes __No			
type of incident	1	2	3	4	5	__Yes __No	__Yes __No			
severity level	1	2	3	4	5	__Yes __No	__Yes __No			
lanes blocked	1	2	3	4	5	__Yes __No	__Yes __No			
hazmat involved	1	2	3	4	5	__Yes __No	__Yes __No			
police accident report reference	1	2	3	4	5	__Yes __No	__Yes __No			
cause	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Emergency Vehicle Dispatch Records (possible uses: emergency management route planning)										
Overall	**1**	**2**	**3**	**4**	**5**	__**Yes** __**No**	__**Yes** __**No**			
dispatch time	1	2	3	4	5	__Yes __No	__Yes __No			
arrival time	1	2	3	4	5	__Yes __No	__Yes __No			
clearance time	1	2	3	4	5	__Yes __No	__Yes __No			
departure time	1	2	3	4	5	__Yes __No	__Yes __No			
origin/destination	1	2	3	4	5	__Yes __No	__Yes __No			
route	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Emergency Vehicle Locations (possible uses: emergency management route planning)										
Overall	**1**	**2**	**3**	**4**	**5**	__**Yes** __**No**	__**Yes** __**No**			
time of data collection	1	2	3	4	5	__Yes __No	__Yes __No			
location	1	2	3	4	5	__Yes __No	__Yes __No			
vehicle identification number	1	2	3	4	5	__Yes __No	__Yes __No			
vehicle type	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										

Data Element	Importance of data to your agency? Not Needed 1	2	3 Desirable	4	5 Critical	Is data available to you from your jurisdiction? Yes/No	Would you like data from other jurisdictions? Yes/No	Desired time increments of data? (e.g., 30 sec, 1 min, daily, etc.)	Desired format? (e.g., ASCII, dbase, spreadsheet, etc.)	Other comments?
Train Arrivals at Highway Rail Intersections (possible uses: grade crossing safety and operational studies)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
intersection location	1	2	3	4	5	__Yes __No	__Yes __No			
begin time (time train arrives at intersection)	1	2	3	4	5	__Yes __No	__Yes __No			
end time (time train departs from intersection)	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Construction and Work Zone Identification (possible uses: correlate with congestion and safety data)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
time/date of construction	1	2	3	4	5	__Yes __No	__Yes __No			
construction/work zone location	1	2	3	4	5	__Yes __No	__Yes __No			
lanes/shoulders blocked	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
COMMERCIAL VEHICLE OPERATORS										
Weigh-in-Motion (WIM) Data (possible uses: identification of areas needing overweight vehicle enforcement, vehicle weight studies)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
date of count	1	2	3	4	5	__Yes __No	__Yes __No			
WIM location	1	2	3	4	5	__Yes __No	__Yes __No			
vehicle weights	1	2	3	4	5	__Yes __No	__Yes __No			
vehicle classification (by axle)	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
HazMat Cargo Identifiers (possible uses: HazMat route planning)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
type of hazmat	1	2	3	4	5	__Yes __No	__Yes __No			
motor carrier name	1	2	3	4	5	__Yes __No	__Yes __No			
route	1	2	3	4	5	__Yes __No	__Yes __No			
time/date of trip	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Fleet Activity Reports (possible uses: commercial vehicle safety studies)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
motor carrier name	1	2	3	4	5	__Yes __No	__Yes __No			
citations	1	2	3	4	5	__Yes __No	__Yes __No			
accidents	1	2	3	4	5	__Yes __No	__Yes __No			
inspection results	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
other _____	1	2	3	4	5	__Yes __No	__Yes __No			
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										

Data Element	Importance of data to your agency? Not Needed 1	2	Desirable 3	4	Critical 5	Is data available to you from your jurisdiction? Yes/No	Would you like data from other jurisdictions? Yes/No	Desired time increments of data? (e.g., 30 sec, 1 min, daily, etc.)	Desired format? (e.g., ASCII, dbase, spreadsheet, etc.)	Other comments?
Cargo Identification (possible uses: freight movement studies)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
motor carrier name	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
cargo type	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
origin/destination	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
other _____	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
other _____	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Border Crossings (possible uses: freight movement studies, port efficiency studies)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
motor carrier name	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
time/date of trip	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
counts by vehicle type	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
cargo type	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
origin/destination	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
other _____	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
other _____	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
On-board Safety Data (possible uses: commercial vehicle operations safety studies)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
motor carrier name	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
vehicle type	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
cumulative mileage	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
driver log (hours of service)	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
subsystem status (e.g., brakes)	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
other _____	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
other _____	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										
Weather										
Weather Data (possible uses: monitoring of flooding, monitoring of high winds)										
Overall	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**			
time of data collection	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
location of monitoring device	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
precipitation	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
temperature	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
wind conditions	1	2	3	4	5	__Yes __No	__Yes __No	_____	_____	_____
☐ *NOT INTERESTED IN THIS DATA CATEGORY*										

Data Element	Importance of data to your agency?					Is data available to you from your jurisdiction? Yes/No	Would you like data from other jurisdictions? Yes/No	Desired time increments of data? (e.g., 30 sec, 1 min, daily, etc.)	Desired format? (e.g., ASCII, dbase, spreadsheet, etc.)	Other comments?
	Not Needed 1	2	Desirable 3	4	Critical 5					
OTHER DATA NOT LISTED ABOVE										
Data Category ____________	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
Data Category ____________	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
Data Category ____________	**1**	**2**	**3**	**4**	**5**	**__Yes __No**	**__Yes __No**	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________
data element ____________	1	2	3	4	5	__Yes __No	__Yes __No	________	________	____________

APPENDIX C - Survey Questionnaire Reports

Data Importance by Data Category

Archived Data Server - Stakeholder Survey Results

DATA CATEGORY **DATA**

Arterial Traffic Flow Surveillance Data

location of detection station

Average Importance of location of detection station: 4.16
Number of responses for location of detection station: 25

occupancy

Average Importance of occupancy: 3.84
Number of responses for occupancy: 25

speed

Average Importance of speed: 4.15
Number of responses for speed: 27

vehicle headway

Average Importance of vehicle headway: 4.00
Number of responses for vehicle headway: 1

volume

Average Importance of volume: 4.13
Number of responses for volume: 32

Average Importance of Arterial Traffic Flow Surveillance Data: 4.07
Number of responses for Arterial Traffic Flow Surveillance Data: 110

Arterial Variable Message Sign

message

Average Importance of message: 3.85
Number of responses for message: 13

name of message initiator

Average Importance of name of message initiator: 3.45
Number of responses for name of message initiator: 11

sign identification number/location

Average Importance of sign identification number/location: 3.83
Number of responses for sign identification number/location: 12

sign status

Average Importance of sign status: 3.73
Number of responses for sign status: 11

time message was initiated

Average Importance of time message was initiated: 3.58
Number of responses for time message was initiated: 12

Average Importance of Arterial Variable Message Sign: 3.69
Number of responses for Arterial Variable Message Sign: 59

Border Crossings

cargo type

DATA CATEGORY	DATA

Average Importance of cargo type: 3.67
Number of responses for cargo type: 6

counts by vehicle type

Average Importance of counts by vehicle type: 4.17
Number of responses for counts by vehicle type: 6

motor carrier name

Average Importance of motor carrier name: 4.40
Number of responses for motor carrier name: 5

origin/destination

Average Importance of origin/destination: 4.17
Number of responses for origin/destination: 6

time/date of trip

Average Importance of time/date of trip: 4.17
Number of responses for time/date of trip: 6

Average Importance of Border Crossings: 4.10
Number of responses for Border Crossings: 29

Cargo Identification

cargo type

Average Importance of cargo type: 3.33
Number of responses for cargo type: 6

motor carrier name

Average Importance of motor carrier name: 3.20
Number of responses for motor carrier name: 5

origin/destination

Average Importance of origin/destination: 3.50
Number of responses for origin/destination: 6

Average Importance of Cargo Identification: 3.35
Number of responses for Cargo Identification: 17

Construction and Work Zone Identification

construction/work zone location

Average Importance of construction/work zone location: 4.24
Number of responses for construction/work zone location: 17

lanes/shoulders blocked

Average Importance of lanes/shoulders blocked: 4.06
Number of responses for lanes/shoulders blocked: 17

time/date of construction

Average Importance of time/date of construction: 4.18
Number of responses for time/date of construction: 17

Average Importance of Construction and Work Zone Identification: 4.16
Number of responses for Construction and Work Zone Identification: 51

DATA CATEGORY **DATA**

Emergency Vehicle Dispatch Records

arrival time

Average Importance of arrival time: 4.00
Number of responses for arrival time: 6

clearance time

Average Importance of clearance time: 4.00
Number of responses for clearance time: 6

departure time

Average Importance of departure time: 4.00
Number of responses for departure time: 6

dispatch time

Average Importance of dispatch time: 4.00
Number of responses for dispatch time: 6

origin/destination

Average Importance of origin/destination: 4.00
Number of responses for origin/destination: 6

Average Importance of Emergency Vehicle Dispatch Records: 4.00
Number of responses for Emergency Vehicle Dispatch Records: 30

Emergency Vehicle Locations

location

Average Importance of location: 3.83
Number of responses for location: 6

time of data collection

Average Importance of time of data collection: 3.83
Number of responses for time of data collection: 6

vehicle identification number

Average Importance of vehicle identification number: 3.83
Number of responses for vehicle identification number: 6

vehicle type

Average Importance of vehicle type: 3.83
Number of responses for vehicle type: 6

Average Importance of Emergency Vehicle Locations: 3.83
Number of responses for Emergency Vehicle Locations: 24

Fleet Activity Reports

accidents

Average Importance of accidents: 3.25
Number of responses for accidents: 8

citations

Average Importance of citations: 3.00
Number of responses for citations: 6

inspection results

DATA CATEGORY	DATA

Average Importance of inspection results: 2.83
Number of responses for inspection results: 6

motor carrier name

Average Importance of motor carrier name: 3.43
Number of responses for motor carrier name: 7

Average Importance of Fleet Activity Reports: 3.15
Number of responses for Fleet Activity Reports: 27

Freeway Ramp Meters

HOV lane volume

Average Importance of HOV lane volume: 4.08
Number of responses for HOV lane volume: 13

metering rate

Average Importance of metering rate: 3.83
Number of responses for metering rate: 12

normal lane volume

Average Importance of normal lane volume: 4.00
Number of responses for normal lane volume: 14

ramp identification number

Average Importance of ramp identification number: 3.67
Number of responses for ramp identification number: 12

ramp metering begin time

Average Importance of ramp metering begin time: 3.77
Number of responses for ramp metering begin time: 13

ramp metering end time

Average Importance of ramp metering end time: 3.77
Number of responses for ramp metering end time: 13

ramp metering pre-emption time

Average Importance of ramp metering pre-emption time: 3.83
Number of responses for ramp metering pre-emption time: 12

traffic control device preemptions

Average Importance of traffic control device preemptions: 3.67
Number of responses for traffic control device preemptions: 9

Average Importance of Freeway Ramp Meters: 3.84
Number of responses for Freeway Ramp Meters: 98

Freeway Traffic Flow Surveillance Data

average occupancy

Average Importance of average occupancy: 3.55
Number of responses for average occupancy: 20

average speed

Average Importance of average speed: 3.62
Number of responses for average speed: 21

DATA CATEGORY	DATA

average vehicles per hour

Average Importance of average vehicles per hour: 3.92
Number of responses for average vehicles per hour: 24

detector identification number

Average Importance of detector identification number: 3.61
Number of responses for detector identification number: 18

individual lane occupancy

Average Importance of individual lane occupancy: 3.28
Number of responses for individual lane occupancy: 18

individual lane speed

Average Importance of individual lane speed: 3.22
Number of responses for individual lane speed: 18

individual lane vehicles per hour

Average Importance of individual lane vehicles per hour: 3.60
Number of responses for individual lane vehicles per hour: 20

vehicle classification

Average Importance of vehicle classification: 3.60
Number of responses for vehicle classification: 20

vehicle weight

Average Importance of vehicle weight: 2.63
Number of responses for vehicle weight: 19

Average Importance of Freeway Traffic Flow Surveillance Data: 3.47
Number of responses for Freeway Traffic Flow Surveillance Data: 178

Freeway Variable Message Sign

message

Average Importance of message: 3.73
Number of responses for message: 11

name of message initiator

Average Importance of name of message initiator: 3.22
Number of responses for name of message initiator: 9

sign identification number/location

Average Importance of sign identification number/location: 3.55
Number of responses for sign identification number/location: 11

sign status

Average Importance of sign status: 3.60
Number of responses for sign status: 10

time message was initiated

Average Importance of time message was initiated: 3.40
Number of responses for time message was initiated: 10

Average Importance of Freeway Variable Message Sign: 3.51
Number of responses for Freeway Variable Message Sign: 51

DATA CATEGORY DATA

HazMat Cargo Identifiers

motor carrier name

Average Importance of motor carrier name: 3.25
Number of responses for motor carrier name: 8

route

Average Importance of route: 3.38
Number of responses for route: 8

time/date of trip

Average Importance of time/date of trip: 3.38
Number of responses for time/date of trip: 8

type of hazmat

Average Importance of type of hazmat: 3.13
Number of responses for type of hazmat: 8

Average Importance of HazMat Cargo Identifiers: 3.28
Number of responses for HazMat Cargo Identifiers: 32

Incident Logs

arrival time

Average Importance of arrival time: 3.56
Number of responses for arrival time: 16

cause

Average Importance of cause: 3.94
Number of responses for cause: 17

clearance time

Average Importance of clearance time: 4.19
Number of responses for clearance time: 16

departure time

Average Importance of departure time: 3.86
Number of responses for departure time: 14

dispatch time

Average Importance of dispatch time: 3.57
Number of responses for dispatch time: 14

hazmat involved

Average Importance of hazmat involved: 3.59
Number of responses for hazmat involved: 17

incident begin time

Average Importance of incident begin time: 4.19
Number of responses for incident begin time: 16

incident location

Average Importance of incident location: 4.25
Number of responses for incident location: 16

initiator

DATA CATEGORY	DATA

Average Importance of initiator: 3.53
Number of responses for initiator: 15

lanes blocked

Average Importance of lanes blocked: 3.83
Number of responses for lanes blocked: 18

police accident report reference

Average Importance of police accident report reference: 3.69
Number of responses for police accident report reference: 16

responder

Average Importance of responder: 3.67
Number of responses for responder: 15

severity level

Average Importance of severity level: 4.16
Number of responses for severity level: 19

type of incident

Average Importance of type of incident: 4.17
Number of responses for type of incident: 18

Average Importance of Incident Logs: 3.88
Number of responses for Incident Logs: 227

On-board Safety Data

cumulative mileage

Average Importance of cumulative mileage: 3.20
Number of responses for cumulative mileage: 5

driver log (hours of service)

Average Importance of driver log (hours of service): 3.20
Number of responses for driver log (hours of service): 5

motor carrier name

Average Importance of motor carrier name: 3.20
Number of responses for motor carrier name: 5

subsystem status (e.g., brakes)

Average Importance of subsystem status (e.g., brakes): 3.20
Number of responses for subsystem status (e.g., brakes): 5

vehicle type

Average Importance of vehicle type: 3.20
Number of responses for vehicle type: 5

Average Importance of On-board Safety Data: 3.20
Number of responses for On-board Safety Data: 25

Parking Management

available spaces

Average Importance of available spaces: 3.60
Number of responses for available spaces: 15

DATA CATEGORY	DATA

lot location

Average Importance of lot location: 3.65
Number of responses for lot location: 17

lot size

Average Importance of lot size: 3.56
Number of responses for lot size: 16

time of data collection

Average Importance of time of data collection: 3.40
Number of responses for time of data collection: 15

Average Importance of Parking Management: 3.56
Number of responses for Parking Management: 63

Traffic Signal Phasing

actuated settings

Average Importance of actuated settings: 3.71
Number of responses for actuated settings: 14

clearance interval

Average Importance of clearance interval: 3.71
Number of responses for clearance interval: 14

cycle length/green time

Average Importance of cycle length/green time: 3.94
Number of responses for cycle length/green time: 16

delay settings

Average Importance of delay settings: 3.57
Number of responses for delay settings: 14

left turn treatment

Average Importance of left turn treatment: 3.75
Number of responses for left turn treatment: 16

minimum pedestrian green

Average Importance of minimum pedestrian green: 3.62
Number of responses for minimum pedestrian green: 13

number of phases

Average Importance of number of phases: 3.88
Number of responses for number of phases: 16

pre-timed settings

Average Importance of pre-timed settings: 3.70
Number of responses for pre-timed settings: 10

signal coordination settings

Average Importance of signal coordination settings: 3.71
Number of responses for signal coordination settings: 14

signal location

Average Importance of signal location: 4.24
Number of responses for signal location: 17

DATA CATEGORY	DATA

signal pre-emption settings

Average Importance of signal pre-emption settings: 3.53
Number of responses for signal pre-emption settings: 15

Average Importance of Traffic Signal Phasing: 3.77
Number of responses for Traffic Signal Phasing: 159

Train Arrivals at Highway Rail Intersections

begin time

Average Importance of begin time: 3.55
Number of responses for begin time: 11

end time

Average Importance of end time: 3.55
Number of responses for end time: 11

intersection location

Average Importance of intersection location: 3.67
Number of responses for intersection location: 12

Average Importance of Train Arrivals at Highway Rail Intersections: 3.59
Number of responses for Train Arrivals at Highway Rail Intersections: 34

Transit Route Deviations

bus identification number

Average Importance of bus identification number: 3.50
Number of responses for bus identification number: 10

location

Average Importance of location: 3.50
Number of responses for location: 12

route number

Average Importance of route number: 3.55
Number of responses for route number: 11

time of data collection

Average Importance of time of data collection: 3.36
Number of responses for time of data collection: 11

Average Importance of Transit Route Deviations: 3.48
Number of responses for Transit Route Deviations: 44

Transit Schedule Adherence

actual arrival time at station

Average Importance of actual arrival time at station: 4.15
Number of responses for actual arrival time at station: 13

bus identification number

Average Importance of bus identification number: 4.00
Number of responses for bus identification number: 11

bus stop id number

DATA CATEGORY	DATA

Average Importance of bus stop id number: 4.17
Number of responses for bus stop id number: 12

scheduled arrival time at station

Average Importance of scheduled arrival time at station: 4.15
Number of responses for scheduled arrival time at station: 13

transit route

Average Importance of transit route: 4.21
Number of responses for transit route: 14

Average Importance of Transit Schedule Adherence: 4.14
Number of responses for Transit Schedule Adherence: 63

Transit Usage

bus identification number

Average Importance of bus identification number: 3.75
Number of responses for bus identification number: 16

origin and destination numbers

Average Importance of origin and destination numbers: 3.86
Number of responses for origin and destination numbers: 21

route number

Average Importance of route number: 4.00
Number of responses for route number: 21

vehicle boardings

Average Importance of vehicle boardings: 4.10
Number of responses for vehicle boardings: 20

Average Importance of Transit Usage: 3.94
Number of responses for Transit Usage: 78

Weather Data

location of monitoring device

Average Importance of location of monitoring device: 3.50
Number of responses for location of monitoring device: 14

precipitation

Average Importance of precipitation: 3.50
Number of responses for precipitation: 14

temperature

Average Importance of temperature: 3.50
Number of responses for temperature: 14

time of data collection

Average Importance of time of data collection: 3.31
Number of responses for time of data collection: 13

wind conditions

Average Importance of wind conditions: 3.50
Number of responses for wind conditions: 14

DATA CATEGORY	DATA

Average Importance of Weather Data: 3.46
Number of responses for Weather Data: 69

Weigh-in-Motion (WIM) Data

date of count

Average Importance of date of count: 4.10
Number of responses for date of count: 10

vehicle classification (by axle)

Average Importance of vehicle classification (by axle): 4.00
Number of responses for vehicle classification (by axle): 10

vehicle weights

Average Importance of vehicle weights: 4.00
Number of responses for vehicle weights: 11

WIM location

Average Importance of WIM location: 4.09
Number of responses for WIM location: 11

Average Importance of Weigh-in-Motion (WIM) Data: 4.05
Number of responses for Weigh-in-Motion (WIM) Data: 42

Data Availability By Data Category

Archived Data Server - Stakeholder Survey Results

CATEGORY	DATA	AVAIL. FROM STAKEHOLDER'S JURISDICTION	DESIRED FROM OTHER JURISDICTIONS
Arterial Traffic Flow Surveillance Data			
	location of detection station	12	18
	occupancy	10	16
	speed	10	18
	vehicle headway	1	1
	volume	21	20
TOTAL FOR Arterial Traffic Flow Surveillance Data:		**54**	**73**
Arterial Variable Message Sign			
	message	1	6
	name of message initiator	1	5
	sign identification number/location	1	6
	sign status	1	5
	time message was initiated	1	5
TOTAL FOR Arterial Variable Message Sign:		**5**	**27**
Border Crossings			
	cargo type	2	4
	counts by vehicle type	2	5
	motor carrier name	2	4
	origin/destination	2	5
	time/date of trip	2	4
TOTAL FOR Border Crossings:		**10**	**22**
Cargo Identification			

CATEGORY	DATA	AVAIL. FROM STAKEHOLDER'S JURISDICTION	DESIRED FROM OTHER JURISDICTIONS
	cargo type		
		1	3
	motor carrier name		
		1	3
	origin/destination		
		1	3
TOTAL FOR Cargo Identification:		**3**	**9**
Construction and Work Zone Identification			
	construction/work zone location		
		7	8
	lanes/shoulders blocked		
		6	8
	time/date of construction		
		7	8
TOTAL FOR Construction and Work Zone Identification:		**20**	**24**
Emergency Vehicle Dispatch Records			
	arrival time		
		2	4
	clearance time		
		2	4
	departure time		
		2	4
	dispatch time		
		2	4
	origin/destination		
		1	3
TOTAL FOR Emergency Vehicle Dispatch Records:		**9**	**19**
Emergency Vehicle Locations			
	location		
		2	3
	time of data collection		
		2	3
	vehicle identification number		
		2	3
	vehicle type		
		2	3
TOTAL FOR Emergency Vehicle Locations:		**8**	**12**
Fleet Activity Reports			
	accidents		
		1	5

CATEGORY	DATA	AVAIL. FROM STAKEHOLDER'S JURISDICTION	DESIRED FROM OTHER JURISDICTIONS
	citations		
			4
	inspection results		
		1	4
	motor carrier name		
		1	4
TOTAL FOR Fleet Activity Reports:		**3**	**17**
Freeway Ramp Meters			
	HOV lane volume		
		2	8
	metering rate		
		2	8
	normal lane volume		
		3	9
	ramp identification number		
		2	8
	ramp metering begin time		
		3	9
	ramp metering end time		
		3	9
	ramp metering pre-emption time		
		2	8
	traffic control device preemptions		
		2	6
TOTAL FOR Freeway Ramp Meters:		**19**	**65**
Freeway Traffic Flow Surveillance Data			
	average occupancy		
		7	13
	average speed		
		8	14
	average vehicles per hour		
		10	17
	detector identification number		
		3	11
	individual lane occupancy		
		3	9
	individual lane speed		
		3	9
	individual lane vehicles per hour		
		4	10
	vehicle classification		

CATEGORY	DATA	AVAIL. FROM STAKEHOLDER'S JURISDICTION	DESIRED FROM OTHER JURISDICTIONS
		6	10
	vehicle weight		
		4	7
TOTAL FOR Freeway Traffic Flow Surveillance Data:		**48**	**100**
Freeway Variable Message Sign			
	message		
		4	8
	name of message initiator		
		3	7
	sign identification number/location		
		4	8
	sign status		
		4	6
	time message was initiated		
		4	8
TOTAL FOR Freeway Variable Message Sign:		**19**	**37**
HazMat Cargo Identifiers			
	motor carrier name		
		1	5
	route		
		1	5
	time/date of trip		
		1	5
	type of hazmat		
		1	5
TOTAL FOR HazMat Cargo Identifiers:		**4**	**20**
Incident Logs			
	arrival time		
		3	6
	cause		
		5	9
	clearance time		
		4	6
	departure time		
		3	5
	dispatch time		
		3	5
	hazmat involved		
		5	8
	incident begin time		
		6	8

CATEGORY	DATA	AVAIL. FROM STAKEHOLDER'S JURISDICTION	DESIRED FROM OTHER JURISDICTIONS
	incident location	6	8
	initiator	4	7
	lanes blocked	4	10
	police accident report reference	4	7
	responder	6	7
	severity level	5	9
	type of incident	5	8
TOTAL FOR Incident Logs:		**63**	**103**
On-board Safety Data			
	cumulative mileage		2
	driver log (hours of service)		3
	motor carrier name		3
	subsystem status (e.g., brakes)		3
	vehicle type		3
TOTAL FOR On-board Safety Data:			**14**
Parking Management			
	available spaces	2	6
	lot location	2	7
	lot size	2	7
	time of data collection		7
TOTAL FOR Parking Management:		**6**	**27**
Traffic Signal Phasing			
	actuated settings	5	6

CATEGORY	DATA	AVAIL. FROM STAKEHOLDER'S JURISDICTION	DESIRED FROM OTHER JURISDICTIONS
	clearance interval	6	6
	cycle length/green time	7	8
	delay settings	6	7
	left turn treatment	7	7
	minimum pedestrian green	6	6
	number of phases	8	8
	pre-timed settings	6	5
	signal coordination settings	7	7
	signal location	8	8
	signal pre-emption settings	6	7
TOTAL FOR Traffic Signal Phasing:		**72**	**75**

Train Arrivals at Highway Rail Intersections

	begin time	1	6
	end time	1	6
	intersection location	1	7
TOTAL FOR Train Arrivals at Highway Rail Intersections:		**3**	**19**

Transit Route Deviations

	bus identification number	4	6
	location	4	7
	route number	5	6
	time of data collection	2	6
TOTAL FOR Transit Route Deviations:		**15**	**25**

Transit Schedule Adherence

CATEGORY	DATA	AVAIL. FROM STAKEHOLDER'S JURISDICTION	DESIRED FROM OTHER JURISDICTIONS
	actual arrival time at station	4	6
	bus identification number	4	6
	bus stop id number	4	6
	scheduled arrival time at station	5	6
	transit route	5	7
TOTAL FOR Transit Schedule Adherence:		**22**	**31**
Transit Usage			
	bus identification number	8	10
	origin and destination numbers	6	14
	route number	8	13
	vehicle boardings	6	12
TOTAL FOR Transit Usage:		**28**	**49**
Weather Data			
	location of monitoring device	4	4
	precipitation	3	4
	temperature	4	4
	time of data collection	4	5
	wind conditions	4	4
TOTAL FOR Weather Data:		**19**	**21**
Weigh-in-Motion (WIM) Data			
	date of count	4	7
	vehicle classification (by axle)	4	7
	vehicle weights	4	7

CATEGORY	DATA	AVAIL. FROM STAKEHOLDER'S JURISDICTION	DESIRED FROM OTHER JURISDICTIONS
	WIM location		
		5	6
TOTAL FOR Weigh-in-Motion (WIM) Data:		**17**	**27**
Grand Total		**447**	**816**

DATA STORAGE TIME INCREMENT VOTES - SUMMARY

CATEGORY	DATA	30SEC	1MIN	3MIN	5MIN	10MIN	15MIN	20MIN	30MIN	1HR	1DAY	1YR	1WK	1MO	6MO	PKHR	WKEND
Arterial Traffic Flow Surveillance Data																	
	density	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	location of detection station	0	1	0	2	0	1	0	1	0	2	1	0	0	1	0	0
	occupancy	0	2	0	2	0	2	0	2	0	2	0	0	0	0	1	0
	speed	0	2	0	2	0	1	0	3	0	0	0	0	0	0	0	0
	Traffic control device preemptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Traffic control device queue detection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	vehicle classification	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	vehicle headway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	volume	0	1	0	2	0	3	0	2	1	3	1	0	0	0	0	0
TOTAL FOR: Arterial Traffic Flow Surveillance Data		0	6	0	8	0	7	0	8	1	7	2	0	0	1	1	0
Arterial Variable Message Sign																	
	message	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
	name of message initiator	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
	sign identification number/location	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
	sign status	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
	time message was initiated	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL FOR: Arterial Variable Message Sign		0	0	0	5	0	0	0	1	0	4	0	0	0	1	0	0
Border Crossings																	

CATEGORY	DATA	30SEC	1MIN	3MIN	5MIN	10MIN	15MIN	20MIN	30MIN	1HR	1DAY	1YR	1WK	1MO	6MO	PKHR	WKEND
	cargo type																
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	counts by vehicle type																
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	motor carrier name																
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	origin/destination																
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	time/date of trip																
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FOR: Border Crossings																	
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cargo Identification																	
	cargo type																
		0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
	motor carrier name																
		0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
	origin/destination																
		0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
TOTAL FOR: Cargo Identification																	
		0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0
Construction and Work Zone Identification																	
	construction/work zone location																
		0	0	0	0	1	0	0	0	2	3	0	0	0	0	0	0
	lanes/shoulders blocked																
		0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0
	time/date of construction																
		0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0
TOTAL FOR: Construction and Work Zone Identification																	
		0	0	0	0	3	0	0	0	2	7	0	0	0	0	0	0
Emergency Vehicle Dispatch Records																	
	arrival time																
		0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	clearance time																
		0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	departure time																
		0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	dispatch time																

CATEGORY	DATA	30SEC	1MIN	3MIN	5MIN	10MIN	15MIN	20MIN	30MIN	1HR	1DAY	1YR	1WK	1MO	6MO	PKHR	WKEND
		0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	origin/destination																
		0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	route																
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FOR: Emergency Vehicle Dispatch Records																	
		0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0
Emergency Vehicle Locations																	
	location																
		0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	time of data collection																
		0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	vehicle identification number																
		0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	vehicle type																
		0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FOR: Emergency Vehicle Locations																	
		0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
Fleet Activity Reports																	
	accidents																
		0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
	citations																
		0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	inspection results																
		0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	motor carrier name																
		0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
TOTAL FOR: Fleet Activity Reports																	
		0	0	0	0	0	0	0	0	4	1	1	0	0	0	0	0
Freeway Ramp Meters																	
	HOV lane volume																
		0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0
	metering rate																
		0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0
	normal lane volume																
		0	1	0	0	0	1	0	1	1	0	0	1	0	0	0	0
	ramp identification number																

CATEGORY	DATA	30SEC	1MIN	3MIN	5MIN	10MIN	15MIN	20MIN	30MIN	1HR	1DAY	1YR	1WK	1MO	6MO	PKHR	WKEND
		0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	0
	ramp metering begin time																
		0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	0
	ramp metering end time																
		0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	0
	ramp metering pre-emption time																
		0	2	0	0	0	1	0	1	0	0	0	1	0	0	0	0
	traffic control device preemptions																
		0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0
TOTAL FOR: Freeway Ramp Meters																	
		0	8	0	1	0	8	0	6	2	3	0	8	0	1	0	0
Freeway Traffic Flow Surveillance Data																	
	average occupancy																
		0	1	0	1	0	2	0	1	0	1	0	0	0	0	1	0
	average speed																
		0	1	0	1	0	2	0	1	0	1	0	0	0	0	1	0
	average vehicles per hour																
		0	0	0	1	1	4	0	2	1	4	0	0	0	0	1	0
	detector identification number																
		0	1	0	1	0	2	0	2	0	1	0	0	0	0	1	0
	individual lane occupancy																
		0	1	0	1	0	2	0	1	0	1	0	0	0	0	0	0
	individual lane speed																
		0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0
	individual lane vehicles per hour																
		0	0	0	1	1	2	0	2	0	1	0	0	0	0	0	0
	vehicle classification																
		0	0	0	2	0	1	0	1	0	2	0	0	0	0	0	0
	vehicle weight																
		0	0	0	2	0	1	0	1	0	1	0	0	0	0	0	0
TOTAL FOR: Freeway Traffic Flow Surveillance Data																	
		0	5	0	11	2	17	0	12	1	12	0	0	0	0	4	0
Freeway Variable Message Sign																	
	message																
		0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	name of message initiator																
		0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	sign identification number/location																

CATEGORY	DATA	30SEC	1MIN	3MIN	5MIN	10MIN	15MIN	20MIN	30MIN	1HR	1DAY	1YR	1WK	1MO	6MO	PKHR	WKEND
		0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
	sign status																
		0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
	time message was initiated																
		0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL FOR: Freeway Variable Message Sign																	
		0	2	0	3	0	0	0	0	0	4	0	0	0	1	0	0
HazMat Cargo Identifiers																	
	motor carrier name																
		0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0
	route																
		0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
	time/date of trip																
		0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
	type of hazmat																
		0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
TOTAL FOR: HazMat Cargo Identifiers																	
		0	0	0	0	0	0	0	4	0	4	1	0	1	0	0	0
Incident Logs																	
	arrival time																
		0	0	0	2	1	0	0	0	0	1	0	0	1	0	0	0
	cause																
		0	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0
	clearance time																
		0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0
	departure time																
		0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
	dispatch time																
		0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
	hazmat involved																
		0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0
	incident begin time																
		0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
	incident location																
		0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
	initiator																
		0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
	lanes blocked																

CATEGORY	DATA	30SEC	1MIN	3MIN	5MIN	10MIN	15MIN	20MIN	30MIN	1HR	1DAY	1YR	1WK	1MO	6MO	PKHR	WKEND
		0	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0
	police accident report reference																
		0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
	responder																
		0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
	severity level																
		0	0	0	1	1	0	0	0	0	1	0	1	1	0	0	0
	type of incident																
		0	0	0	1	1	0	0	0	0	1	0	1	2	0	0	0
TOTAL FOR: Incident Logs																	
		0	0	0	15	14	0	0	0	0	14	0	4	6	0	0	0
On-board Safety Data																	
	cumulative mileage																
		0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	driver log (hours of service)																
		0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	motor carrier name																
		0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	subsystem status (e.g., brakes)																
		0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	vehicle type																
		0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL FOR: On-board Safety Data																	
		0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0
Parking Management																	
	available spaces																
		0	0	0	0	2	0	0	0	1	1	0	0	0	0	2	1
	lot location																
		0	0	0	0	2	0	0	0	1	0	1	0	1	0	0	0
	lot size																
		0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0
	time of data collection																
		0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0
TOTAL FOR: Parking Management																	
		0	0	0	0	8	0	0	0	3	1	2	0	1	0	2	1
Traffic Signal Phasing																	
	actuated settings																

CATEGORY	DATA	30SEC	1MIN	3MIN	5MIN	10MIN	15MIN	20MIN	30MIN	1HR	1DAY	1YR	1WK	1MO	6MO	PKHR	WKEND
		0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
	clearance interval																
		0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
	cycle length/green time																
		0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0
	delay settings																
		0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
	left turn treatment																
		0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
	minimum pedestrian green																
		0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	number of phases																
		0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0
	pre-timed settings																
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	signal coordination settings																
		0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
	signal location																
		0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0
	signal pre-emption settings																
		0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
TOTAL FOR: Traffic Signal Phasing																	
		0	1	0	1	0	4	0	9	6	2	0	0	0	1	0	0
Train Arrivals at Highway Rail Intersections																	
	begin time																
		0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
	end time																
		0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
	intersection location																
		0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL FOR: Train Arrivals at Highway Rail Intersections																	
		0	0	2	3	0	0	0	0	3	0	0	0	0	0	0	0
Transit Route Deviations																	
	bus identification number																
		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	location																
		1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	route number																

CATEGORY	DATA	30SEC	1MIN	3MIN	5MIN	10MIN	15MIN	20MIN	30MIN	1HR	1DAY	1YR	1WK	1MO	6MO	PKHR	WKEND
		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	time of data collection																
		0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FOR: Transit Route Deviations																	
		1	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0
Transit Schedule Adherence																	
	actual arrival time at station																
		0	1	1	1	0	0	0	0	0	1	0	0	0	0	1	1
	bus identification number																
		0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
	bus stop id number																
		0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	scheduled arrival time at station																
		0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0
	transit route																
		0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL FOR: Transit Schedule Adherence																	
		0	1	5	6	0	0	0	0	0	3	0	0	0	0	1	1
Transit Usage																	
	bus identification number																
		0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0
	origin and destination numbers																
		0	0	1	0	0	0	1	0	0	3	0	0	0	0	1	1
	route number																
		0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0
	vehicle boardings																
		0	0	1	0	0	1	1	0	0	2	0	0	0	0	0	0
TOTAL FOR: Transit Usage																	
		0	0	4	1	0	3	4	0	0	6	0	0	0	0	1	1
Weather Data																	
	location of monitoring device																
		0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0
	precipitation																
		0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0
	temperature																
		0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0
	time of data collection																

CATEGORY	DATA	30SEC	1MIN	3MIN	5MIN	10MIN	15MIN	20MIN	30MIN	1HR	1DAY	1YR	1WK	1MO	6MO	PKHR	WKEND
		0	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
	wind conditions																
		0	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL FOR: Weather Data																	
		0	**0**	**0**	**0**	**5**	**0**	**0**	**4**	**1**	**5**	**0**	**0**	**0**	**0**	**0**	**0**
Weigh-in-Motion (WIM) Data																	
	date of count																
		0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
	vehicle classification (by axle)																
		0	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	vehicle weights																
		0	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
	WIM location																
		0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL FOR: Weigh-in-Motion (WIM) Data																	
		0	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**1**	**0**	**0**	**0**

DESIRED DATA STORAGE FORMAT BY CATEGORY

CATEGORY	DATA	MS ACCESS	ASCII	OTHER DBMS	SPREADSHEET	GIS-ENABLED	UTDF2
Arterial Traffic Flow Surveillance Data							
	density	0	0	0	0	0	0
	location of detection station	0	3	2	1	0	1
	occupancy	0	2	1	1	0	1
	speed	0	2	1	1	0	1
	Traffic control device preemptions	0	0	0	0	0	0
	Traffic control device queue detection	0	0	0	0	0	0
	vehicle classification	0	0	0	0	0	0
	vehicle headway	0	0	0	0	0	0
	volume	0	3	3	2	0	1
TOTAL FOR DATA CATEGORY:		0	10	7	5	0	4
Arterial Variable Message Sign							
	message	0	1	1	1	0	0
	name of message initiator	0	1	1	0	0	0
	sign identification number/location	0	1	3	0	0	0
	sign status	0	1	1	0	0	0
	time message was initiated	0	1	1	0	0	0
TOTAL FOR DATA CATEGORY:		0	5	7	1	0	0
Border Crossings							
	cargo type	0	0	0	1	0	0
	counts by vehicle type	0	0	0	1	0	0

CATEGORY	DATA	MS ACCESS	ASCII	OTHER DBMS	SPREADSHEET	GIS-ENABLED	UTDF2
	motor carrier name						
		0	0	0	1	0	0
	origin/destination						
		0	0	0	1	0	0
	time/date of trip						
		0	0	0	1	0	0
	TOTAL FOR DATA CATEGORY:	0	0	0	5	0	0

Cargo Identification

	cargo type						
		0	2	0	1	0	0
	motor carrier name						
		0	2	0	1	0	0
	origin/destination						
		0	2	0	1	0	0
	TOTAL FOR DATA CATEGORY:	0	6	0	3	0	0

Construction and Work Zone Identification

	construction/work zone location						
		0	1	2	1	0	0
	lanes/shoulders blocked						
		0	1	1	1	0	0
	time/date of construction						
		0	1	1	1	0	0
	TOTAL FOR DATA CATEGORY:	0	3	4	3	0	0

Emergency Vehicle Dispatch Records

	arrival time						
		0	0	0	1	0	0
	clearance time						
		0	0	0	1	0	0
	departure time						
		0	0	0	1	0	0
	dispatch time						
		0	0	1	1	0	0
	origin/destination						
		0	0	0	1	0	0
	route						
		0	0	0	0	0	0
	TOTAL FOR DATA CATEGORY:	0	0	1	5	0	0

Emergency Vehicle Locations

	location						

CATEGORY	DATA	MS ACCESS	ASCII	OTHER DBMS	SPREADSHEET	GIS-ENABLED	UTDF2
		0	0	0	1	0	0
	time of data collection						
		0	0	1	1	0	0
	vehicle identification number						
		0	0	0	1	0	0
	vehicle type						
		0	0	0	1	0	0
	TOTAL FOR DATA CATEGORY:	0	0	1	4	0	0

Fleet Activity Reports

	accidents						
		0	0	1	2	1	0
	citations						
		0	0	0	2	0	0
	inspection results						
		0	0	0	2	0	0
	motor carrier name						
		0	1	0	2	0	0
	TOTAL FOR DATA CATEGORY:	0	1	1	8	1	0

Freeway Ramp Meters

	HOV lane volume						
		0	2	2	0	0	0
	metering rate						
		0	3	2	0	0	0
	normal lane volume						
		0	3	2	0	0	0
	ramp identification number						
		0	4	2	0	0	0
	ramp metering begin time						
		0	3	2	0	0	0
	ramp metering end time						
		0	3	2	0	0	0
	ramp metering pre-emption time						
		0	3	2	0	0	0
	traffic control device preemptions						
		0	2	1	0	0	0
	TOTAL FOR DATA CATEGORY:	0	23	15	0	0	0

Freeway Traffic Flow Surveillance Data

	average occupancy						
		0	4	4	2	0	0
	average speed						

CATEGORY	DATA	MS ACCESS	ASCII	OTHER DBMS	SPREADSHEET	GIS-ENABLED	UTDF2
		0	4	4	2	0	0
	average vehicles per hour						
		0	5	5	3	0	0
	detector identification number						
		0	5	4	2	0	0
	individual lane occupancy						
		0	3	2	1	0	0
	individual lane speed						
		0	3	2	1	0	0
	individual lane vehicles per hour						
		0	4	3	2	0	0
	vehicle classification						
		0	3	3	2	0	0
	vehicle weight						
		0	3	2	1	0	0
	TOTAL FOR DATA CATEGORY:	**0**	**34**	**29**	**16**	**0**	**0**

Freeway Variable Message Sign

	message						
		0	1	1	0	0	0
	name of message initiator						
		0	1	1	0	0	0
	sign identification number/location						
		0	1	2	0	0	0
	sign status						
		0	1	1	0	0	0
	time message was initiated						
		0	1	1	0	0	0
	TOTAL FOR DATA CATEGORY:	**0**	**5**	**6**	**0**	**0**	**0**

HazMat Cargo Identifiers

	motor carrier name						
		0	0	0	2	0	0
	route						
		0	0	0	2	0	0
	time/date of trip						
		0	0	0	2	0	0
	type of hazmat						
		0	0	0	2	0	0
	TOTAL FOR DATA CATEGORY:	**0**	**0**	**0**	**8**	**0**	**0**

Incident Logs

	arrival time						

CATEGORY	DATA	MS ACCESS	ASCII	OTHER DBMS	SPREADSHEET	GIS-ENABLED	UTDF2
		0	1	3	3	0	0
	cause						
		0	1	2	3	0	0
	clearance time						
		0	1	1	2	0	0
	departure time						
		0	1	1	2	0	0
	dispatch time						
		0	1	1	2	0	0
	hazmat involved						
		0	1	1	2	0	0
	incident begin time						
		0	1	1	2	0	0
	incident location						
		0	2	1	2	0	0
	initiator						
		0	1	1	2	0	0
	lanes blocked						
		0	1	2	3	0	0
	police accident report reference						
		0	1	1	2	0	0
	responder						
		0	1	1	2	0	0
	severity level						
		0	1	2	3	0	0
	type of incident						
		0	1	2	3	0	0
	TOTAL FOR DATA CATEGORY:	**0**	**15**	**20**	**33**	**0**	**0**

On-board Safety Data

	cumulative mileage						
		0	0	0	2	0	0
	driver log (hours of service)						
		0	0	0	2	0	0
	motor carrier name						
		0	0	0	2	0	0
	subsystem status (e.g., brakes)						
		0	0	0	2	0	0
	vehicle type						
		0	0	0	2	0	0
	TOTAL FOR DATA CATEGORY:	**0**	**0**	**0**	**10**	**0**	**0**

Parking Management

CATEGORY	DATA	MS ACCESS	ASCII	OTHER DBMS	SPREADSHEET	GIS-ENABLED	UTDF2
	available spaces						
		0	**1**	**2**	**0**	**0**	**0**
	lot location						
		0	**1**	**1**	**0**	**0**	**0**
	lot size						
		0	**1**	**1**	**0**	**0**	**0**
	time of data collection						
		0	**1**	**1**	**0**	**0**	**0**
	TOTAL FOR DATA CATEGORY:	**0**	**4**	**5**	**0**	**0**	**0**
Traffic Signal Phasing							
	actuated settings						
		0	**1**	**1**	**0**	**0**	**0**
	clearance interval						
		0	**1**	**1**	**0**	**0**	**0**
	cycle length/green time						
		0	**1**	**1**	**0**	**0**	**1**
	delay settings						
		0	**1**	**1**	**0**	**0**	**0**
	left turn treatment						
		0	**1**	**1**	**0**	**0**	**0**
	minimum pedestrian green						
		0	**1**	**1**	**0**	**0**	**0**
	number of phases						
		0	**1**	**1**	**0**	**0**	**1**
	pre-timed settings						
		0	**0**	**0**	**0**	**0**	**0**
	signal coordination settings						
		0	**1**	**1**	**0**	**0**	**1**
	signal location						
		0	**1**	**2**	**0**	**0**	**1**
	signal pre-emption settings						
		0	**1**	**1**	**0**	**0**	**0**
	TOTAL FOR DATA CATEGORY:	**0**	**10**	**11**	**0**	**0**	**4**
Train Arrivals at Highway Rail Intersections							
	begin time						
		0	**2**	**1**	**2**	**0**	**0**
	end time						
		0	**2**	**1**	**1**	**0**	**0**
	intersection location						
		0	**2**	**1**	**1**	**0**	**0**

CATEGORY	DATA	MS ACCESS	ASCII	OTHER DBMS	SPREADSHEET	GIS-ENABLED	UTDF2
	TOTAL FOR DATA CATEGORY:	**0**	**6**	**3**	**4**	**0**	**0**
Transit Route Deviations							
	bus identification number						
		0	**1**	**2**	**0**	**0**	**0**
	location						
		1	**1**	**2**	**0**	**0**	**0**
	route number						
		0	**1**	**2**	**0**	**0**	**0**
	time of data collection						
		0	**1**	**3**	**0**	**0**	**0**
	TOTAL FOR DATA CATEGORY:	**1**	**4**	**9**	**0**	**0**	**0**
Transit Schedule Adherence							
	actual arrival time at station						
		0	**2**	**2**	**2**	**0**	**0**
	bus identification number						
		0	**2**	**3**	**1**	**0**	**0**
	bus stop id number						
		0	**2**	**2**	**1**	**0**	**0**
	scheduled arrival time at station						
		0	**2**	**2**	**1**	**0**	**0**
	transit route						
		0	**2**	**2**	**1**	**0**	**0**
	TOTAL FOR DATA CATEGORY:	**0**	**10**	**11**	**6**	**0**	**0**
Transit Usage							
	bus identification number						
		0	**3**	**4**	**1**	**0**	**0**
	origin and destination numbers						
		0	**3**	**5**	**2**	**1**	**0**
	route number						
		0	**3**	**4**	**2**	**0**	**0**
	vehicle boardings						
		0	**2**	**4**	**2**	**0**	**0**
	TOTAL FOR DATA CATEGORY:	**0**	**11**	**17**	**7**	**1**	**0**
Weather Data							
	location of monitoring device						
		0	**1**	**1**	**0**	**0**	**0**
	precipitation						
		0	**1**	**0**	**0**	**0**	**0**
	temperature						

CATEGORY	DATA	MS ACCESS	ASCII	OTHER DBMS	SPREADSHEET	GIS-ENABLED	UTDF2
		0	1	0	0	0	0
	time of data collection						
		0	1	0	0	0	0
	wind conditions						
		0	1	0	0	0	0
	TOTAL FOR DATA CATEGORY:	0	5	1	0	0	0
Weigh-in-Motion (WIM) Data							
	date of count						
		0	1	0	2	0	0
	vehicle classification (by axle)						
		0	1	0	1	0	0
	vehicle weights						
		0	2	0	1	0	0
	WIM location						
		0	2	0	1	0	0
	TOTAL FOR DATA CATEGORY:	0	6	0	5	0	0
Grand Total		1	158	148	123	2	8