

3. STUDY METHODOLOGY

3.1 PROJECT APPROACH

The remaining sections provide more detail about this project’s evaluation methodology, goal areas, performance measures, stakeholders and information resources, data collection processes, and geographic distribution of survey responses. The following table summarizes the major project activities and accomplishments:

Table 3: Major Project Activities and Accomplishments

Project Phase	Activities	Accomplishments
1 – Review of ADOT’s ITS Program Concepts and System Design (Apr. 21-June 18)	Reviewed ADOT-specific background documents; performed literature review; produced task report (see Appendix O for a bibliography).	Report identified guidelines for evaluation methodology; identified performance measures and initial performance evaluation plan for each ITI; and laid groundwork for data collection.
2 – Data Collection and Findings (May 10-Oct. 27)	Collected information about key and additional ITI from ADOT and non-ADOT stakeholders (including postcard and website surveys of commercial vehicle operators and the public; produced task report.	Report identified stakeholders; how information was gathered; geographic distribution of survey responses; and findings about ITI deployed statewide, with special emphasis on Kingman District innovations.
3 – Data Analysis, Conclusions and Recommendations (Sept. 3-Oct. 14)	Analyzed information about key and additional ITI from ADOT and non-ADOT stakeholders; formulated recommendations; produced task report.	Report provided information on the quantity of ADOT’s rural ITI; where and how deployments have occurred; ITI performance, costs, benefits, and problems/issues; funding sources, deployment plans and maintenance arrangements; needs met and unmet; recommendations for future rural ITI deployment, performance measurement and promotion.
4 – Final Report Preparation (Oct. 14-Nov. 12)	Reviewed and incorporated comments on task reports; incorporated late-arriving information; produced draft final report and research note.	Report summarizes all project activities, methodologies, findings, conclusions and recommendations.
Throughout	Held five TAC meetings (May 10, June 24, July 20, Sept. 9, Oct. 19).	The TAC provided invaluable feedback, guidance and assistance at the TAC meetings.

3.2 EVALUATION METHODOLOGY

An important outcome of Phase 1 (the review of ADOT's ITS program concepts and system design) was the identification of several guidelines, which were used to design this project's evaluation methodology, as summarized below:

1. Using a goal-based approach for this project's evaluation methodology made sense. The goal-based approach is touted by USDOT (7), has already been used for an evaluation of I-40 in Arizona (8), and coincides with the approach taken in the strategic action plans that ADOT organizations are familiar with preparing and working from (9:2).
2. In selecting the goal areas for this project, consideration was given to:
 - a. The National ITS Program Plan (7) goal areas (Safety Improvements, Delay Savings, Throughput, Customer Satisfaction, Cost Savings, Environmental).
 - b. The goal areas used for evaluating I-40 (8:12-17) (Mobility, Access, Congestion, Economic Impact, Safety).
 - c. The TTG Fiscal Year 2004 Strategic Action Plan goals (9:2):
 - i. Assist in maintaining the security and safety of the public;
 - ii. Reduce congestion in urban areas;
 - iii. Provide statewide incident management;
 - iv. Provide quality and timely information to the public;
 - v. Design, construct, and implement quality ITS projects in a timely manner;
 - vi. Develop and retain a high performing, successful workforce;
 - vii. Support, maintain, and operate ITS infrastructure; and
 - viii. Improve public and political support.
 - d. System objectives identified in the I-40 Corridor and Statewide ITS Strategic Plans (1:39; 2:4-12 – 4-13, 7-3):
 - i. Collect, process, and disseminate accurate and up-to-date information;
 - ii. Ensure conformance with laws;
 - iii. Improve driver/traveler safety and personal security, HAZMAT operations, and inter- and intra-agency coordination, cooperation and information exchange; and
 - iv. Provide accurate and timely directions to travelers, centralized storage and retrieval of information, efficient traffic flow, and timely emergency services.
3. For this project, there was little impetus or need to attempt to quantify in monetary terms all the rural ITS benefits in Arizona. A Texas Transportation Institute report (Turner et al., 10:23) states that "...another basic approach to evaluating ITS [is] economic analyses which attempted to quantify the specific monetary value of all ITS impacts. These approaches typically report a single benefit-to-cost ratio for ITS deployments, but these analyses are based on many

assumptions about monetary benefits.” Also, “[a]lthough non-technical audiences or decision-makers may prefer or even demand that ITS benefits be described in purely monetary terms, there appears to be a lack of credibility for such analyses among the transportation profession. Because of this lack of credibility, the researchers recommend that ITS benefit analyses concentrate on basic measures of effectiveness.”(10:xiii)

4. As suggested by Turner et al. (10:19), the evaluation methodology for this project was designed to take various stakeholder groups into account. While the primary focus of the study was on ADOT’s internal needs, surveys of additional stakeholders such as DPS, NWS, commercial vehicle operators, and the general public broadened the types of information gathered.
5. The past recommendations for performance measures in the I-40 Corridor and Statewide ITS strategic plans (1:43; 2:7-3) took ease of data collection into account. This approach corresponds with the recommendation in Turner et al. (10:xiii) that performance measures depend as much as possible on data already collected by the deployed systems themselves, or in any case on data already being collected. This project used that approach.

3.3 GOAL AREAS

Based on feedback from the TAC and the Districts, the goal areas to be evaluated by this study were identified as follows:

- To improve traveler and worker safety;
- To improve rural mobility;
- To reduce highway construction, operations, maintenance and user costs; and
- To improve system reliability and usefulness.

3.4 PERFORMANCE MEASURES

In selecting performance measures to be employed in this evaluation, consideration was given to:

- The information obtained from stakeholders during the data collection and findings phase of the project;
- The performance measures’ value to assessing the overall usefulness of each ITS element; and
- The performance measures’ ability to assess the contribution of each ITS element to ADOT’s rural ITS goal areas.

Given that the ITS elements under consideration share some characteristics but are unique in other aspects, the performance measures were subdivided into universal and element-specific categories. Both sets of performance measures are listed below.

**Table 4: Universal Rural Intelligent Transportation System (ITS)
Performance Measures**

Goal Area	Performance Measures by Stakeholder Group		
	ADOT and Partners	Commercial Vehicle Operators	The General Public
Improve Safety	The ITS element improves ADOT employee and/or partner safety.	The ITS element improves commercial vehicle operator safety.	The ITS element improves the safety of the driving public.
Improve Rural Mobility		The ITS element improves commercial vehicle mobility.	The ITS element improves public mobility.
Reduce Infrastructure and User Costs	<p>The ITS element reduces infrastructure construction costs.</p> <p>The ITS element reduces infrastructure maintenance and operations costs.</p> <p>The ITS element reduces workload of ADOT and/or partners.</p>	The ITS element reduces trucking costs.	The ITS element reduces public travel costs.
Improve System Reliability and Usefulness	<p>The ITS element is quickly replaced or repaired and returned to service.</p> <p>The ITS element has widespread and frequent use by ADOT and/or partners.</p> <p>ADOT Districts and / or partners unfamiliar with ITS element express interest in using it.</p> <p>ADOT partners (Department of Public Safety, National Weather Service) depend on or have interest in the ITS element.</p>	<p>The ITS element is familiar to commercial vehicle operators.</p> <p>The ITS element is used frequently by commercial vehicle operators.</p> <p>The ITS element is useful to commercial vehicle operators.</p>	<p>The ITS element is familiar to the public.</p> <p>The ITS element is used frequently by the public.</p> <p>The ITS element is useful to the public.</p>

The following performance measures were used to evaluate individual ITS elements:

GROUP A: SURVEILLANCE AND DATA COLLECTION SYSTEMS

- A1. Road Weather Information Systems (RWIS)
 - Number of full RWIS Stations
 - Number of Districts using RWIS
 - RWIS percent deficiency
- A2. Passive Acoustic Detectors (PAD)/Other Traffic Detectors
 - Number of permanent PAD sites
- A3. Remote Cameras
 - Number of remote cameras located at full RWIS stations
 - Number of remote cameras located at VMS sites
 - Number of remote cameras in instrumented truck escape ramp systems
 - Remote camera percent deficiency
- A4. Speed Detection/Warning Devices
 - Number of permanent speed detection/warning devices
 - Reduction in 85th percentile speed (before vs. after installation)
- A5. License Plate Readers
 - Number of license plate reader systems used by ADOT contractors
 - Detection rate

GROUP B: INFORMATION FUSION AND DISSEMINATION SYSTEMS

- B1. Highway Condition Reporting System (HCRS) Input Application
 - Number of HCRS users in ADOT Districts
 - Number of HCRS entries statewide
 - HCRS ease of training and use
 - HCRS availability
 - HCRS ease of updating
- B2. 511 Traveler Information (511)
 - Number of 511 calls
 - Awareness of 511 by non-ADOT stakeholders
 - 511 usefulness to non-ADOT stakeholders
- B3. az511.com Traveler Information Website (www.az511.com)
 - Number of az511.com hits and page views
 - Awareness of az511.com by non-ADOT stakeholders
 - az511.com usefulness to non-ADOT stakeholders
- B4. Overhead Variable Message Signs
 - Number of overhead VMS owned by ADOT
 - Number of planned and unplanned messages on overhead VMS
 - Overhead VMS percent deficiency
 - Awareness of VMS by non-ADOT stakeholders
 - VMS message usefulness to non-ADOT stakeholders
- B5. Shoulder-Mounted Variable Message Signs
 - Number of shoulder-mounted VMS owned or leased by ADOT
 - Number of Districts that use or have used shoulder-mounted VMS

- B6. Portable Trailer-Mounted Variable Message Signs
 - Number of portable trailer-mounted VMS managed for ADOT Districts by Equipment Services (diesel-powered, solar-powered)
 - Typical number of trailer-mounted VMS in to Equipment Services for repairs at any given time
- B7. Highway Advisory Radio (HAR)
 - Number of ADOT construction projects currently using HAR
 - Number of ADOT Districts that are using or have used HAR
 - Awareness of HAR by non-ADOT stakeholders
 - HAR message usefulness to non-ADOT stakeholders

GROUP C: TRAFFIC CONTROL / COMMERCIAL VEHICLE ELECTRONIC CLEARANCE SYSTEMS

- C1. Portable Traffic Signals
 - Number of portable traffic signals owned by ADOT
 - Number of Districts that are using or have used portable traffic signals
- C2. Commercial Vehicle Electronic Clearance/PrePass
 - Number of PrePass-equipped ports of entry
 - Statewide and site-specific PrePass statistics
 - Awareness of PrePass by non-ADOT stakeholders
 - PrePass usefulness to non-ADOT stakeholders
- C3. Expedited Processing at International Crossings (EPIC)
 - Number of ports of entry involved in EPIC
 - Total number of international ports of entry

GROUP D: EMERGENCY DETECTION AND RESPONSE SYSTEMS

- D1. Instrumented Truck Escape Ramps
 - Number of instrumented truck escape ramp systems
 - Total number of truck escape ramps in Arizona
 - Number of uses of instrumented truck escape ramp system
 - Awareness of instrumented truck escape ramps by non-ADOT stakeholders
 - Instrumented truck escape ramp usefulness to non-ADOT stakeholders
- D2. Emergency Roadside Callboxes
 - Number of emergency roadside callbox systems
 - Total number of emergency roadside callboxes
 - Number of calls received at DPS Operational Communications (OpComm) Centers
 - Awareness of emergency roadside callboxes by non-ADOT stakeholders
 - Emergency roadside callbox usefulness to non-ADOT stakeholders
- D3. Motorist Assist Patrols (MAPs)
 - Number of assists/other activities
 - Awareness of MAPs by non-ADOT stakeholders
 - MAP usefulness to non-ADOT stakeholders

3.5 STAKEHOLDERS AND INFORMATION RESOURCES

This project's Technical Advisory Committee (TAC) included representatives from several of the primary ADOT and non-ADOT stakeholder organizations, mentioned previously. The TAC, the ADOT Districts and TTG guided the Consultant effort of identifying rural ITS stakeholders and information resources. The lists below enumerate the various ADOT and non-ADOT stakeholders and other information resources whose input was desired for this study.

ADOT Rural ITS Stakeholders

1. Transportation Technology Group (TTG)
2. ADOT Districts (Flagstaff, Globe, Holbrook, Kingman, Phoenix Construction, Phoenix Maintenance, Prescott, Safford, Tucson, and Yuma)
 - a. District engineers
 - b. Administrative services officers
 - c. Maintenance engineers
 - d. Maintenance superintendents
 - e. Maintenance supervisors
 - f. Senior construction resident engineers
 - g. Operations center coordinators (other than Phoenix)
 - h. Snow desk coordinators
 - i. HCRS coordinators
 - j. Specialists involved in ITS element planning and installation
3. Regional Traffic Engineering Offices (RTEOs: Baja Regional Traffic, Northern Regional Traffic, Phoenix Maintenance District, Western Regional Traffic)
 - a. Regional traffic engineers
 - b. Traffic signal and lighting managers
 - c. Regional signal technicians
 - d. Field signal technicians
 - e. Analysts
4. Information Technology Group (ITG)
5. Motor Vehicle Division (MVD)
6. Equipment Services
 - a. Fleet Management Manager
 - b. Regional Equipment Managers

Other ADOT Rural ITS Information Resources

1. Occupational Safety and Health (OSH) – for ADOT Employee Safety Statistics

2. Traffic Records Section – for the ALISS Accident Database
3. Roadway Design Section – for background information about truck escape ramps

Non-ADOT Rural ITS Stakeholders

1. Arizona Department of Public Safety (DPS)
 - a. Highway patrol (district commanders and other patrol officers)
 - b. Operational Communications Center supervisors (Phoenix, Flagstaff, Tucson)
2. National Weather Service (NWS) forecast offices
 - a. Flagstaff office (located in Bellemont)
 - b. Tucson office
3. Neighboring state departments of transportation (California, Nevada, Utah, Colorado, New Mexico)
4. Equipment vendors and consultants
5. Other Organizations
 - a. Native American Nation police forces
 - b. Hoover Dam police (Bureau of Reclamation)
 - c. Counties, cities and metropolitan planning organizations/councils of government
 - d. School districts
 - e. US Forest Service
 - f. US Bureau of Land Management
6. Commercial Vehicle Operators
7. The general public

Other Non-ADOT Rural ITS Information Resources

1. Other state departments of transportation (Montana and Iowa)

3.6 DATA COLLECTION PROCESSES

A wide variety of techniques were used to collect data from the various stakeholders and information resources. The Consultant designed the approach for information gathering from each of the rural ITS stakeholder groups based on:

- Guidance from the project TAC,
- The groups' roles or relationships to rural ITS,
- The information available from the groups, and the groups' accessibility.

Table 5 summarizes the information obtained about the various ITI from each group, and how the information was obtained.

Table 5: Data Collection Activities Summary

Group Contacted	Information Obtained	How Information Was Obtained
Project TAC	General information Key ITI: All	Five TAC meetings were held in 2004 (May 10, June 24, July 20, September 9, October 19). Meeting agendas were sent in advance of meetings; minutes were prepared and distributed afterward. Other communications took place as required. The Unmet Needs Scoring Matrix (see Appendix B) was distributed via e-mail on October 22; as of Nov. 9, the Consultant had received 10 responses.
TTG	General information Key ITI: All	Consultant held meetings with TTG on May 17 and September 27, 2004 and followed up with TTG staff as needed. TTG staff facilitated link from www.az511.com to online versions of Commercial Vehicle Operator (CVO) and public surveys. Consultant received comments during Safford and Phoenix Construction District interviews.
ADOT Districts	General information Key ITI: All except Expedited Processing at International Corridors (EPIC)	Between May 10 and August 16, 2004, Consultant interviewed staff from all 10 ADOT Districts in person or via phone (see Appendix C for a list of District interviews; Appendix D for the District Questionnaire). Formal follow-up questions (see Appendix E) were sent to Districts via e-mail on Aug. 11; other follow-ups were made as needed.
RTEOs	Key ITI: Road Weather Information Systems (RWIS), Passive Acoustic Detectors (PAD), remote cameras, variable message signs (VMS), shoulder-mounted VMS, emergency roadside callboxes	Consultant recorded comments received during Flagstaff, Prescott and Tucson District interviews. Consultant conducted phone interview with Phoenix Maintenance District staff on Aug. 16, 2004. Formal follow-up questions (see Appendix E) were sent to RTEO staff via email on Aug. 17.
ITG	Key ITI: RWIS, PAD, remote cameras, Highway Condition Reporting System (HCRS), 511, az511.com, VMS, instrumented truck escape ramps, EPIC	Consultant conducted phone interviews with ITG staff.
Motor Vehicle Division (MVD) – Ports of Entry (POEs)	Key ITI: PrePass	Via an e-mail dated Aug. 16, 2004 Consultant distributed surveys (see Appendix F) to managers of POEs at which PrePass is used; three responses were received (representing the Kingman [and Topock], St. George and San Simon POEs). Consultant conducted phone interviews with other MVD staff.

Table 5: Data Collection Activities Summary (Cont'd)

Group Contacted	Information Obtained	How Information Was Obtained
Equipment Services	Key ITI: portable trailer-mounted VMS (PTM-VMS)	Questions to Equipment Services staff were e-mailed on Sep. 14.
Office of Safety and Health (OSH)	General information	Consultant downloaded public employee accident reports available at OSH's website.
Traffic Records Section	General information	Consultant acquired ALISS accident records for segments of the state highway system where ITI has been installed.
Roadway Design Section	Key ITI: Instrumented truck escape ramps	Consultant conducted phone interview with Roadway Design Section staff on June 2.
Department of Public Safety (DPS) – Highway Patrol	Key ITI: 511, az511.com, VMS/shoulder-mounted VMS (SM-VMS), PTM-VMS, HAR, Instrumented truck escape ramps, Emergency roadside callboxes, Motorist Assist Patrols (MAPs)	Consultant recorded comments received during Globe, Willcox and Phoenix Construction District Interviews (representing highway patrol Districts 11, 9 and Phoenix Metro, respectively). On July 23, Consultant distributed 150 copies of the DPS questionnaire (see Appendix G) to highway patrol Districts; as of Sep. 14, Consultant had received 70 responses.
DPS – Operational Communications (OpComm)	Key ITI: Emergency roadside callboxes	Consultant recorded comments received during Tucson District interview (representing the Tucson DPS OpComm Center). Consultant conducted phone interviews with DPS-OpComm staff and followed up via phone and email as needed.
National Weather Service (NWS)	Key ITI: RWIS, remote cameras, az511.com	Consultant conducted a phone interview with NWS staff.
Neighboring State departments of transportation	Key ITI: RWIS, HCRS, 511, az511.com, VMS, HAR, PrePass	Consultant recorded neighboring state DOT comments received during Safford District interview (representing New Mexico DOT). Consultant distributed the Neighboring State Questionnaire (see Appendix F) via e-mails dated Aug. 17 to neighboring state DOT contacts; two responses were received (representing California DOT and Nevada DOT).
Equipment Vendors and Consultants	Key ITI: RWIS, PAD, 511, PTM-VMS, HAR, Portable Traffic Signals, PrePass, EPIC	Consultant gather information via phone interviews, vendor website visits, and literature review documents

Table 5: Data Collection Activities Summary (Cont'd)

Group Contacted	Information Obtained	How Information Was Obtained
Other Organizations	Key ITI: 511, az511.com, VMS/SM-VMS/PTM-VMS, HAR, Emergency roadside callboxes, MAPs	Consultant recorded City of Tucson comments received during Tucson District interview. Consultant invited members of other organizations to fill out the general public survey and to return any other comments online or by e-mail or letter. The Consultant received one online survey from other organizations (the US Forest Service).
Commercial Vehicle Operators	Key ITI: 511, az511.com, VMS/SM-VMS/PTM-VMS, HAR, PrePass, Instrumented truck escape ramps	On July 23, the Consultant distributed 2000 postcard surveys (see Appendix G) to CVO via Ports of Entry, and prepared an online survey version. From July 28 through August 31, the www.az511.com website included a link to the online survey. Truck drivers were invited to return comments online or by e-mail or letter. As of Sep. 14, the Consultant had received 82 postcards and five online surveys.
General Public	Key ITI: 511, az511.com, VMS/SM-VMS, PTM-VMS, HAR, Emergency roadside callboxes, MAPs	On July 23, the Consultant distributed 5000 postcard surveys (see Appendix G) to the general public via ADOT districts and DPS, and prepared an online survey version. From July 28 through August 31, the www.az511.com website included a link to the online survey. The public was invited to return comments online or by e-mail or letter. As of Sep. 14, the Consultant had received 112 postcards and 261 online surveys. Between July 28 and August 29, a total of 17 e-mails were received at ruralsurvey@itsengineers.com , all probably from the general public.
Other State DOTs	Key ITI: RWIS	Consultant visited Montana and Iowa DOT websites to gather information on their RWIS.

3.7 DPS, CVO AND PUBLIC SURVEYS AND RESPONSES

DPS Highway Patrol Surveys

Because DPS and ADOT work together so closely on highway closures and other matters, the project TAC asked the Consultant to gather DPS input on related ITS elements. The Consultant prepared 150 copies of a DPS survey and on July 23, transmitted the surveys to a DPS representative on the project TAC. Shortly thereafter, DPS prepared an explanatory memo and distributed the surveys to DPS highway patrol officers throughout the state. Additional copies of the survey were made in some instances, bringing the total estimated number of surveys to 200.

As of September 14, the Consultant had received 70 responses. With an estimated 200 total surveys distributed, the 70 survey responses represent a 35% response rate. Figure 2 shows the geographic distribution of survey responses from DPS highway patrol officers.

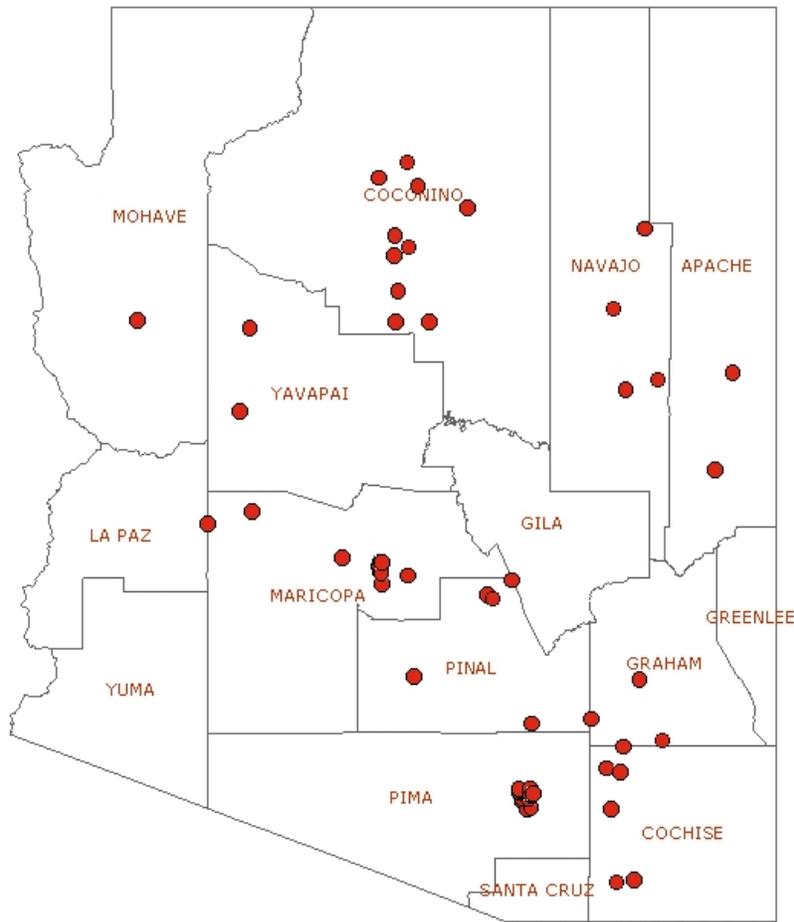


Figure 2: Geographic Distribution of DPS Survey Responses (N=70)

DPS highway patrol officers participating in the survey were asked to declare their home ZIP code. Figure 2 indicates that at least one DPS survey response was received from all but Gila, Greenlee, La Paz, Santa Cruz, and Yuma counties; all DPS highway patrol districts are represented. More responses were received from DPS officers located in Pima County than in any other county. A substantial number (32) were received from areas defined as rural for the purposes of this project (ZIP codes outside of Phoenix and Tucson). Eleven surveys of indeterminate origin were received.

Commercial Vehicle Operator (CVO) Surveys

Because CVO stakeholders have a vested interest in reliable traveler information and emergency systems, the project TAC asked the Consultant to gather CVO input on related ITS elements. By telephone, the Consultant contacted Motor Vehicle Division (MVD) representatives at nine ports of entry and confirmed their willingness to participate. The Consultant prepared 2000 copies of the CVO survey and on July 23, transmitted 1800 of the surveys to the MVD contacts, along with posters to advertise the survey and a list of talking points and frequently asked questions to help MVD explain

and address driver questions about the survey. The Consultant placed emphasis on the importance of person-to-person contact as the surveys were distributed since it was felt this would enhance driver understanding and willingness to participate. The Consultant personally distributed 200 CVO surveys during late July and early August. Postcard survey participants were invited to return comments online or by e-mail or letter. From July 28 through August 31, 2004, the www.az511.com website included a link to the online version of the survey.

As of September 14, the Consultant had received five online and 82 postcard surveys (5.7% online). One of the five online surveys (20%) included comments. The postcard response rate was 4.1% (82 of 2000). No e-mails or letters were received from truck drivers. Figure 3 shows the geographic distribution of online and postcard survey responses from commercial vehicle operators.

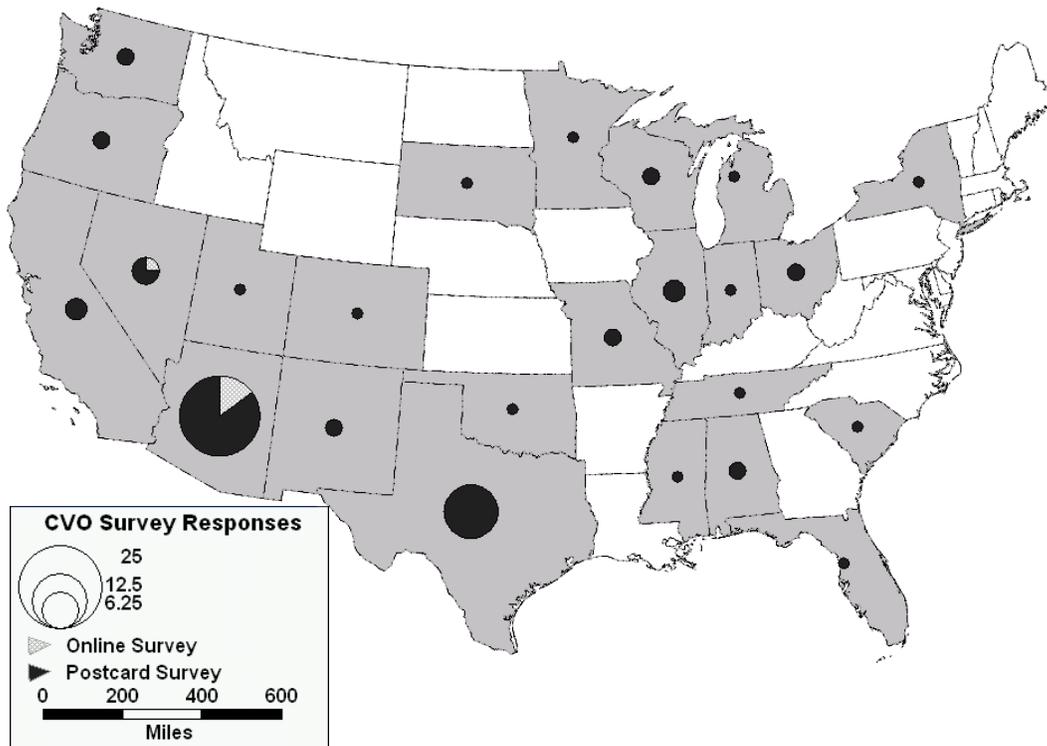


Figure 3: Geographic Distribution of CVO Survey Responses (N=87)

CVO survey respondents were asked to declare their home state. More CVO from Arizona (22) responded than from any other state. A total of 24 states are represented in the survey results. Only five online surveys were received (less than 6% of the total surveys returned), with four from Arizona and one from Nevada. Nineteen surveys of indeterminate origin were received.

Public Surveys

Because the public has a vested interest in reliable traveler information and emergency systems, the project TAC asked the Consultant to gather public input on related ITS elements. The Consultant confirmed the willingness of ADOT Districts and DPS highway patrol districts to participate in survey distribution. The Consultant prepared 5000 copies of the public survey and on July 23, transmitted 4800 surveys to the ADOT and DPS district contacts, along with posters to advertise the survey and a list of talking points and frequently asked questions to help survey distributors explain and address driver questions about the survey. Three thousand of the surveys went to the ADOT Districts and 1800 surveys went to DPS. The Consultant suggested that ADOT Districts tailor a distribution plan suitable to their local circumstances, with driver's license offices, chambers of commerce, visitors centers, and District offices suggested as likely distribution points. The DPS distributed the surveys primarily through highway patrol contacts with the public – in both enforcement and traveler-assistance contacts.

In both cases, the Consultant placed emphasis on the importance of person-to-person contact as the surveys were distributed, since it was felt this would enhance driver understanding and willingness to participate. The Consultant personally distributed 200 public surveys during late July and early August. From July 28 through August 31, 2004 the www.az511.com website included a link to the online version of the survey. Postcard survey participants were invited to return comments online or by e-mail or letter.

As of September 14, the Consultant had received 261 online and 112 postcard surveys (70% online). One hundred seventy-four, or 67% of the 261 online surveys included comments. Between July 28 and August 29, 2004, a total of 17 e-mails were received at ruralsurvey@itsengineers.com, all probably from the general public; no letters were received. The postcard response rate was 2.2% (112 of 5000). Among the 112 postcard survey responses, the 17 e-mails with additional comments represent 15% of the total. Figure 4 shows the geographic distribution of survey responses from the general public.

General public survey respondents were asked to declare their home ZIP code. Based on the ZIP code information, responses were received from 346 in-state respondents, 11 out-of-state respondents, and 16 responses of indeterminate origin (no ZIP code provided, ZIP code illegible etc.). Two hundred forty-two (222 or 92% online) in-state respondents declared ZIP codes from areas defined as urban for the purposes of this project (the Phoenix and Tucson metropolitan areas); 104 (29 or 28% online) declared rural ZIP codes. Out-of-state responses were received from a total of 10 states, including California, Indiana, Louisiana, Missouri, Montana, Nevada, South Carolina, Texas, Washington, and Wisconsin.

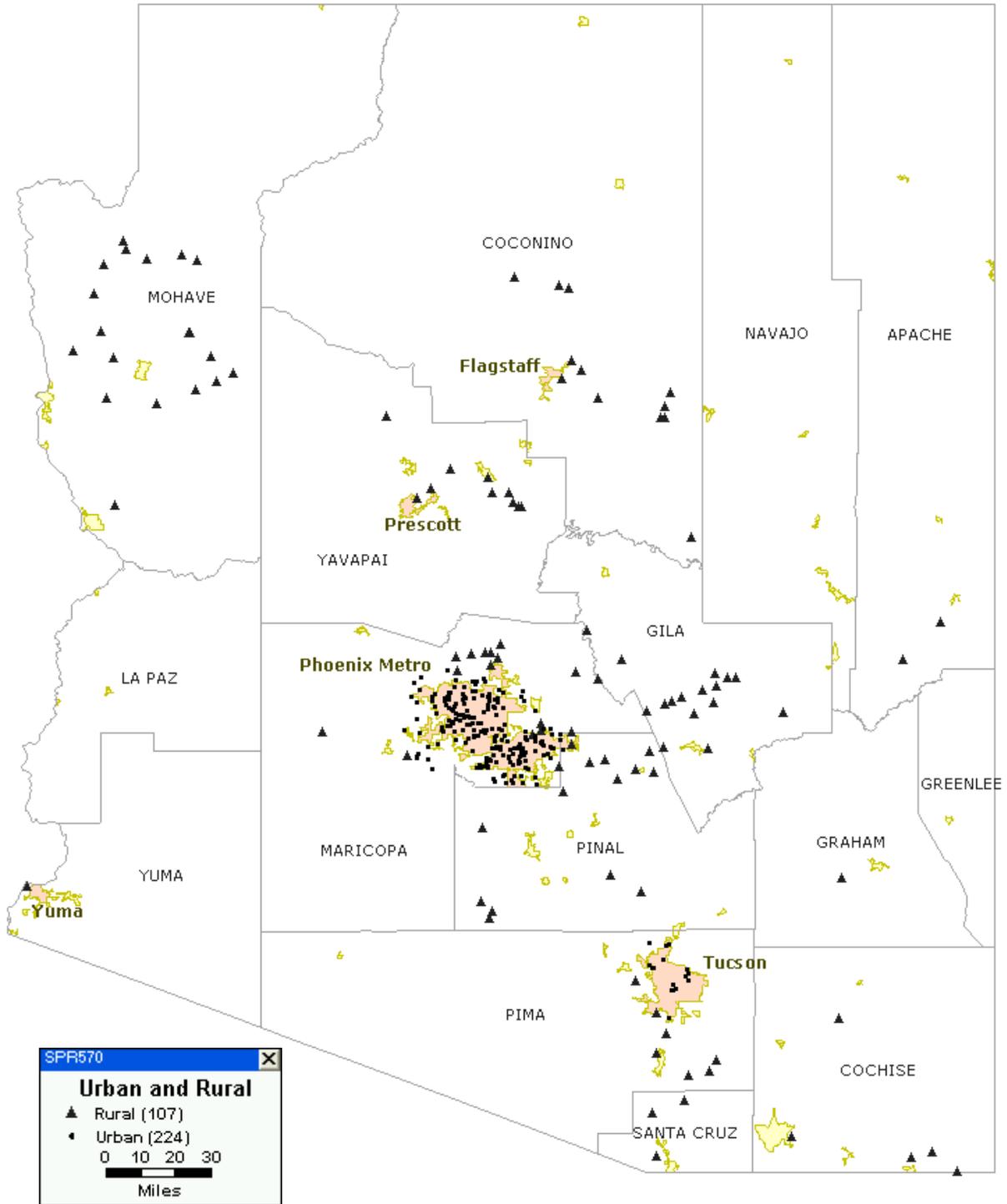


Figure 4: Geographic Distribution of General Public Survey Responses (N=373)

