ARIZONA STATEWIDE INCIDENT MANAGEMENT PLAN

Final Report 497

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16. Abstract

The purpose of this project was to develop a comprehensive plan for improvement of highway incident management in Arizona. Increased traffic, traffic crashes, secondary crashes, and the resulting long delays to motorists are a serious public safety issue. The objective of the plan is to reduce injuries, deaths, and delays caused by roadway incidents.

The project workplan brought together experienced incident responders and stakeholders across Arizona to give their insights, and participate in the development and prioritization of the recommendations. The first project tasks were to review similar plans in other states for managing incidents, and to apply the best elements for Arizona. A review of other programs was presented in a series of eight Focus Group meetings across the state. The meetings drew over 250 individuals from city, county, and state police, fire, transportation and public works agencies, as well as towing companies, media, and federal agencies. A preliminary report with the initial results of all the Focus Groups was provided to all who attended, and a second set of eight follow-up meetings were then held to discuss comments, seek approval and prioritize the recommendations.

The resulting final plan contains 18 categories with 61 recommendations. They are in order of priority as determined by the Focus Group attendees and validated by the project advisory team. The plan also defines recommendations for action by individual agencies, those requiring multiple agency effort, and those requiring legislative or budget action.

This project resulted in a comprehensive Statewide Roadway Incident Management Plan with clear recommendations. It gained strong support from the stakeholders and will, if fully implemented, give Arizona the most effective statewide incident management program in the nation.

The project assembled many response agencies to discuss issues and offer solutions. For some, it was a first meeting of all the agencies and private responders that work roadway incidents, and they found it worthwhile and informative.

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METRIC (SI*) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	2.54	centimeters	cm
ft	feet	0.3048	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
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ft^2	square feet	0.0929	meters squared	m^2
yd^2	square yards	0.836	meters squared	m^2
mi^2	square miles	2.59	kilometers squared	km^2
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oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams	Mg
		VOLUME		
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gal	gallons	3.785	liters	L
ft^3	cubic feet	0.0328	meters cubed	m^3
yd^3	cubic yards	0.765	meters cubed	m^3

Note: Volumes greater than 1000 L shall be shown in m^3.

		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

These factors conform to the requirement of FHWA Order 5190.1A

*SI is the symbol for the International System of Measurements

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
yd	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	millimeters squared	0.0016	square inches	in^2
m^2	meters squared	10.764	square feet	ft^2
yd^2	kilometers squared	0.39	square miles	mi^2
ha	hectares (10,000 m^2)	2.53	acres	ac
		MASS (weight)		
g	grams	0.0353	ounces	oz
kg	kilograms	2.205	pounds	lb
Mg	megagrams (1000 kg)	1.103	short tons	T
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
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m^3	meters cubed	1.308	cubic yards	yd^3

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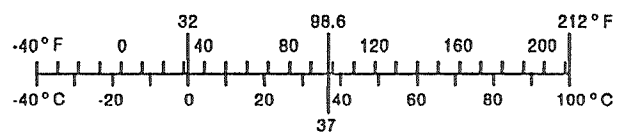

TABLE OF CONTENTS

1.0 **INTRODUCTION** 1
- 1.1 PURPOSE 1
- 1.2 METHODOLOGY 2
- 1.3 PROJECT DIRECTION AND OVERSIGHT 3

2.0 **REVIEW OF PROGRAMS IN OTHER STATES** 6
- 2.1 ILLINOIS 6
- 2.2 WASHINGTON 7
- 2.3 MARYLAND 9
- 2.4 KEY INITIATIVES IN OTHER STATES 10
  - 2.4.1 Florida 10
  - 2.4.2 California 10
  - 2.4.3 Indiana 11
  - 2.4.4 Idaho 11
  - 2.4.5 Utah 11
  - 2.4.6 Texas 11
  - 2.4.7 Louisiana 12
- 2.5 NATIONAL TRENDS IN INCIDENT MANAGEMENT 12
- 2.6 CONCLUSION 13

3.0 **STATEWIDE FOCUS GROUPS INPUT** 14

4.0 **CURRENT ARIZONA PLANNING STATUS AND ISSUES** 17

5.0 **SUMMARY OF FINDINGS AND RECOMMENDATIONS** 21
- 5.1 PREVENTION OF SECONDARY CRASHES 25
- 5.2 INTER-AGENCY TRAINING 26
- 5.3 COMMUNICATIONS 29
- 5.4 INVESTIGATION RELATED TRAFFIC MANAGEMENT AND TECHNOLOGY 31
- 5.5 RESPONDER SAFETY 33
- 5.6 INCIDENT MANAGEMENT EQUIPMENT AND FUNDING 34
- 5.7 LIABILITY FOR TRAFFIC CONTROL ISSUES 36
- 5.8 TOWING AND RECOVERY 37
- 5.9 FORM REGIONAL INCIDENT MANAGEMENT TEAMS 40
- 5.10 ALTERNATE ROUTES 41
- 5.11 CONSTRUCTION WORK ZONE INCIDENT MANAGEMENT PLANS 42
- 5.12 TRAVELER INFORMATION 43
- 5.13 PATIENT CARE AND TRANSPORT 44
- 5.14 STAFFING ISSUES 46
- 5.15 HAZARDOUS MATERIALS RESPONSE 46
- 5.16 COST RECOVERY 47
- 5.17 DEVELOP INTERAGENCY AGREEMENTS WITH TRIBAL AGENCIES 47
- 5.18 SERVICE PATROLS 47

6.0 **CONCLUSION** 49

APPENDICES

APPENDIX A	ARIZONA SERVICE PATROL RECOMMENDATIONS ARIZONA DEPARTMENT OF PUBLIC SAFETY Urban Freeway Service Patrol Program	52
APPENDIX B	THE ARIZONA DEPARTMENTS OF PUBLIC SAFETY AND TRANSPORTATION JOINT OPERATING STATEMENT FOR SERVICE PATROLS AND THE ALERT PROGRAM	60
APPENDIX C	FOCUS GROUP MEETING MATERIALS	64
APPENDIX D	INCIDENT MANAGEMENT TEAM FORMATION The Florida Example	71
APPENDIX E	ARIZONA INCIDENT MANAGEMENT PLAN PBFI SCOPE OF WORK 8/23/99	75
APPENDIX F	REFERENCES	80

LIST OF TABLES

Table 1 STATEWIDE INCIDENT MANAGEMENT PLAN
TECHNICAL ADVISORY COMMITTEE MEMBERS 4

Table 2 ANALYSIS OF ISSUES RAISED IN FOCUS GROUPS
Statewide Focus Groups, December – January 2000 15

Table 3 STATEWIDE INCIDENT MANAGEMENT PLAN RECOMMENDATIONS
Stakeholder & Technical Advisory Committee Summary 22

LIST OF FIGURES

Figure 1 STAKEHOLDER MEETING LOCATIONS
First & Second Series of Statewide Focus Group Meetings 5

1.0 INTRODUCTION

On Sunday, August 9, 1998, a multiple-vehicle fatality crash occurred near Sunset Point in the southbound lanes of Interstate 17 in the Black Canyon. The resulting full highway closure in this remote mountainside area created major difficulties for the responders trying to reach the scene, treat and evacuate the injured, complete necessary investigative steps, and clean up the wreckage. This crash also resulted in stopped traffic being backed up for approximately 60 miles, with delays of up to 6 hours in mid-summer heat for many of the motorists.

The responders at this crash location conducted their duties in a professional manner in adherence to their agency policies and procedures. They deployed all the resources and personnel that were available. Due to the extensive backed up traffic and the length of delays, the media closely scrutinized those procedures.

On August 20, 1998, a Traffic Action Plan was announced by Governor Jane Hull's office. It included immediate actions by state agencies such as better motorist information, improved response to key incident locations and faster clearance of incidents from the roadway. Follow-up actions were to include better signing, training, and an incident management statewide plan.

In the months that followed the Interstate 17 incident, several mandated steps in that plan were taken to reduce the impact of incidents on everyone. Multi-agency incident management training has been conducted in several areas of the state. The Department of Transportation (ADOT) has installed numerous Variable Message signs throughout the state to provide motorists with timely, accurate traveler information. The Department of Public Safety (DPS) has begun using techniques and technology to reduce the time required to complete felony and fatal crash investigations. An interagency agreement has been developed that outlines the goals for managing incidents by both agencies. An alternate route plan has been completed to assist with moving traffic to their destinations by use of other roadways when a major incident closes the best, most direct route.

One key impact on this process is the vast population growth in the State of Arizona that has significantly increased the number of vehicles on the roadways. Procedures that worked satisfactorily in light traffic 10 or 20 years ago need to be updated to accommodate better handling of incidents with the heavy volumes being experienced currently. Agencies are well aware that significant resources are required to deal with large-scale incidents properly.

Arizona's population, economy, and related travel desires are expected to continue growing at rates that exceed national averages. This growth will be accompanied by corresponding increased demands on the state's transportation infrastructure. Growth in traffic congestion, crashes, and major incidents will impact the overall efficiency and effectiveness of the states roadway system and will have a negative impact on the state's citizens, travelers, and economic stakeholders.

1.1 PURPOSE

As noted above, one mandate from the Governor's action plan was the creation of a statewide program to improve and coordinate highway incident management. An Incident Management Plan is a key part of improving the overall management of incidents on both rural and urban roadways. This plan was approved and funded as an ADOT research project, and consultant PB Farradyne came on board in mid-1999 to develop an effective Statewide Roadway Incident Management Plan. The project was initiated through the Arizona Transportation Research Center (ATRC).

As the consultant, the highway safety agencies and the key stakeholders began work on this process, they quickly recognized that a formal plan would be necessary to address the issue in a

comprehensive manner, and to support necessary changes to current practices. It was apparent that long-term improvements could require strong agency and legislative support for funding of needed personnel, equipment, and training. There could also be a need for changes in the various laws associated with the incident management process.

The resulting plan for management of roadway incidents recommends thorough, uniform policies and protocols, training of personnel, and development of a statewide unity of purpose among legislative, transportation, police, fire, medical and other involved professionals. Sound incident management requires a highly cooperative and interdependent coordination of equipment, computer-based communications systems, planning, and most importantly, people. Coordinated incident response will help ensure that Arizona's transportation system will operate at its peak efficiency whenever possible.

1.2 METHODOLOGY

The PB Farradyne approach to developing an incident management plan included the following tasks as detailed in the proposal (see Appendix E for PBFI's Proposal Scope of Work):

- Task 1: Project Management
- Task 2: Review Current Incident Management Plans in Other States
- Task 3: Regional Focus Group Meetings
- Task 4: Current Planning Status and Issues Report
- Task 5: Prepare Draft Arizona Incident Management Plan
- Task 6: Meetings with the Stakeholders to Discuss the Plan
- Task 7: Final Arizona Incident Management Plan
- Task 8: Summary Final Report
- Task 9: Final Presentations

Each of the major task areas is discussed in detail in subsequent sections of this report. The following paragraphs briefly describe each task and the steps necessary to complete a plan that represents the best practices in use across Arizona, and that offers sound recommendations to improve incident management operations and resources in a consistent manner.

In order to determine what the needs are and develop a set of recommendations for improvement, the consultant, PB Farradyne, was tasked with reviewing incident management plans in other states. The states selected as the best current examples were Illinois, Maryland, and Washington, all known nationally for their incident management programs. The purpose of this task was to identify how these and other states developed their plans to implement their incident management programs and what was in those plans. This task also pointed out what has worked well and what has not worked as well as expected in the other states.

The next task, to conduct regional focus group meetings, was an important step in determining the range of existing practices across the state, as well as regionally-specific needs of state and local response agencies in the area of incident management. It was recognized that the personnel of all agencies involved in incident management operations are the key to the successful implementation of the plan to be developed. Therefore, stakeholders representing each key response discipline in the Incident Management process throughout the state of Arizona were invited to participate in a series of local Focus Group meetings (See Map, Figure 1).

A total of 258 individual responders and interested parties attended eight fact-finding meetings in localities throughout the state. After a short review of the elements and issues of successful programs in other states, the participants provided excellent input on a range of topics that are discussed in detail in Section 3 of this report.

Developing the current Arizona planning status and issues report was a concurrent task that was accomplished with the information in the focus groups, with input from the project's Technical Advisory Committee (TAC), and with interviews of other incident response professionals. Arizona has recently accomplished significant improvements and is already planning several others, which are outlined in Section 4 of this report.

After reviewing all of the input from these first three major research tasks, the consultant was able to develop a Draft of the Arizona statewide incident management plan, to guide the improvement of incident management services in the years to come.

Each of the stakeholders that were so important in the development of the Draft IM Plan then had the opportunity to review it in detail and to add their input, before it was put into its final form. A second series of eight Focus Group meetings was held statewide for this purpose.

When this effort was concluded, the consultant and the TAC were confident that the state of incident management practices and needs in Arizona had been effectively captured, and that sound recommendations could be made and justified. At that point, in May 2000, the Statewide Roadway Incident Management Plan document was completed, reviewed and published.

In order to receive the needed acknowledgement and support of the leadership in the key agencies and organizations, PB Farradyne conducted three presentations. The formal presentations were given to the following agency leadership groups:

- May 16 - The ADOT/DPS Directors' Core Staff Partnering Meeting
- May 16 - The ADOT Research Council
- June 12 - Incident Management Forum (FHWA and Phoenix Fire Dept)

The final step in the completion of the IM Plan was its distribution to all affected organizations, which was done with an emphasis on the need for these parties to work together to implement the recommendations made in the plan.

1.3 PROJECT DIRECTION AND OVERSIGHT

Table 1, on the following page, presents a list of Technical Advisory Committee (TAC) members for this research project. The members of the TAC provided invaluable input. Several attended multiple stakeholder meetings across the state, to hear firsthand what the concerns were. All of the TAC members reviewed and validated the information in this report. Their efforts in categorizing recommendations, finalizing priorities, identifying the agencies responsible, and determining action timeframes helped to give the report realistic timelines with valid priorities. The TAC's collective expertise was essential to the success of this project.

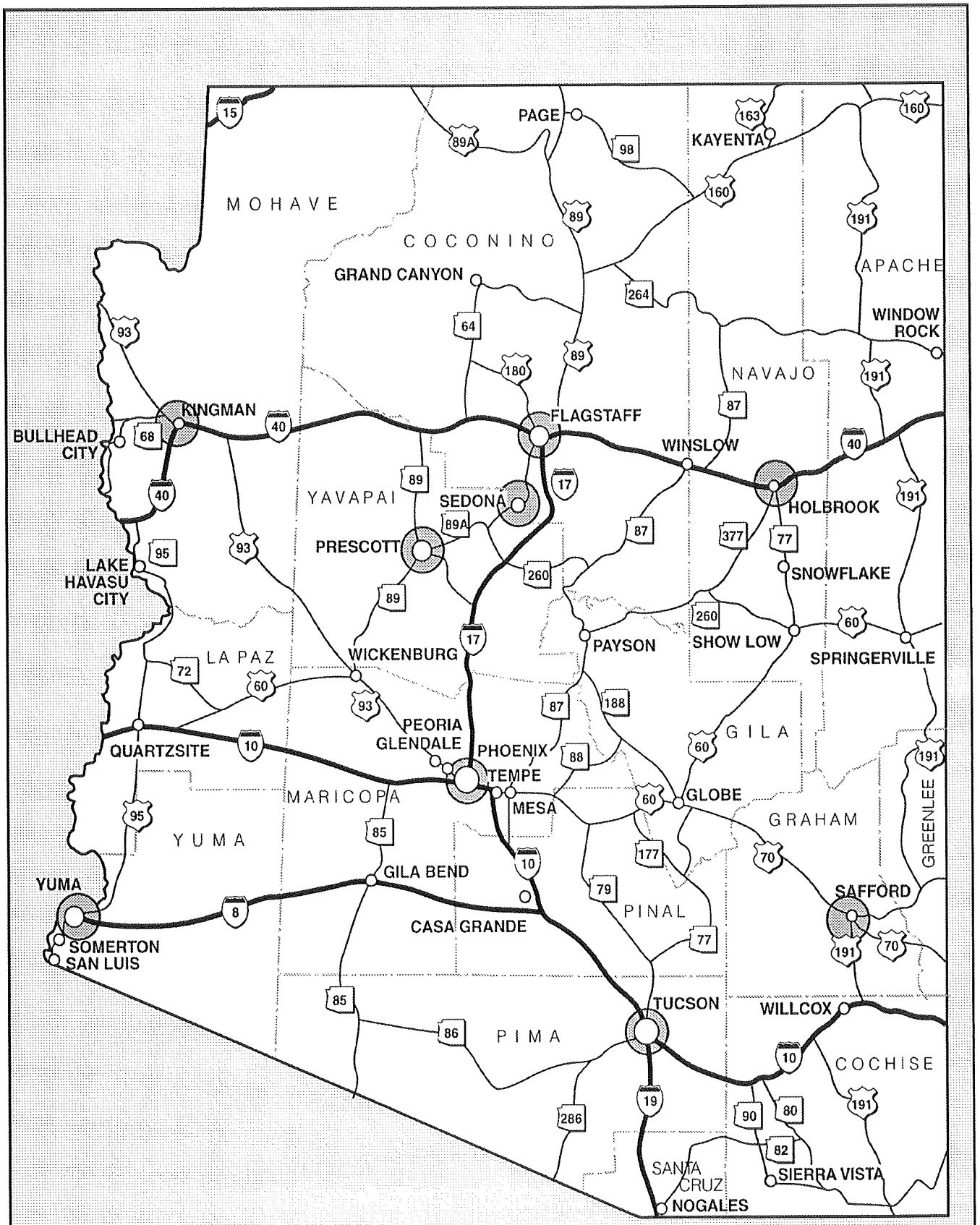

Figure 1

Stakeholder Meeting Locations

2.0 REVIEW OF PROGRAMS IN OTHER STATES

As one basis for the development of a statewide incident management plan for the State of Arizona, PB Farradyne was tasked with reviewing other state incident management plans. The purpose of this task was to identify how other states developed plans to implement their incident management programs, and what was in those plans. This section will also point out what has worked well and what has not worked as well as expected.

PB Farradyne identified several states and regions known nationally for quality, comprehensive incident management programs. They are Illinois, with the oldest, largest and most comprehensive regional incident management program in the nation, Washington State with one of the only statewide formal incident management response programs, and Maryland with an aggressive response program operated out of a joint statewide traffic operations center. Successful programs in several other states were also reviewed and summarized.

The summary of information for each IM program identifies the most significant differences in the approaches that these three states took to develop their programs. Illinois, for example, did not have a strategic plan or a blueprint. Maryland did an exhaustive review of other programs and took elements from several to develop their own unique and effective approach. Washington did a cursory review of the programs in California and Illinois before forming their program. For each of these three successful examples, their claimed basic benefit-to-cost figures are also provided.

This section of the report also provides short summaries or excerpts from programs in other states and regions that have gained a level of success.

2.1 ILLINOIS

Chicago, Illinois, was one of the first metropolitan areas to implement a state DOT-supported incident management program. It began in 1962 when the Dan Ryan expressway was opened and incidents were causing motorists to take longer to get to work than before the freeway was completed. Crashes, debris, and disabled vehicles had not been factored into the operation of the roadway and response methods had not been developed. The severity of accidents also increased due to the increased speed limit resulting in more injuries and longer closures.

The Illinois DOT came under media scrutiny and responded by staffing service pickups with design engineers and other staff during rush hours. The response helped reduce delays, and the agency decided a that long-term formal effort was necessary.

The program began with nine pickup trucks operated by maintenance workers. When permanent funding was authorized, the program became the "Minutemen" and was placed under the fledgling operations organization that was developing a traffic management system for the Chicago area. The "Minutemen" quickly became very popular with Illinois motorists. They provided all types of motorist assistance, helped at accident scenes, removed debris, and provided motorist information through the traffic management center.

As the program grew and added services, attempts were made to develop a strategic plan to spell out the goals and objectives. The plan was never funded, and the program grew by reacting to the perceived needs of the freeway system as it also grew.

The services added by the Minutemen were the most controversial in the incident management arena. Large truck wrecks were a major problem and clearance time was substantial. Towing companies using traditional methods often took several hours to clear accidents.

Illinois DOT staff decided they would try and reduce the clearance times by obtaining their own heavy lift equipment. Budgetary attempts were thwarted due to the revolutionary approach and the cost of the equipment. Surplus military towing equipment was finally obtained and put into service. Truck wrecks that previously had taken 6 to 8 hours were now cleared in 2 to 3 hours.

Recognizing the potential for saving motorist time and faced with over 100 truck crashes per year, the state upgraded their heavy-duty fleet with state-of-the-art trucks. Today, the fleet contains two 60-ton rotators, two 45-ton rotators, and several medium lift trucks complete with automated under-lifts. Truck wrecks are now cleared from the traveled lanes in an average of 40 minutes.

Throughout this process, the towing industry battled to keep the program from growing. Towing companies maintain that the state should not be in the towing business and were even successful in getting Congress to pass a bill requiring all new service patrol programs using federal funds must be operated by private sector companies. This bill did not pass the Senate but may be introduced again. At state level, towing associations have been very active and have been successful in keeping state DOT's from acquiring tow trucks.

The Illinois DOT has developed corridor studies, ITS deployment plans, and transportation strategic plans. The plans include descriptions of systems or services for incident management, however, an incident management plan was not developed.

Illinois also has experienced several of the same problems encountered in other states. Traffic operations are run out of one center while the Minutemen program is run out of another. Illinois State Police, who are responsible for police services, are run out of still another center. There is no real-time link between the centers and the responders, resulting in delays and miscommunications.

Generally, this program has the best street-level operations program, but it lacks the interagency information systems which have become so effective in other states.

Cost-Benefit Analysis

The Illinois Department of Transportation had a thorough study completed of their "Minuteman" program to determine the cost benefit-ratio. They used the reduction in traffic congestion as the rationale for savings for motorists. Based on costs of $8.00 per hour for passenger vehicles and $25.00 for commercial vehicles, the study determined that the benefit-cost ratio was 17 to 1.

The cost factors used for the study, especially for commercial vehicles, are substantially lower than would be expected today. The American Trucking Association has determined that the costs associated with commercial vehicles today are between $50.00 and $60.00 per hour.

2.2 WASHINGTON

The Washington State Department of Transportation (WSDOT) has had a successful incident management program for over 12 years. Transportation officials implemented the program in 1988 in the Seattle area. Early successes and the support of other response agencies, led to the expansion of the program to the remainder of the state.

The focus of Washington's program is major accidents. They respond to incidents that will close one or more lanes for one or more hours on interstates or major state routes. Responders are either full-time incident management engineers (two in Seattle and two in Tacoma) or are part-time employees assigned to maintenance. Operators are assigned trucks that have adequate equipment to install a standard traffic closure, alternate route, or other alteration of traffic flow. They can communicate directly with the State Patrol communications center or officers by radio.

Seattle, Washington also has one of the most comprehensive Traffic Operations Centers in any city. The first center was first developed in 1967 to control the reversible lanes on Interstate 5. It expanded into today's center with real-time control of area signal systems, ramp metering, closed circuit television (CCTV), loop detectors, Highway Advisory Radio (HAR), Variable Message Signs (VMS), and Internet traffic information.

This program is now statewide. Incident response trucks are taken home by maintenance division volunteers, who are on call. They receive approximately $1.00 per hour on-call time and they are issued a pager and cellular telephone. They respond from their residence within 30 minutes for all accidents that will block one or more lanes for one or more hours. A major part of their duties is to provide traffic control to reduce the length and size of roadway closures. They also determine what other DOT response is required. The operators are trained by the full time incident response engineers from the metropolitan areas, as well as by the Washington State Patrol.

WSDOT has also operated up to four tow trucks on the floating bridges near Seattle for over 30 years. The operators work a split shift on weekdays as well as for special events. They clear every type of blockage on these systems as quickly as possible. A 1997 study indicated that the average clearance time for these units was 8 minutes.

WSDOT has attempted to expand their service patrol program at least five times without success. Towing interests have lobbied to do away with the DOT tow trucks, however, they have previously supported non-tow truck DOT service vehicles.

Incident Management Planning

In 1997, WSDOT completed a plan to upgrade incident response statewide. The plan included recommendations to:

- Provide Service Patrols in all urban areas.
- Introduce Quick-Clearance legislation.
- Upgrade the towing regulations.
- Remove minor collisions to ramps or other sites for investigation.
- Provide more training to responders.
- Develop a multiple-agency Emergency Light Use policy.
- Develop and implement Interagency Incident Management Agreements.
- Establish an Expedited Tow program.
- Increase coordination with private Service Patrol operators.
- Improved equipment for all responders (cones, arrow boards, portable VMS, tow straps, etc.).
- Direct police communications with the tow trucks.
- No-Stopping zones.
- Regular and consistent Program evaluations.
- Mandatory WSP staffing in urban areas.

- Continued interagency task force meetings.
- Increase the services of the WSDOT Traffic Operations Center.
- Public information campaign.

The plan was submitted to the legislature for funding in 1998. Due to late disagreements from some of the participants, the funding was denied. Several of the non-budgetary items such as interagency agreements, continued meetings, and training have been implemented. The remainder is on hold.

Cost-Benefit Analysis

A study of the WSDOT program, including the bridge tow trucks, was completed in 1997. The analysis was based on costs of $10.00 per hour for passenger vehicle delay and $25.00 per hour of commercial vehicle delay. The study indicated that the benefit-to-cost ratio was 8.6 to 1.

This figure is lower than in Chicago for a variety of reasons. WSDOT doesn't provide roaming services, Washington State has a much lower percentage of commercial traffic, and Chicago has a larger variety of equipment that provide quick clearance of all types of incidents.

2.3 MARYLAND

Congestion in the Washington Beltway and Baltimore areas has become one of the worst traffic situations in the nation. 13 years ago, it was actually congestion on the roadways to Maryland's ocean beaches that led to the start of today's incident management program. Chesapeake Highway Advisory Routing Traffic (CHART) began with efforts to clear accidents from the coastal routes on Friday and Sunday. It soon expanded to the beltway and consists of the following initiatives:

- Service Patrols.
- Incident Management technicians.
- Quick-Clearance policy.
- Interagency Agreements.
- Combined Traffic Operations Center.
- Aggressive Equipment Response Program.
- Ongoing Incident Management Task Force.
- Multi-State Interagency Agreements (I-95 Coalition).
- Control of HAR, VMS, Ramp Metering, and CCTV.
- Links to local Traffic Management systems.
- Frequent multiple-agency Incident Management training.
- Special Events traffic management.

Maryland continues to add to their system. They are updating the Traffic Operations Center to increase automation of functions. Field units have added programmable message signs in place of arrow boards on some response vehicles. Truck accidents are given high priority, with immediate dispatch of a front-end loader and sand truck. Clearance times have been reduced by 50 percent for overturned trucks.

By using these aggressive methods of removal from the traveled lanes and by having a variety of equipment patrolling their freeways during peak periods to relocate vehicles and deal with blocking incidents, Maryland has become a leader in comprehensive Incident Management.

Maryland has not developed a statewide incident management plan. They have completed ITS plans, Strategic Transportation plans, and regional ITS deployment plans which all contain some information on incident management. They have most of the state's population covered by the existing program and are continuing to expand coverage, training, staffing, equipment, and planning.

Cost-Benefit Analysis

Maryland, like Illinois and Washington, has done a cost-benefit analysis based on the service patrol function of their program. They determined that their cost-benefit return is approximately 10-1.

2.4 KEY INITIATIVES IN OTHER STATES

2.4.1 Florida

Focus group members in several Arizona communities talked about the need for a more formal process for agencies to work together on all aspects of managing incidents. Florida is one state that has had success with forming and maintaining Incident Management Teams over a long period of time. This program has operated for the past 4 years in heavily populated Broward and Palm Beach Counties, and plans are currently in place to expand to other Florida counties.

The institutional challenges to improved incident management are often the most difficult to overcome. Relationships built in this team process have improved interagency coordination and cooperation for day-to-day freeway incident management issues. Other response challenges that require multiple agency coordination such as roadway construction planning, special events traffic control planning, and disaster preparedness have also been addressed successfully by these teams.

The incident management teams in Florida and elsewhere have proven their value in coordinated efforts to improve multi-agency response programs, and they serve as a model for others to follow. More complete information and guidelines on Florida's approach to initiating the IM Team process are included in Appendix D of this report.

2.4.2 California

Widespread use of service patrols in urban areas has reduced the response times for minor incidents to 8 minutes. These service vehicles are from the towing industry and remove vehicles to a safe location for service by private towing firms or auto clubs.

The program is expensive at a cost of approximately $50.00 per truck per hour. There are additional costs for the communications and supervisory personnel from the Highway Patrol (CHP), California DOT (Caltrans), and regional transportation authority agencies.

The CHP also has an aggressive lane clearance policy for minor collisions. They do, not have a formal quick clearance process yet for truck wrecks, but are developing one. California recently passed a quick clearance and reduced liability law to facilitate clearance efforts.

The CHP recently began using Photogrammetry technology to enhance investigative efforts. They also have established Major Accident incident response teams for multiple-fatality incidents and for

commercial vehicle crashes that result in fatalities. One drawback is the travel time to the scene, which often results in long roadway closures.

Caltrans also has initiated urban-area Traffic Management Teams who patrol the roadways during peak periods with trucks equipped with variable message signs. They respond to all blocking accidents to stay behind the traffic backup to prevent secondary collisions. They are also on call for off-hours and if requested by local forces will respond to major blocking accidents statewide.

2.4.3 Indiana

Indiana has a wide variety of incident management initiatives underway. They have remote control of VMS from their response trucks. They also use portable video systems to cover construction zones, and they will station a response vehicle to monitor the cameras and take care of all blocking incidents. They are also developing a multi-agency approach to traffic management.

2.4.4 Idaho

The Boise area is the only highly populated area in their state. They are developing a combined transportation control center, which will be operated by the County and supported by the state. They have a statewide Hazardous Materials Plan that is being modified to include a statewide incident management plan. They patrol the metropolitan area freeways during peak hours with Idaho Transportation Department incident response trucks that are equipped with a full range of equipment including high visibility VMS.

The Boise Fire Department has taken an active role in incident management issues with the other agencies. They have modified their vehicle positioning to accommodate movement of traffic and have installed arrow boards on their trucks to facilitate movement of traffic.

2.4.5 Utah

Utah continues to improve their overall program. They recently opened a new transportation center, which has highway patrol and transportation agencies together. They have an aggressive clearance program with incident response trucks operated by DOT. Their trucks will soon be equipped with on-board cameras for sending images to the center from major incident scenes or special events. They have on-board computers and can link to the TOC from remote locations. The response units have the authority to use whatever means is necessary to open roadways. UDOT recently purchased Photogrammetry equipment for the Highway Patrol.

Utah is possibly the only location where a formal effort exists to move all vehicles caught in a backup within one hour. They accomplish this by manually directing the traffic out of the area.

2.4.6 Texas

Texas has a wide variety of incident management programs in several cities. They have the full range of service patrols, traffic operations centers, and traffic management teams. They do face challenges in all urban areas because Texas Department of Transportation must work with so many local jurisdictions that patrol the freeways and handle incidents.

Two noteworthy efforts involve Richardson, Texas, which has provided a video feed of their cameras to the towing company who has the contract for the freeways. Tows are dispatched based on what they see on the monitors, and they return at no cost if not required. Clearance times were reduced by an average of seven minutes for minor collisions.

Austin, Texas is presently building a combined center that will house city, county, and state response and transportation agencies. This will be the largest number of agencies under one roof in the nation when it is completed.

2.4.7 Louisiana

Baton Rouge has a long-standing traffic management team of city, parish, state, and private agencies. They have developed a regional approach to incident management and have an excellent working relationship. One unique feature of their motorist information program is a direct line to 19 media outlets simultaneously. They can make one call that rings in all 19 locations; they can provide the information directly and even be taped by one or more outlets simultaneously.

Baton Rouge is also developing a multi-agency Traffic Operations Center with their traffic management team taking a significant role in facilitating the process.

2.5 NATIONAL TRENDS IN INCIDENT MANAGEMENT

In the past several years, many more efforts have been focused on incident management operations and policies for cities, metropolitan regions, and on the state level. Key trends that are developing on a national level include the following:

- Approximately 14 states have established formal quick-clearance policies or interagency agreements, up from 7 states just a few years ago.
- More than 80 metropolitan areas now have urban or regional freeway service patrols, the majority of which have been started within the last 6 years.
- Many states are beginning to review and change towing regulations to bring them up to date. Tennessee has increased the large tow requirement from 25 to 40 tons and Montana to 32 tons. Other states, such as New Mexico, are currently involved in this legislative process.
- Faster investigations are being promoted to reduce congestion and secondary collisions in many states, including Arizona. The entire I-95 coalition is also working on this issue.
- Better motorist advisory information throughout an incident is also a major initiative in California, Missouri, Wisconsin, Florida, Texas, New Mexico, Indiana, Iowa and others.
- Increased emphasis on removing abandoned vehicles from freeway emergency lanes is also underway in several cities. New methods of marking the vehicles to readily identify when they were checked is helping reduce the time it takes to get them impounded. Reducing the waiting time limit required before they can be impounded is also effective. Allowing non-police service patrols to tag and check the vehicles can also reduce delays in their removal from the roadside.
- More involvement by transportation agencies in day-to-day incident management issues is also significantly increasing, due in part to their better ITS traffic monitoring and data collection.
- Better incident management planning for construction projects is being formally incorporated by some states, and by numerous construction managers and Districts of many DOTs.
- Better training for all responders is now being recognized as a fundamental need.

2.6 CONCLUSION

This task activity of the research project has developed a partial overview of incident management programs throughout the nation. There are a large number of other good programs that were not mentioned because they are basically consistent with the program examples covered in this section of the report. Additionally, there are numerous other programs that are being created, updated, or expanded, which makes it difficult to provide a thoroughly timely and accurate summary.

For that very reason, it is encouraging to report that, on a national basis, the awareness of and the level of professional interest in the field is increasing daily. For reasons of traveler and responder safety as well as highway system efficiency this progress needs to be supported and carried further.

Arizona has some excellent incident management programs and policies in place already, with strong support from the partner response agencies (see Section 4). These initial efforts can benefit by the experiences of others, as described above, in developing a statewide plan that will make Arizona even more prepared to deal with incidents properly.

Based upon the current level of effort and involvement, and if the key agencies, elected officials and private industry will support this statewide planning process, Arizona can become the nation's leader in comprehensive incident management within the next two years.

3.0 STATEWIDE FOCUS GROUPS INPUT

The key factor for success for this project's recommendations, as seen by the consulant, the ATRC and the agency partners, was the ability to seek out information at the local level across the state of Arizona. It was agreed that the fact-finding team must visit every region of the state in order to gather information on needs, on problems, and on what current practices were already working successfully for local highway incident responders. The fundamental mandate for the project team was first to speak, and then to listen.

As described earlier, two series of eight meetings were needed. The first eight sessions raised the level of awareness on current Incident Management concepts and vision, and gathered information on local conditions and operating plans. Later, all participants were sent draft recommendations. Then, a second series of workshops were held in the same locales as the first, to work out any issues with the draft and to accept input from any agency that had missed the earlier meetings. The Focus Group meeting schedules and invitations are included in Appendix C.

The focus groups in each location provided a significant amount of insight pertaining to local issues and conditions. A total of 258 incident management stakeholders attended the first eight meetings held in December and January. [1] At each location across Arizona, new issues were brought up in the focus group meetings. The attendance counts at each of the follow-up series of meetings were nearly the same, which showed the keen interest at every level in these IM issues.

Making contact with all appropriate stakeholder agencies was a major task for the consultant. Contact lists were developed from ADOT's local District offices and Community Relations staff, and from the TAC members, which ultimately supported the sending of over 700 meeting notices. All police agencies, fire departments, Sheriff's offices, public works, and public transportation agencies were invited. Private firms including ambulance companies, towing companies, trucking associations and and auto clubs were also invited, as were all of the tribal and many of the federal agencies in Arizona.

Of the more than 250 incident management stakeholders who committed their time to attend one or both of these meetings, there were 91 ADOT personnel, 30 from the Department of Public Safety, and 22 individuals form the towing industry. The meeting sign-in sheets show that stakeholders represented 57 cities and towns across the state of Arizona.

In general, many issues from the Focus Group meetings were universal across the state. There were of course several unique types of needs on a more local basis, due to Arizona's tremendous range of climate and terrain. The Northern regional meetings had more specific issues related to winter's inclement weather, while southern tier meetings were more concerned about commercial truck crashes, border issues, and congestion.

Table 2 illustrates the issues, and identifies where they were mentioned. This summary ranks the need categories by the number of regions where they were seen as critical issues. [2]

Table 2

Analysis of Issues Raised in Focus Groups
(Two or More Mentions Statewide)

Arizona Incident Management Focus Groups, First Series
December-January, 2000

Note: Issues presented below are ranked by the number of focus group mentions

ISSUE	Mentions	Yuma	Phoenix	Kingman	Prescott	Holbrook	Flagstaff	Tucson	Safford
Inter-agency communications	8	♦	♦	♦	♦	♦	♦	♦	♦
Incident Management Equipment/Funding	8	♦	♦	♦	♦	♦	♦	♦	♦
Update Towing Regulations	8	♦	♦	♦	♦	♦	♦	♦	♦
Responder Safety	8	♦	♦	♦	♦	♦	♦	♦	♦
Patient Care and Transport	8	♦	♦	♦	♦	♦	♦	♦	♦
Prevention of Secondary Crashes	8	♦	♦	♦	♦	♦	♦	♦	♦
Interagency Training	8	♦	♦	♦	♦	♦	♦	♦	♦
Need Better Information for the travelling public	7		♦	♦	♦	♦	♦	♦	♦
Liability for Traffic Control Issues	7	♦	♦	♦	♦	♦	♦	♦	
Better Use of Variable Messaging Boards	7		♦	♦	♦	♦	♦	♦	♦
Hazardous Material Response Times and Haz-Mat Incident Management	7	♦	♦	♦		♦	♦	♦	♦
ADOT Lacking Resources to Adequately Respond to Major Incidents	7	♦		♦	♦	♦	♦	♦	♦
Emergency Light Discipline	6	♦	♦	♦	♦		♦	♦	
Staffing Issues	6	♦		♦	♦	♦	♦	♦	
Vehicle Placement during Emergencies	6	♦	♦		♦	♦	♦	♦	
Post-Incident Analysis	6	♦		♦	♦	♦		♦	♦
Quick Clearance Legislation & Reduced Liability for Clearance	5	♦	♦		♦		♦		♦

ISSUE	Mentions	Yuma	Phoenix	Kingman	Prescott	Holbrook	Flagstaff	Tucson	Safford
Cost Recovery for ADOT Districts and Towers	5	♦		♦	♦	♦		♦	
Incident Command Issues (who's in charge, who's responding, etc.)	5	♦	♦		♦		♦		♦
ADOT/Towing Industry Traffic Control Policy Memo	5	♦		♦	♦		♦	♦	
Alternative Route Issues	5		♦	♦	♦		♦		♦
Inclement Weather Issues	5			♦	♦	♦	♦		♦
Integrate Incident Management into Construction Zone Planning	4		♦		♦		♦	♦	
Implement Highway Advisory Radio	4			♦	♦	♦	♦		
Salvaging Loads	3	♦		♦	♦				
Service Patrols or Motorist Assistance	2		♦					♦	
Marking Roadways to Locate Incidents	2	♦	♦						
Incident Traffic Control Training	2		♦		♦				
Chain Laws	2			♦			♦		
Adjusting Traffic Signals for Incidents	2		♦					♦	

Other, Single issue Mentions from individual Focus Groups:

Yuma – Size of front-end loaders required, police and fire hesitancy to call ADOT, long distances lead to long response times, standardized policy needed for road closures, and patient care the first priority.
Phoenix – Radio linkages between media station aircraft, quality of information available for ADOT crews.
Kingman – Transportation of trauma victims over long distances, fine structure and policy for abandoned vehicles, liability of detouring traffic on city and county streets.
Prescott – Long response times, better information on construction projects, signage standards, and plain language instead of incident codes.
Holbrook – Continued availability of air ambulances, multifunctional training, photogrammetry, critical incident stress, better coordination between Indian and local governments with intergovernmental agreements, travel times for coroner, and mass evacuations.
Flagstaff – Inclement weather issues: bottlenecks, traction controls, variable speed limits, traffic volumes, single lane restriction during inclement weather, weather forecasting, on-call towing contracts during inclement weather, and a traffic operations center in Flagstaff.
Tucson – Electronic transfer of information between agencies, ITS issues, public education and public service announcements, senior leadership guidance, major accident investigation policies, and fuel spills.
Safford – Lane closure permit problems.

4.0 CURRENT ARIZONA PLANNING STATUS AND ISSUES

One of Arizona's key information needs in this field was to determine the current status of incident management activity in the state relative to regional and national levels of activity. Developing the current Arizona planning status and issues report was a concurrent task that was accomplished with information gathered from the focus groups, with input from the project's Technical Advisory Committee (TAC), and with interviews of other incident response professionals. Arizona has recently accomplished significant improvements and is already planning others, which are outlined in this section of the project's research report.

Arizona efforts to improve all aspects of incident management have increased in the past several years. Recognizing that growth would increase faster than funding and construction of additional roadways, Arizona has implemented one of the most comprehensive congestion management and freeway management systems in the United States. The development of the Traffic Operations Center (TOC) in Phoenix, plans for satellite regional centers in Tucson and Flagstaff, and the wide deployment of Intelligent Transportation Systems (ITS), all will enable a long-term program of improvement by Arizona emergency response and transportation agencies.

For example, the Highway Condition Reporting System (HCRS) and linked Roadway Condition Reporting System (RCRS) both can provide excellent route traffic information for motorists and commercial transporters. The HCRS provides state highway system information that includes border areas of partner states, and RCRS offers local / regional roadway information. These complementary systems are among the first examples of statewide efforts to make entire corridor information available 24 hours per day.

Arizona's ITS planning and deployment work is a key part of the overall incident management program. The ability to detect, and verify all pertinent details of incidents while providing motorists with real time valid traffic information can reduce congestion, decrease pollution, and most importantly, prevent secondary collisions. Managing traffic flow, keeping traffic information current, and providing route information through Variable Message Signs (VMS), the media, telephone, and Internet all help to eliminate unnecessary delays for motorists.

The Arizona Department of Public Safety (DPS) has also taken steps to improve incident management. They have committed resources to respond faster and with more staff to key roadways that have experienced high collision rates and lack alternate routes. The support for these major collisions includes deploying aircraft for aerial photographs, traffic management guidance, and quick transport of investigators or equipment. DPS is also using new technologies to reduce the time required to investigate felony or fatal collisions. Total Station surveying equipment is being used to map accident scenes and produce more comprehensive diagrams. Investigators have received training to reduce on-scene time and are using photo-based software to save time in taking measurements.

DPS is also involved with ADOT working groups throughout the state on a variety of Incident Management issues. They are conducting and participating in training to manage all types of incidents in a more effective manner. They have studied co-location of their communications operations in Phoenix with the TOC.

Other key current Arizona planning and implementation efforts, as well as issues, are:

1. Traffic control agreements between the towing industry and ADOT. This effort began when a need was identified to clarify who was responsible and how traffic control for long-term cleanup, primarily of truck crashes, would be handled. The current working agreement was

implemented in 1999; however, there are still issues to resolve before it has uniform support and implementation.

Some areas of the state do not have adequate ADOT resources to provide proper long-term traffic control for truck recovery activities. They have asked that the towing industry either contract with a traffic control vendor or handle traffic control themselves.

2. Interagency Levels of Service is a concept that has been agreed upon by ADOT and DPS [3]. This agreement outlines what the goals are for levels of service, response, investigation, and clearance of major collisions. Both rural and urban criteria were developed to make sure there was a clear set of goals for the entire state.

   This agreement is one of the first of its kind in the nation. The agencies have outlined what the levels of service and goals are to help determine what acceptable time frames would be for each aspect of incident response. These goals need wide distribution and discussion to make sure all key personnel are aware of their content and the reason they are needed.

3. ADOT's Statewide Alternate Route Plan is completed. This is a tabular-format workbook of route segment closures with approved detour options. The research project became necessary when long closures resulted in extreme traffic backups, and practical alternate routes were not designated or marked for use by diverted traffic. When congested multiple lane freeways are shut down for any reason, a number of alternate routes, if available, will be required to effectively disperse the traffic from the freeway onto secondary roads. This plan will give transportation and police officials the ability to manage this shift of traffic as safely and efficiently as possible under the circumstances.

   Alternate routes do have their limitations, especially for truck traffic. Reducing the length of closures is the most effective method of reducing the need for alternate routes. In addition, keeping motorists informed of projected re-opening time estimates will allow them to wait and not divert to a long alternate route.

4. The Statewide Emergency Operations Plan was developed for all types of major emergencies. It contains agreements between agencies and designates who is the primary agency for all types of disasters. It follows the Incident Command System guidelines for managing incidents.

   This plan is not referred to for most traffic incidents but is a very good document to use for training purposes. If a major incident is beyond the capabilities of the local responders, the statewide plan can be implemented and provide support to the local efforts.

5. TOC (Traffic Operations Center) Incident Management Operations Guidelines were developed to help the staff of the Phoenix TOC manage incidents better. They contain a comprehensive set of guidelines for all types of roadway emergencies with implementation procedures spelled out for each.

   The TOC staff is the key to successful implementation of motorist information procedures for incident management. They rely on the DPS and ADOT field personnel to keep them up to date on the details of all incidents that have a long-term effect on traffic flow. When the planned additional VMS signs come on line, the workload in the center will increase.

DPS will continue to play a major role in this process. They must keep the TOC staff well informed on the progress of all lane-blocking incidents, and any other situations that are reducing the capacity of the roadway.

6. Statewide ITS strategic plans have been developed to ensure that Intelligent Transportation Systems are deployed throughout Arizona in the best manner possible. All the plans are being coordinated to prioritize implementation strategies, determine optimum locations for installations, and coordinate purchasing and installations. Interagency agreements and coordination are a large part of this process.

7. As part of the ongoing ITS deployment efforts, several specific initiatives were undertaken in the Phoenix region to effectively manage the roadway transportation system. One such initiative deals with the deployment of a traveler information system that provides real-time data to travelers in a web-based format at www.azfms.com, through kiosks in the field, and through a telephone line. Available information for the Phoenix freeway system includes dynamic speed map information, CCTV camera pictures, and VMS sign messages. The goal of this project was to share information with travelers so that they may plan ahead and determine which route will provide the most efficient path (see Section 9, AZTech, below).

8. The ADOT Highway Condition Reporting System provides information about the status of maintenance activities, road construction, special events and incidents to travelers on Arizona's highways. This data is manually inputted into the HCRS, where they are transferred to the AZTech server to be processed and distributed to private partnerships and to the public by telephone, kiosks, and on the ADOT web sites www.dot.state.az.us or www.azfms.com. Information can also be received by calling toll-free to 1-888-411-ROAD (411-7623).

   Until recently, Rural ITS was not widely recognized as a good investment, but that has been proven to be untrue in several national applications. The statewide VMS system in Arizona, for example, can have a highly positive effect on intrastate traffic as well as interstate traffic when used to keep motorists informed well enough in advance to give them a broader range of choices. When closures may last hours, informing drivers even hundreds of miles away can allow then to take better alternates, stop and rest in appropriate locations, or postpone their trips until full roadway use is resumed. ADOT and private partners have established a web-based rural traveler information program for northern Arizona, at arizona.tripusa.com/

9. "AZTech" is an ambitious undertaking to expand and improve the overall ITS program in the Phoenix area. [4] Supported under the Model Deployment Initiative (MDI) by The Federal Highways Administration (FHWA), this program tied city, county, and state freeway and traffic control functions together electronically. Information is transferred to the AzTech server to be processed and distributed to the public. See www.aztech.org.

10. Incident management teams are working together informally in several areas. ADOT has facilitated this process by initiating meetings, funding incident management workshops, and developing local agreements for IM related issues. Improvements in response and clearance times as well as interagency coordination have resulted from several successful applications of incident management techniques in rural parts of the state. These interagency working groups continue to grow and expand into other parts of the state.

11. ADOT has also initiated a training program for hazardous materials incidents and Incident Command Systems (ICS) training. This program provides a good working knowledge of these topics for ADOT personnel and enables them to work more effectively with other response agencies. Safety for all responders is also improved through this program.

12. U S Highway 93 has been the focus of an emergency notification system research project to determine the ability of programs such as Mayday to reduce detection and verification times for remote accidents. Mayday devices can transmit a signal via satellite if activated in a crash or other emergency. This NAFTA route corridor carries high volumes of traffic through remote, sparsely populated areas that lack cellular coverage, telephones and emergency response coverage. Recommendations from this project included rural workzone service patrols, a commercial vehicle corridor watch program due to the high volume of trucks, and testing of satellite call boxes in remote areas that lack cellular coverage. Both the first and the third of these concepts have received limited funding commitments for pilot programs.

This report section has summarized the most significant of the many recent and ongoing initiatives related to incident management in Arizona. The recommendations that will be developed in the next portion of this report will take into consideration each of these current programs as well as the suggestions and the needs expressed in the statewide focus group meetings.

5.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

Table 3 on the following pages presents a summary of the research project findings on Arizona's incident management issues and priorities, as submitted by the IM stakeholders in the workshops. This matrix of issues provides the structure for the detailed recommendations that follow.

Please note that the "high" priorities reflect the input from the focus group workshops. All of the 61 individual concerns identified by stakeholders were assigned "high or low" priorities in the second series of focus group meetings. Those rated "high priority" by more than 90 percent of the stakeholders are shown in Table 3 in **bold**.

The project Technical Advisory Committee (TAC) members, representing the state's core highway, enforcement, and response agencies, then determined the final ranking for each of the 18 categories of this table. They reviewed and discussed the stakeholder prioritization percentage figures, and they reached a consensus based on the group's statewide perspective and their knowledge of each involved agency's interests, resources and concerns.

Some recommendations, such as care and transport of injured, are clearly a high priority, however, they were not so highly rated by response stakeholders in this process. That fact may be due to the perception that patients presently are being well cared for, and that little change is needed in this element of the process. Also, some recommendations are region-specific and did not get strong support from other parts of the state. That impacted their relative ranking in the report, but it does not diminish their importance.

The table indicates who has ownership of an incident management issue, and therefore who will have to take action to get the recommendation implemented. Where individual agencies have this control, they are identified in the issue description. As noted in the header, "Legislative" action for change refers in Arizona's case either to legislated changes in enabling laws, <u>or</u> to legislature-funded <u>new</u> resources for the affected agency. The project Technical Advisory Committee developed these views on implementation ownership with additional solicited input from the District Engineers of ADOT.

Following Table 3, all of the 18 categories of key IM issues are subsequently discussed and summarized in this Section 5.0 of the research report. The table and the supporting information on the 18 recommendation categories is basically identical to the project's main deliverable product, the Statewide Roadway Incident Management Plan, released in May 2000. Some minor status updates and text corrections were made later, in the preparation of this final report.

Final research project conclusions, recommendations, perspectives and current status are then provided as Section 6.0 of this report.

Table 3

SPR 497 – STATEWIDE ROADWAY INCIDENT MANAGEMENT PLAN RECOMMENDATIONS				
Stakeholder Evaluation Summary w/ Technical Advisory Committee Input				
ITEM NO.	**ISSUES** Ranked by the TAC from Stakeholders' Priority Voting (*Bold: Issues w/ more than 90% as "High Priority"*)	What Type of Action is Required? ("Legislative" means Law or Budget impact)	PRIORITY High – Low	
1	PREVENTION OF SECONDARY CRASHES			
A	**Secondary Crash Reductions as a Multi-Agency Goal**	**Multi-Agency**	**95%**	**5%**
B	More Consistent Response by ADOT Statewide	Individual Agency	81%	19%
C	Faster VMS Implementation and Media Notification	Multi-Agency	83%	17%
D	Development of Team Training to Prevent Secondary Crashes	Multi-Agency	89%	11%
E	Seek Quick Clearance and Reduced Liability Legislation	Legislative	88%	12%
2	INTER-AGENCY TRAINING			
A	Better Use of Variable Message Signs – ADOT	Individual Agency	85%	15%
B	Emergency Light Discipline	Multi-Agency	77%	23%
C	**Vehicle Positioning at Incidents**	**Multi-Agency**	**91%**	**9%**
D	Incident Command – Who's in Charge?	Multi-Agency	82%	18%
E	Multi-agency Traffic Control Training	Multi-Agency	81%	19%
F	Conduct Post Incident Review of All Closures Over 3 Hours	Multi-Agency	77%	23%
3	COMMUNICATIONS			
A	**Develop Statewide Communications System / Support Computer Dispatch system for DPS**	**Legislative**	**91%**	**9%**
B	Implement a pilot program of any communications program in a rural area involving ADOT, DPS and Fire Departments	Multi-Agency	76%	24%
C	Establish Direct Communications Between Media Aircraft and the DPS	Individual Agency	61%	39%
D	Expand DPS Media Alert System	Individual Agency	68%	32%
E	Continue Efforts for Northern and Southern AZ Regional Traffic Operations Centers	Legislative	75%	25%
4	INVESTIGATIONS: TECHNOLOGY AND TRAFFIC MANAGEMENT			
A	**Conduct Training to Reduce Size and Length of Closures**	**Multi-Agency**	**93%**	**7%**
B	Implement a Peer-to-Peer Program to Share Best Practices	Multi-Agency	76%	24%
C	Form Teams for Felony and Fatal Collisions	Multi-Agency	72%	28%
D	Seek /Use Better Investigative Technology & Procedures – DPS	Individual Agency	77%	23%

ITEM NO.	ISSUES: Ranked by the TAC from Stakeholders' Priority Voting (Bold: Issues w/ more than 90% as "High Priority")	What Type of Action is Required? ("Legislative" means Law or Budget impact)	PRIORITY High – Low	
5	RESPONDER SAFETY			
A	**Evaluation of Response Training to Increase Safety - ADOT and DPS**	**Individual Agencies**	**91%**	**9%**
B	Search for Latest Equipment and Training – ADOT	Individual Agency	75%	25%
6	INCIDENT MANAGEMENT EQUIPMENT AND FUNDING			
A	Develop a Statewide Response Program Within ADOT	Legislative	86%	14%
B	Upgrade Equipment for Response	Legislative	87%	13%
C	Implement Take-Home On-Call Procedures – ADOT	Individual Agency	82%	18%
D	Determine if Risk Management can Fund Improvements	Multi-Agency	85%	15%
E	Provide Joint Purchasing of Traffic Control Equipment	Multi-Agency	58%	42%
F	More ADOT Portable Cellular VMS Signs for Incident Response	Individual Agency	83%	17%
7	LIABILITY FOR TRAFFIC CONTROL ISSUES			
A	Review Past and Current Arizona Litigation to Detect Trends	Multi-Agency	71%	29%
B	Utilize Liability History of Programs in Other States – ADOT	Individual Agency	65%	35%
C	**Pursue a Liability Cap for Arizona**	**Legislative**	**91%**	**9%**
8	TOWING AND RECOVERY			
A	Upgrade Towing Regulations	Legislative	82%	18%
B	Provide Recovery Training and Certification	Multi-Agency	74%	26%
C	Implement an On-Call Heavy Duty Towing Snow Program	Legislative	61%	39%
D	Implement a Chain Law for Trucks over 10,000 pound GVW	Legislative	71%	29%
E	Expand the Traffic Control Agreement	Multi-Agency	65%	35%
F	Explore Payment by the Pound for Recovery – DPS	Individual Agency	33%	67%
G	Implement an Expeditious Salvaging Loads Policy	Multi-Agency	67%	33%
9	FORM REGIONAL INCIDENT MANAGEMENT TEAMS	Multi-Agency	87%	13%
10	ALTERNATE ROUTES			
A	Familiarize All Response Agencies with New Plans	Multi-Agency	82%	18%
B	Develop Notification Procedures for Other States	Multi-Agency	57%	43%
C	Develop and Distribute an Alternative Route Map	Multi-Agency	71%	29%
D	Implement a Traffic Signal Plan for Incident Management	Multi-Agency	68%	32%

ITEM NO.	ISSUES: Ranked by the TAC from Stakeholders' Priority Voting (Bold: Issues w/ more than 90% as "High Priority")	What Type of Action is Required? ("Legislative" means Law or Budget impact)	PRIORITY High – Low	
11	REQUIRE CONSTRUCTION ZONE INCIDENT MANAGEMENT PLANS	Multi-Agency	76%	24%
12	TRAVELER INFORMATION			
A	Develop a Partnership for Motorist Information	Multi-Agency	70%	30%
B	Develop an Agreement with the Emergency Advisory System	Multi-Agency	81%	19%
C	Improve the Accuracy and Timeliness of HCRS	Multi-Agency	84%	16%
D	Study if Marking Roadways Will Help Locate Incidents – ADOT	Individual Agency	49%	51%
E	Implement & Evaluate Highway Advisory Radio (HAR) - ADOT	Individual Agency	50%	50%
13	PATIENT CARE AND TRANSPORT			
A	Develop Interagency Agreements and Training	Multi-Agency	74%	26%
B	Develop a Policy for Consistent Removal of Bio-Waste	Multi-Agency	70%	30%
C	Develop a Policy for Organ Donors in Fatal Collisions	Multi-Agency	48%	52%
14	STAFFING ISSUES			
A	Develop a Regional Staffing Request	Legislative	79%	21%
B	Develop a Statewide Staffing Needs Summary – ADOT & DPS	Individual Agencies	69%	31%
15	HAZMAT ISSUES			
A	Reevaluate the Shipment of HAZMAT in Bad Weather	Multi-Agency	70%	30%
B	Develop a Consistent Diesel Cleanup Procedure	Multi Agency	68%	32%
16	EXPAND COST RECOVERY AND RETURN FUNDS TO LOCAL ORGS	Legislative	75%	25%
17	DEVELOP INTERAGENCY AGREEMENTS WITH TRIBAL AGENCIES	Multi-Agency	62%	38%
18	DEVELOP A PHOENIX AREA SERVICE PATROL PROGRAM BY 2001	Multi-Agency	62%	38%

5.1 PREVENTION OF SECONDARY CRASHES

Crashes that occur as the result of previous incidents result in deaths and injuries on a frequent basis. These collisions often occur before responders have reached the scene or before they have had time to make the scene safe. The occurrence of these tragedies is entirely unpredictable; however, they increase in severity and number on high speed, heavily traveled roadways. Secondary crashes are often far more severe than the original incident that created the traffic queue (or back-up).

A recent study by the Missouri Department of Transportation in the St. Louis area found that 28% of the collisions in a two-city area on Interstate 270 were secondary to other incidents. [5] According to FHWA, a similar study in Minnesota indicated that 13% of their collisions were secondary. The significant difference in these studies may be associated with the volume of traffic, roadway design, average speeds, methods used for response, motorist information, and response times.

California has a Traffic Management Team that responds immediately to set up warnings behind the back-ups associated with blocking incidents. Based on traffic volumes, and types of incidents, they may deploy trucks several miles from the incident location to advise motorists about the incident with their truck mounted VMS signs. This program has been credited with reducing the number and severity of secondary crashes.

Response programs in numerous other states and cities such as Portland, Oregon and Salt Lake City, Utah have the prevention of secondary crashes as a primary mission. They use service patrols, incident response vehicles, VMS, motorist traffic reports, police officers, Highway Advisory Radio (HAR) and DOT maintenance to provide this service.

Recent events in Arizona, such as a fatality crash on Interstate 10 in western Arizona that took seven lives, are tragedies that do occur after responders have arrived. While driver error is the primary cause of this and all secondary crashes, efforts to reduce these types of crashes are increasing. There are obstacles to improvement such as the time required to respond, the lack of resources, and weather conditions. A team approach to protection of the traffic back-up can have a positive impact.

Quick Clearance and Reduced Liability Legislation

Some 14 states, including Florida, Texas and California, now have passed laws requiring motorists to remove their vehicles from the roadway if they are not injured seriously and if the vehicle can be driven. These statutes are supported by the insurance industry, trucking industry and auto clubs and are designed to keep congestion to a minimum.

Other states such as Maryland and Washington have implemented quick clearance by agency policy or mandate. Signs on their freeways give motorists the message – "FENDER BENDER? CLEAR THE ROADWAY!" [6]

A second part of some of these statutes is a reduced liability section for police, DOT, and the towing personnel acting at their direction. They can quickly remove load materials and vehicles to open roadways without liability unless there is gross negligence. The key to this process is also training and an understanding of the right application of the policy. Vehicles of all types should be removed from the travel portion of the roadway immediately by whatever safe means is available. Damage associated with the prudent clearance of lanes is not a liability issue in these states.

The latest state to implement this law is California. It gives the CHP the authority to clear roadways without liability, and it will eliminate waiting for the owner of the truck or cargo to determine cleanup needs. [7] Maryland has accomplished the same by Executive Order jointly signed by the Director of the State Highway Administration and the Chief of the Maryland State Police. [8]

Recommendations

A. Establish the reduction of secondary crashes as a multi-agency goal. Add prevention of secondary crashes to ongoing and entry level training programs.

B. Implement better, more consistent response by ADOT, especially after normal business hours, to provide better traffic control at incidents and to reduce secondary crashes. This need is also discussed in Section 6, Incident Management Equipment and Funding.

C. Improve the implementation of VMS messages and media notification when incidents that impact traffic have occurred. This improvement will require better information from DPS and Fire to the ADOT Traffic Operations Center, and proactive use of messages by the TOC staff.

D. Develop a team approach for managing blocking incidents with secondary accident prevention being part of the collective immediate response criteria.

E. Quick clearance and reduced liability legislation was considered in Arizona in 1998 without success. It should be considered again.

5.2 INTER-AGENCY TRAINING

On November 17, 1999, a multiple truck and car fatality crash occurred in Texas Canyon on Interstate 10 west of Wilcox. Three trucks burned in the crash, one of which was carrying flammable cleaning solvents in 55 gallon drums.

Several of the responders from fire, DOT, DPS, and towing had attended a multi-agency training program less than three months before. Traffic was at least partially restored in both directions within 4 hours. Secondary incidents were prevented by a combined approach of utilizing temporary alternate routes and portable VMS signs. Response to this accident came from two fire departments, two ADOT maintenance offices, DPS, the Sheriff's office, and two towing firms.

Mike Seney of ADOT Willcox Maintenance was part of the response to this major truck crash that was cleared rapidly and safely, without any secondary collisions. He stated:

> "I think the most helpful part of the training was all of us in one room hearing the other groups' priorities. It gave all a better understanding of the pressures each face. By knowing that, I think all parties put more effort in trying to meet the needs of the others. [9]

Training programs can resolve a large number of the issues from the focus group meetings and should be a basic goal of this plan. While it is very common for agencies to train internally on a frequent basis, they seldom participate in training with other agencies unless it is related to larger emergencies like terrorism, aircraft crashes, floods, or mass casualty issues.

Multiple agency responses to traffic collisions occur every day, yet there are often confusion and delays. Most responders do a very good job on their elements of the response, but collectively there are still areas that they could work on to improve.

Recommendations

The following focus group issues should be addressed in multi-agency training:

A. Better Use Of Variable Message Signs

Expanding the network of VMS signs gives ADOT the capability to use the system statewide for all types of motorist information. All agencies that respond to incidents that impact traffic flow on state highways should be given an overview of the VMS program so they can provide better information to the TOC.

The current VMS system on the freeways in the Phoenix area relies on the ADOT operators to detect the incidents, interpret them, and activate the signs. If the incident is outside the range of the detection and camera system, they must rely on the DPS officers. Often the officers do not request the use of these signs because they are busy with the incident and may not know the extent of the incident impact on traffic. When the VMS program is expanded, there will be a significant need for training in each new deployment area.

Training should include the criteria for use, procedures for getting messages posted, and the notification process to activate and deactivate messages.

B. Emergency Light Discipline

The Phoenix Fire Department has developed a training videotape with an emphasis on light discipline at roadway incidents. It is based on the need to provide better visibility for motorists by reducing the amount and types of lights in use at incident scenes. Several studies in other states are referenced in the tape and all emphasize that light control can increase safety. [10]

The California Highway Patrol has always restricted emergency lights in the roadway during emergency response, and while actually stopping violators. They want motorists to know it is an actual emergency when blue lights are illuminated. Officers are trained to turn them off during violator stops and to use amber lights only.

Light control can also reduce congestion and dangers associated with motorists that are distracted trying to see what is occurring at an incident scene. Members of ADOT and DPS have tried turning off excessive emergency lights at crash scenes on I-17 with positive results. Motorists seem to drive better and not slow dramatically when these lights are not on.

The Phoenix Fire Department training film is a good start to improving light discipline statewide. All police, fire, and ambulance companies will require information on this training. Due to the long-standing policies for emergency light use, change will be resisted and will take time to accomplish.

C. Vehicle Positioning At Incidents

This issue is very similar to the light discipline training. Multiple agencies respond to accidents every day, and vehicle positioning is based on who arrives first. How the vehicles are arranged at the scene depends as much on arrival order as on function.

Unified efforts in some parts of the nation have revealed that there are functional methods to place vehicles that reduce the impact on traffic and can help reduce the duration of incidents.

Vehicles should be positioned so that multiple tasks can be accomplished at the same time. Inclement weather and limited visibility issues change the deployment of vehicles to increase the safety of the responders. Changes in vehicle deployment in Utah are credited with reducing the number of vehicles being struck on icy roads by over half. Part of multi-agency training should include vehicle positioning for all types of incidents in all types of conditions.

D. Incident Command - Who's In Charge?

Incident Command Systems (ICS) training has been conducted for several years for fire and police departments. It is based on the command structure used in the United States Marine Corps and the Army. ICS provides a flexible structure that can be adapted to all sizes and classes of incidents.

Under this system, there is only one incident commander. It is difficult to apply this process with a strict interpretation to multi-agency participation at roadway incidents.

Unified Command takes a slightly different approach. Each agency that responds has an incident commander. They work as a team to manage the incident. The agency with the primary responsibility at the scene has the overall incident command responsibility. Support is provided by the other responders during each phase. One agency may conclude their portion of the incident and relinquish command to the agency with the next primary responsibility.

A typical injury accident starts with the first responder being the incident commander until relieved by higher authority. It may be a police officer, fire officer, ambulance crewmember, or other official responder who arrives first. All first responders should know the process of site management and have all the skills required to protect the scene, provide first responder first aid, communicate the needs for additional response, identify hazardous materials issues, control traffic, and organize the response.

Incident responders should train with responders from other types of agencies to gain an understanding of their priorities. This type of training creates familiarity and working relationships and solves the institutional issues that can affect operations at an incident.

E. Traffic Control Training

Traffic control measures taken at incident scenes can improve responder safety, prevent secondary crashes, and decrease motorist delays. All emergency responders should have a basic understanding of the proper procedures to be used when portions of roadways are affected by incidents. Inclement weather and darkness require additional traffic control measures and each responder should also be aware of what they are.

Traffic control training for ADOT personnel is based on the Manual of Uniform Traffic Control Devices (MUTCD). It is more extensive and rigid than training for police and other responders. Some response agencies are not aware of the requirement to develop an MUTCD plan for incidents that extend beyond a reasonable period of time.

Cross training of responders in several states such as Oregon and Florida has resulted in increased effectiveness at incident scenes. Officers help operate the "Jaws of Life" and other fire equipment, and all firefighters have had basic traffic management training.

F. Post-Incident Analysis

After-Action reviews or analyses of serious incidents are opportunities to determine training needs, identify successful practices, recognize exemplary performance, and determine what improvements are needed.

Reviews should be conducted with all agencies that took part in the incident and should be scheduled within a few days of the incident. A chronological review of incident details with all agencies providing comment is an accepted method of handling reviews. Notes should be taken and a list of follow-up issues developed, with someone specifically tasked to handle them. A later meeting may be set if issues are not resolved.

Post-incident analysis should be conducted whenever closures exceed three hours.

5.3 COMMUNICATIONS

Communications problems covered a wide range of concerns. The most common issue was the lack of ability to communicate from one agency to another using radios. Some agencies have switched to new 800 MHz systems that are not compatible with the older frequencies still in use by numerous agencies. The result of this inability to speak directly to other responders by radio causes delays, mis-information, confusion, and frustration. Responders needing immediate assistance must convey their request through a communications center staff who then must call another center to have the information relayed to the recipient. The accuracy of the information also suffers when the message is repeated three times by the time the person it is intended for receives it.

In the case of agencies that work closely with each other, this lack of radio communications is a responder and public safety concern. Delays in getting assistance at incident scenes can lead to an increase in secondary collisions and more exposure to injury for responders.

Communications Expedients

Communication between ADOT and DPS is not consistent throughout the state. Responders in some rural areas have solved the problem by cross-installation of old radio equipment donated by the parter agency. Maintenance of these old radios is a long-term problem as repair parts are difficult to obtain, however, the officers and ADOT maintenance personnel indicate that they are still valuable tools.

In most areas of the state, significant numbers of responders have either been issued cellular telephones or have purchased their own. As cellular coverage improves, this tool becomes a more cost-effective alternative to purchasing and installing new radio systems. Agencies that are not

involved in the incident management response process on a frequent basis were less concerned about the radio frequency issue. They were more concerned about the on-site communication and coordination between agencies when a multitude of agencies was present. They were also concerned about the timeliness and accuracy of information when initially notified of incidents.

In the Phoenix area, there is a distinct difference in the flow of information between ADOT and DPS where the roadway is instrumented. Traffic Operations Center (TOC) personnel can activate Variable Message Signs and provide information to the media and motorists based on what they detect and observe on their system. When incidents occur outside the installed range of the Freeway Management System (FMS), ADOT often is not informed in a timely manner, if at all. Staff members at DPS Communications do keep ADOT informed whenever possible, but emergency communications needs are a priority. The center staff is limited and sometimes are not able to make timely calls to ADOT.

These incidents could be handled better if the communications flow between the two agencies was less dependent on person-to-person voice communications. Several agencies in the country have either co-located with DOT centers or share real time emergency traffic information electronically.

Computer-Aided Dispatch Systems

One significant drawback to implementing a communications program like these in Arizona is the lack of a Computer Aided Dispatch (CAD) system in DPS communications. CAD would be able to provide electronic data on incidents to ADOT as soon as they were received and entered into the system. ADOT would then be able to utilize the FMS to better inform motorists, reduce the likelihood of secondary crashes, and improve responder safety.

With the planned completion of the rural VMS installations, this becomes a statewide issue. Information about incidents on rural interstates and major routes must be provided to ADOT quickly so the VMS system can be activated. Delays in utilizing the system or inadequate information can be an embarrassment and even a potential liability problem for both agencies.

Public-private direct communications can also be beneficial to response organizations. Airborne traffic reporters in some cities have the capability to talk directly with the responders on the street. This allows better two-way information flow and better motorist information. Traffic reporters provide responders with accurate information on incident status, giving them the big picture they can use to be more effective. These programs also build rapport and improve the image of the response agencies through the positive comments the traffic reporters frequently use to describe the street level efforts.

DPS also provides information to the media through its Media Notification System. The system allows for a one-call format, which is sent to up to 35 agencies and media outlets simultaneously. This system is operating at maximum capacity and needs to be updated to accommodate additional media recipients.

In southern areas near the international border, cellular transmissions are often interfered with by Mexican cellular phone traffic. Responders are unable to use their cellular telephones effectively in those areas due to this interference. Cellular providers on both sides of the border have been asked to correct this problem and they report that some progress is being made.

Development of Northern and Southern Regional Traffic Operations Centers

The expansion of District office capabilities as part of the statewide Traffic Operations program was requested in focus group meetings. During inclement weather, a temporary center is activated to deal with any potential increase in incidents. For instance, in Flagstaff the District Snow Desk

becomes extremely busy for extended periods of time during winter storms. I-17 and I-40 in the Flagstaff area have unique problems that are rarely experienced in southern Arizona, and summer thunderstorms and dust storms are frequent in southern Arizona while rare in northern Arizona. Close coordination of such satellite centers would still be required with the Phoenix TOC, which is operated 24 hours per day 7 days per week.

Recommendations

A. Interagency communications limitations continue to impact the effectiveness of incident management and responder safety across Arizona. Support for DPS in its effort to upgrade the overall communications system is strongly recommended. A Computer Aided Dispatch system (CAD) for DPS will provide a significant management tool for DPS command staff to better evaluate the effectiveness of the incident management and investigative functions. It would also be capable of real-time transfer of incident data to ADOT for traffic management and motorist information purposes. Support for early implementation of a CAD system as part of the overall communications upgrade is recommended.

B. A pilot program of any new radio systems should be considered for evaluation in a rural area. The opportunity to determine costs, benefits, use levels, and technical challenges on a small scale could be a sound proposal basis for grant funding. By including ADOT and fire departments in this plan, it may increase the opportunity to be successful. Interagency communication projects in police and fire departments are far more common but seldom include transportation agencies.

C. Explore the possibility of developing a public-private communications link with airborne traffic reporters and DPS officers on the roadways. This level of cooperation and communication is being used successfully in other cities.

D. Expand the media alert system for DPS in the Tucson and Phoenix areas. Include area ADOT offices and TOC's as recipients of those media alerts.

E. Continue efforts to establish northern and southern regional traffic operations centers.

5.4 INVESTIGATION RELATED TRAFFIC MANAGEMENT AND TECHNOLOGY

Long term incidents, especially those requiring the closing of multiple lanes or full freeway closures, have a significant negative impact on highway capacity. They can require a huge commitment of resources, just to provide minimal traffic control. These major, long-term traffic disruptions are exactly the type of event that an effective, well-run Incident Management Program is all about.

It is recognized that at major incident scenes involving fatalities, severe or multiple injuries, hazardous materials, vehicle fires or even spilled cargo, prudent practice may be to close all travel lanes or initiate a full closure in at least one direction of travel. In most jurisdictions a roadway is considered closed when all travel in at least one direction is prohibited.

Long closures with negative publicity toward the agencies involved, and litigation for injuries and deaths in secondary crashes, have been a major reason to start or seek improvements to the existing incident management programs. The public and media are becoming very critical of, and concerned about, long closures that they perceive to be excessive in duration.

Diversion of Traffic

On today's congested roadways, it is unacceptable for traffic to be stopped due to an incident for a long period of time without the implementation of a coordinated, well planned effort to provide alternate routes while completing the investigation and clearance as quickly as practical.

When the first responding personnel conclude that the incident cannot be resolved in less than 15 minutes, action should be taken to implement at least informal diversion of traffic from the freeway. If the situation is more involved and a long duration or full closure seems unavoidable, formal traffic diversion should begin almost immediately. As off-scene rerouting and diversion plans are being put into place, aggressive scene clearance and investigation should continue to be the primary focus at the point of the closure.

When evaluating the phases of a major incident, the greatest amount of time is spent on scene investigation and clearance. As was pointed out in the findings and conclusions of the FHWA Demonstration Project 86, ..."Rapid response and clearance is the single most effective incident management strategy." [11] With this in mind, the responders and on-scene managers should keep looking for ways to resolve the incident, complete priority investigative tasks, and reduce the number of lanes affected.

Police arriving at collision scenes where death or injury may have been caused by criminal means, often find that traffic is still traveling through the scene. Officers often close the roadway immediately without first formulating and instituting a traffic control plan. Traffic should be controlled but allowed to continue, until adequate scene safety and traffic control resources have responded and are in place to do a coordinated closure that reduces the opportunity for secondary collisions and injuries to responders. Traffic may also continue to flow through the scene until the investigative resources are on the scene and are ready to do their portion of the investigation.

The effort made to reroute traffic must also include as a high priority the vehicles trapped between the last diversionary point, usually the last upstream exit, and the incident site. In some cases these motorists can be allowed to proceed past the scene by opening a shoulder or even a portion of one lane for a brief period, then securing the scene and continuing the investigation. This process is only undertaken after the scene has been made safe, critical life support has been provided, and adequate traffic control is in place to ensure the safety of the responders.

Evidence Protection Issues

Protection of evidence is a valid concern and is often cited as the reason for immediate roadway closures. Unfortunately, most highway scenes are heavily contaminated by traffic, and exact location of loose debris is seldom of any evidentiary value. Skid marks, gouge marks, and scuff marks are seldom affected by moving traffic for short periods of time. They can be effectively measured even after several hours of traffic has passed over them. Short-term closures can be used effectively to photograph and measure evidentiary marks in lanes that are otherwise not obstructed.

Criminal investigations on or affecting major roadways can also contribute to long closures and secondary crashes. Police agencies are often not aware of the impact of long-term investigations on the transportation system. Steps should be taken to provide the same incident management training to key police leaders and investigators.

The investigative task that takes the most time is usually the measurements. Arizona DPS is now using Accident Investigation Measuring System devices (AIMS) to document the scene and enable them to use the data to produce detailed scale drawings. AIMS is a surveying device requiring an operator with an assistant to hold the target device. The data can be downloaded to a computer

with design software that will produce record diagrams of the scene. Touted as a time saver for traffic investigations, the equipment actually may cause longer closures or delays. Such delays are often due to the time required to transport AIMS to the scene and set it up.

DPS is also experimenting with Photogrammetry methods to measure collisions. This process uses a software system that derives highly accurate measurements from photographs. It is especially effective with aerial photographs and does not require measurements by officers at the scene. Ground level (terrestrial) photographs can also be used, but they require more time on the computer to complete the diagramming process.

Global Positioning System-based measuring devices and lasers are also being considered. Like AIMS stations, they require that single point measurements be taken and can take considerable time on scene.

Recommendations

A. All response agencies including Police, Fire/Rescue, EMS, DOT, and Towing and Recovery should be trained to ensure that fully closing the freeway is the last option, not the first. This action must be avoided if at all possible because of its significant potential for secondary crashes, and for its negative effects on traffic flow and motorist safety both in the immediate area and on the surrounding roadway network, and in local communities.

B. Investigators who are highly successful in completing quality investigations in a timely manner should be used in peer-to-peer training to share their techniques. Training programs should include these techniques for new investigators.

C. Consideration should be given to forming teams to respond to fatal, felony, and other major crashes on heavily congested roadways, who can perform critical tasks to reduce closure times. The best investigators available should always be used to help new or less-experienced investigators at collisions on congested roadways.

D. DPS and other police agencies should continue to use and explore better investigative technology and procedures.

5.5 RESPONDER SAFETY

This issue is interrelated with virtually all of the tasks at roadway incident scenes. Response and DOT maintenance vehicles are often struck while on the shoulder or in closed lanes at incidents. They often will take more lanes than necessary to provide a larger safe zone to work in. Backed-up traffic moving past an incident at low speeds is a safer environment than being next to high-speed traffic. Balancing the need to prevent secondary crashes with the safety of the responders is a significant challenge.

Current methods of light use, deployment of response vehicles, scene traffic control, visibility of responders, and removal of blocking vehicles, are all being scrutinized to determine if there are better and safer methods. A 1997 report summarized by Mort Downey, USDOT, indicated there were 10,000 police vehicles, 2,000 fire vehicles and 3,000 other response vehicles (tows, ambulances, service patrols, DOT etc.) involved in crashes either going to or at crash scenes. [11] Another report by the International Association of Chiefs of Police indicated 8,000 police officers

were injured in car crashes in the same year. And, a 1999 summary of officers killed in the United States indicated over half were killed in traffic crashes with only one third by violent suspects. [12]

Police, fire, transportation, and towing employees are all too often victims of motorists at incident locations. They have to accomplish their duties with a constant regard for traffic and their safety. Injuries and deaths have occurred in these professions at incidents in Arizona and in other states. More than a third of Arizona DPS officer fatalities since 1958 were in this category.

First responders immediately seek a means to make the scene safe for themselves and other responders. They use emergency lights, traffic control devices, flares, and vehicles to help keep them safe, especially in the initial stages. Blocking extra portions of the roadway while they get the scene under control is a routine and recommended method of reducing the danger to the responders and the motorists. What often occurs is that the extra roadway is kept closed for the duration of the incident, instead of making adjustments once the location has been made safe.

As noted earlier, a training videotape produced by the Phoenix Fire Department points out several of the issues related to responder safety. [10] The film reports on studies which indicate that the positioning of vehicles, use of emergency lights, and site management all are factors in improving responder safety. There is, however, a lack of good training materials for improving responder safety for all the agencies that respond to roadway incidents.

Recommendations

A. Responder safety is the highest priority at all incidents, especially in the early stages. Given the large number of employees who respond to incidents statewide, the evaluation of polices, procedures, and training programs should be focused on reducing injuries, increasing awareness, and identifying procedures that may contribute to injuries by each of the disciplines. The safety and training personnel in each organization are key to this process.

B. A search for the latest information about safety equipment, procedures, and training should be implemented to determine how Arizona can best stay current. Involved agencies should work collectively to develop multi-agency training materials for incident response.

5.6 INCIDENT MANAGEMENT EQUIPMENT AND FUNDING

Fire and Police agencies are accustomed to responding to emergencies 24 hours per day. They are equipped, trained and staffed to provide the same level of service whenever necessary. However, transportation agencies have not had that same mission and therefore don't have the same focus on response structure, staffing or equipment.

Incident Management needs associated with congested roadways, prevention of secondary crashes, improved clearance of crashes, and traffic control have all significantly increased the role of transportation agencies. It is no longer an afterthought to be involved early in incident response, to insure that transportation facilities are managed properly.

Under current policy, most after-hour responses by ADOT are from an on-call list. The employees are telephoned or paged, and they go to a maintenance facility to get the appropriate equipment and vehicle(s). Supervisors often respond first if requests are unclear, which can slow the right equipment and personnel response.

Some state DOTs have formalized their responses after working hours by a series of steps. First, they have equipped trucks for handling most transportation-related needs at incident scenes. They have trained maintenance volunteers who take the trucks home when on call. They respond to any requests from the traditional response agencies for transportation-related support. A common rule used to determine when they should be deployed is when the initial responders see that one or more lanes will be blocked for one or more hours.

A modest amount of funding is required for on-call pay. Call-outs also require overtime pay. A large number of the call-outs may warrant the state's billing and collecting from the causing party for the materials used. Some states also bill the causing driver's insurance company for the costs associated with traffic control and cleanup. That funding resource could then be used to help fund further improvements in the IM process.

A DOT response truck or van should be large enough to transport adequate equipment in safe and secure containers. The vehicle should be equipped with DOT and DPS radios, cellular phones, an arrow board or roof-mounted VMS, and a lighting system with generator.

Other standard equipment provided to after-hours DOT responders usually includes:

- Rubber rain gear
- Safety glasses
- Rubber gloves
- Cotton gloves
- Two push brooms
- Flat shovels
- Pinch bars
- Rechargeable flashlights
- 4 cases fusees
- 50 reflectorized cones
- Reflectorized vests
- Portable signs (ACCIDENT AHEAD, ROAD CLOSED, RIGHT LANE CLOSED, LEFT LANE CLOSED)
- Red flags for signs
- Bases for signs
- 100' extension cord
- Shop lights
- Binoculars
- 35 mm camera and several rolls of film
- Plastic garbage bags
- Hand cleaner
- Paper towels
- 4-6 bags absorbent material
- Absorbent pads
- Absorbent booms for oil
- Absorbent booms for solvents and acids
- "Plug and Dike"
- Two 20 pound fire extinguishers
- Disposable blankets

- Area maps
- Minimum 36 unit first aid kit
- Chlorine bleach/water mixture spray bottles
- Two 100' tape measures
- Rubber floor matting
- Face masks
- Eye rinse kit
- Law enforcement barrier tape
- Spare bulbs for arrow boards

In addition to the equipment, basic training is required for the responders. This will include First Aid First Responder, Unified Incident Command, Hazardous Materials First Responder, and Emergency Traffic Control procedures. More information on training is discussed elsewhere in this report.

Recommendations

A. Develop a statewide ADOT incident management policy and program which funds additional equipment and more consistent availability of response 24 hours per day.

B. Upgrade equipment for response to improve incident traffic control.

C. Implement on-call procedures that include take-home vehicles.

D. Request that State Risk Management fund part of the improvements in the incident management program as a means to reduce liability costs.

E. Establish a program for joint purchase of standard traffic control equipment with local fire departments and other responders.

F. Purchase additional cellular activated portable Variable Message Signs to facilitate more timely updates for incidents.

5.7 LIABILITY FOR TRAFFIC CONTROL ISSUES

Liability concerns and issues have a significant impact on the operation of all response and transportation agencies. Litigation for public agencies related to traffic collisions is a significant cost factor and impacts the decisions associated with incident response. Implementing changes in programs is often delayed or not undertaken due to the potential for legal action.

The California Department of Transportation spent 75 million dollars in 1998 on damage awards or settlements. [13] They currently have approximately 3,000 claims pending. A large number of the procedures used by their agency, such as secondary crash prevention, are a result of litigation. Improvement requirements identified as the result of litigation are often implemented before a final settlement, if the agency agrees that the change will reduce the potential for additional injuries or accidents.

Illinois has had a very aggressive clearance program since the early 1960's. They have been successful in their operations with little litigation because they have been able to demonstrate that their actions were consistent with good public policy, prevented further collisions, and didn't create excessive additional damage. Illinois's Attorney General advised IDOT that "Concerns over

litigation should not stand in the way of implementing good policies designed to improve operations."

Washington State has determined that there were 14 recent claims filed as the result of inadequate traffic control at incident scenes. [14] Seven were defended successfully and seven were settled. One factor in the settlements was how long the vehicles had been positioned and if any additional traffic control had been implemented. If it appeared that the officers had been on scene long enough to have reasonably improved warning to approaching motorists, the state settled the case.

Incident management issues that raise liability concerns include: secondary crashes, inadequate patient care or transport, improper traffic control, improper investigations, damage to vehicles or cargo during clearance, privacy issues related to freeway camera systems, timely use of VMS and HAR, and hazardous materials clean-up.

The largest area for concern is collisions that occur in the back-up from a previous incident. One case in Illinois involved the toll road authority, state police, and towing company. A fatal collision that occurred in the stopped traffic resulted in a jury award against the three defendant agencies of 9.5 million dollars. The award was later overturned on an appeal, and settled for an undisclosed amount.

Finally, some states have legislated maximum amounts or caps that public agencies can be held liable for. This has reduced their costs for litigation considerably. Such statutes limit the amount of damage for road design or traffic management cases to a set amount, instead of giving them total immunity. Although strongly supported by the Arizona stakeholders, further project research determined that this recommendation (7C) is not viable in Arizona law.

Recommendations

A. The history and current status of litigation in Arizona should be reviewed to determine trends.

B. If there is a lack of documented Arizona cases related to the proposed IM program changes, then the liability experience of states using those techniques should be considered.

5.8 TOWING AND RECOVERY

Arizona, like most other states, has a state agency that regulates the towing industry. The Department of Public Safety works with the industry to set standards for towing equipment, service, and response requirements. The current policy has not been updated since 1985. The heavy-duty tow truck standard for lift capacity has not changed since approximately 1960.

Revisions to Arizona Towing Regulations

The lift capacity is critical due to new towing equipment, heavier loads, and more fragile commercial trucks and trailers. Arizona has a 25-ton requirement that is not adequate today. The 25-ton equipment has been manufactured since the late 1950's and is still in use in a large number of small or rural tow companies. It is mechanical with fixed booms which severely reduces its ability to recover overturned trucks, or trucks over embankments. New heavy-duty tow trucks, up to 70 ton ratings with rotating booms, can cost up to $450,000, yet they are on the same DPS call rotation lists as the old trucks that can now be purchased used for approximately $20,000. [15]

Current DPS policy allows towing companies that meet minimum standards to be on rotational lists. They are called out when they move to the top of the list. One company may have extensive equipment, training and experienced staff for up righting overturned trucks, while another has older

equipment, limited experience and training. The rotational list, not the equipment, determines who is dispatched to the crash site for recovery.

Towing companies in rural areas expressed concern on the recommended upgrades due to the cost of better equipment. They indicated that they seldom are used and cannot justify spending for new heavy-duty equipment. Any new policy should take this into consideration and ensure these towing companies are kept on the lists until equipment meeting new regulations is available in their area.

Newer equipment can also park parallel to vehicles and upright them without being perpendicular and blocking more of the available lanes. Recovery can be accomplished in much less time with increased safety and decreased impact on traffic.

Recovery Training Standards

Towing regulations discuss response times and equipment in detail, but not driver qualifications. When these regulations were written, there was a lack of formal training programs for towing. Drivers learned by trial and error and often lacked experience in uprighting overturned trucks. Tanker trucks require even more specialized training, yet, towing companies do not have to demonstrate they can accomplish these types of recoveries to be on the approved tow list for DPS.

California is among a group of states considering establishing minimum training standards for towing, especially for truck recovery. The National Towing and Recovery Association of America is supportive of training standards, however, a large number of their members are not in favor of it.

Professional recovery training is available from a number of sources and is highly respected in the industry. Towing companies who have put their employees through these programs have been very impressed with their improvement. Up to now, the companies have sent a few to training on their own, but it hasn't been a large number. New techniques could significantly reduce the delays that have occurred with recent truck crashes in Arizona. Relocating the trucks out of the roadway by dragging or winching them while on their sides or tops can also greatly increase traffic flow. This training is also offered by some national training companies.

Winter Storm Issues

The northern part of the state has an additional major issue related to winter weather. When snow or ice affects the major routes, the tow trucks have a very difficult time reaching incidents in a timely manner, if at all. In a recent storm in the Flagstaff area, trucks were requested by DPS and spent up to 17 hours trapped in the backup or stalled due to the snow, in some cases without ever reaching the initial problem. Several did assist other vehicles but essentially were on the roads at the request of DPS and did not do any work that they could be compensated for.

Chicago has used a team approach to handling snowstorms and keeping roads open. Heavy duty tows are teamed with the snowplows and sanders to make sure that the roadway isn't blocked when the plows are working. By working together, they can keep more of the roadway open and can attack problem areas such as grades and bridges collectively. This approach would allow towers to actively support ADOT and DPS before worsening traffic and snow conditions require closures.

One procedure in most Western states that is not followed in Arizona is the requirement for chains on trucks over 10,000 pounds Gross Vehicle Weight (GVW) when snow and ice conditions exist. Pass areas, areas of high snowfall, and areas with steep grades often have chain installation or removal areas in Arizona, but do not have a law to require trucks to carry chains in winter months. According to the responders at the focus groups, chain requirements would help alleviate the long closures during snow and ice because fewer trucks would be stalled in the roadway on grades.

Traffic Control at Incident Scenes

Traffic control at long-term or delayed truck crash clean-ups resulted in a 1999 memorandum of understanding between the state towing association and ADOT. Concern still exists in defining who is responsible for traffic control if the clean up takes more than four hours or if the towing company returns at a later time to do the recovery due to weather, traffic, or lighting conditions.

Another factor in this process, is the need to obtain a traffic control permit for planned closures. Currently, ADOT has approximately a three-day turnaround to review the traffic control plan and issue the traffic control permit. That process is not often used by the towing industry to recover trucks, however, they often have DPS officers or traffic control subcontractors provide the traffic control if these resources are available in their local area.

When the lane closure or traffic alteration is planned ahead and is not part of the original response, then following the Manual of Uniform Traffic Control Devices is required by ADOT. Requiring the same permit process, however, would cause unacceptable delays in recovery of vehicles and loads.

Payment methods for towing and recovery have been revised in some states such as Ohio. Instead of payment by the hour, a price is established for recovery by the type and weight of the vehicle and cargo. This method is credited with decreasing clearance time by giving the towing company an incentive to finish sooner.

Salvaging Loads

Recovery of spilled loads and wrecked trucks is a concern in some parts of the state. The towing and trucking industry has almost always had input on the scene into these operations. If loads could be salvaged, they were often off-loaded by hand or with forklifts while the roadway was all or partially blocked. Truck owners could also call their preferred tow, which sometimes created delays in arrival and recovery.

While salvaging loads is important, the consensus of those attending the focus group meetings was that the first available means should be used to open the travel lanes. Recovery can then be completed with the input of the owner and insurance company.

Care must be taken if the load and vehicle is relocated to ensure that where it is placed will not cause unnecessary difficulties for the recovery team. If it is put over an embankment, for example, lane closures may be significant for the removal of the vehicle.

Some loads require cleanup or inspection by other agencies before they can be disposed of. Food products, for example, may require an agricultural inspection to ensure spoiled or contaminated food is disposed of properly. They do not require the material remain in the roadway before they do the inspection, and only require that it is all accounted for before it can be disposed of.

In some states, DOT takes an active role in loading and removing load materials with DOT or contract vehicles. When the material is cleaned up and loaded, the DOT works with the towing, insurance, and trucking companies to determine how to dispose of it. This is usually done only when other resources are not available within a reasonable length of time.

Recommendations

A. Towing regulations in Arizona should be revised. A new class for recovery of overturned trucks should be established with a minimum standard of 35-ton extendable booms. Existing

25-ton units would remain in use until better equipment becomes available, and would remain on a list for towing upright disabled or damaged trucks.

B. Training for towing operators who handle major truck crashes should be required. The state may consider sponsoring the training, and developing standards for the towing industry. This training would greatly increase the ability of the towing industry to do fast and safe recovery. Dragging or winching vehicles out of the roadway before uprighting them is a new requirement and most towing companies are not trained to do this quick clearance.

C. ADOT should consider an on-call contract for heavy duty towing services in the northern part of the state for snowstorm response. The towing company would be deployed at the request of ADOT to areas that traditionally become bottlenecks in these storms before the weather closed the roadways.

D. Arizona should adopt a chain law consistent with other Western states. With the new rural variable message system coming on line, getting information to motorists and truckers can be accomplished more easily than in the past.

E. The traffic control agreement with the towing industry should be expanded to include concurrence on the procedures to reduce delays to obtain permits for scheduled recovery of wrecked trucks or loads. Traffic management plan approval procedures for recovering loads and trucks should be added to this agreement.

F. A review of the use of payment by the pound for recovery should be conducted. This process is used in some states and is credited with speeding up the clearance process.

G. A statewide policy to ensure that load materials and overturned vehicles are removed in an expeditious manner should be developed for all response agencies and towing companies

5.9 FORM REGIONAL INCIDENT MANAGEMENT TEAMS

Focus group members in several cities talked about the need for a more formal process for agencies to work together on all aspects of managing incidents. There are some local informal groups who have frequent meetings, but several attendees felt that there should be more efforts to improve interagency communications, training, understandings and teamwork.

Departments of transportation and public works are among the newest players in incident management, having a traditional role of planning, design, construction and maintaining roadways. The recent emphasis on managing and operating roadway facilities in real-time is a trend which is motivating transportation and public works agencies to become more involved among incident response agencies.

Several states and localities have had success with forming and maintaining incident management teams. This success results from the formalized coordination among agencies, which has shown to provide many benefits including saving lives and reducing injuries, better use of resources, and time savings for incident responders and travelers. The relationships built in this team process also improve interagency communications for other issues such as roadway construction planning, special events traffic control planning, and disaster preparedness.

The institutional challenges to improve incident management are often the most difficult. Each response agency, while often highly trained and professional, works within its own role and responsibility and may have limited experience with multi-agency coordination, especially for traffic incidents. The most effective progress has been made by raising the issues from the basis of

credibility and knowledge of incident management, and asking questions or suggesting alternatives to generate discussion among the participants.

In Arizona, as in many states, there is increasing demand on the freeways and major highways. Time is also increasingly valuable to people and businesses. Under these pressures, the impact of even the smallest incidents is significant. The impact of a major lane closure for an hour or more during a peak period can gridlock a city causing many thousands of dollars in lost time, sales and business, not to mention the losses and injuries from secondary crashes.

Specific guidelines for incident management teambuilding are referenced in the Appendix X of this report, based upon recent successful efforts in Florida.

Recommendation

A. Incident management requires leadership, teamwork, broad support, and continuous effort. Incident Management Teams would be a good investment toward long-term multi-agency improvements and have been requested in several parts of Arizona. The project Technical Advisory Committee may be the appropriate state-level incident management task force to provide guidance and support to local or regional teams. Support for regional teams by state-level agencies is recommended.

5.10 ALTERNATE ROUTES

The new Arizona Statewide Alternate Route Plan research project has been completed and the document has been distributed. To implement any portion of the plan's detours will require a large commitment of resources and personnel for the immediate routes and for motorist information. All cities and counties that will be affected by the increase in traffic on their routes must be notified in a timely manner and may be requested to provide traffic control resources in their area. Alternate routes should be used only when other alternatives are exhausted.

Closures of several hours on major routes with few alternatives have the largest impact on motorists. When traffic congestion is also a factor, multiple alternate routes will be required to disperse the traffic from the closed route. This may require tactics not usually considered by responders on scene. A good policy is to advise motorists at least 50 miles away for every hour that the road is estimated to be closed. Also, if it is an interstate highway, let other neighboring states know so that their traveler information systems can also notify motorists.

An attempt should be made to route traffic, especially heavy and oversize trucks, onto other interstates or major routes. This may require portable signing, maps or media notification hundreds of miles away from the incident.

Commercial trucking has a stringent requirement for rest time for drivers. If they can get good information soon enough to stop in a city or truck stop and take rest periods, it will further reduce the impact on the alternate routes.

Adjusting Traffic Signals for Incident Management

Incidents that cause delays for traffic can affect local routes nearby. Traffic signals on a central control system can be timed to increase traffic flow on parallel routes. This process can alleviate congestion and reduce the potential for secondary crashes. It does require real-time coordination between the freeway operations personnel and the agencies that manage the signal system.

In long-term closures, local agencies without central signal control can make manual adjustments if they know about the incidents. Timely notification of the signal personnel is required to make this program effective.

Recommendations

A. Familiarize all response agencies with the alternate route plan.

B. Develop notification procedures for motorist information providers, state police, and transportation agencies in neighboring states as well as all Arizona regions.

C. Develop regional alternate route maps for distribution to scale houses, rest areas, media outlets, and truck stops.

D. All agencies that have control of signal systems where there exists a possibility of a large increase of traffic due to incidents on other roadways, should be part of regional incident management planning efforts. Signal system technicians should be part of the on-call process for nights and weekends if they are required to make timing changes related to incidents.

5.11 CONSTRUCTION WORK ZONE INCIDENT MANAGEMENT PLANS

Construction workzone areas require the driver's attention far more than normal driving situations. Clear, concise meanings of every traffic control device will help guide them safely through the work zone. A properly designed and implemented work zone will protect the motorist from the dangers of the construction, as well as protect the construction workers from the motorist.

Unfortunately, even the best-designed and controlled construction zones have historically experienced approximately 5 times the collision rate as other highways. Prevention and mitigation of these incidents can:

- Increase efficiency of the roadway system
- Reduce construction delays
- Reduce liability for the contractors and public agencies
- Improve contractor and responder safety
- Decrease secondary collisions

To accomplish these improvements, the following procedures and program elements should be included in an incident response plan for every major construction project on open roadways:

- Organizing maximum response to blocking incidents.
- Implementing 24 hour stationary or roving service patrols in the construction zone.
- Creating temporary collision investigation sites within the construction zone.
- Establishing the construction zone as an immediate tow area.
- Developing agreements with the construction companies to use their heavy equipment to assist in clearance of debris from truck accidents.
- Establishing emergency vehicle alternate access routes when lanes are altered or closed.
- Identifying landing locations near the construction zone for medical response helicopters.
- Providing advanced incident response training for all responders.
- Conducting at least one training exercise to test the incident response plan.
- Offering presentations to key stakeholders such as the trucking industry and automobile clubs before construction starts.

- Providing the briefing to the media and seeking their support for more frequent traffic reports.
- Maintaining a liaison role with the key response agencies throughout all phases of construction.
- Developing and maintaining a comprehensive list of all key project personnel including emergency numbers.
- Establishing incident alternate routes consistent with planned alternate routes for construction.

Recommendation

A. Require the development of an incident management plan for all major construction projects that will have an impact on traffic. Involve the response agencies early in the planning process and seek their involvement throughout the project.

5.12 TRAVELER INFORMATION

When roads are closed or severely restricted at incidents, the public should be receiving real-time accurate information. They should be made aware through radio broadcasts, news media, and Variable Message signs (VMS) at locations that will allow them to make alternate route or trip delay decisions. There is also a need to provide information to motorists that are caught in the closure near the scene. This can prevent motorists from taking risks by crossing medians or taking other hazardous measures to get out of the stopped traffic. All agencies should receive and, when appropriate, provide information for other responders and the public.

One challenge is getting the information to a large percentage of the motorists in a timely manner. In rural areas, fewer motorists listen to radio stations than in urban areas due to the lack of clear signals and lack of knowledge of station frequencies. Even when the media is given timely information, there is no guarantee that a significant number of motorists will hear the reports.

In Northern Arizona, the National Weather Service has a network of radio stations that provide real-time weather information. They are working to combine information sources with ADOT to give road information with the weather reports.

The Emergency Advisory System (EAS) funded by the Federal Communications Commission is designed for alerting the public to emergencies. Although it has not been used for routine traffic crash information, it could be considered for major road closure information as a matter of public safety. EAS should be considered when trying to expand the timely flow of information to as many motorists as possible.

The Traffic Operations Center in Phoenix updates Highway Condition Reporting System (HCRS) information 24 hours per day. One concern about the information is the number of construction-related messages that do not pertain to the current conditions of the roadway. There is also a concern about the staffing in the TOC. Often, delays in information flow are attributed to the lack of staff experience and level of supervision. An increase in pay levels to make the pay consistent with like positions in other communication centers was recommended in a related project report two years ago but has not occurred. The low pay and lack of supervisory positions will continue to impact the performance of this center.

Marking Roadways to Locate Incidents

Cellular telephone reports are the overwhelming method for reporting incidents. One continuing problem is establishing the location. Some states have added rural milepost markers at every $2/10^{th}$ mile and in urban areas, every $1/10^{th}$ mile. The markers give the milepost, highway name and

direction of travel. The markers are in the median and are large enough to be read easily even while driving at night. Response organizations of all types have indicated they support the new markers because they do receive better information.

Establishing a need for these markers involves determining from statewide 911 operations centers if they have difficulties with determining locations, where the problem areas are, and the frequency of the problem. This issue was noted in some local Focus Group meetings but not others. Areas with freeways and streets that intersect each other more than once, such as Loop 101 in Phoenix, can benefit from these markers.

Highway Advisory Radio

Highway Advisory Radio (HAR) is a common tool for construction zone and incident management motorist information. They can be instrumental in implementing alternate route plans, announcing construction delays or closures, and providing traffic-related weather information.

HAR has limitations in range and flexibility. Programming messages into the older HAR systems is difficult and time consuming. Range is limited to 3 to 5 miles and attempts to get authorization from FCC to increase that range have been difficult. A portable HAR may be effective for use in major incidents to set up ahead of traffic congestion, however a similar but abbreviated message can be provided by portable VMS.

Recommendations

A. A public-private partnership pilot project utilizing weather stations, radio stations, and ADOT is recommended to improve delivery of real-time information to motorists. Using variable message signs to identify participating radio stations with information on traffic emergencies would be more effective than static signs. Radio stations must agree to broadcast the details every few minutes if their call signs were placed on the VMS. To ensure the credibility of the system, timely and accurate information on status must be provided by the incident responders.

B. Pursue an agreement for providing major road closure information through the EAS.

C. Upgrade the accuracy and timeliness of the HCRS system and consider staff enhancements in the Traffic Operations Center.

D. Operators of the 911 centers should be polled to see if the route milepost signing issue is indeed a problem. A small pilot project in any identified problem areas may be considered.

E. Two Highway Advisory Radio systems are being deployed by ADOT. Steps should be taken to use them for incident management information as well as construction information. A review of this program should be conducted to determine if further HAR developments would improve incident management information dissemination.

5.13 PATIENT CARE AND TRANSPORT

A key issue in all areas of the state is the proper care and transportation of the injured. The time required to stabilize and prepare for transport can be extensive if victims are pinned in the vehicles and/or have extensive injuries.

The on-scene medical response personnel have the responsibility to assess the most appropriate means of transportation to the proper facility for treatment. If time and distance or congested roadways are a concern, helicopter ambulances may be used.

In some remote areas of the state, helicopters are often among the first responders and need a safe location to land to render aid. This may necessitate blocking roadways previously not impacted by the collision. Care must be taken to coordinate this procedure with ground response.

Landing helicopters on or near roadways can cause significant distractions for motorists and responders. Delays associated with the additional roadway closures for this procedure can create further delays for motorists and expose them to the increased likelihood of secondary collisions at the end of the queues. Generally, medical aircraft reported good working relationships and adequate landing zone assistance from all responders. Training for establishment of temporary landing zones is an ongoing need.

The terrain and physical nature of most of Arizona's rural landscape prevents safe landing away from the road surface. Loose debris, sand, and gravel can cause significant damage to the aircraft and any personnel nearby. In urban areas, however, alternate landing sites can be used a short distance away from the roadway that will reduce the impact on traffic and reduce the danger to motorists from secondary collisions. Ground transport to the aircraft is by fire unit or ambulance.

Coordination of all patient transport services for incidents is required to increase efficiency at incidents. Often ambulances seek locations close to the damaged vehicles to facilitate loading the patients, and they block lanes previously not obstructed by the incident. Patient triage can take time and the ambulances may remain in the roadway while that task is completed. While patient care is certainly the priority, proper positioning of vehicles for loading and triage can reduce the impact on traffic. Training was recommended for ambulance drivers to deal with these issues.

Medical waste at collision scenes can be a health concern. In some cities, medical response personnel package up and remove all bandages, bloody clothing that is not evidence, and all other biohazards related to the medical care. This process assists the on-scene personnel by removing items that the police and towing companies are not equipped to handle properly.

Another issue that is becoming more important is the disposition of deceased persons who have organ donor status on their person. There is not a formal means to ensure that the family can have the opportunity to decide if organ transplant can be done. Often motor vehicle victims are left alongside the roadway or in vehicles until the investigation is complete and the coroner is called. This practice was established years ago before organ transplant became possible. According to emergency medical personnel in the Stakeholders meetings, organs such as kidneys and corneas can be transplanted successfully up to 5 hours after death.

One DPS sergeant indicated that attempts to get information by calling the organ donor toll free number has been unsuccessful in rural Arizona. With thousands of critically ill persons on donor lists, some more reliable method of organ donation from fatal victims should be developed.

Recommendations

A. The development of interagency agreements and multi-agency training for the patient care portion of the incident management process would improve delivery of these services throughout the state. Representatives of these organizations who attended the focus group meetings expressed their willingness to participate in this process.

B. An agreement should be reached for a consistent policy of removal of all biohazard waste from medical treatment by the aid personnel.

C. Organ Donor procedures should be developed to allow families to determine if organs can be donated from fatality victims meeting the donor criteria.

5.14 STAFFING ISSUES

Shortages of response personnel in certain parts of the state can have an adverse effect on incident response and management. As congestion has increased, incidents have also increased. Response personnel and agency resources have not kept up with the growth in traffic and incidents.

This problem is especially acute in rural fire departments, many of which rely on volunteers to protect their communities. Large numbers of responses, often several miles distant from the community, strain the resources and leave the community unprotected for extended periods of time. Equipment is often several years old and may be very slow, especially on high-speed freeways and in mountainous terrain.

Tracking response times is one method of determining coverage and staffing. With the increased speed limits and traffic volumes, response may require more personnel with better equipment to handle incidents faster, and prevent secondary collisions.

Some states have had success in increasing staff levels when partner agencies support each other's requests. Groups of agencies that identify a critical shortage in another response organization can help solve that shortage by publicly supporting the requested increase.

Recommendations

A. Each region has different needs and should develop their own collective requests for staffing. A statewide plan should then be proposed to the key agencies to increase understanding of the needs and unify support.

B. Develop a statewide staffing need summary.

5.15 HAZARDOUS MATERIALS RESPONSE

The response time for hazardous materials contractors was reported by stakeholders to be overly long. Cleanup processes for major diesel fuel spills were also reported to be becoming more difficult. For small diesel spills up to a recommended 50 gallons, clean up should remain as-is, with anyone on scene being able to use sand or absorbent material to trap and absorb the diesel that is spilled on the roadway. For larger diesel spills, several meeting participants pointed out that the Department of Environmental Quality is considering making the cleanup standard a "parts per million" test that would require a laboratory test. This process would pertain to spills that soak into the ground or enter water sources.

Clean up of fuel spills, primarily diesel, can be time consuming and leave the DOT with costly disposal problems. There is no set policy to deal with these spills and they comprise approximately 75% of the spills on roadways.

Movement of Hazardous Materials, including nuclear wastes, is a concern in Northern Arizona during inclement weather. A recent multiple-vehicle crash on icy roads resulted in a propane truck overturning and leaking propane while a motorist was pinned underneath the truck. Quick and effective rescue measures by the Flagstaff Fire Department may have prevented a large-scale disaster.

Recommendations

A. Consider restriction of the movement of hazardous materials during inclement weather.

B. A consistent procedure needs to be developed and distributed to all hazardous response agencies for the clean up of diesel spilled on the traveled portion of roadways.

5.16 COST RECOVERY

Costs associated with clearance of accidents, which includes personnel for traffic control, supplies, and equipment use, is recovered from the causing driver or their insurance in several states. Current practice in Arizona only allows for recovery of the supplies used such as guardrail repairs, but not labor costs. The amount recovered is returned to the general fund.

Existing maintenance budgets do not include adequate funding for these types of activities and they can quickly be depleted by overtime costs for traffic control. Cost recovery for all activities associated with incident traffic control and clean-up, with the funds returning to the organizations who completed the work, would allow much better cost control and would improve the equipment and response process.

Recommendation

A. A change in procedures to allow recovery of all actual costs and return it to the appropriate budget is recommended. Cost recovery should be tracked for every incident that DOT responds to, and reimbursement sought for all responses with the exception of regular work day short term involvement (less than one hour) and no expenditure of supplies.

5.17 DEVELOPING INTERAGENCY AGREEMENTS WITH TRIBAL AGENCIES

Working traffic incidents on state highways in tribal jurisdiction is not always handled in a consistent manner. Focus group attendees discussed concerns about the need for agreements to clarify the roles of each response organization. Some areas have working agreements on roles at these incidents and others do not. A statewide agreement is not practical due to the individual nature of the body of law governing each tribal government.

Recommendation

A. Each District should initiate a meeting to outline an agreement for handling incidents in tribal jurisdictions. Some areas already have incident management teams that could work on this task. Any existing policies that are viewed as effective should be shared with other regions to see if they could be used as a basis for a new regional policy.

5.18 SERVICE PATROLS

Service patrols are universally accepted as the most effective tools for incident management. The most cost-effective programs have multi-purpose vehicles with a variety of safety equipment including arrow boards or variable message boards. They double as incident response vehicles for collisions, spills and investigations. They have direct police radio contact. There is coverage in major cities 24 hours a day or they have an on-call program for nights and weekends. With such a

commitment, service patrols may be successful in becoming a true part of the incident management decision-making process at incident sites.

There are approximately 80 service patrol programs in the United States today. Metropolitan Phoenix is one of the largest urban areas in the nation yet to implement a freeway service patrol program. Work is being done by ADOT and DPS on this issue. A program proposal is being developed and should be completed by mid-year. This program could be implemented by the fall of 2000.

Recommendation

A. Service patrols are needed on the Phoenix area freeways. The City of Phoenix has a motorist assistance program for city streets, as do Chandler and other local governments. A review of service patrol operations in other cities would help clarify what elements and operational policies the most effective programs have in common

6.0 CONCLUSION

This research and planning process has resulted in the most comprehensive statewide incident management plan ever completed. Focus group members and stakeholders provided excellent input because they all have extensive working experience with the challenges of roadway incidents. Their opinions and recommendations are valid and they deserve careful consideration by agency and elected leaders.

There are three categories of Incident Management Program recommendations in this report:

- Recommendations requiring new funding allocations and/or specific legislative action at the state or local level.
- Recommendations requiring multi-agency agreements or training.
- Recommendations requiring actions by individual agencies and organizations.

The first two categories of recommendations will require the uniform support of the agencies and organizations that participated in their development for them to become successful. They will also need uniform support in the legislative process to achieve funding, and staffing improvements.

The third category will require full commitment by each agency's management and supervisory personnel. This category of actions, however, can be initiated in the near term by agency directives or policy mandates, if the necessary upper management support for it exists.

Training improvements will be the greatest challenge, especially in large statewide organizations. The high level of importance given to multi-agency training could easily be a shared responsibility between key agencies. Costs could be kept to a minimum by developing "Train the Trainer" teams who would then provide instruction for all agencies.

This plan has developed 59 recommendations in 18 categories. For action by individual agencies, there are 14 which are specific to the Department of Public Safety and / or the Department of Transportation. There are also 34 multi-agency recommendations, and 11 in the legislative or budgetary action category.

Steps can be taken now to initiate action on at least 48 of the recommendations if approved and assigned by agency leadership.

6.1 PROGRESS ON ARIZONA INCIDENT MANAGEMENT ISSUES

Since the Incident Management Plan was completed in May, significant progress has occurred:

6.1.1 Governor's Traffic Safety Initiative

As part of the traffic safety program announced on May 25, 2000 by Arizona Governor Jane Hull, Arizona DPS Director Dennis Garrett, and ADOT Director Mary Peters, four recommendations in this Incident Management Plan report were highlighted as priorities. They are:

- A quick clearance law to expedite opening roadways after collisions.
- A major upgrade of the communications system for DPS to include a CAD system
- Expansion of the ALERT program to provide better after-hours ADOT response statewide.
- Implement service patrols in the Phoenix area.

All four of these recommendations will require significant support form all response agencies to obtain legislative approval, funding, and long-term support. The service patrols (see below) will require state funding after the initial years of the program.

If the remainder of the recommendations are accepted and implemented, Arizona will have the most comprehensive and effective incident management program in the nation. Other states have good individual programs but lack a comprehensive statewide approach as is described in this plan.

6.1.2 Service Patrol Update

As this research project neared completion, the implementation of a freeway service patrol program for the Phoenix area was approved. The project will be funded during its initial two years with Federal funds from the Congestion Mitigation Air Quality program. The Maricopa Association of Governments (MAG) will administer the funding and the Department of Public Safety will staff and operate the program. Patrol drivers will be civilian employees of DPS.

In preparation for implementing this program, ADOT expanded the scope of this current research project to include a Freeway Service Patrol Study. This new task added an overview of service patrol programs throughout the United States including recommendations for equipment, training, and operational guidelines. A draft interagency operational agreement was also submitted as part of this change to the project. This study developed two new deliverables:

- Recommendations for equipment, training, and operational guidelines for the Arizona Freeway Service Patrol program based on a review of similar programs in other parts of the United States. Please see Appendix A for the report document from this task.
- Development of an Inter-Agency Agreement for DPS and ADOT; please see Appendix B for a draft of this agreement.

APPENDICES

APPENDIX A	ARIZONA SERVICE PATROL RECOMMENDATIONS ARIZONA DEPARTMENT OF PUBLIC SAFETY Urban Freeway Service Patrol Program	52
APPENDIX B	THE ARIZONA DEPARTMENTS OF PUBLIC SAFETY AND TRANSPORTATION JOINT OPERATING STATEMENT FOR SERVICE PATROLS AND THE ALERT PROGRAM	60
APPENDIX C	FOCUS GROUP MEETING MATERIALS	64
APPENDIX D	INCIDENT MANAGEMENT TEAM FORMATION The Florida Example	71
APPENDIX E	ARIZONA INCIDENT MANAGEMENT PLAN PBFI SCOPE OF WORK 8/23/99	75
APPENDIX F	REFERENCES	80

APPENDIX A

ARIZONA SERVICE PATROL RECOMMENDATIONS

PREPARED FOR THE ARIZONA DEPARTMENT OF PUBLIC SAFETY, ARIZONA DEPARTMENT OF TRANSPORTATION, AND MARICOPA ASSOCIATION OF GOVERNMENTS

By

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July 31, 2000

ARIZONA SERVICE PATROL RECOMMENDATIONS

For the
ARIZONA DEPARTMENT OF PUBLIC SAFETY
Urban Freeway Service Patrol Program

1.0 INTRODUCTION

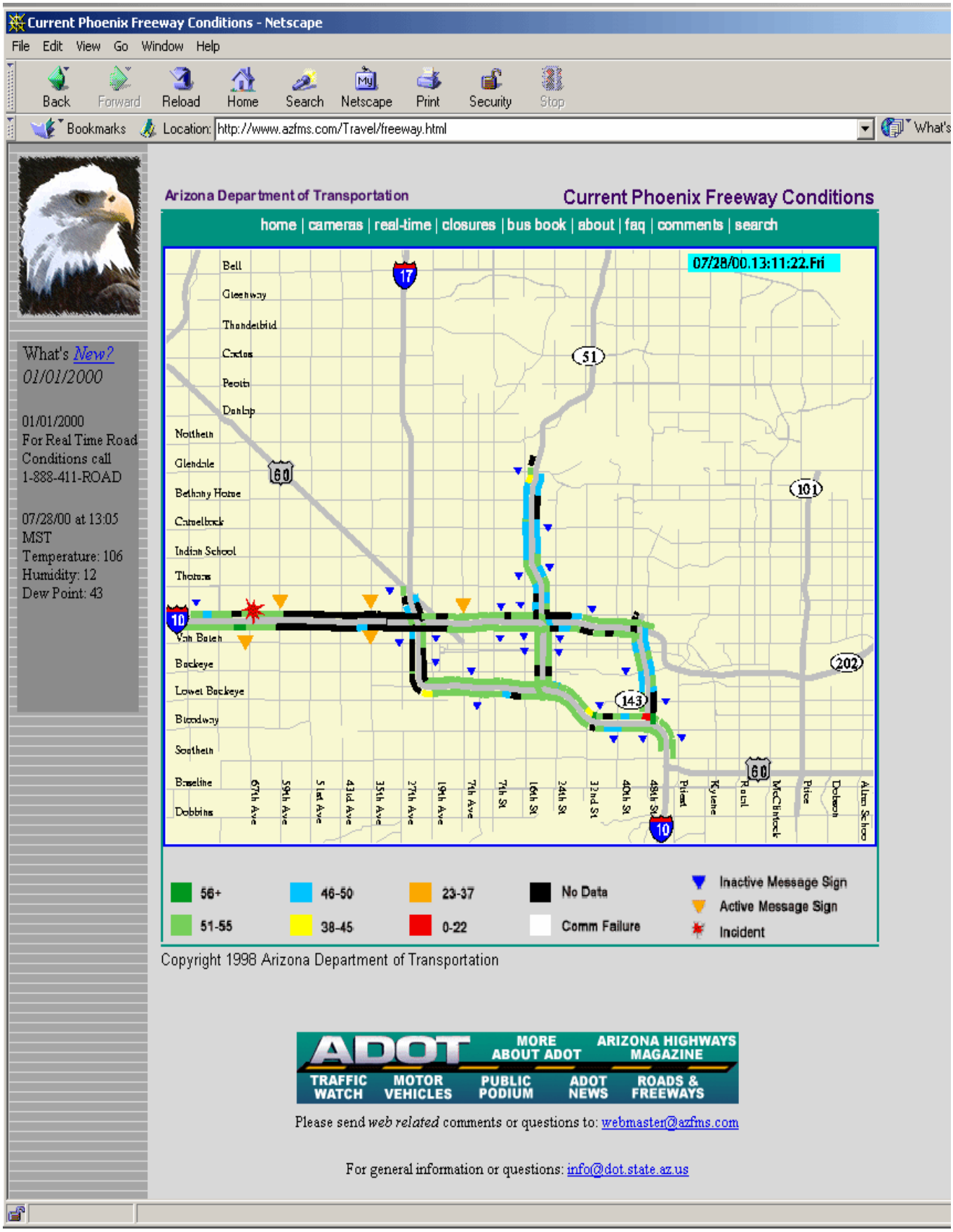
The new Arizona Department of Public Safety (DPS) Freeway Service Patrol Program is a coordinated effort by DPS, the Arizona Department of Transportation (ADOT), and the Maricopa Association of Governments (MAG). This program will increase public safety, and will optimize the efficient operation of the highway network by improving traffic flow on Phoenix area freeways. The Service Patrol Program is a key tool for more effective management of existing highway facilities. By providing assistance to motorists in the event of minor crashes or vehicle breakdowns, the Program can provide prompt clearance of traffic flow restrictions on the Phoenix regional urban freeway system.

Traffic delays due to minor fender-benders, stalled vehicles and other lane-closing situations can cause major secondary crashes with injuries or fatalities. These delays also can reduce the ability of response agencies to provide quick clearance or to answer other emergency calls. The delays also have an economic impact of lost wages, spent fuel, missed appointments or flights, and undelivered cargo. In addition, the public is affected by additional stress and fatigue, increased air pollution and the wear and tear on motor vehicles. The Freeway Service Patrol can help prevent further loss of life and property by reducing the impact of freeway incidents on the flow of traffic through the urban areas.

There are over 80 service patrol programs in urban areas in the United States today. They range in size from two vehicles in Albuquerque during weekday rush hours to nearly 300 trucks on the Los Angeles freeway system, with some programs providing seven day, 24 hour coverage. The services provided range from motorist assistance only, in Connecticut, to full removal of all crashes in Chicago. These freeway patrol programs have a history of service that ranges from forty years (since 1961) in Chicago to only a few months in Chattanooga, Tennessee.

Cost and benefit analysis studies of service patrol programs conducted for the Federal Highway Administration determined that all are cost-effective, ranging from a 2 to 1 benefit-cost ratio in Minneapolis, to 17 to one in Chicago. Generally, the programs that provide more comprehensive incident response services are the most cost effective.

The ADOT website map on Page 3 (www.azfms.com) shows traffic flows on instrumented sections of the Phoenix area freeway system. Congested areas are clearly indicated by color. Phoenix until now was the largest city in the nation without an urban freeway service patrol program. Service patrol histories from other cities have proven that such programs are cost effective, improve safety and are supported by the motoring public.


Current Phoenix Freeway Conditions - Netscape
File Edit View Go Window Help
Back Forward Reload Home Search Netscape Print Security Stop
Bookmarks Location: http://www.azfms.com/Travel/freeway.html
What's New?
01/01/2000
01/01/2000
For Real Time Road Conditions call
1-888-411-ROAD
07/28/00 at 13:05 MST
Temperature: 106
Humidity: 12
Dew Point: 43
Arizona Department of Transportation
Current Phoenix Freeway Conditions
home | cameras | real-time | closures | bus book | about | faq | comments | search
07/28/00.13:11:22.Fri
Bell
Glendale
Bethany Home
Indian School
Thomas
Van Buren
Buckeye
Lower Buckeye
Broadway
Southern
Baseline
Dobbins
67th Ave
59th Ave
51st Ave
43rd Ave
35th Ave
27th Ave
19th Ave
7th Ave
7th St
16th St
24th St
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Priest
Kyrene
McClintock
Price
Dobson
56+
51-55
46-50
38-45
23-37
0-22
No Data
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For general information or questions: info@dot.state.az.us

2.0 PROGRAM GOALS, OBJECTIVES, AND OPERATOR DUTIES

2.1 The basic GOAL of the DPS Freeway Service Patrol Program is to provide efficient response and assistance at all highway incidents that may impede traffic flow along the urban freeways. The operators will assist motorists, support all highway incident response agencies, remove debris, and perform other duties as directed to maintain the safe traffic flow.

2.2 The OBJECTIVES of the DPS Service Patrol are to:

a. Increase safety for stranded motorists and other responders.

b. Reduce the number of secondary crashes through diligent traffic management of incidents.

c. Decrease delays for stranded motorists and the public.

d. Decrease the number of abandoned vehicles through prompt response to stopped vehicles.

e. Reduce exhaust emissions through improvement of traffic flow at incident scenes.

f. Decrease hazards and delays associated with debris on the roadway.

2.3 The DUTIES of the Service Patrol Operators include:

a. Patrol designated areas during designated hours.
b. Respond to incidents as directed.
c. Summon proper response to crashes and other emergencies.
d. Protect the scene with vehicle lighting, cones and other devices.
e. Provide first-responder first aid until arrival of Emergency Medical Service (EMS).
f. Respond to on-site requests for assistance from DPS officers, fire, EMT and other transportation officials.
g. Direct traffic at incident scenes to increase traffic capacity.
h. Provide warning to motorists approaching an incident queue.
i. Provide fuel or other vehicle fluids needed by stranded motorists.
j. Assist with flat tire changes.
k. Provide minor repair items needed by stranded motorists.
l. Remove debris from roadway including crash debris from collisions not requiring towing services.
m. Provide motorists with directions and other information.
n. Provide a prepaid postcard to all motorists assisted.
o. Document all activities as directed by DPS officers.
p. Facilitate the flow of traffic related information to the ADOT Traffic Operations Center through DPS Dispatch.

3.0 SERVICE PATROL TRAINING RECOMMENDATIONS

The following program recommendations for operator training are based upon successful service patrols in other metropolitan areas. Training program concepts range from being totally provided by contractors rather than public agencies in Florida, to a full nine weeks of comprehensive training provided by state agencies in Tennessee. Numerous service patrols employ extensive ride-along programs to train new operators in an On-the-Job Training (OJT) status. For this Arizona regional freeway program, experienced DPS patrol officers in the Phoenix area could lead this type of training.

Arizona's existing DPS training curriculum for its volunteer service patrols effectively covers many areas of these recommendations. The Department would adapt these study recommendations as appropriate for the urban freeway service patrol training program.

Training Course Topic	**Training Resource**
Agency Orientation	DPS
Organizational Policies and Practices	DPS
First Responder Medical	TBD
ITS Awareness	ADOT
Traffic Operations Center Orientation	ADOT
Hazardous Materials Awareness	DPS
Fire Extinguisher Training	TBD
Service Vehicle Operations	DPS
Vehicle / Special Equipment (Push bumper training included)	DPS
Traffic Management At Incident Scenes (includes ADOT SOP's)	DPS
Check Rides (1 hr. each participant)	DPS
Local Mechanics Troubleshooting	DPS
Radio / Telephone Protocol	DPS
Legal & Liability Issues	DPS
Work Zone Traffic Control (includes flagging & liability)	ADOT
Service Patrol Operator Procedures	DPS

4.0 VEHICLE AND EQUIPMENT RECOMMENDATIONS

The following recommendations for service patrol equipment are based upon successful programs in other cities. Older response programs have had the opportunity to evaluate equipment and vehicles to determine what works best in an urban freeway environment. There are still a variety of vehicle types being used, however, there is a basic vehicle and equipment package that is becoming the standard.

There are two common types of vehicles in use; tow trucks and trucks with utility boxes. Generally, tow trucks are under contract from private firms except in a few states where they are operated by transportation agencies (Illinois, Maryland, Washington)

The most common service vehicle now in use nationally is a 1 ton super-cab truck chassis with a utility box for safe and secure storage of equipment. It is large enough to protect the operator if struck by another vehicle and high enough to be seen easily in traffic, especially when equipped with retractable arrow boards or variable message signs. It allows the most frequently used tools and supplies to be accessed from the passenger side of the vehicle. Some smaller programs use pickup trucks with canopies.

Another vehicle type, being used primarily by private assistance programs, is a cargo or passenger van. These vans can transport and assist more passengers, but may place the operators behind the vehicle more frequently, with their backs to traffic, to load or unload tools and other equipment. Such vehicles should be heavy-duty units for severe service.

Public-private partnerships involving media, automobile clubs, automobile dealerships, insurance companies, telephone companies, and retail outlets are also common in several other states. A drugstore chain, for example, provides motorist assistance in several eastern states and they are partnered with state transportation agencies. Also, a national oil refinery company is partnered with a television station in Seattle and has provided a service vehicle with driver on the Seattle freeway system for over 20 years. At least one automotive insurance company has partnered with other states to provide free service vehicles in exchange for the use of their advertising graphics.

As the Phoenix-area freeway service patrol develops in the future, and establishes a record of public service and improved safety, such partnering opportunities may be of benefit to the program. It is recommended that Arizona should consider these types of partnerships to reduce the direct cost of providing services.

With regard to the equipment for urban freeway service patrol activity, the following list provides recommendations for the severe climate and traffic conditions of the Phoenix metropolitan region. It is based upon successful programs in other urban areas, and it also addresses local needs and requirements as defined in the course of this study.

URBAN FREEWAY SERVICE PATROLS
RECOMMENDED EQUIPMENT

The specific equipment that is recommended for each service vehicle includes, but is not limited to, the following:

- ❑ Oversized front push bumper
- ❑ Wheel chocks
- ❑ Tow straps
- ❑ Two-way radios (ADOT & DPS)
- ❑ Citizens Band radio
- ❑ Cellular telephone, re-charger and batteries
- ❑ Public address system
- ❑ Retractable traffic control arrow board
- ❑ Roof mounted vehicle light bar
- ❑ Spot lights
- ❑ Reflectorized traffic control cones (20)
- ❑ Reflectorized vests
- ❑ Roadway flares
- ❑ Flashlights
- ❑ Stop / slow traffic control paddle
- ❑ Standard and metric tools, sockets and wrenches
- ❑ Portable air canister
- ❑ Two 20 pound Fire Extinguishers
- ❑ 30 foot jumper cables, jumper pack
- ❑ Jacks - hydraulic and floor
- ❑ Ball peen hammer
- ❑ Pry bar
- ❑ Two 2-gallon cans of gas, two funnels
- ❑ Antifreeze/coolant or water
- ❑ Electrical and duct tape
- ❑ Push broom and shovel
- ❑ Leather gloves, rubber gloves, and box of latex gloves
- ❑ Safety eye wear, face wear, dust masks
- ❑ First aid kit
- ❑ Paper towels and hand cleaner
- ❑ Bleach/water spray bottle
- ❑ Sand and absorbent agents
- ❑ DPS Traffic Control operational manual
- ❑ Emergency Response manual and directory
- ❑ North American Emergency Response Guidebook
- ❑ Incident report forms
- ❑ DPS motorist information brochures, area maps and Comment Cards
- ❑ Camera and film

5.0 PROGRAM DOCUMENTATION

Service Patrol operators will comply with all of the standard DPS procedures for recording and tracking their activities. They will file their reports and logs under the same timeframes and policies governing other DPS field employees. DPS will also ensure that a quarterly report is provided to the Maricopa Association of Governments summarizing all activities of the Service Patrol.

6.0 OPERATIONAL GUIDELINES

The existing DPS policies and procedures manual and urban freeway operations manual contain a comprehensive set of rules, regulations and procedures. It is recommended, in the interest of consistency, that these be adopted as the guidance documents for this Freeway Service Patrol program.

If operational issues arise that are not covered in these documents or in the interagency agreement, DPS will initiate guidelines to resolve the concern. Significant policy or procedure changes in the service patrol program that affect joint operations with partner agencies such as ADOT or MAG will be provided for reference to those agencies.

7.0 AGENCY COMMITMENTS

In the interest of establishing a sound basis for operations by the partner state agencies, the directors of ADOT and DPS will formally commit to the success of the new freeway service patrol program in the metropolitan Phoenix area.

Attached to this document is a recommended example of an initial working agreement between the two state highway management agencies, entitled “a joint operating statement for service patrols and the alert program.”

APPENDIX B

** SAMPLE **

THE ARIZONA DEPARTMENTS OF PUBLIC SAFETY AND TRANSPORTATION

JOINT OPERATING STATEMENT FOR SERVICE PATROLS AND THE ALERT PROGRAM

(Date)

INTRODUCTION

The Arizona Department of Public Safety (DPS) and the Arizona Department of Transportation (ADOT) have long recognized the importance of maintaining the efficient movement of traffic on our state's highways. Continuous increases in travel, with traffic growth rates that exceed expansion of the highway system, contribute to congestion, air pollution, delays associated with incidents, and serious economic implications. Lane or road closures of any kind in areas with highly congested roadways can result in entire communities being gridlocked with few if any alternate routes available. Secondary crashes related to incidents increase delays, and increase liability for public agencies.

Our agencies have the responsibility to do whatever is reasonable and necessary to reduce the delays associated with incidents, accidents, roadway maintenance, construction, and law enforcement activities. Minor incidents, such as disabled vehicles on the side of the roadway, can cause traffic congestion that may result in more serious incidents.

Part of the solution to these problems is the implementation of the DPS Freeway Service Patrol program. The following joint agency guidance is based on the philosophy that our roadways will not be closed or restricted for any longer than is absolutely necessary.

OPEN ROADS PHILOSOPHY

Whenever a roadway or lane is closed or partially blocked by any crash, incident, secondary crash or vehicle breakdown, the Arizona Department of Public Safety officers, Freeway Service Patrol operators, and Department of Transportation forces shall open the roadway as soon as possible, on an urgent basis.

Public safety is the highest priority and must be maintained at all times. Roadways will be cleared as soon as initial investigative needs are met, medical care is provided, and any hazardous cargo is removed. It is understood that some damage to vehicles or cargo may occur as a result of clearing the roadway on an urgent basis. While reasonable attempts to avoid such property damage shall be taken, the highest priority is restoring traffic to normal safe conditions.

** SAMPLE **

DPS FREEWAY SERVICE PATROL RESPONSIBILITIES

The Service Patrol will be assigned to urban freeway coverage as prescribed by DPS. The operators will maintain roving patrol in those areas during the hours assigned. They will provide assistance to motorists as needed, including minor repairs, flat tire changes, summoning assistance as requested, directing traffic at incident scenes to increase traffic capacity, removing debris that is a traffic hazard, and marking abandoned vehicles. They will also relocate disabled vehicles from the traveled lanes, by use of push bumpers or tow straps, to the nearest safe location. If first at the scene of minor crashes, and if the drivers involved are able and willing to do so, they will clear the lanes to a safe location.

In the case of more serious crashes, at the direction of DPS officers, the Service Patrol operators will establish traffic control, provide warning to motorists approaching the end of the queue, and provide any other assistance as directed. They will provide initial traffic control at all blocking incidents in support of the investigating officers, assist with debris removal, manually direct traffic, and provide any other support as requested.

DPS personnel who respond to the scene of traffic incidents will make clearing the roadway a priority. If, in their judgement, one or more lanes will be blocked for one or more hours, then ADOT will be notified as soon as possible that support from ALERT may be needed.

Whenever practical, to reduce the delays associated with motorists slowing down to "rubberneck," stalled or damaged vehicles will be removed to off-ramps or other areas for the completion of any required investigative reports, damage assessment, and witness statements. Tow trucks will be requested as soon as it is evident that they will be needed to remove vehicles from the freeway.

DPS Communications will support consistent incident status updates from the Service Patrol operators or patrol officers, through Dispatch, to the ADOT Traffic Operations Center (TOC) to facilitate accurate and timely motorist information.

ADOT RESPONSIBILITIES

Whenever the DPS personnel on scene make an initial estimate that the incident will block one or more lanes for one or more hours, they will immediately request the support of ADOT's ALERT incident response team. Upon arrival of the ALERT team and establishment of traffic control including queue protection, the Service Patrol operators will be returned to their normal freeway patrol duties.

The ADOT area maintenance supervisor or a representative will respond to all incidents requiring more support than the initial ALERT response. The supervisor will coordinate with the DPS incident commander when the equipment and manpower needed to reopen the roadway is beyond the capabilities of the on-scene towing resources. If commercial loads are spilled or overturned, ADOT and DPS will make every effort to facilitate the relocation of the materials out of the traveled lanes in the shortest possible time, using whatever equipment and other resources as may be necessary. All such materials or vehicles will be relocated as short a distance as possible in order to open the lanes and to reduce the traffic hazard.

ADOT will provide long-term traffic control in accordance with the MUTCD standards (Manual of Uniform Traffic Control Devices) whenever an incident is estimated to close lanes for 3 or more hours. The ADOT maintenance supervisor or their representative will coordinate the traffic control and alternate route implementation. They will also ensure that the appropriate local agencies are advised when closures will cause traffic pattern changes on local roadways.

ADOT will assume the responsibility for keeping the TOC informed of incident status when the ALERT team or maintenance forces are at the scene. They will provide information as necessary to other transportation agencies that may be affected by the traffic pattern changes associated with the incident.

INTERAGENCY COORDINATION

When an investigation is required, it will be conducted in as expedient a manner as possible considering the severity of the collision. Lengthy investigations will require prioritization of tasks, diligent use of resources, and due consideration for use of detour routes to reduce traffic delays. Portions of the investigation may be delayed until the roadway is open and lighter traffic conditions allow completion of those tasks. DPS will only close those lanes that are absolutely necessary to conduct the investigation safely. Officers will coordinate with ADOT representatives to establish alternate routes, expedite the movement of traffic, and restore the roadway to normal traffic as soon as possible. DPS personnel will also provide incident status information on a regular and timely basis to the ADOT Traffic Operations Center (TOC).

DPS will not unnecessarily delay the reopening of all or part of a roadway to allow a company to dispatch their own equipment to offload or remove a vehicle or load material from the traveled portion of the roadway during peak traffic hours. DPS and ADOT will cooperate fully in planning and implementing clearance operations in the safest and most expeditious manner.

** SAMPLE **

DPS and ADOT will conduct regular meetings to coordinate the activities of the service patrols, ALERT team and maintenance resources. They will also participate in after-action reviews of all incidents closing one or more lanes for three or more hours. Other agencies participating in these incidents will also be invited to the after-action review.

STATEMENT OF COMMITMENT AND PARTNERSHIP

We, the undersigned, provide this Interagency Agreement as guidance to our agencies for safe and effective handling of roadway incidents. We are committed to the safety of all DPS and ADOT employees, the safety of other responders, the safety of the motoring public, and the efficient operation of our state highways. All employees will be informed of this agreement and it shall be posted in all DPS and ADOT offices.

SIGNED _____
Director
Arizona Department of Public Safety

DATE _____

SIGNED _____
Director
Arizona Department of Transportation

DATE _____

APPENDIX C

FOCUS GROUP MEETING MATERIALS:

- INVITATIONS
- SCHEDULES
- PROJECT FACT SHEET

ARIZONA DEPARTMENT OF TRANSPORTATION

ARIZONA TRANSPORTATION RESEARCH CENTER

1130 N. 22nd Avenue, Phoenix, Arizona 85009
Phone 602-712-6910 / Fax 602-256-6367

JANE DEE HULL
Governor

DICK WRIGHT
State Engineer

MARY E. PETERS
Director

Date: November 16, 1999

To: Arizona Highway Incident Management Stakeholders
From: Steve Owen - ATRC Project Monitor - Research Project 497
Subject: Workshop Series for Statewide Incident Management Plan

Congestion on roadways throughout Arizona has become more severe in the past few years. Incidents such as accidents and disabled vehicles account for between 50 and 60 percent of those delays. Improved management of those incidents can reduce congestion, improve air quality, and keep our transportation system reliable. The key agencies and leaders responsible for our roadways understand the need to work together to improve the Arizona highway system's reliability.

The Arizona Department of Transportation and consultant PB Farradyne, are now developing a Statewide Incident Management Plan, which will incorporate all of the work that has been done to date. Arizona already has one of the best Intelligent Transportation Systems (ITS) programs in the nation. Motorist information, a key part of managing incidents, is becoming available statewide. Private and public sector leaders are working together to improve responder safety, reduce the impact of incidents on congestion, reduce secondary accidents, and improve motorist information.

Future incident management program upgrades or new initiatives may require legislation, equipment, training, and staff increases. To make sure that this project's recommendations meet the needs of Arizona citizens and businesses and gain the widespread support needed to be successful, we are asking for your participation. The best plan will have input from highway user groups, police, fire departments, emergency medical, towing, media, and the public. Representatives from all levels of government would be appreciated, as all communities are effected by roadway incidents.

There will initially be seven focus group meetings across Arizona to gather input for development of the draft plan. The meetings will include an overview of programs and plans from other states. The schedule, and location of each meeting, is attached. Please feel free to attend any of the meetings, however, it may be more beneficial for you as an agency representative to attend in your own area if possible.

The draft statewide plan and recommendations will be presented in a second series of meetings in the same areas, to gain final input. We hope to complete this entire process and publish the plan by May 1, 2000.

Please call Paula Mooney at PB Farradyne (480-966-8295, ex 100) to RSVP for the meetings. You may also call the PBFI principal investigator, John O'Laughlin at that number, or you can call me at ADOT, with any questions or to provide further input for this planning effort. Thank you in advance for your support of this process. We look forward to seeing you and gaining your insights.

Stephen R. Owen, P.E.
602 – 712 – 6910
stowen@dot.state.az.us

SPR PROJECT 497
ADOT - STATEWIDE INCIDENT MANAGEMENT PLAN

FOCUS GROUP MEETING
OVERVIEW

- I-17 southbound near Sunset Point – 1 fatality, 8 hour closure, Sunday afternoon 30-mile backup
- SR 87 NB north of Sunflower – runaway truck wreck / 10 vehicles hit, 2 dead, 19 injured – Resulting in 10 1/2 hr closure
- I-10 eastbound near Wintersburg – 1 fatality when vehicle hit on shoulder, one hour later there were 7 more fatalities in a secondary collision – car crushed between two 18-wheelers
- I-10 near Elliott Road in metro Phoenix – body in NB freeway lanes, 8 hr closure for criminal investigation with jurisdictional questions

Numerous events – dust storms on I-10 and snowstorms / fog / ice on I-40

This is an ADOT research project to provide consistent, up-to-date highway incident management guidelines

Goals:

- Improve communications within ADOT
- Improve communications and working relationship with DPS
- Improve procedures for both ADOT and DPS to work with regional and local agencies
- Reduce the impact and duration of incidents - improve the safety and efficiency of the highway system

The Process:

- Review I.M. goals – **save lives / protect & record the scene / open the highway to traffic**
- Review current "best practices" from across the country
- Open forum on recent incidents and any issues that arose
- Roundtable to identify processes, tools and needs to improve performance

Includes:

- Communications (radio channels, cell phone, on-call lists, coordination)
- Standard Procedures (dispatch procedures, incident command, standby resources, motorist alerts)
- Training (agency and interagency)
- Legal (liability questions, quick-clearance laws or policies)
- Partnering (post-incident analysis, regular team sessions)

This Project:

- 8 focus group meetings – December / January
- Develop a draft plan
- another series of statewide meetings to present draft
- Final Plan – to be implemented by ADOT with DPS concurrence
- Recommendations – human resources, equipment, programs, legislation to ADOT / DPS management

Visit the ADOT Operations Website at http://www.azfms.com

ARIZONA STATEWIDE INCIDENT MANAGEMENT PLANNING MEETINGS

DECEMBER 15, 1999 **1:30 PM TO 4:30 PM**	**CITY OF YUMA PUBLIC WORKS DEPT** **155 WEST 14TH STREET, YUMA** **520 783 1287**
DECEMBER 17, 1999 **8:30 AM TO 11:30 AM**	**PHOENIX - ADOT HRDC** **1130 NORTH 22ND AVE, PHOENIX** **602 712 7613**
DECEMBER 21, 1999 **8:30 AM TO 11:30 AM**	**KINGMAN ADOT DISTRICT OFFICE** **3660 E. ANDY DEVINE, KINGMAN** **520 757 5828**
JANUARY 5, 2000 **8:30 AM TO 11:30 AM**	**PRESCOTT - ADOT MAINTENANCE** **6989 E. 2ND ST, PRESCOTT VALLEY** **520 779 2426**
JANUARY 6, 2000 **8:30 AM TO 11:30 AM**	**HOLBROOK - ADOT DISTRICT OFFICE** **2407 NAVAJO BLVD, HOLBROOK** **520 524 6801**
JANUARY 7, 2000 **8:30 AM TO 11:30 AM**	**FLAGSTAFF DAYS INN** **1000 W. ROUTE 66, FLAGSTAFF** **520 774 5221**
***JANUARY 12, 2000** **8:00 AM TO 11:00 AM**	**TUCSON HIDTA CENTER (near airport)** **6868 S PLUMER, TUCSON** **520 547-8700**
JANUARY 14, 2000 **8:30 AM TO 11:30 AM**	**GRAHAM COUNTY OFFICE BUILDING** **921 THATCHER BLVD, SAFFORD** **520 428 3250**

*PART OF A TWO DAY INCIDENT MANAGEMENT WORKSHOP THAT WILL BE HELD FROM 8;00 AM TO 4;00 PM JANUARY 12 AND 13, 1999.

ARIZONA DEPARTMENT OF TRANSPORTATION

ARIZONA TRANSPORTATION RESEARCH CENTER

1130 N. 22nd Avenue, Phoenix, Arizona 85009
Phone 602-712-6910 / Fax 602-256-6367

JANE DEE HULL
Governor

DICK WRIGHT
State Engineer

MARY E. PETERS
Director

Date: February 1, 2000

To: Arizona Highway Incident Management Stakeholders
From: Steve Owen - ATRC Project Monitor - Research Project 497
Subject: Follow up Meetings for Statewide Incident Management Plan

First of all, thank you so much for taking the time to provide input at the focus group meeting on this project. We were very pleased with the quantity and quality of input we received throughout the state. As a result of that input, we are confident we will have a very comprehensive plan for you to comment on.

On approximately March 3rd, you will receive a draft copy of the Statewide Incident Management Plan for your review. Please look it over and make any needed additions deletions or comments for discussion in the planned series of follow up meetings. We hope that you or your designee will attend to share your comments with us at that meeting. The attached list indicates when and where the follow up meetings will be held.

Please call Paula Mooney at PB Farradyne (480-966-8295) to RSVP for the meetings. You may also call John O'Laughlin or Gregg Snyder at 480-966-8295 if you need clarification or have questions prior to the meetings. We look forward to seeing you at one of the meetings in March. Also, please feel free to contact any other key incident management partner agency in your area that did not attend the initial workshop.

As we indicated in our first letter to you, future Arizona incident management program upgrades or new initiatives may require legislation, equipment, training, and staff increases. We are again asking for your participation to make sure that this project's recommendations will meet the needs of Arizona incident responders, citizens and businesses to and will gain the widespread support needed to be successful.

Sincerely,

Steve Owen
ADOT-ATRC
602 712 6910

ARIZONA STATEWIDE INCIDENT MANAGEMENT PLANNING MEETINGS
MARCH, 2000

March 13	**8:30 am to 11:30 am**	**YUMA CIVIC & CONVENTION CENTER** **1440 Desert Hills Dr.** **Yuma, AZ. 520-344-3800**
March 14	**8:30 am to 11:30 am**	**SEDONA FIRE STATION # 3** **125 Slide Rock Rd. (corner of Cortez & Slide Rock Rd.)** **Village of Oak Creek, Sedona 520-282-7101**
March 15	**8:30 am to 11:30 am**	**HOLBROOK VOLUNTEER FIRE DEPARTMENT** **100 W Airport Rd.** **Holbrook, AZ. 520-524-6801**
March 16	**8:30 am to 11:30 am**	**FLAGSTAFF CITY COUNCIL CHAMBER** **City Hall (Park in Front Lot on northeast side)** **211 W. Aspen, Flagstaff 520-774-5281**
March 17	**8:30 am to 11:30 am**	**KINGMAN – BOARD OF SUPERVISORS** **809 E. Beale Street** **Kingman, AZ. 520-753-0729**
March 27	**8:30 am to 11:30am**	**PHOENIX ADOT Human Resource Center** **1130 N. 22nd Ave.** **Phoenix, AZ 602-712-7613**
March 30	**8:30 am to 11:30**	**SAFFORD COUNTY OFFICE BUILDING** **921 Thatcher Blvd.** **Safford, AZ 520-428-3250**
March 31	**8:30 am to 11:30**	**TUCSON – EL PUEBLO REGIONAL CENTER** **101 W. Irvington (Corner of 6th & Irvington)** **Tucson, AZ 520-791-4629**

* * * * * * * * * * * *

JANE HULL
Governor

ARIZONA DEPARTMENT OF TRANSPORTATION

DIRECTOR'S SUPPORT DIVISION

ARIZONA TRANSPORTATION RESEARCH CENTER

2739 E. Washington St., Mail Drop 075R, Phoenix, Arizona 85034
Phone: (602) 712-3130, Fax: (602) 712-3400

MARY PETERS
Director

April 21, 2000

To: Arizona State Transportation Stakeholders

From: Steve Owen - ATRC Project Monitor - Research Project 497
John O'Laughlin – Consultant Project Manager, PB Farradyne

Subject: **Results of Statewide Incident Management Plan Focus Group Meetings**

Thank you very much for attending the two recent cycles of Focus Group meetings for development of ADOT's Statewide Incident Management Plan. Your participation was very valuable to our project team.

Enclosed are the results of the balloting from the workshops around the state during March. The topics that were high priority are clearly noted. The scores also show the group's perceptions of what state or agency level has the responsibility and the authority to make needed changes in each area of concern.

ADOT and consultant PB Farradyne are now proceeding on the final Statewide Incident Management Plan. The plan is intended to enable agencies and service-provider partners at all levels to improve first-response efforts, reduce congestion from incidents, reduce secondary accidents, and improve traveler advisories.

Future improvements in incident management capabilities may require legislation or department policy changes as well as equipment, training, and manpower increases. Through our series of regional workshops, PB Farradyne and the ATRC have tried to ensure that this project will meet the needs of Arizona citizens and gain the widespread support needed to be successful.

The next steps are the completion of the Plan and presentations to the ADOT Research Council, and to the Directors and senior managers of ADOT and the Arizona DPS. Every effort will be made to obtain sponsorship commitments for the needed funding and policy changes of this project's recommendations.

ADOT will also distribute the Incident Management Plan as a set of working guidelines for the districts and regional and local offices. Many of the Plan's concepts are simple and obvious ways for responders from all agencies to deal more safely and effectively with highway incidents, and to restore traffic flow.

Thanks again for your help in this research effort; later, you'll be sent the 4-page project summary report.

Stephen R. Owen, P.E.
Arizona Transportation Research Center
602 – 712 – 6910
stowen@dot.state.az.us

John B. O'Laughlin
PB Farradyne, Inc.
480 – 966 – 8295
Olaughlin@pbworld.com

CC: Project TAC Members

APPENDIX D

INCIDENT MANAGEMENT TEAM FORMATION
The Florida Example

Note: Consultant PB Farradyne was recently involved in the planning and guidance of regional Incident Management Team development in several areas of Florida, notably in Broward and Palm Beach Counties. The following provides a process summary and facilitator's outline for local and regional groups that intend to develop such cooperative IM team efforts.

Overview – Florida Incident Management Teams

A strong local interest in improved Incident Management led to discussions of forming regional teams. Specifically, Focus Group members in several cities talked about the need for a more formal process for agencies to work together on all aspects of managing incidents. Several other states and localities have had success with forming and maintaining incident management teams.

This success results from the formalized coordination among agencies, which has been shown to provide many benefits including saving lives, resources, and time for incident responders and travelers. The relationships built in this team process also improve interagency communications for other issues such as roadway construction planning, special events traffic control planning, and disaster preparedness.

The institutional challenges to improved incident management are often the most difficult. Each response agency, while often highly trained and professional, works within its own focus, role and responsibility and may have limited experience with multi-agency cooperation especially for traffic incidents.

Departments of transportation and public works are probably the newest players in incident management, having a traditional role of planning, design, construction and maintaining roadways. The recent emphasis on managing and operating roadway facilities in real-time is a recent trend which is motivating DOT's and public works departments to become active players among incident response agencies.

The key response agencies making up the IM Team membership should include:

- Law Enforcement –Highway Patrol, County Sheriff, Local Police Departments, Tribal Police, and National Park Police.
- Fire – Rescue – Federal, State, County, City and Private.
- Emergency Medical Services – County and City, Private Ambulance and Air Evacuation, 911 public service answering points.
- Transportation – State DOT operations, maintenance, HAZMAT, clean-up contractors, County Traffic Engineering Divisions; City Engineering Departments, and the Federal Highway Administration.
- Towing and Recovery – Light and Heavy duty, Towing Association Representative.
- Media –Traffic Reporters, Information Providers.

Others who may participate on a part time basis are:

- Metropolitan Planning Organizations.
- Automobile Clubs.
- Trucking Associations.
- Transit.
- County Medical Examiner.
- Hazardous Materials – Private HAZMAT Contractors, State Environmental Services.
- Emergency Operations – County Emergency Management.

The participation of this broad group of agencies results in a typical meeting attendance of 20 to 40 persons. A team roster should be maintained identifying contact information for each agency. A sign-in sheet is also useful each time to update the information on participants.

The philosophy of conducting any large meeting with competing priorities and agendas is often one of facilitation. Meetings must be well planned, scheduled in advance, and have a meaningful agenda. The value of participating in the team meetings to the response agency members has to be there for continued involvement. A positive focused agenda is a key part of keeping the level of interest high.

The Role of Transportation Agencies

Transportation agencies typically have overall responsibility for planning and implementation of incident management programs. They have has been an important catalyst for improved incident management services by bringing key agencies together and facilitating planning meetings. The agencies may provide a modest funding level to support the planning and training process.

Meeting Frequency, Locations

Meeting should be organized on at least a monthly basis initially. The meeting sites should be rotated among many different venues with the stated purpose of introducing the participants to the environment of all of the various response agencies. With each new meeting facility, a tour should be arranged to give the participants the touch and feel of the response agency's operations and resources.

Team Notebooks

Each team member should be provided with a notebook to save the meeting materials and special materials provided at the meetings, sometimes including newspaper clippings of major incidents, brochures of new programs and response resources, agency policies, or materials developed by the teams themselves.

Minutes

Detailed meeting minutes should be taken and distributed to the entire team membership. Agencies who didn't attend may read the minutes and follow the progress of the team. When a focus topic or a hot issue comes up, the attendance will increase due to the need to render input by all of the agencies.

Team work-plans should begin with the team's first meeting. Issues and concerns are brainstormed by the participants along with introductions of the participants' roles and responsibilities. The brainstorming list can then be used to derive a team agenda for a one or two year period. The list is then revisited in a team-planning meeting at least every six months.

Examples of Florida work plans illustrate the variety of topics that IM Teams are dealing with:

Broward County FIM Team 2000 Work Plan

- Responder to responder [Inter-agency] communication in Broward County, how can the FIM Team help make it happen.
- The FHP Trooper shortage and its ramifications to other agencies' operations.
- Strategies to keep a balance between incident scene safety and impact to traffic.
- Heavy duty towing and clearance of major truck crash scenes, raising the standards.
- Synergies with Traffic Reporting Media and improved traveler information.
- Removing road debris from hazardous locations - a team approach.
- Operating and managing a freeway system in 'Real Time' - can FDOT step-up and enhance its role on scene as well as operate the Traffic Management Centers.
- How to improve awareness of the FIM Team and generate more participation.
- Diversion route planning, trailblazing signs to Turnpike/I-95 signal timing and the use of ITS elements.

Palm Beach County FIM Team 2000 Work Plan

- Develop revised procedures for more effective response and clearance of diesel fuel spilled on travel lanes.
- Inter-county/city, Inter-agency, issues.
- Responder-to-responder communications, can it happen in Palm Beach Co.
- Heavy duty towing and the clearance of major truck crash scenes, raising the standards for equipment and performance.
- "Quick clearance" what is being done elsewhere and which of these strategies will help here.
- Improved traveler information and synergies with the Traffic Reporting Media.
- Creating a database for Level 3 Incidents and criteria for post-incident reviews.
- Operating and Managing the Turnpike and I-95 in 'Real Time' - what FDOT is doing to step up and enhance its role as owner/operators of the roadway systems.
- Public education and awareness.
- Diversion and trailblazing signs from one facility to/from the other - Turnpike & I-95.
- New technology applications for incident Management.

Facilitator

The critical role of Team facilitator may be selected from the group, provided by a planning organization, or hired from a consulting firm. The most effective progress has been made by raising the issues from the facilitator's basis of credibility and knowledge of incident management, and asking questions or suggesting alternatives to generate discussion among the participants.

The facilitator must be careful not to criticize or condemn any idea or practice to maintain a neutral role. There typically is sufficient peer pressure among the participants to motivate the participants to do the right thing or to go back to their agencies to clarify policies, for example, as opposed to reaching stalemate on an issue.

Numerous team accomplishments have been achieved. These have been derived from activities initiated by a Consultant, and also led by the member agencies. The approach has been to conduct the team activities with as much cross-functional team activity as possible. This approach has provided the maximum amount of ownership of the accomplishments by the participants, and the most amount of agency specific input into the effort.

The Facilitation Process

One proven method of achieving results from the FIM Team has been through the use of tabletop exercises. This approach gets everyone involved, allows the participants to share their expertise with their team members, and includes a group presentation of the results.

Another proven approach is with in-depth research. A Consultant was tasked with developing an incident notification and agency resource guide. As a result of the research, and the cooperation of all of the response agencies, a notebook was published which mapped the fire-rescue jurisdictions for all freeway segments, and provided a corresponding notification protocol for first responders and dispatchers to follow. The protocol included varying responses depending on a defined severity level. The notebook also contained a "yellow pages" of incident management resources from all of the agencies and private parties for a wide range of possible services that can be required during incidents. The manuals were distributed to all of the team member agencies for immediate use.

Achieving an effective incident management team program is an effort in continuous improvement. There is never a point in which you are finished because of the changing conditions and players in key agencies. In many high-growth areas such Arizona, there is increasing demand on the freeways. This calls for a continuous effort of the Incident Management Teams to work together.

One of the most difficult challenges is how to put the team's plans into action. While there is one representative from DPS, for example, their experiences with the team must be communicated to numerous stations, commanders, shift supervisors, and patrol officers. This could be a very long process, although working within the response agency's well structured organizations should help.

Long-Term Team Issues

An ongoing program can lose steam if the same issues are discussed over a period of several years. This frustration has surfaced recently in Palm Beach County. Continuous efforts to make the meeting topics timely, relevant, and focused helps to overcome this. Specialty meeting topics like a briefing on a major interstate reconstruction project provides incentives for members to attend, gather information and provide input.

In public agencies and private companies alike, the only thing that is constant is change. Personnel, policies, jurisdictions, management organizations and laws all are changes that the team must stay abreast of and react to in order to continue to achieving improved incident management. The Broward and Palm Beach FIM Teams are focused on where policies and procedures need to be changed and view themselves as potential change agents. For example, the teams recently worked to receive a clarification on procedures for lifting of the tolls in emergency and traffic diversion situations.

The incident management teams in Florida and elsewhere have proven their value in coordinated efforts to improve multi-agency response programs and serve as a model for others to follow.

APPENDIX E

ARIZONA INCIDENT MANAGEMENT PLAN
PBFI SCOPE OF WORK 8/23/99

TASK 1: PROJECT MANAGEMENT

The PBFI Project Manager will be responsible for the overall management and coordination of all activities related to the completion of work activities for this project. PBF's Task Leader, assigned to our Tempe office for extended time periods, as needed, will have day-to-day responsibility for work activities, the preparation of project deliverables and coordination with ADOT and core stakeholder agencies. The Project Manager and Task Leader will be fully supported, as needed, by the full resources of PB's Tempe office and the PBF organization to ensure that the technical and administrative resources required for the completion of project elements are provided in a timely manner.

A Project Kick-off Meeting, to be scheduled and arranged by ADOT's Project Manager, with the Project Technical Advisory Committee (TAC) will be conducted as soon as possible following receipt of the Notice To Proceed. This meeting will be directed toward the following objectives:

- Review the project scope and work plan.
- Identify potential stakeholder agencies and contacts. PBFI has working relationships with a number of traditional and non-traditional stakeholders, and will be prepared to discuss what each can bring to this project in order to develop a recommended roster of key contacts and stakeholders who would be helpful to the planning process.
- Seek a broader based stakeholder group made up of public and private organizations that have a vested interest in the development of effective incident management programs. In addition to the normal responders such as law enforcement agencies, fire departments, DOT, towing service providers, and emergency medical services, the stakeholder group might include representatives from local and statewide organizations, such as automobile clubs, as well as organizations representing public transit, media, insurance companies, associated contractors, and trucking organizations.
- Provide a summary of information gained from the incident management workshops PBFI has conducted throughout Arizona and adjacent states.

Throughout the course of the project, PBFI will conduct monthly progress briefings with the TAC. The progress briefings will provide a summary of the project status, project progress, and a 30-day look-ahead, plus a discussion of any issues requiring TAC resolution.

PBFI will prepare and submit written monthly progress reports that detail the status of work being performed. These progress reports will include a narrative of the tasks accomplished in that month, an outline of the tasks anticipated to be accomplished in the next month, a summary of problems and opportunities identified during the previous month and any anticipated problems, an updated project schedule and invoice detailing resources, and a summary of the percent completion for each task of the project.

Task 1 - Deliverables
Revised Scope of Work and Schedule
List of Stakeholders
Monthly TAC Briefings
Monthly Progress Reports

TASK 2: REVIEW CURRENT INCIDENT MANAGEMENT PLANS IN OTHER STATES

In this task, PBFI will identify, review, and, analyze incident management plans developed by other States that may offer lessons for developing an Arizona statewide plan. PBFI has been involved in the development of incident management plans for other States, and has conducted training programs and workshops on incident management for several states, including Arizona. Both the IM plans as well as the training programs have addressed incident management needs in urban as well as rural areas, the latter being of special interest as background for undertaking this important assignment.

From participation in national incident management committees and working groups, PBFI staff members are well acquainted with ADOT and law enforcement officials involved with these programs, both in the State of Arizona and in other States and Provinces throughout North America.

PBFI will review the incident management plans prepared by other States and prepare a Technical Memorandum to summarize the key elements of these plans as well as the experience of other States with the implementation of incident management plans. If possible, the review will identify the aspects of other programs that have worked well as well as aspects that have not worked as planned. The review will be accomplished using published reports and telephone interviews with selected officials, as necessary.

PBFI will summarize the results of this task, including a list of lessons learned, in a Technical Memorandum to be delivered in a suitable electronic format. In particular, it is anticipated that the information collected in this task will provide useful discussion material for the regional focus group meetings to be conducted in Task 3.

Task 2 - Deliverable
Milestone Technical Memorandum on Review of Incident Management Plans

TASK 3: REGIONAL FOCUS GROUP MEETINGS

In this task, PBFI will conduct seven regional focus group meetings at locations across Arizona. The focus groups will include local staff from the core TAC agencies, ADOT and DPS, as well as representatives from local, county, and regional governments. PBFI project staff have worked with many of the personnel from several areas of the State who will be involved in the focus group meetings, and it is expected these established working relationships should assist in maximizing the inputs for plan development obtained from the focus group meetings. PBFI will work with ADOT and DPS to assist in identifying the stakeholders to be involved from each focus group location. In order to maximize participation by meeting participants, PBFI will prepare a letter to each participating agency that summarizes the objective and desired end products of the focus group meetings, noting the potential benefits to each agency from participation in the focus group meetings.

For the Focus Group meetings, PBFI will prepare or collect any materials required for the meetings but it is assumed that ADOT will be responsible for the identification of meeting facilities, for any costs associated with the meeting facilities including refreshments for meeting participants, and for video or tape recording the meetings. At the focus group meetings, PBFI will provide an overview of ADOT's existing incident management programs, current efforts underway to improve programs, and Arizona's statewide traffic management program to the meeting participants.

The objective of the focus group meetings will be to gain local insight concerning current needs and issues related incident management in rural areas, and, as appropriate seek input from participating stakeholders on prioritizing needs and alternative solutions in the following areas:

- Nature and extent of incident management problem(s);
- Incident management planning;

- Gap assessment;
- Training;
- Communications; and
- Protocols for responsibility and authority.

As noted above, the information gathered in Task 2 will be used to facilitate discussion by providing examples of how other States have addressed certain needs and what alternatives may be available for the development of incident management plan elements.

PBFI will prepare the minutes of each meeting and distribute to all attendees for their review and comment. All comments received will be incorporated into the final version of the minutes and distributed in a form of milestone report, to be delivered to ADOT in a suitable electronic format, to all attendees and the TAC.

Task 3 - Deliverables
Focus Group Meetings (7)
Draft Meeting Minutes (7)
Milestone Technical Memorandum on Focus Group Meetings

TASK 4: CURRENT PLANNING STATUS AND ISSUES REPORT

Upon completion of the focus group meetings and a review of information gathered from agencies on their on-going incident management programs, PBFI will review and document the current planning processes for the development of incident management services being provided in select Arizona locales. This will be accomplished through information collected in Tasks 2 and 3 from geographically selected (with concurrence of the TAC) local agencies having prime responsibility for incident management in rural areas. . The review will include an assessment of the following items for each local agency:

- Roles and responsibilities, including current and anticipated resources;
- Communication protocols;
- Overview of incident management programs and procedures; and
- Needs and issues for the development of improved incident management services.

The report will identify any gaps in the existing planning process. It is expected that this assessment will also identify coordination requirements between different agencies for incidents requiring response from different States as well as from local authorities. One of the important aspects of an incident management program is the effective coordination and communications between involved agencies with jurisdiction over the different aspects of an incident response.

PBFI will summarize the results of this task in a Technical Memorandum to be provided to ADOT in a suitable electronic format.

Task 4 - Deliverable
Milestone Technical Memorandum on Current IM Status and Issues

TASK 5: PREPARE DRAFT ARIZONA INCIDENT MANAGEMENT PLAN

In this key task, PBFI will develop a draft Incident Management Plan utilizing the information gathered in previous three work tasks. The plan will be organized in a fashion that effectively serves as a functional working tool for all core stakeholders, and is suitable for distribution to traffic operations centers, ADOT

and DSP district offices, and to select law enforcement, emergency response, and safety personnel. The plan will establish uniform guidelines to agencies involved in responding to incidents on rural highways with the objective of ensuring that incident management services are provided through consistent identification and response methods, lines of responsibility, and communication plans.

The plan will address the following key institutional and implementation issues:

Institutional Issues
The plan will address each core incident management stakeholder institutional role and authority and will identify needs, desires, and outstanding issues and will propose recommendations toward their resolution. Further, the plan will clearly define roles, responsibilities, and functional authority of each public incident management agency. By doing so, the plan will also identify the resource deficiencies in terms of personnel, equipment, and facilities within each agency as they would fulfill their lines of responsibility. As the Plan might identify appropriate opportunities and/or requirements for inter-agency sharing of equipment, or for mutual aid, areas for formal inter-agency agreements will be identified.

Implementation Issues
This part of the plan will identify key issues and will translate these issues to operational guidelines for statewide uniformity and for a statewide incident management approach in the following areas:

- Institutional and public policy elements desirable to implementing the Plan;
- Key Stakeholder roles for the implementation of plan elements;
- Opportunities for Statewide coordination and cooperation in incident management planning;
- Opportunities for advanced technologies in addressing incident management problem areas;
- Identifying areas of highway traffic information deficiencies;
- Identifying areas requiring extraordinary traffic information and controls;
- Posting appropriate motorist advisory and re-routing messages;
- Developing procedures for traffic controls including lane closures during incidents;
- Considerations in planning and conducting scheduled maintenance activities; and
- Media and public relations.

The plan will also provide a training plan for multi-agency training of the key response personnel in ADOT, law enforcement, fire, and towing. Part of that process will be a training plan for entry level personnel, supervisory personnel, and existing responders.

PBF's Implementation Plan will include recommendations for implementation activities based on similar programs elsewhere in North America.

PBFI will provide the draft Incident Management Plan to ADOT in a suitable electronic format.

Task 5 - Deliverable
Draft Arizona Rural Incident Management Plan

TASK 6: MEETINGS WITH THE STAKEHOLDERS TO DISCUSS THE PLAN

PBFI will conduct seven regional presentations to introduce the new Statewide Incident Management Plan to the core stakeholder agencies, to the focus group participants, and to representatives of other interested groups and organizations. It is suggested that copy of the draft Incident Management Plan, or portions of the plan document, be provided to all or selected meeting participants in advance of the meetings. PBF's

experience has shown that meetings of this type can be more effective and that the meeting participants can provide meaningful input, if meeting participants are given the opportunity to review the plan document to be discussed in advance of the meeting.

It is further suggested that, in addition to or possibly in place of two or three regional meetings, PBFI make presentations at regularly-scheduled meetings of the statewide police chiefs and sheriffs association, fire chiefs association, and towing services association. Each of these memberships will include individuals who will have a key role in the success of this planning effort.

The comments and other feedback received from the meeting participants at each of the seven regional presentations will be documented, and summarized in table format where the disposition of each comment, as far as changes in the final version of the Incident Management Plan, will be noted.

Task 6 - Deliverables
Incident Management Plan Regional Presentations (7)
Summary of Comments

TASK 7: FINAL ARIZONA INCIDENT MANAGEMENT PLAN

In this task, PBFI will make modifications to the draft Incident Management Plan based on the comments received at the seven regional presentations. The final Incident Management Plan will be provided to ADOT in a appropriate electronic format so that the report can be easily duplicated. A copy of the final report will also be provided as a Word document to facilitate future revisions and updates. The final report will be prepared so that it is suitable for distribution to operations centers, ADOT and DPS district offices, and to selected other law enforcement, emergency response, and safety personnel throughout the State.

Task 7 - Deliverable
Final Arizona Rural Incident Management Plan

TASK 8: SUMMARY FINAL REPORT

PBFI will develop a Summary Final Report and a Research Note on the project based on the Arizona Transportation Research Center (ATRC) guidelines for research publications. It is expected that the Summary Final Report and Research Note will be prepared directly from project technical memorandum reports and Incident Management Plan documentation, with only minor tailoring to meet ATRC requirements.

Task 8 - Deliverables
Summary Final Report
Research Note

TASK 9: FINAL PRESENTATIONS

PBFI will make three presentations, one each, to the ADOT Research Council, the ADOT Research Steering Committee, and the ADOT/DPS Partnering Meeting. These presentations will summarize the process used in carrying out the project and the major accomplishments of the project.

Task 9- Deliverable
Final Presentations (3)

APPENDIX F

REFERENCES

1. Focus Group Attendance Lists, Phoenix, Yuma, Safford, Prescott, Kingman, Flagstaff, Holbrook, and Tucson.

2. Focus Group Meeting Notes, All cities.

3. ADOT-DPS "Level of Service Agreement", Tim Wolfe, 1998.

4. Arizona Department of Transportation Traffic Operations Center Operations Manual, October 1998.

5. Missouri DOT Secondary Collision Study, Dan Bruno, October 1999.

6. CHART Standard Operations Procedures Manual, Maryland State Highways Administration, July 1995.

7. California Senate Bill 681, Senator Jackie Speiers, September 1999.

8. "Framework for Developing Incident Management Systems" US Department of Transportation, Federal Highway Administration, August 1991.

9. Incident Summary Report, Arizona Department of Transportation, November 1999.

10. ITS America address by Mortimer Downey, USDOT, May 1999.

11. "National Police Week Observed", The Police Chief, International Association of Chiefs of Police, May 2000.

12. "APPARATUS PARKING - Positioning Apparatus at Roadway Incidents", Phoenix Fire Department, 1994.

13. California Attorney General's office, Attorney Ron Harrison, January 2000.

14. Washington State Attorney General's office, May 1999.

15. "American Towman" Magazine classified section, December 1999.