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EVALUATION OF 2005 ARIZONA CRASH DATA REPORTED TO MCMIS CRASH FILE

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16. Abstract

This report is part of a series evaluating the data reported to the Motor Carrier Management Information System (MCMIS) Crash File undertaken by the Center for National Truck and Bus Statistics at the University of Michigan Transportation Research Institute. Earlier studies showed that reporting to the MCMIS Crash File was incomplete. This report examines factors that are associated with reporting rates for the state of Arizona.

MCMIS Crash File records were matched to the Arizona Crash file to determine the nature and extent of underreporting. Overall, it appears that Arizona is reporting 78.2 percent of crash involvements that should be reported to the MCMIS Crash file.

Based on crash severity, the reporting rate is 93.8 percent for fatal crashes, 83.4 percent for injured/transported crashes, and 75.6 percent for towed/disabled crashes. It is possible that the number of injured/transported reportable cases is underestimated since the definition was applied in the strict sense using the medical transport variable. The reporting rate for trucks is 77.8 percent, and the rate for buses is 82.5 percent. The reporting rates for the Arizona Highway Patrol, sheriffs offices, and police departments are 82.4 percent, 79.6 percent, and 74.0 percent, respectively. It appears that 66 of the 4,411 reportable cases involved explosion or fire and only 2 of these were not reported. Of the 66 vehicles, 44 involved no injury.

Missing data rates are generally low for most variables in the MCMIS Crash file, except in a few instances as noted.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
	NOTE: volumes greater than 1000 L shall be shown in m^3			
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
^oF	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	^oC
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	$candela/m^2$	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact degrees)		
^oC	Celsius	1.8C+32	Fahrenheit	^oF
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	$candela/m^2$	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.
(Revised March 2003)

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Evaluation of 2005 Arizona Crash Data Reported to the MCMIS Crash File

1. Introduction

The Motor Carrier Management Information System (MCMIS) Crash file has been developed by the Federal Motor Carrier Safety Administration (FMCSA) to serve as a census file of trucks and buses involved in traffic crashes meeting a specified selection criteria and crash severity threshold. FMCSA maintains the MCMIS file to support its mission to reduce crashes, injuries, and fatalities involving large trucks and buses. It is essential to assess the magnitude and characteristics of motor carrier crashes to design effective safety measures to prevent such crashes. The usefulness of the MCMIS Crash file depends upon individual states transmitting a standard set of data items on all trucks and buses involved in traffic crashes that meet a specific severity threshold.

The present report is part of a series evaluating the completeness and accuracy of the data in the MCMIS Crash file. Previous reports on a number of states showed underreporting due in large part to problems in interpreting and applying the reporting criteria. The problems were more severe in large jurisdictions and police departments. Each state also had problems specific to the nature of its system. Some states also had overreporting of cases, often due to technical problems with duplicate records. [See references 1 to 19.] The states are responsible for identifying and reporting qualifying crash involvements. Accordingly, improved completeness and accuracy must ultimately reside with the individual states.

In this report, we focus on MCMIS Crash file reporting by Arizona. In recent years, Arizona has reported from 2,420 to 2,980 involvements annually to the MCMIS Crash file. According to the 2002 Vehicle Inventory and Use Survey, in 2002, Arizona had over 116,000 trucks registered, ranking 17th among the states and accounting for 2.1 percent of all truck registrations [20]. Arizona is the 17th largest state by population [21] and generally falls near the 60th percentile (20th) in terms of the number of annual truck and bus fatal involvements [22].

The method employed in this study is similar to previous studies.

1. The complete police accident report file (PAR file hereafter) from Arizona was obtained for the most recent year available, 2005. This file was processed to identify all cases that qualified for reporting to the MCMIS Crash file.

2. All cases in the Arizona PAR file—those that qualified for reporting to the Crash file as well as those that did not—were matched to the cases actually reported to the MCMIS Crash file from Arizona.

3. Cases that should have been reported, but were not, were compared with those that were reported to identify the sources of underreporting.

4. Cases that did not qualify but which were reported were examined to identify the extent and nature of overreporting.

Police accident report (PAR) data recorded in Arizona's statewide files as of January 16, 2007 were used in this analysis. The 2005 PAR file contains the computerized records of 268,774 vehicles involved in 139,776 crashes that occurred in Arizona.

2. Data Preparation

The Arizona PAR file and MCMIS Crash file each required some preparation before the Arizona records in the MCMIS Crash file could be matched to the Arizona PAR file. In the case of the MCMIS Crash file, the only processing necessary was to extract records reported from Arizona and to eliminate duplicate records. The Arizona PAR file required more extensive work to create a comprehensive vehicle-level file from accident, vehicle, and occupant files. The following sections describe the methods used to prepare each file and some of the problems uncovered.

2.1 MCMIS Crash Data File

The 2005 MCMIS Crash file as of August 21, 2006, was used to identify records submitted from Arizona. For calendar year 2005 there were 3,799 cases. An analysis file was constructed using all variables in the file. The file was then examined for duplicate records (those involvements where more than one record was submitted for the same vehicle in the same crash; i.e., the report number and sequence number were identical). One such duplicate pair was found. However, further examination of the cases revealed that these were not duplicate records. Although they were in the same accident, the vehicles and drivers were not the same. Perhaps the vehicle number was mistakenly assigned as a '1' in both cases.

In addition, records were examined for identical values for accident date, time, crash county, officer badge number, vehicle license plate number, and driver license number, even though their case numbers were perhaps different. One would not expect all of these variables to be identical between two cases. Thirty-two such duplicates were found, representing sixteen unique occurrences of the examined variables. In all pairs, case numbers differed, but the vehicles and drivers involved were identical.

One explanation could be that a vehicle was involved in two accidents at the same place and virtually at the same time. Once crash events are stabilized, subsequent crashes are reported as new crashes. If a vehicle is reported as being in a second crash after the first one has stabilized, one would expect accident date, location, driver and vehicle information to be identical, but accident time to vary by a short interval. However, in the case of these records, accident hour and minute are identical, suggesting they are in fact duplicate records. Since one record may have been an update to the earlier one, the record with the latest change date was kept, and the earlier one was deleted. After deletion of 16 records the resulting file contains 3,783 unique records.

2.2 Arizona Police Accident Report File

The Arizona PAR data for 2005 (dated January 16, 2007) was obtained from the state of Arizona. The data were contained in a set of thirteen tables in ACCESS format, representing accident, vehicle, and person records. The combined files contain records for 139,776 crashes involving 268,774 vehicles. Data for the PAR file are coded from the Arizona Traffic Accident Report (01-2704), the Fatal Supplement (01-2705), and the Truck/Bus Supplement (01-2710) completed by police officers (See Appendix B).

The PAR file was first examined for duplicate records. A search for records with identical case numbers and vehicle numbers found no such instances. In addition, inspection of case numbers verified that they were recorded in a consistent format, so there was no reason to suspect duplicate records based on similar, but not identical, case numbers (such as 14350475 and 1435-475, for example). However, cases were also examined to determine if there were any records that contained identical time, place and vehicle/driver variables, even though their case numbers were perhaps different. Two cases would not be expected to be identical on all variables. To investigate this possibility, records were examined for duplicate occurrences based on the variables accident date/time, road, reporting officer number, driver age, and vehicle license plate number. A total of 329 duplicate instances were found, representing 164 unique occurrences of the examined variables.

Duplicate pairs (triplicates) were examined more closely for any patterns that might explain why they were occurring. In all but two cases, both members of the duplicate pair had the same accident number, but vehicle number differed. In addition to driver age and vehicle license plate number being identical, in all but a few cases, driver date of birth was on exactly the same day. Although driver license number and certain other variables differed in a few of the pairs, most of the variables were identical between the two records. It appears that one record was possibly an update, and that vehicle number was changed in the process. Thus, the pairs identified above were considered to be duplicates. Since there were no processing dates on the records, other than at the crash level, the second (and third, in one instance) member of each pair was excluded. After deletion of 165 cases, the resulting PAR file has 268,609 records.

3. Matching Process

The next step involved matching records from the Arizona PAR file to corresponding records from the MCMIS file. After removing duplicates, there were 3,783 Arizona records from the MCMIS file available for matching, and 268,609 records from the Arizona PAR file. All records from the Arizona PAR data file were used in the match, even those that were not reportable to the MCMIS Crash file. This allowed the identification of cases in the MCMIS Crash file that did not meet the MCMIS Crash file reporting criteria.

Matching records in the two files requires finding combinations of variables common to the two files that have a high probability of uniquely identifying accidents and specific vehicles within the accidents. Microfilm number, which is the identifier used to uniquely identify a crash in the Arizona PAR data, and report number in the MCMIS Crash file, are obvious first choices. Indeed, there is a correspondence between the two numbers, and case number was never unrecorded in either file. Microfilm number in the Arizona PAR file is an eight-digit numeric value, while in the MCMIS Crash file, report number is stored as a 12-character alphanumeric value, a combination of alphabetic characters and numbers. It appears that the report number in the MCMIS Crash file is constructed as follows: The first two columns contain the state abbreviation (AZ, in this case), followed by ten digits**.** In 46% of MCMIS cases, the report number variable included only 3-6 non-zero numbers, but the balance of cases contained eight non-zero numeric digits, which could be matched to the PAR microfilm number.

Other variables available for matching at the crash level include crash date, crash time (stored in military time as hour/minute), crash city, crash road, and reporting officer's identification number. Crash county was not available on the electronic PAR file. The PAR road variable was

not used for the match, as it was not formatted the same as the MCMIS street variable. City was used for the first match attempt, but it was unrecorded in 12% of PAR cases and in 30% of MCMIS cases. However, where unique values existed, these variables were used to verify cases were accurately matched.

Variables in the MCMIS file that distinguish one vehicle from another within the same crash include vehicle sequence number, vehicle license plate number, driver license number, vehicle identification number (VIN), driver date of birth, and driver last name. Vehicle sequence number did not match PAR unit number. Vehicle license number, driver license number, driver date of birth, and driver age were all present in the PAR file. VIN and driver last name were only recorded for the subset of PAR cases with a supplemental record. Of these variables, those with the lowest unrecorded rates were used in the match.

Four separate matches were performed using the available variables. At each step, records in either file with duplicate values on all the match variables were excluded, along with records that were missing values on the match variables. The first match included the variables case number, crash date (month, day), crash time (hour, minute), crash city, officer ID, VIN, vehicle license number, driver license number, driver age, and driver last name. The second match step dropped case number, minute, city, VIN, driver age, and driver last name, but retained the other variables. The third match step matched on crash date, officer ID, vehicle license number, and driver last name. The fourth match included variables crash date, and driver last name. The fourth match step was hand-verified using all available variables in both files. This process resulted in matching 99.3% of the MCMIS records to the PAR file.

Table 1 shows the variables used in each match step along with the number of records matched at each step. Matched records were verified using other variables common to the MCMIS and PAR file as a final check to ensure the match was valid. The above procedure resulted in 3,755 matches, representing 99.3% of the 3,783 non-duplicate records reported to MCMIS.

Table 1 Steps in MCMIS/Arizona PAR File Match, 2005

Step	Matching variables	Cases matched
Match 1	Case number, crash date, crash time, crash city, officer ID, VIN, vehicle license number, driver license number, driver age, and driver last name	1,102
Match 2	Crash date, crash hour, officer ID, vehicle license number, and driver license number	2,434
Match 3	Crash date, officer ID, vehicle license number, and driver last name	127
Match 4	Crash date, driver last name	92
Total cases matched		3,755

Figure 1 shows the flow of cases in the matching process. Of the 3,755 matched cases, 305 are not reportable and 3,450 are reportable. The method of identifying cases reportable to the MCMIS Crash file is discussed in the next section.

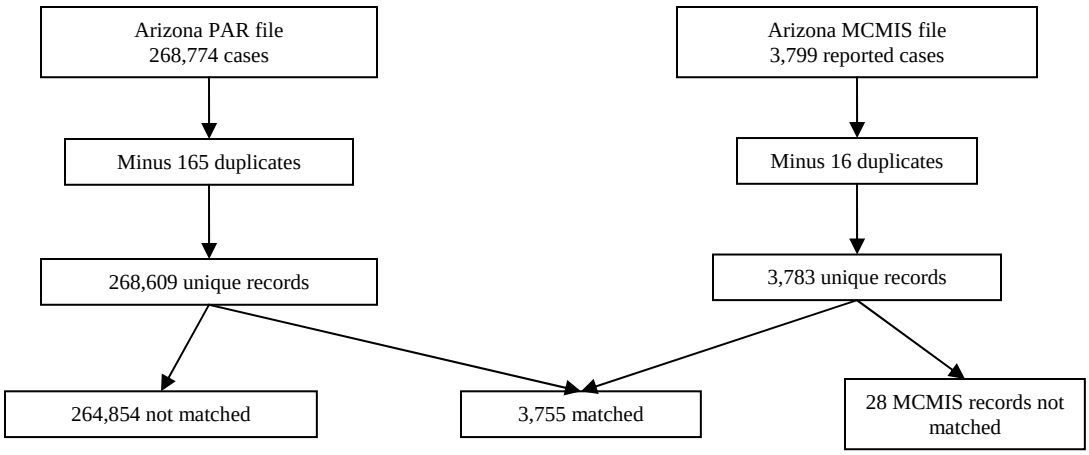

Figure 1 Case Flow in MCMIS/Arizona Crash File Match

4. Identifying Reportable Cases

The next step in data preparation is to identify records in the Arizona data that qualified for reporting to the MCMIS Crash file. Records are identified using the information available in the computerized crash files that were sent by Arizona. To identify reportable records, information is used that is completed by the officers for all vehicles. That is, some police reports place certain data elements that are to be collected for the MCMIS file in a special section or supplemental form, with the instruction to the officer to complete that section if the vehicle and crash meets the MCMIS reporting criteria. But since our goal is to evaluate the completeness of reporting, we attempt to identify all reportable cases, even those an officer may have overlooked. For this purpose, we use the data that is completed for all cases. The goal of the selection process is to approximate as closely as possible the reporting threshold of the MCMIS file. The MCMIS criteria for a reportable crash involving a qualifying vehicle are shown in Table 2.

Table 2 Vehicle and Crash Severity Threshold for MCMIS Crash File

Vehicle	Truck with GVWR over 10,000 or GCWR over 10,000, or Bus with seating for at least nine, including the driver, or Vehicle displaying a hazardous materials placard.
Accident	Fatality, or Injury transported to a medical facility for immediate medical attention, or Vehicle towed due to disabling damage.

The process of identifying reportable records, as set out in Table 2 above, is fairly straightforward in the Arizona PAR file, because Arizona crash data includes most of the variables and levels needed to identify reportable cases. Arizona, like many other states, utilizes a Supplemental Truck/Bus Accident Report that officers must complete if any of the involved vehicles meet a specified set of criteria. Instructions in the manual state [23]:

THIS FORM IS TO BE USED ONLY WHEN AT LEAST ONE CONDITION EXISTS FROM EACH OF THE FOLLOWING:

Qualifying Vehicles. The accident must involve either:

- a vehicle with a Gross Vehicle Weight Rating (GVWR) greater than 10,000 pounds, **or;**
- a vehicle displaying a hazardous materials placard, **or;**
- a vehicle designated to transport persons (bus) with seating for 8 or more individuals including the driver. There is a discrepancy in the notation of 9 to 15 seats; is [sic] should read 8 to 15. This will be/has been corrected on the subsequent printings.

AND

Severity of Accident. The accident must result in:

- at least one fatality, **or**;
- at least one injury severe enough for the injured person to require transportation from the scene in need of immediate medical attention, **or;**
- at least one involved vehicle sustaining damage, other than a flat tire, which is sufficient to prevent the vehicle from being driven away without repairs (disabling damage) or an event which requires that the vehicle be moved, sat upright, or otherwise assisted by emergency equipment (disabling event).

These criteria accurately reflect the MCMIS definition of a qualifying accident. The vehicle criteria are accurate except for the minor confusion regarding qualifying buses: MCMIS criteria currently specify reportable buses as those with 9 or more passengers, including the driver. For such cases officers are supposed to record the additional variables displayed on the supplemental form. However, for purposes of this study, variables elsewhere on the main form covering *all* vehicles are used to identify eligible vehicles. This, in theory, allows the identification of cases that should have been reported but were not. Data from the crash form appear to have all the information needed to identify reportable cases, including vehicle type, injury severity, whether an injured person was transported for medical attention, and whether a vehicle was towed with disabling damage. Thus, it appears that it will be possible to identify MCMIS-reportable cases in the Arizona crash file.

The Arizona PAR file contains a variable that can be used to identify trucks and buses. Body Style is a 24-level variable containing vehicle configuration codes. It is apparently recoded from the body style box on the PAR form, where the officer is instructed to write in a text description of the body style of the vehicle, such as 2 dr., SW (station wagon), SUV(sport utility vehicle), PU(pickup), TT(tractor-trailer). The officer is also instructed to "Check the included box to indicate if the vehicle was a bus/van used as a non-family transport vehicle. A common bus/van inclusion is one used for airport/home shuttle service and normally commercially licensed." Apparently the body style text written-in by the officer, as well as the checked box, are classified centrally and categorized into the 24-level body style classification.

It is important to emphasize that the officer is not given a set of vehicle types to choose among, or even any guidance in what to record in the field, beyond the instruction to enter the body style, with five examples given. As a result, it is very likely that a great variety of body styles are entered on the forms, far beyond the 24 levels that appear in the coded data. Therefore, it is

likely that at some point in the processing of the 01-2704 forms, what the officer enters is re-classified into the 24-level variable that appears in the computerized data. It should also be noted that the category for pickup trucks includes panel trucks and mini-buses which could be a source of confusion on the part of officers attempting to classify Single Unit Trucks (SUTs) or small buses. Table 3 shows the relevant body style codes available in the Arizona PAR file. Unlike the MCMIS Crash file which contains categories for SUTs (2-axles, 6 tires), SUTs (3+ axles), and SUTs with trailers, the PAR file does not have any categories for SUTs. A cross-tabulation of the body style variable in the PAR file with some variables available in the Truck/Bus Supplement section, such as GVWR, cargo body style, trailer, and vehicle configuration, suggests that many SUTs are grouped into code level 22, Other Truck Combination. Accordingly, reportable vehicles were identified as all those assigned one of the body style codes displayed in Table 3.

Table 3 Relevant Vehicle Body Style Codes on Arizona Accident Report

7 Truck Tractor and Semi-Trailer
8 Truck Tractor Only
22 Other Truck Combination
11 Commercial bus
12 Non-Commercial bus
13 School bus/type 1
14 School bus/type 2

A hazmat placard checkbox is available on the main accident report form for officers to check. Of the 268,609 vehicles in the PAR Crash file, 50 vehicles are recorded as hazmat placarded vehicles. All 50 vehicles are trucks classified into body styles 7, 8, or 22, as shown in Table 3.

In total, there were 10,748 vehicles identified as trucks or buses in the Arizona PAR file. Table 4 shows the distribution of vehicle type. About 86.7 percent are trucks and 13.3 percent are buses. Since all 50 vehicles described above displaying hazmat placards are trucks, no vehicles are identified as non-trucks with a hazmat placard. The 10,748 eligible vehicles represent 4 percent of all 268,609 vehicles in the PAR file. This is consistent with other MCMIS evaluations in which the percentage of eligible vehicles has ranged from 2.6 percent to 6.1 percent.

Table 4 Vehicles Meeting MCMIS Vehicle Criteria, Arizona PAR File, 2005

Vehicle type	N	%
Trucks	9,314	86.7
Buses	1,434	13.3
Non-trucks with hazmat placard	0	0.0
Total	10,748	100.0

Having identified qualifying vehicles, the next step is to identify crashes of sufficient severity to qualify for reporting to the MCMIS Crash file. Qualifying crashes include either a fatality, an injury transported for immediate medical attention, or a vehicle towed from the scene due to disabling damage.

Fatal crashes and whether a crash included an injured person transported for medical attention can be determined. A maximum injury severity variable is available in the Arizona PAR file at the crash level. This variable is coded using the usual KABCOU scale. To check the validity of this variable, a maximum injury severity variable was created using the injury variable in the Arizona Person file. The created variable and the variable already present in the PAR file matched exactly, indicating that either variable would provide identical results when used for identifying crashes involving injuries. In addition, a medical transport variable is available in the PAR file at the crash level which appears to be coded from the check circle in section 2 of the Arizona Traffic Accident Report (see Appendix B). In the PAR file, the medical transport variable is coded '1' if any person involved in the crash was transported for medical care and '0' otherwise. Thus, the injured and transported criterion was judged to be satisfied if a crash involved an A, B, or C injury, **and** the medical transport variable was coded as '1'.

It is recognized that the procedure described above for estimating the number of vehicles involved in crashes in which at least one person was injured and transported may underestimate the true value. For example, Table 5 shows a cross-classification of maximum injury severity and medical transport, with emphasis on percentages of transported at each level of injury severity. The transported percentages are 72.1, 39.3, and 16.5 for A-injuries, B-injuries, and C-injuries, respectively. Compared to previous MCMIS evaluations, these percentages tend to be low. In the North Carolina study, for example, the estimated percentages were 88.6, 71.2, and 38.9. In an Ohio study, the percentages were 76.2, 51.6, and 28.5. Therefore, based on coding of the medical transport variable in the Arizona PAR file, it is possible that the number of vehicles identified as satisfying the MCMIS injured and transported criterion is underestimated.

Table 5 Cross-tabulation of Maximum Injury Severity and Medical Transport, Arizona PAR File, 2005

	Medical transport				
Maximum injury severity	Yes		No		
	N	%	N	%	Total
A	6,743	72.1	2,603	27.9	9,346
B	12,883	39.3	19,911	60.7	32,794
C	7,818	16.5	39,666	83.5	47,484

With respect to towed vehicles, the Arizona PAR file has two variables related to damage severity, one at the vehicle level, and a derived variable at the crash level. Both variables are coded with the same levels: not reported, left at scene, drivable, and disabled/towed. To check the validity of the derived variable, a maximum damage severity variable was created using the damage variable at the vehicle level. The created variable and the variable already present in the PAR file differed greatly. Previous knowledge of this variable, using the manner of leaving scene (towed) variable in the 2005 General Estimates System (GES) database [24] , for example, shows that about 68 percent of vehicles are driven away, while about 27 percent are towed due to damage, and about 5 percent are towed not due to damage. These percentages match closely the percentages of the damage severity variable at the vehicle level in the Arizona PAR file. Therefore, the damage severity variable created from the vehicle level variable was used to estimate the number of vehicles involved in crashes in which at least one vehicle was towed due to disabling damage.

Table 6 shows the numbers of qualifying vehicles that meet the threshold for a MCMIS reportable crash according to the MCMIS criteria. In total, it is estimated that 4,411 vehicles were reportable to the MCMIS Crash file. Of these, 128 were involved in fatal crashes, 1,174 or 26.6 percent were involved in injury crashes where at least one person was transported for medical attention, and 3,109 or 70.5 percent were involved in crashes where at least one vehicle was towed due to disabling damage. As noted above, the number of injured and transported may be underestimated, and if this is the case, the number of towed due to disabling damage may be overestimated. In other words, underestimation of injured and transported can result in overestimation of towed and disabled, causing a shift in the crash type distribution shown in Table 6. However, the total number of reportable records shown in Table 6, 4,411, should be relatively accurate[1]. Therefore, the overall reporting rate, to be shown in Section 5, is stable and robust, irrespective of reasonable changes to the definition of the injured and transported criterion.

Table 6 Reportable Records in Arizona Crash File, 2005

Crash type	N	%
Fatal	128	2.9
Injury transported for treatment	1,174	26.6
Vehicle towed due to damage	3,109	70.5
Total	4,411	100.0

5. Factors Associated with Reporting

The procedure described in the previous section identified 4,411 vehicles involved in crashes as reportable to the MCMIS Crash file. The match process described in Section 3 determined that 3,783 unique cases were reported to the MCMIS Crash file, of which 3,755 could be matched to the Arizona PAR data. Of the 3,755 cases that could be matched, 3,450 were determined to meet the MCMIS Crash file reporting criteria. Therefore, of the 4,411 reportable crashes in 2005, Arizona reported 3,450, for an overall reporting rate of 78.2 percent. In this section, some of the factors that affect the chance that a qualifying crash would be submitted through the SafetyNet system and appear in the MCMIS Crash file are identified. The results are presented in five subsections: overreporting, case processing, reporting criteria, reporting agency and area, and truck/bus fire and explosion occurrence. Analysis of overreporting attempts to identify why cases were submitted that do not meet the MCMIS reporting criteria as defined by Table 2. Case processing deals with timing issues in reporting such as crash month and time lag between crash date and uploading date to the MCMIS Crash file. Reporting criteria includes factors such as vehicle type and crash severity. Reporting agency is associated with differences in reporting rates due to the agency, such as state police or local police, while area investigates reporting by location, such as the county or city where the crash occurred. Truck/bus fire occurrence examines reportable cases of crashes involving fire or explosion.

[1] To test this claim, injured and transported was redefined as all A or B-injuries, or C-injuries if medical transport=1. Using this method, the total number of reportable cases is 4,538.

5.1 Overreporting

MCMIS evaluations tend to focus on underreporting because sources of underreporting tend to be more prevalent than overreporting. However, almost all states overreport cases to some degree. Overreporting results when cases are submitted to the MCMIS Crash file that do not meet the criteria for a reportable crash. Since 3,755 MCMIS cases could be matched to the Arizona PAR data, and 3,450 were determined to meet the reporting criteria, the difference, or 305 cases, were not reportable, and should not have been reported.

Table 6 shows a two-way classification of vehicle type and crash severity, and provides some explanation as to why these vehicles should not have been reported to the MCMIS Crash file. Note that all 305 vehicles do not meet the crash severity threshold for a MCMIS reportable crash. In addition, 176 vehicles do not meet the vehicle criteria since they are not trucks, buses, or hazmat placarded vehicles. The 117 trucks and 12 buses are qualifying vehicles, but they were involved in crashes in which there were no fatalities, no persons were injured and transported for medical attention, and no vehicles were towed due to disabling damage.

Table 7 Distribution of Non-reportable Vehicles in MCMIS Crash File, Arizona 2005

Vehicle type	Crash severity				
	Fatal	Transported injury	Towed/disabled	Other crash severity	Total
Truck	0	0	0	117	117
Bus	0	0	0	12	12
Other vehicle (not transporting hazmat)	0	0	0	176	176
Total	0	0	0	305	305

5.2 Case Processing

Delays in transmitting cases may partially account for the incompleteness of the MCMIS Crash file. The time lag in extracting and submitting reports to the MCMIS Crash file might explain some portion of the unreported cases. All reportable crash involvements for a calendar year are required to be transmitted to the MCMIS Crash file within 90 days of the date of the crash. The 2005 MCMIS Crash file as of August 21, 2006 was used to identify records submitted from Arizona, so all 2005 cases should have been reported by that date.

Table 8 shows reporting rates according to month of the crash. The numbers of reportable cases per month range between 297 and 455. January and February stand out as two months in which the reporting rates are considerably lower than the overall average. In those two months the reporting rates are 51.5 percent and 64.9 percent, respectively. The highest reporting rates tend to cluster in the spring and summer months of May, June, July, and August. The highest reporting rate is 89.1 percent, which occurs in June. The rates then begin to decline somewhat in the fall and winter months. January, February, and December have the highest percentages of unreported cases, and are the only months with more than 100 unreported cases each. January has 18.9 percent of total unreported cases.

Table 8 Reporting Rate by Accident Month, Arizona 2005

Crash month	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
January	375	51.5	182	18.9
February	308	64.9	108	11.2
March	344	82.6	60	6.2
April	297	81.8	54	5.6
May	388	85.8	55	5.7
June	359	89.1	39	4.1
July	338	82.5	59	6.1
August	386	85.5	56	5.8
September	334	77.5	75	7.8
October	434	80.6	84	8.7
November	393	78.6	84	8.7
December	455	76.9	105	10.9
Total	4,411	78.2	961	100.0

Figure 2 shows the average latency in case submission by month, where latency is the number of days between crash date and the date the case was uploaded to the MCMIS Crash file, minus the 90-day grace period. Therefore, a positive number for a month gives the average number of days that cases were submitted after the 90-day grace period. Negative numbers indicate that on average, cases were submitted within the 90-day grace period for a month. The plot shows that in January, February, and March, cases were submitted close to, or within the 90-day grace period. For the remaining months, cases were submitted after the 90-day grace period, even though there

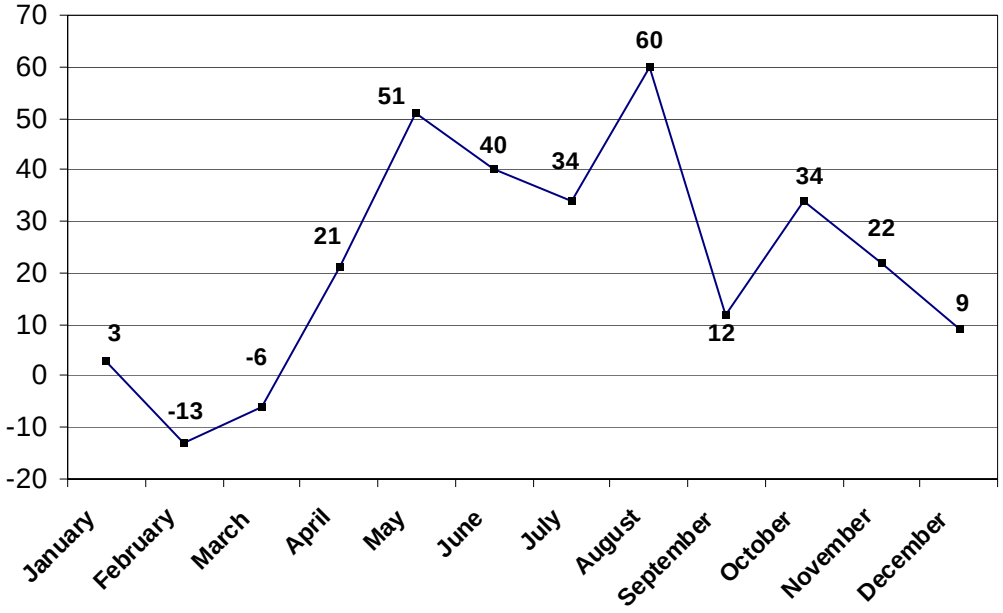

Figure 2 Average Latency (in Days, Minus 90) in Reporting to the MCMIS Crash File, Arizona Reported Cases, 2005

is a declining trend towards the end of the year. Note that the plot in Figure 2 is in contrast to the results in Table 8 in which reporting rates are lowest in January and February, increase in the summer months, and then decline slightly in the winter months.

5.3 Reporting Criteria

In this section, reporting is investigated according to variables in the Arizona PAR file related to the reporting criteria for a MCMIS-reportable crash, as outlined in Table 2. Previous studies have consistently shown that trucks are more likely to be reported than buses and that fatal crashes are more likely to be reported than injury involvements. Since the criteria revolve around attributes associated with the vehicle type and crash severity, calculating reporting rates for these two variables is a logical starting point for assessing where improvements can be gained.

Table 9 shows reporting rates by vehicle type. Unlike other MCMIS evaluations, in Arizona the reporting rate for buses is higher than the rate for trucks, although the difference is not great. Since trucks represent the vast majority of reportable cases, the truck reporting rate is very close to the overall rate. Trucks represent 92.7 percent of total unreported cases. As stated earlier in this report, all vehicles coded with a hazmat placard in the Arizona PAR file are trucks, and therefore, no hazmat vehicles are identified.

Table 9 Reporting Rate by Vehicle Type, Arizona 2005

Vehicle type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck	4,012	77.8	891	92.7
Bus	399	82.5	70	7.3
Total	4,411	78.2	961	100.0

Although Table 9 shows that buses were more likely to be reported than trucks overall, Table 10 shows that tractor semi-trailers and school buses (type 1) have the same reporting rates. At 85.1 percent, these two vehicle types have the highest reporting rates. Since there are no categories for single unit trucks (SUTs) in the Arizona PAR file, it is likely that SUTs are classified into the

Table 10 Reporting Rate by Detailed Vehicle Body Style, Arizona 2005

Vehicle body style	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck tractor/semi-trailer	2,054	85.1	307	31.9
Truck tractor only	100	77.0	23	2.4
Commercial bus	54	79.6	11	1.1
Non-commercial bus	193	80.8	37	3.9
School bus/type 1	148	85.1	22	2.3
School bus/type 2	4	100.0	0	0.0
Other truck combination	1,858	69.8	561	58.4
Total	4,411	78.2	961	100.0

other truck combination category. Note that the numbers of reportable cases for tractor semi-trailers and other truck combinations are large and similar. In the 2005 Ohio MCMIS evaluation [16], for example, reportable cases for tractor semi-trailers and SUTs were also very close in number. Another consistent trend in previous MCMIS evaluations has been that tractor semi-trailers tend to have higher reporting rates than SUTs. Furthermore, SUTs with 3+ axles are often more likely reported than SUTs with 2-axles (see, for example, [12], [14], [16]). The reporting rate for other truck combinations is 69.8, making it the lowest rate of all vehicle types shown in Table 10. In addition, other truck combinations account for 58.4 percent of total unreported cases. If, in fact, other truck combinations are comprised mostly of SUT's, these patterns tend to be consistent with several other MCMIS evaluations.

Along with vehicle type, crash severity is another characteristic of a crash that should be considered when determining if a crash meets the threshold for reporting to the MCMIS Crash file. Previous MCMIS evaluations have shown that serious injury crashes tend to be reported at a higher rate than those involving less injury. Table 11 shows that reporting rates with respect to crash severity for Arizona follow the usual trend. Reporting rates decline with decreasing severity. Fatal crash involvements are reported at a rate of 93.8 percent, but since these involvements represent a small percentage of all reportable cases, they have little influence on affecting the overall reporting rate. The reporting rate for injured and transported involvements is 83.4 percent, and the reporting rate for towed and disabled involvements is 75.6 percent. The towed/disabled category has the greatest influence on the overall reporting rate since it represents 78.9 percent of total unreported cases.

Table 11 Reporting Rate by Crash Severity, Arizona 2005

Crash severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal	128	93.8	8	0.8
Injured/transported	1,174	83.4	195	20.3
Towed/disabled	3,109	75.6	758	78.9
Total	4,411	78.2	961	100.0

Table 12 shows reporting rates to the MCMIS Crash file by maximum injury severity in the crash, according to the usual KABCOU scale. The fatal involvement results are identical to those shown in Table 11. As expected, reporting rates tend to decrease with decreasing crash severity. The reporting rates for A and B involvements are similar, and the rates for C and O involvements are similar. Note that the largest number of reportable cases, 2,152, represents those involving no injury. These cases must be reportable based on the towed/disabled criterion. However, Table 11 shows that 3,109 cases are reportable based on the towed/disabled criterion. Therefore, the difference, $3,109 - 2,152 = 957$[2] shows that many of the towed/disabled reportable cases also involved injuries, but were not reportable as injured/transported because it could not be shown in the strict sense of the definition that these cases satisfied the transported for medical treatment requirement. As such, crashes involving no injury account for 55.2 percent of total unreported cases.

[2] The actual number is 939 since injury severity is unknown for 18 reportable cases (Table 12).

Table 12 Reporting Rate by Detailed Injury Severity, Arizona 2005

Crash severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal (K)	128	93.8	8	0.8
Incapacitating (A)	382	85.9	54	5.6
Non-incapacitating (B)	960	83.5	158	16.4
Possible (C)	771	73.9	201	20.9
None (O)	2,152	75.4	530	55.2
Unkown (U)	18	44.4	10	1.0
Total	4,411	78.2	961	100.0

5.4 Reporting Agency and Area

Although there is space on the Arizona PAR form for the officer to record the county of the crash (Appendix B), a county variable cannot be found in the PAR data file. Instead, Table 13 shows reporting rates for the top 12 cities sorted by number of reportable cases. The reporting rate for the top 12 cities is about 5.5 percentage points less than the rate for the remaining locations. The top 12 cities account for 63.8 percent of unreported cases, and Phoenix accounts for 29.3 percent. Goodyear and Marana have reporting rates greater than 80 percent, while Flagstaff, Chandler, and Tucson have reporting rates less than 70 percent. Note that Maricopa County is coded as a city in the PAR file. Perhaps this field gets coded for crashes occurring in rural areas outside of major cities.

Table 13 Reporting Rate by City, Arizona 2005

City	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Phoenix	1,252	77.5	282	29.3
Tucson	235	68.9	73	7.6
Tempe	199	78.9	42	4.4
Mesa	191	78.5	41	4.3
Maricopa County	114	75.4	28	2.9
Glendale	110	70.9	32	3.3
Scottsdale	89	79.8	18	1.9
Goodyear	76	84.2	12	1.2
Marana	75	82.7	13	1.4
Chandler	72	63.9	26	2.7
Gilbert	68	70.6	20	2.1
Flagstaff	61	57.4	26	2.7
Top 12 cities	2,542	75.9	613	63.8
Other locations	1,869	81.4	348	36.2
Total	4,411	78.2	961	100.0

Three kinds of reporting agencies could be identified in the Arizona PAR file using the NCIC number: police departments, sheriffs offices, and public safety. A box is available on the main PAR form for recording the NCIC number. The NCIC number could then be decoded using a

table in the Manual of Instructions for use with State of Arizona Traffic Accident Report Forms [23]. According to the Arizona Department of Public Safety webpage [25], the department provides state level law enforcement services. The Highway Patrol Division is one of its four divisions. Table 14 shows reporting rates according to reporting agency. It can be seen that the Department of Public Safety has the highest reporting rate. The reporting rate for sheriffs offices is not far from the overall rate. Police departments have the lowest rate, and in addition, account for 55.8 percent of total unreported cases.

Table 14 Reporting Rate by Reporting Agency, Arizona 2005

Reporting agency	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Police departments	2,062	74.0	536	55.8
Sheriffs offices	387	79.6	79	8.2
Dept Public Safety	1,962	82.4	346	36.0
Total	4,411	78.2	961	100.0

5.5 Truck/Bus Fire or Explosion

On the Truck/Bus Supplement of the Arizona PAR form (Appendix B), there is space for the officer to record a sequence of events. Up to four events may be recorded for each involved vehicle, and the officer fills in a number from 1-24 for each event. One of the choices is ‘explosion or fire’. Table 15 shows reporting rate according to explosion or fire under the assumption that fire or explosion occurred if it was coded in any one of the four events. Of 4,411 reportable cases, explosion or fire was coded as one of the four events for 66 vehicles. Of these, 63 are trucks and 3 are buses. Only 2 of these vehicles were not reported to the MCMIS Crash file.

Table 15 Reporting Rate by Event, Arizona 2005

Event	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck				
Fire/expolsion	63	96.8	2	0.2
Other/unknown	3,949	77.5	889	92.5
Bus				
Fire/explosion	3	100.0	0	0.0
Other/unknown	396	82.3	70	7.3
Total	4,411	78.2	961	100.0

One hypothesis is that many of the 66 reportable cases that involved explosion or fire also involved serious or fatal injury. However Table 16 shows that only 13 cases involved a fatality and only 9 cases involved A, B, or C-injuries. On the other hand, 44 cases involved no injury.

Table 16 Injury Severity for Reportable Cases Involving Fire or Explosion, Arizona 2005

Injury severity	N	%
Fatal (K)	13	19.7
Incapacitating (A)	5	7.6
Non-incapacitating (B)	2	3.0
Possible C	2	3.0
None (O)	44	66.7
Unkown (U)	0	0.0
Total	66	100.0

6. Data Quality of Reported Cases

In this section, we consider the quality of data reported to the MCMIS Crash file. Two aspects of data quality are examined. The first is the amount of missing data. Missing data rates are important to the usefulness of a data file because records with missing data cannot contribute to an analysis. The second aspect of data quality considered here is the consistency of coding between records as they appear in the Arizona PAR file and in the MCMIS Crash file. Inconsistencies can indicate errors in translating information recorded on the crash report to the values in the MCMIS Crash file.

Table 17 shows missing data rates for selected, important variables in the MCMIS Crash file. Missing data rates are generally quite low, with a handful of exceptions. On most fundamental, structural variables, such as date, time, number of fatalities and number of injuries, missing data percentages are zero. Missing data rates for some of the driver-related variables are slightly higher. The missing percentage for driver license class is 4.2 percent, while missing percentages are 2.5 percent for driver license number, and 1.7 percent for driver date of birth. For road trafficway 16 percent of data are missing, and for vehicle license number 1.9 percent are missing. DOT number is missing 3.4 percent for which a carrier is coded as interstate, and as often is the case, the event variables, after the first event, have high percentages of missing data.

Table 17 Missing Data Rates for Selected MCMIS Crash File Variables, Arizona 2005

Variable	Percent unrecorded	Variable	Percent unrecorded
Report number	0.0	Fatal injuries	0.0
Accident year	0.0	Non-fatal injuries	0.0
Accident month	0.0	Interstate	0.0
Accident day	0.0	Light	0.0
Accident hour	0.0	Event one	1.1
Accident minute	0.0	Event two	81.8
County	<0.1	Event three	92.5
Body type	<0.1	Event four	97.9
Configuration	<0.1	Number of vehicles	0.0
GVWR class	0.0	Road access	<0.1

Variable	Percent unrecorded	Variable	Percent unrecorded
DOT number*	3.4	Road surface	0.0
Carrier state	0.0	Road trafficway	16.0
Citation issued	0.0	Towaway	0.0
Driver date of birth	1.7	Truck or bus	0.0
Driver license number	2.5	Vehicle license number	1.9
Driver license state	0.0	Vehicle license state	0.0
Driver license class	4.2	VIN	0.6
Driver license valid	0.0	Weather	0.0

* Counting cases where the carrier is coded interstate.

Hazardous materials variable	Percent unrecorded
Hazardous materials placard	0.1
Percentages of hazmat placarded vehicles only:	
Hazardous cargo release	0.0
Hazardous materials class (1-digit)	33.3
Hazardous materials class (4-digit)	7.4
Hazardous materials name	100.0

There were 27 vehicles for which it was recorded that a hazmat placard was displayed. The table above shows information about the recording of hazmat variables for those vehicles coded with a hazmat placard. The 1-digit materials class variable is unrecorded for 33.3 percent of the 27 vehicles and the 4-digit hazardous materials class variable is unrecorded for 7.4 percent of the 27 placarded vehicles.

Values of variables in the MCMIS Crash file can also be compared with the values of comparable variables in the Arizona PAR file. The purpose of this comparison is to identify any errors in translating variables from the values in the state crash file to the values required for SafetyNet. Table 18 shows a comparison between the vehicle configuration variable in the MCMIS Crash file and the body style variable in the Arizona PAR file for the 3,755 matched cases. Another point of interest is to examine how SUTs in the MCMIS file are classified in the PAR file, since the PAR file has no explicit category for SUTs.

One pickup truck in the PAR file is coded as a light truck with a hazmat placard in the MCMIS file, however, it was not identified as hazmat placarded in the PAR file. Except for one passenger car in the PAR file coded as a bus, and one non-commercial bus coded as an SUT with 2-axles and 6 tires, the bus categories are consistent. The great majority of buses are classified as buses

Table 18 Vehicle Configuration in Arizona and MCMIS Crash Files, 2005

MCMIS Configuration	PAR Body style	N	%
Unknown	Other truck comb	1	0.0
Light truck (if HM placard)	Pick-up trk (inc panel/mini-bus)	1	0.0
Bus (seats 9-15,incl dr)	Passenger car/reg	1	0.0
	Commercial bus	5	0.1
	Non-commercial bus	6	0.2
	School bus/type 1	4	0.1
	School bus/type 2	1	0.0
Bus (seats >15,incl dr)	Commercial bus	39	1.0
	Non-commercial bus	156	4.2
	School bus/type 1	126	3.4
	School bus/type 2	3	0.1
SUT, 2-axle, 6 tire	Pick-up trk (inc panel/mini-bus)	47	1.3
	Truck tractor/semi-trailer	1	0.0
	Truck tractor only	1	0.0
	Non-commercial bus	1	0.0
	Other truck comb	915	24.4
SUT, 3+ axles	Pick-up trk (inc panel/mini-bus)	1	0.0
	Truck tractor/semi-trailer	3	0.1
	Other truck comb	331	8.8
Truck trailer	Pick-up trk (inc panel/mini-bus)	1	0.0
	Truck tractor/semi-trailer	3	0.1
	Other truck comb	39	1.0
Truck tractor (bobtail)	Truck tractor/semi-trailer	7	0.2
	Truck tractor only	76	2.0
	Other truck comb	2	0.1
Tractor/semi-trailer	Truck tractor/semi-trailer	1,725	45.9
	Truck tractor only	2	0.1
	Other truck comb	7	0.2
Tractor/double	Truck tractor/semi-trailer	69	1.8
Tractor/triple	Truck tractor/semi-trailer	2	0.1
Unk heavy truck>10,000	Pick-up trk (inc panel/mini-bus)	18	0.5
	Pick-up w/camper	1	0.0
	Truck tractor/semi-trailer	2	0.1
	Truck tractor only	1	0.0
	Farm tractor/other farm veh	8	0.2
	RV (AWD/dune buggy/jalopy/custom	1	0.0
	Motor home/house car	42	1.1
	Emergency vehicle	13	0.3
	Other truck comb	51	1.4
	Other veh	42	1.1
Total		3,755	100.0

with seats greater than 15. The pick-up truck category in the PAR file is a source of some concern since the definition also includes panel trucks and mini-buses. Forty- seven of these vehicles are identified as SUTs with 2-axles and 6 tires in the MCMIS file. It appears that the other truck combination in the Arizona PAR file is intended for classifying SUTs. Note that 915 of these vehicles are classified as SUTs with 2-axles and 6 tires, and that 331 are classified as

SUTs with 3+ axles. In addition, 39 are classified into the truck/trailer category. Except for a few differences, the tractor configurations tend to agree between the two files. Bobtails and tractor semi-trailers tend to agree. Doubles and triples in the MCMIS file are classified as truck tractor/semi-trailer in the PAR file. Some vehicles such as motor homes, emergency vehicles, and other vehicles are classified into the unknown heavy truck>10,000 category of the MCMIS file.

Finally, Table 19 shows a comparison between recording the numbers of fatals in the crash in the two files. Agreement appears to be exact for all matched vehicles in both files.

Table 19 Comparison of Fatals in Crash in MCMIS and Arizona Crash Files, 2005

Number of fatals in crash		N	%
MCMIS Crash file	Arizona PAR file		
0	0	3,624	96.5
1	1	114	3.0
2	2	9	0.2
3	3	5	0.1
4	4	3	0.1
Total		3,755	100.0

7. Summary and Discussion

This report is an evaluation of reporting to the MCMIS Crash file by the state of Arizona in 2005. Records were matched between the Arizona PAR file and the MCMIS Crash file using variables common to both files with low percentages of missing data. After removing duplicate records from both files, 268,609 unique records remained for matching from the PAR file and 3,783 unique records remained for matching from the MCMIS file. In total, 3,755, or 99.3 percent of the MCMIS records were matched.

The next step in the evaluation process focused on identifying reportable cases using the Arizona PAR file according to established vehicle and crash severity criteria. Overall, 10,748 vehicles were identified as qualifying trucks or buses. All 50 vehicles recorded as hazmat placarded vehicles are qualifying trucks, so no vehicles are identified as non-trucks displaying a hazardous materials placard. Of qualifying vehicles, 86.7 percent are trucks and 13.3 percent are buses.

After identifying qualifying vehicles, it is necessary to determine which of these vehicles meet the crash severity criteria for reporting to MCMIS. A maximum injury severity variable is available in the PAR file at the crash level that follows the usual KABCOU scale. In addition, an injury variable is coded in the Person file, and a maximum injury variable was created. The two injury severity variables agreed exactly. A medical transport variable is also available at the crash level. In summary, the injured and transported criterion was satisfied if at least one person in the crash had injury severity equal to A or B or C, and medical transport was coded ‘yes’. Due to applying this criterion in the strict sense of the definition, it may be possible that the number of reportable injured/transported cases is underestimated. This conclusion is arrived at by comparison with other MCMIS evaluations which tend to show greater percentages of transported cases at each level of injury severity.

To identify crashes in which at least one vehicle was towed from the scene due to disabling damage, a maximum damage variable was created at the crash level from a damage extent variable coded in the Arizona PAR file at the vehicle level. The damage extent variable has levels: not reported, left at scene, drivable, and disabled/towed. The towed and disabled criterion was satisfied if at least one vehicle in the crash fell into the disabled/towed category.

Using the procedure described above resulted in identification of 4,411 vehicles involved in crashes that were reportable to the MCMIS Crash file. Of these, 128 were involved in fatal crashes, 1,174 were involved in injury crashes where at least one person was transported for medical attention, and 3,109 were involved in crashes where at least one vehicle was towed due to disabling damage. Of the 3,755 records that were matched between the Arizona PAR file and the MCMIS Crash file, 3,450 were determined to meet the MCMIS Crash file reporting criteria. Therefore, the overall reporting rate in Arizona in 2005 is estimated at 3,450/4,411 = 78.2 percent. The difference between 3,755 and 3,450 suggests that 305 cases were overreported to the MCMIS Crash file. According to this analysis, all 305 cases did not meet the crash severity threshold for reporting to MCMIS.

Since the overall reporting rate is estimated at 78.2 percent, specific variables were examined to identify sources of underreporting. Reporting rates were calculated and presented in three groups. The three groups are case processing, reporting criteria, and reporting agency and area. Case processing considers timing issues, reporting criteria deals with vehicle and crash severity issues, and agency and area are related to the reporting agency and the city of the crash.

Reporting rates tended to be lowest in January and February. The reporting rates in these two months are 51.5 percent and 64.9 percent, respectively. Between March and August, the rates are all greater than 80 percent, and the largest rate, which is 89.1 percent, is in June. Between September and December, the rates tend to cluster around the overall average of 78.2 percent. Although reporting rates tended to be largest in the summer months, the lag time between crash date and the date crashes were uploaded to the MCMIS Crash file were largest during these months (Figure 2). Between May and August, cases were uploaded between one and two months after the 90-day grace period. In January, February, and March, however, cases tended to be uploaded within or close to the 90-day grace period.

The vehicle body style variable in the Arizona PAR file has limited numbers of categories for identifying vehicle configuration. Tractor semi-trailers and bobtails can be identified, but there are no categories for single unit trucks (SUTs). Therefore, there is no way to identify SUTs with 2-axles and 6 tires, or SUTs with 3+ axles. It appears that the majority of SUTs are classified into the other truck combination category. Overall, the reporting rate is 77.8 percent for trucks, and 82.5 percent for buses, although trucks represent 4,012 of the 4,411 reportable cases. Tractor semi-trailers and school buses have reporting rates of 85.1 percent, which are the largest rates among identifiable body styles. The lowest reporting rate is 69.8 percent for the other truck combination category. That this rate is lower than other truck configurations is consistent with the idea that this group is populated mostly with SUTs. Previous MCMIS evaluations suggest that reporting rates for SUTs are generally lower than those for truck tractor combinations. In particular, this has been the case for SUTs with 2-axles and 6 tires.

Based on crash severity, the reporting rate is 93.8 percent for fatal crashes, 83.4 percent for injured/transported crashes, and 75.6 percent for towed/disabled crashes. It is possible that the

number of injured/transported reportable cases is underestimated since the definition was applied in the strict sense using the medical transport variable. That is, a vehicle was judged to satisfy the injured/transported criterion if it was involved in a crash in which injury severity was A or B or C, and the medical transport variable was ‘yes’. A cross-tabulation of injury severity and medical transport suggests that percentages of vehicles involved in crashes where medical transport is ‘yes’, are lower at each level of injury severity in relation to other percentages from other MCMIS evaluations.

Underestimation of injured/transported cases most likely results in overestimation of towed/disabled cases. This can be seen from inspection of Table 11 which show 3,109 towed/disabled reportable cases, and Table 12 which shows 2,152 reportable cases involving no injuries. The difference, 957, suggests that many of the towed/disabled cases also involved injuries, but were not reportable as injured/transported because it could not be shown that these cases satisfied the transported for medical treatment requirement. To check whether a redefinition of the injured/transported criterion would affect the overall reporting rate, injured/transported vehicles were defined to include all A and B-injuries, and C-injuries if medical transport=’yes’. This redefinition did not adversely affect the overall reporting rate of 78.2 percent, but it did result in a shift of the crash severity variable in which more vehicles fell into the injured/transported category, and fewer vehicles fell into the towed/disabled category.

A county variable could not be identified in the Arizona PAR file, but a city variable is present. The cities of Goodyear and Marana have reporting rates greater than 80 percent, while Flagstaff, Chandler, and Tucson have rates less than 70 percent. By far, Phoenix has the largest percentage of reportable cases, and a reporting rate of 77.5 percent. Based on reportable cases, the top 12 cities have a reporting rate of 75.9 percent, while the reporting rate for the remaining locations is 81.4 percent. With respect to agency, the Arizona Highway Patrol has a reporting rate of 82.4 percent, which is slightly higher than the 79.6 percent rate for sheriffs offices. The reporting rate for police departments is 74.0 percent and police departments account for 55.8 percent of unreported cases.

A sequence of events variable was used to assess reportable cases that involved explosion or fire. It was assumed that a case involved explosion or fire if any of the four events were coded as such. Of the 4,411 reportable cases, it could be determined that 66 cases involved explosion or fire. Of these, 63 are trucks and 3 are buses. Only 2 of these vehicles were not reported to the MCMIS Crash file. In addition, 44 of these vehicles were involved in crashes that did not involve any injury.

Except for a few variables, the Arizona MCMIS file does not have large percentages of missing data on key variables. As in other state MCMIS files, after the first event, subsequent event variables tend to have high percentages of missing data. The road trafficway variable is missing 16 percent of observations, but other key variables are missing less than 5 percent. Comparison of the body style variable in the PAR file and the vehicle configuration variable in the MCMIS file shows general agreement between the two variables. Comparison tends to confirm that SUTs are classified in the other truck combination category in the PAR file.

8. References

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Appendix A Variables from Arizona PAR Data to Identify a MCMIS-Reportable Crash

MCMIS Reporting Criteria	Implementation in Arizona PAR Data
Truck with GVWR over 10,000 or GCWR over 10,000	The body style variable in the Arizona PAR file was used to identify medium/heavy trucks with GVWR 10,000 lbs or greater bodystyle = 7 – Truck tractor and semi-trailer 8 – Truck tractor only 22 – Other truck combination
***or* Bus with seating for at least nine, including the driver**	The following codes were used to identify eligible buses: bodystyle = 11 – Commercial bus 12 – Non-commercial bus 13 – School bus type 1 14 – School bus type 2
***or* Vehicle displaying a hazardous materials placard**	These vehicles were identified using the hazardous placard variable. In total, 50 vehicles were identified, however all 50 are qualifying trucks.
AND	
at least one fatality	The Arizona vehicle file contains a maximum injury in the crash variable based on the usual KABCOU scale. A maximum injury severity variable was created from the injury variable in the person file and it agrees exactly with the variable already present. The codes are Injury = 0 – Not reported 1 – No injury 2 – Possible injury 3 – Non-Incapacitating 4 – Incapacitating 5 – Fatal 6 - Unknown

MCMIS Reporting Criteria	Implementation in Arizona PAR Data
***or* at least one person injured and transported to a medical facility for immediate medical attention**	The maximum injury severity variable defined above was used to identify injury accidents. In addition, a medical transport variable identifies whether a person was transported for medical attention. Thus, this criteria was met by the following condition: Injured/transported = (maximum injury severity in (A or B or C) and (transported =yes)
***or* at least one vehicle towed due to disabling damage**	A vehicle damage variable is coded in the Arizona PAR file and has levels 0=Not reported, 1=Left at scene, 2=Drivable, 3=Disabled/towed. A maximum damage in the crash variable was created from the vehicle level variable and this criteria was met if at least one vehicle in the crash was disabled/towed.

Appendix B Arizona Traffic Accident Report Form

ADOT USE ONLY

ARIZONA TRAFFIC ACCIDENT REPORT

1 *POLICE ONLY* - FORWARD COPY TO ADOT TRAFFIC RECORDS SECTION 064R 206 S. 17th AVE., PHOENIX, ARIZONA 85007-3233

REPORT ID					
YEAR	MONTH	DAY	HOUR	NCIC NO.	OFFICERS ID NO.

Agency Report Number

Total No. of Sheets ______

COMPLETE THE FOLLOWING SUPPLEMENT IF ANY (circle) *AND* ANY (diamond) ARE CHECKED

2 Total Units | Total Injuries | Total Fatalities | Estimated Total Damage Compared to Limit: ☐ Over ☐ Under | ◯ Fatal ☐ Hit/Run | ☐ Govt. Prop. | ◯ Persons Transported for Immediate Medical Care? | ◯ Tow Away of At Least One Vehicle from Scene? | District or Grid No.

3 LOCATION

On Highway/Road / Street | ☐ Inside ☐ Outside | City | County

Intersecting Street, Road / M.P. or R.P. ☐ At ☐ From | ☐ North ☐ East ☐ South ☐ West | ☐ Plus ☐ Minus | Distance | ☐ Measured ☐ Approximate | ☐ Miles ☐ Feet

4 TRAFFIC UNIT NO.

State | Class | End. | ☐ DL # | ☐ SSN | ☐ Both | ☐ Driver ☐ Pedestrian ☐ Pedalcyclist | Name | Sex | Inj

Restrictions | Date of Birth | Address | City | State | Zip Code | Telephone Number

Plate Number | State | Year | ☐ Same as Driver | Owner/Carrier Name | Address | City | State | Zip Code

Body Style | ◇ Bus (9 or more seats) | Make | Color | Year | VIN | Safety Device Code

Removed to | ☐ Disabled ☐ Not Disabled | Removed by | Orders of | Posted Speed Limit | Ofc Est Speed

Insurance Company | Telephone Number | Policy Number | Eff Date / Exp Date

Trailer (Other Unit) Plate No. | State | Year | Description of Trailer or Other Unit | GVW (Registered) of Power Unit Greater than 10k pounds? ◇ Yes ☐ No | HazMat Placard? ◇ Yes ☐ No 4-Digit 1-Digit | Was HazMat Cargo Released? ☐ Yes ☐ No

TRAFFIC UNIT NO.

State | Class | End. | ☐ DL # | ☐ SSN | ☐ Both | ☐ Driver ☐ Pedestrian ☐ Pedalcyclist | Name | Sex | Inj

Restrictions | Date of Birth | Address | City | State | Zip Code | Telephone Number

Plate Number | State | Year | ☐ Same as Driver | Owner/Carrier Name | Address | City | State | Zip Code

Body Style | ◇ Bus (9 or more seats) | Make | Color | Year | VIN | Safety Device Code

Removed to | ☐ Disabled ☐ Not Disabled | Removed by | Orders of | Posted Speed Limit | Ofc Est Speed

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Restrictions | Date of Birth | Address | City | State | Zip Code | Telephone Number

Plate Number | State | Year | ☐ Same as Driver | Owner/Carrier Name | Address | City | State | Zip Code

Body Style | ◇ Bus (9 or more seats) | Make | Color | Year | VIN | Safety Device Code

Removed to | ☐ Disabled ☐ Not Disabled | Removed by | Orders of | Posted Speed Limit | Ofc Est Speed

Insurance Company | Telephone Number | Policy Number | Eff Date / Exp Date

Trailer (Other Unit) Plate No. | State | Year | Description of Trailer or Other Unit | GVW (Registered) of Power Unit Greater than 10k pounds? ◇ Yes ☐ No | HazMat Placard? ◇ Yes ☐ No 4-Digit 1-Digit | Was HazMat Cargo Released? ☐ Yes ☐ No

5 PASSENGERS

Seating Position

07	04	01
08	05	02
09	06	03

10 Not in Passenger Compart
11 Motorcycle, Bus
12 Other
13 Unknown
14 Pedalcyclist

Safety Devices
1 None used
2 Lap belt
3 Lap & shoulder
4 Airbag deployed
5 Child restraint
6 Protective helmet
7 Passive belt
8 Passive & lap
9 Other
0 Unknown

Injury Severity Codes
1 - No injury
2 - Possible Injury
3 - Non Incapacitating Injury
4 - Incapacitating Injury
5 - Fatal Injury
6 - Not Reported / Unknown

Unit #	Seat Pos	SD	Name	Address	City	State	Zip Code	Age	Sex	Inj

6 Other Property Damage (Describe)

Owner's Name | Address | City | State | Zip Code | Telephone Number

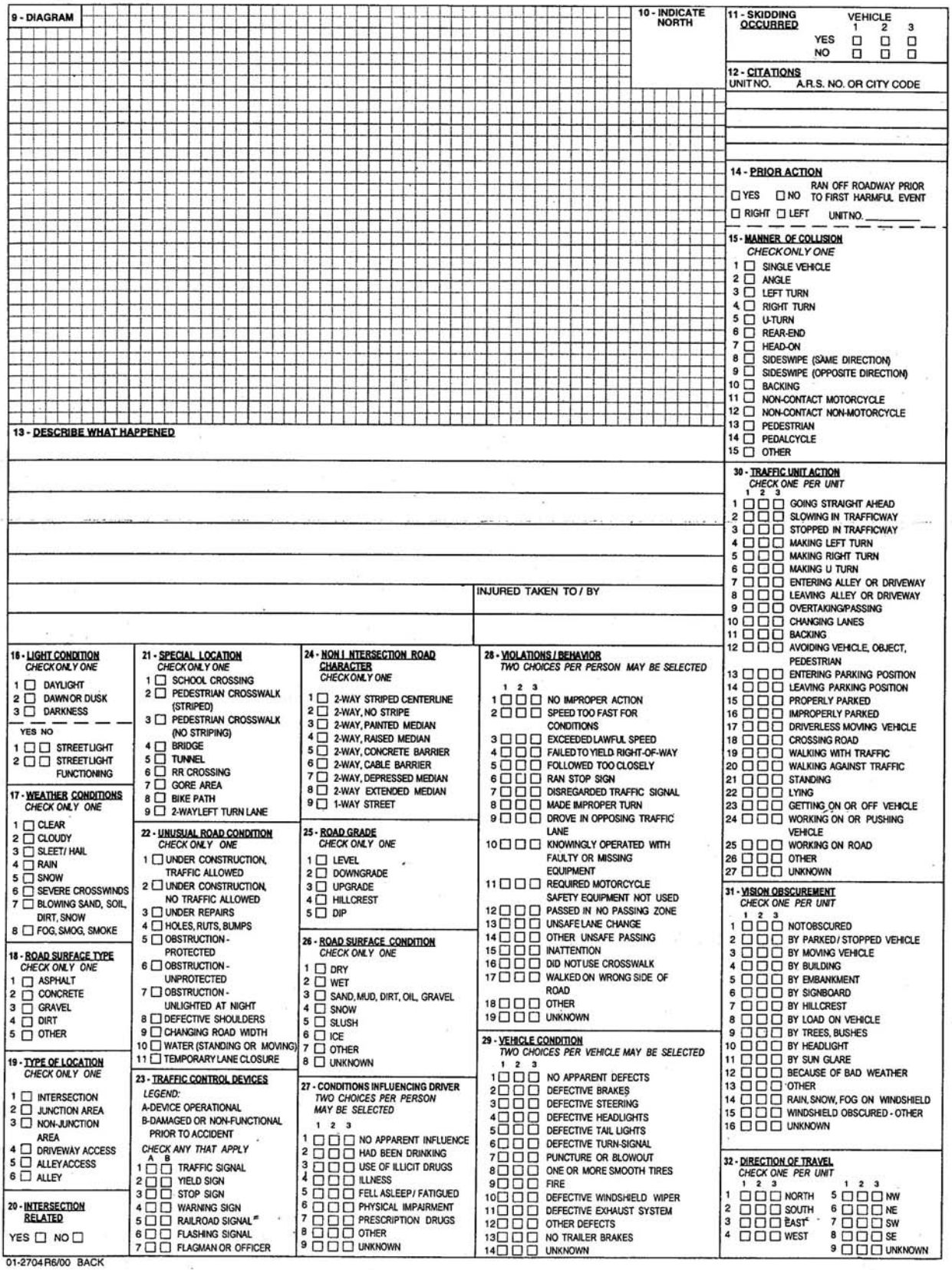
7 WITNESSES

Name	Address	City	State	Zip Code	Telephone Number	Age

8 Photos Taken ☐ Yes ☐ No | Photographer's Name, ID Number, and Agency | Invest. at Scene ☐ Yes ☐ No | Date Invest. | Time Invest.

Officer's Signature and ID Number | Agency | Date Completed

01-2704 R06/00



9 - DIAGRAM

10 - INDICATE NORTH

11 - SKIDDING OCCURRED — VEHICLE 1 2 3
YES ☐ ☐ ☐
NO ☐ ☐ ☐

12 - CITATIONS
UNIT NO. A.R.S. NO. OR CITY CODE

14 - PRIOR ACTION
☐ YES ☐ NO RAN OFF ROADWAY PRIOR TO FIRST HARMFUL EVENT
☐ RIGHT ☐ LEFT UNIT NO. _____

15 - MANNER OF COLLISION
CHECK ONLY ONE
1 ☐ SINGLE VEHICLE
2 ☐ ANGLE
3 ☐ LEFT TURN
4 ☐ RIGHT TURN
5 ☐ U-TURN
6 ☐ REAR-END
7 ☐ HEAD-ON
8 ☐ SIDESWIPE (SAME DIRECTION)
9 ☐ SIDESWIPE (OPPOSITE DIRECTION)
10 ☐ BACKING
11 ☐ NON-CONTACT MOTORCYCLE
12 ☐ NON-CONTACT NON-MOTORCYCLE
13 ☐ PEDESTRIAN
14 ☐ PEDALCYCLE
15 ☐ OTHER

13 - DESCRIBE WHAT HAPPENED

INJURED TAKEN TO / BY

30 - TRAFFIC UNIT ACTION
CHECK ONE PER UNIT — 1 2 3
1 ☐☐☐ GOING STRAIGHT AHEAD
2 ☐☐☐ SLOWING IN TRAFFICWAY
3 ☐☐☐ STOPPED IN TRAFFICWAY
4 ☐☐☐ MAKING LEFT TURN
5 ☐☐☐ MAKING RIGHT TURN
6 ☐☐☐ MAKING U TURN
7 ☐☐☐ ENTERING ALLEY OR DRIVEWAY
8 ☐☐☐ LEAVING ALLEY OR DRIVEWAY
9 ☐☐☐ OVERTAKING/PASSING
10 ☐☐☐ CHANGING LANES
11 ☐☐☐ BACKING
12 ☐☐☐ AVOIDING VEHICLE, OBJECT, PEDESTRIAN
13 ☐☐☐ ENTERING PARKING POSITION
14 ☐☐☐ LEAVING PARKING POSITION
15 ☐☐☐ PROPERLY PARKED
16 ☐☐☐ IMPROPERLY PARKED
17 ☐☐☐ DRIVERLESS MOVING VEHICLE
18 ☐☐☐ CROSSING ROAD
19 ☐☐☐ WALKING WITH TRAFFIC
20 ☐☐☐ WALKING AGAINST TRAFFIC
21 ☐☐☐ STANDING
22 ☐☐☐ LYING
23 ☐☐☐ GETTING ON OR OFF VEHICLE
24 ☐☐☐ WORKING ON OR PUSHING VEHICLE
25 ☐☐☐ WORKING ON ROAD
26 ☐☐☐ OTHER
27 ☐☐☐ UNKNOWN

16 - LIGHT CONDITION
CHECK ONLY ONE
1 ☐ DAYLIGHT
2 ☐ DAWN OR DUSK
3 ☐ DARKNESS
YES NO
1 ☐☐ STREET LIGHT
2 ☐☐ STREET LIGHT FUNCTIONING

17 - WEATHER CONDITIONS
CHECK ONLY ONE
1 ☐ CLEAR
2 ☐ CLOUDY
3 ☐ SLEET/ HAIL
4 ☐ RAIN
5 ☐ SNOW
6 ☐ SEVERE CROSSWINDS
7 ☐ BLOWING SAND, SOIL, DIRT, SNOW
8 ☐ FOG, SMOG, SMOKE

18 - ROAD SURFACE TYPE
CHECK ONLY ONE
1 ☐ ASPHALT
2 ☐ CONCRETE
3 ☐ GRAVEL
4 ☐ DIRT
5 ☐ OTHER

19 - TYPE OF LOCATION
CHECK ONLY ONE
1 ☐ INTERSECTION
2 ☐ JUNCTION AREA
3 ☐ NON-JUNCTION AREA
4 ☐ DRIVEWAY ACCESS
5 ☐ ALLEY ACCESS
6 ☐ ALLEY

20 - INTERSECTION RELATED
YES ☐ NO ☐

21 - SPECIAL LOCATION
CHECK ONLY ONE
1 ☐ SCHOOL CROSSING
2 ☐ PEDESTRIAN CROSSWALK (STRIPED)
3 ☐ PEDESTRIAN CROSSWALK (NO STRIPING)
4 ☐ BRIDGE
5 ☐ TUNNEL
6 ☐ RR CROSSING
7 ☐ GORE AREA
8 ☐ BIKE PATH
9 ☐ 2-WAY LEFT TURN LANE

22 - UNUSUAL ROAD CONDITION
CHECK ONLY ONE
1 ☐ UNDER CONSTRUCTION, TRAFFIC ALLOWED
2 ☐ UNDER CONSTRUCTION, NO TRAFFIC ALLOWED
3 ☐ UNDER REPAIRS
4 ☐ HOLES, RUTS, BUMPS
5 ☐ OBSTRUCTION - PROTECTED
6 ☐ OBSTRUCTION - UNPROTECTED
7 ☐ OBSTRUCTION - UNLIGHTED AT NIGHT
8 ☐ DEFECTIVE SHOULDERS
9 ☐ CHANGING ROAD WIDTH
10 ☐ WATER (STANDING OR MOVING)
11 ☐ TEMPORARY LANE CLOSURE

23 - TRAFFIC CONTROL DEVICES
LEGEND:
A-DEVICE OPERATIONAL
B-DAMAGED OR NON-FUNCTIONAL PRIOR TO ACCIDENT
CHECK ANY THAT APPLY — A B
1 ☐☐ TRAFFIC SIGNAL
2 ☐☐ YIELD SIGN
3 ☐☐ STOP SIGN
4 ☐☐ WARNING SIGN
5 ☐☐ RAILROAD SIGNAL
6 ☐☐ FLASHING SIGNAL
7 ☐☐ FLAGMAN OR OFFICER

24 - NON INTERSECTION ROAD CHARACTER
CHECK ONLY ONE
1 ☐ 2-WAY STRIPED CENTERLINE
2 ☐ 2-WAY, NO STRIPE
3 ☐ 2-WAY, PAINTED MEDIAN
4 ☐ 2-WAY, RAISED MEDIAN
5 ☐ 2-WAY, CONCRETE BARRIER
6 ☐ 2-WAY, CABLE BARRIER
7 ☐ 2-WAY, DEPRESSED MEDIAN
8 ☐ 2-WAY EXTENDED MEDIAN
9 ☐ 1-WAY STREET

25 - ROAD GRADE
CHECK ONLY ONE
1 ☐ LEVEL
2 ☐ DOWNGRADE
3 ☐ UPGRADE
4 ☐ HILLCREST
5 ☐ DIP

26 - ROAD SURFACE CONDITION
CHECK ONLY ONE
1 ☐ DRY
2 ☐ WET
3 ☐ SAND, MUD, DIRT, OIL, GRAVEL
4 ☐ SNOW
5 ☐ SLUSH
6 ☐ ICE
7 ☐ OTHER
8 ☐ UNKNOWN

27 - CONDITIONS INFLUENCING DRIVER
TWO CHOICES PER PERSON MAY BE SELECTED — 1 2 3
1 ☐☐☐ NO APPARENT INFLUENCE
2 ☐☐☐ HAD BEEN DRINKING
3 ☐☐☐ USE OF ILLICIT DRUGS
4 ☐☐☐ ILLNESS
5 ☐☐☐ FELL ASLEEP/ FATIGUED
6 ☐☐☐ PHYSICAL IMPAIRMENT
7 ☐☐☐ PRESCRIPTION DRUGS
8 ☐☐☐ OTHER
9 ☐☐☐ UNKNOWN

28 - VIOLATIONS / BEHAVIOR
TWO CHOICES PER PERSON MAY BE SELECTED — 1 2 3
1 ☐☐☐ NO IMPROPER ACTION
2 ☐☐☐ SPEED TOO FAST FOR CONDITIONS
3 ☐☐☐ EXCEEDED LAWFUL SPEED
4 ☐☐☐ FAILED TO YIELD RIGHT-OF-WAY
5 ☐☐☐ FOLLOWED TOO CLOSELY
6 ☐☐☐ RAN STOP SIGN
7 ☐☐☐ DISREGARDED TRAFFIC SIGNAL
8 ☐☐☐ MADE IMPROPER TURN
9 ☐☐☐ DROVE IN OPPOSING TRAFFIC LANE
10 ☐☐☐ KNOWINGLY OPERATED WITH FAULTY OR MISSING EQUIPMENT
11 ☐☐☐ REQUIRED MOTORCYCLE SAFETY EQUIPMENT NOT USED
12 ☐☐☐ PASSED IN NO PASSING ZONE
13 ☐☐☐ UNSAFE LANE CHANGE
14 ☐☐☐ OTHER UNSAFE PASSING
15 ☐☐☐ INATTENTION
16 ☐☐☐ DID NOT USE CROSSWALK
17 ☐☐☐ WALKED ON WRONG SIDE OF ROAD
18 ☐☐☐ OTHER
19 ☐☐☐ UNKNOWN

29 - VEHICLE CONDITION
TWO CHOICES PER VEHICLE MAY BE SELECTED — 1 2 3
1 ☐☐☐ NO APPARENT DEFECTS
2 ☐☐☐ DEFECTIVE BRAKES
3 ☐☐☐ DEFECTIVE STEERING
4 ☐☐☐ DEFECTIVE HEADLIGHTS
5 ☐☐☐ DEFECTIVE TAIL LIGHTS
6 ☐☐☐ DEFECTIVE TURN-SIGNAL
7 ☐☐☐ PUNCTURE OR BLOWOUT
8 ☐☐☐ ONE OR MORE SMOOTH TIRES
9 ☐☐☐ FIRE
10 ☐☐☐ DEFECTIVE WINDSHIELD WIPER
11 ☐☐☐ DEFECTIVE EXHAUST SYSTEM
12 ☐☐☐ OTHER DEFECTS
13 ☐☐☐ NO TRAILER BRAKES
14 ☐☐☐ UNKNOWN

31 - VISION OBSCUREMENT
CHECK ONE PER UNIT — 1 2 3
1 ☐☐☐ NOT OBSCURED
2 ☐☐☐ BY PARKED / STOPPED VEHICLE
3 ☐☐☐ BY MOVING VEHICLE
4 ☐☐☐ BY BUILDING
5 ☐☐☐ BY EMBANKMENT
6 ☐☐☐ BY SIGNBOARD
7 ☐☐☐ BY HILLCREST
8 ☐☐☐ BY LOAD ON VEHICLE
9 ☐☐☐ BY TREES, BUSHES
10 ☐☐☐ BY HEADLIGHT
11 ☐☐☐ BY SUN GLARE
12 ☐☐☐ BECAUSE OF BAD WEATHER
13 ☐☐☐ OTHER
14 ☐☐☐ RAIN, SNOW, FOG ON WINDSHIELD
15 ☐☐☐ WINDSHIELD OBSCURED - OTHER
16 ☐☐☐ UNKNOWN

32 - DIRECTION OF TRAVEL
CHECK ONE PER UNIT — 1 2 3
1 ☐☐☐ NORTH
2 ☐☐☐ SOUTH
3 ☐☐☐ EAST
4 ☐☐☐ WEST
5 ☐☐☐ NW
6 ☐☐☐ NE
7 ☐☐☐ SW
8 ☐☐☐ SE
9 ☐☐☐ UNKNOWN

01-2704 R6/00 BACK

ARIZONA TRAFFIC ACCIDENT REPORT
TRUCK/BUS SUPPLEMENT
FORWARD COPY TO
ADOT TRAFFIC RECORDS SECTION 064R
206 S. 17th AVE., PHOENIX, AZ 85007-3213

†● 01-2710 R6/00

ADOT USE ONLY

REPORT ID					Agency Report Number
YEAR	MONTH	DAY	HOUR	NCIC NO.	OFFICERS ID NO.

TRAFFIC UNIT NO. (MUST CORRESPOND WITH MAIN REPORT)

CARRIER INFORMATION

NAME: _____

SOURCE: ☐ Shipping Papers ☐ Vehicle Side ☐ Driver ☐ Log Book

ADDRESS: _____ (Street or P.O. Box)

City: _____ State: _____ Zip Code: _____

IDENTIFICATION NUMBERS ☐ None

US DOT: ☐☐☐☐☐☐☐ ICC MC: ☐☐☐☐☐☐☐

VEHICLE CONFIGURATION

☐ Passenger Car
☐ Light Truck
☐ Bus (9-15 seats)
☐ Bus (> 15)
☐ 1-Unit Truck (2 axle/6 or more tires)
☐ 1-Unit Truck (3 or more axles)
☐ Truck with Trailer
☐ Truck Tractor only
☐ Truck Tractor with Semi-trailer
☐ Tractor with Double Trailers
☐ Tractor with Triple Trailers
☐ Other - Unable to Classify

GVWR ☐☐☐☐☐

CARGO BODY TYPE

☐ Not Applicable ☐ Dump
☐ Bus (9-15 seats) ☐ Grain, Chips, Gravel
☐ Bus (> 15 seats) ☐ Concrete Mixer
☐ Van/Enclosed Box ☐ Auto Transporter
☐ Cargo Tank ☐ Garbage or Refuse
☐ Pole ☐ Other
☐ Flatbed

EVENT

1. _____
2. _____
3. _____
4. _____

SEQUENCE OF EVENTS (UP TO FOUR FOR EACH UNIT)

01. Ran off road
02. Jackknifed
03. Overturned or Rollover
04. Downhill runaway
05. Cargo Loss or Shift
06. Explosion or fire
07. Separation of units
08. Cross Median/Centerline
09. Equip. Failure (brakes, blowout)
10. Other Non Collision
11. Unknown Non Collision
12. Pedestrian
13. Motor vehicle in transport
14. Parked vehicle
15. Train
16. Bicycle
17. Animal
18. Fixed object
19. Work Zone Maint. Equip.
20. Other Moveable Object
21. Unknown Moveable Object

TRAFFIC UNIT NO. (MUST CORRESPOND WITH MAIN REPORT)

CARRIER INFORMATION

NAME: _____

SOURCE: ☐ Shipping Papers ☐ Vehicle Side ☐ Driver ☐ Log Book

ADDRESS: _____ (Street or P.O. Box)

City: _____ State: _____ Zip Code: _____

IDENTIFICATION NUMBERS ☐ None

US DOT: ☐☐☐☐☐☐☐ ICC MC: ☐☐☐☐☐☐☐

VEHICLE CONFIGURATION

☐ Passenger Car
☐ Light Truck
☐ Bus (9-15 seats)
☐ Bus (> 15)
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☐ Truck Tractor only
☐ Truck Tractor with Semi-trailer
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☐ Tractor with Triple Trailers
☐ Other - Unable to Classify

GVWR ☐☐☐☐☐

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☐ Bus (9-15 seats) ☐ Grain, Chips, Gravel
☐ Bus (> 15 seats) ☐ Concrete Mixer
☐ Van/Enclosed Box ☐ Auto Transporter
☐ Cargo Tank ☐ Garbage or Refuse
☐ Pole ☐ Other
☐ Flatbed

EVENT

1. _____
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4. _____

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08. Cross Median/Centerline
09. Equip. Failure (brakes, blowout)
10. Other Non Collision
11. Unknown Non Collision
12. Pedestrian
13. Motor vehicle in transport
14. Parked vehicle
15. Train
16. Bicycle
17. Animal
18. Fixed object
19. Work Zone Maint. Equip.
20. Other Moveable Object
21. Unknown Moveable Object

TRAFFIC UNIT NO. (MUST CORRESPOND WITH MAIN REPORT)

CARRIER INFORMATION

NAME: _____

SOURCE: ☐ Shipping Papers ☐ Vehicle Side ☐ Driver ☐ Log Book

ADDRESS: _____ (Street or P.O. Box)

City: _____ State: _____ Zip Code: _____

IDENTIFICATION NUMBERS ☐ None

US DOT: ☐☐☐☐☐☐☐ ICC MC: ☐☐☐☐☐☐☐

VEHICLE CONFIGURATION

☐ Passenger Car
☐ Light Truck
☐ Bus (9-15 seats)
☐ Bus (> 15)
☐ 1-Unit Truck (2 axle/6 or more tires)
☐ 1-Unit Truck (3 or more axles)
☐ Truck with Trailer
☐ Truck Tractor only
☐ Truck Tractor with Semi-trailer
☐ Tractor with Double Trailers
☐ Tractor with Triple Trailers
☐ Other - Unable to Classify

GVWR ☐☐☐☐☐

CARGO BODY TYPE

☐ Not Applicable ☐ Dump
☐ Bus (9-15 seats) ☐ Grain, Chips, Gravel
☐ Bus (> 15 seats) ☐ Concrete Mixer
☐ Van/Enclosed Box ☐ Auto Transporter
☐ Cargo Tank ☐ Garbage or Refuse
☐ Pole ☐ Other
☐ Flatbed

EVENT

1. _____
2. _____
3. _____
4. _____

SEQUENCE OF EVENTS (UP TO FOUR FOR EACH UNIT)

01. Ran off road
02. Jackknifed
03. Overturned or Rollover
04. Downhill runaway
05. Cargo Loss or Shift
06. Explosion or fire
07. Separation of units
08. Cross Median/Centerline
09. Equip. Failure (brakes, blowout)
10. Other Non Collision
11. Unknown Non Collision
12. Pedestrian
13. Motor vehicle in transport
14. Parked vehicle
15. Train
16. Bicycle
17. Animal
18. Fixed object
19. Work Zone Maint. Equip.
20. Other Moveable Object
21. Unknown Moveable Object

SIGNATURE OF OFFICER _____ DATE _____

DEFINITIONS

Truck - A motor vehicle designed, used or maintained primarily for the transportation of property. For the purpose of this form the vehicle must also meet one of the following criteria:

Have at least 6 tires on the ground
- OR -
Carry a Hazardous Material Placard

Bus - A motor vehicle providing seats for 16 or more persons including the driver and used primarily for the transportation of persons.

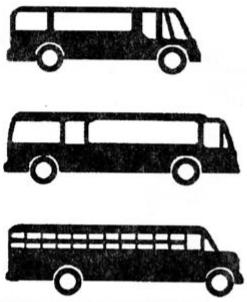
Trailer - A non-power vehicle towed by a motor vehicle.

Reportable Accident - A highway related incident normally investigated by a police officer and reported on a standard accident report form involving one or more trucks or buses (as defined above) which results in:

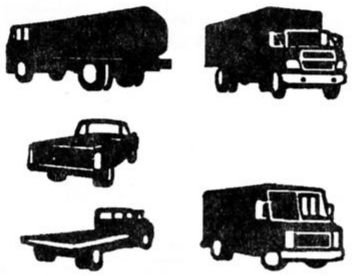
- One or more fatalities
- OR - One or more non-fatal injuries requiring transportation for the purpose of obtaining immediate medical treatment.
- OR - One or more of the vehicles being removed from the scene as a result of disabling damage.
- OR - One or more vehicles requiring intervening assistance before proceeding under it's own power.

TYPICAL VEHICLE SILHOUETTES

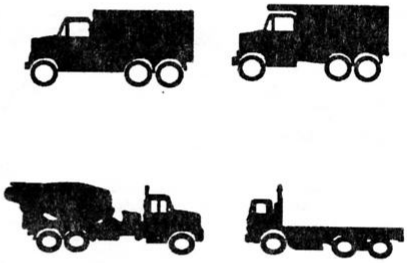
1. Bus



2. Single Unit Truck - 2 Axle / 6 Tire



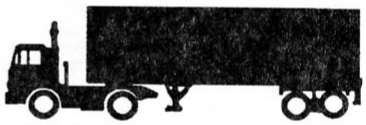
3. Single Unit Truck - 3 Axle



4. Truck with Trailer

5. Truck Tractor (Bobtail)

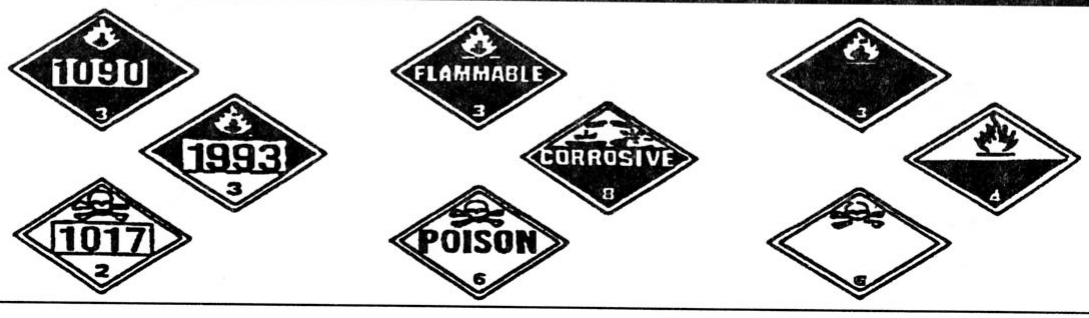
6. Tractor with Semi-Trailer

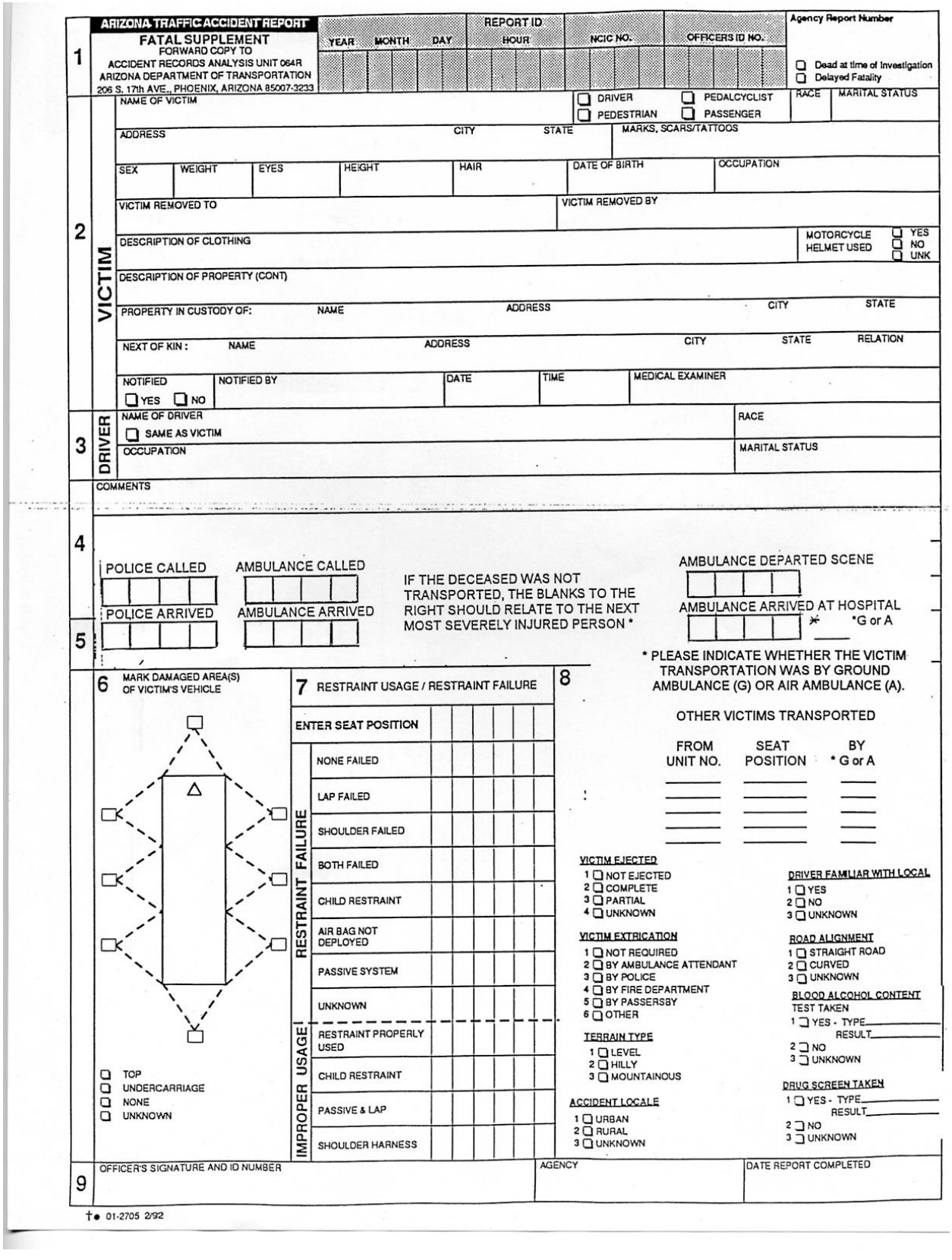


7. Tractor with Double Trailers

8. Tractor with Triple Trailers

TYPICAL HAZARDOUS MATERIAL PLACARDS





ARIZONA TRAFFIC ACCIDENT REPORT

FATAL SUPPLEMENT

FORWARD COPY TO
ACCIDENT RECORDS ANALYSIS UNIT 064R
ARIZONA DEPARTMENT OF TRANSPORTATION
206 S. 17th AVE., PHOENIX, ARIZONA 85007-3233

1

YEAR | MONTH | DAY | REPORT ID HOUR | NCIC NO. | OFFICERS ID NO. | Agency Report Number

☐ Dead at time of Investigation
☐ Delayed Fatality

2 VICTIM

NAME OF VICTIM | ☐ DRIVER ☐ PEDALCYCLIST ☐ PEDESTRIAN ☐ PASSENGER | RACE | MARITAL STATUS

ADDRESS | CITY | STATE | MARKS, SCARS/TATTOOS

SEX | WEIGHT | EYES | HEIGHT | HAIR | DATE OF BIRTH | OCCUPATION

VICTIM REMOVED TO | VICTIM REMOVED BY

DESCRIPTION OF CLOTHING | MOTORCYCLE HELMET USED ☐ YES ☐ NO ☐ UNK

DESCRIPTION OF PROPERTY (CONT)

PROPERTY IN CUSTODY OF: NAME | ADDRESS | CITY | STATE

NEXT OF KIN: NAME | ADDRESS | CITY | STATE | RELATION

NOTIFIED ☐ YES ☐ NO | NOTIFIED BY | DATE | TIME | MEDICAL EXAMINER

3 DRIVER

NAME OF DRIVER ☐ SAME AS VICTIM | RACE

OCCUPATION | MARITAL STATUS

COMMENTS

4

POLICE CALLED | AMBULANCE CALLED

POLICE ARRIVED | AMBULANCE ARRIVED

5

IF THE DECEASED WAS NOT TRANSPORTED, THE BLANKS TO THE RIGHT SHOULD RELATE TO THE NEXT MOST SEVERELY INJURED PERSON *

AMBULANCE DEPARTED SCENE

AMBULANCE ARRIVED AT HOSPITAL * *G or A

* PLEASE INDICATE WHETHER THE VICTIM TRANSPORTATION WAS BY GROUND AMBULANCE (G) OR AIR AMBULANCE (A).

6 MARK DAMAGED AREA(S) OF VICTIM'S VEHICLE

☐ TOP
☐ UNDERCARRIAGE
☐ NONE
☐ UNKNOWN

7 RESTRAINT USAGE / RESTRAINT FAILURE

ENTER SEAT POSITION

RESTRAINT FAILURE
- NONE FAILED
- LAP FAILED
- SHOULDER FAILED
- BOTH FAILED
- CHILD RESTRAINT
- AIR BAG NOT DEPLOYED
- PASSIVE SYSTEM
- UNKNOWN

IMPROPER USAGE
- RESTRAINT PROPERLY USED
- CHILD RESTRAINT
- PASSIVE & LAP
- SHOULDER HARNESS

8

OTHER VICTIMS TRANSPORTED

FROM UNIT NO.	SEAT POSITION	BY * G or A

VICTIM EJECTED
1 ☐ NOT EJECTED
2 ☐ COMPLETE
3 ☐ PARTIAL
4 ☐ UNKNOWN

VICTIM EXTRICATION
1 ☐ NOT REQUIRED
2 ☐ BY AMBULANCE ATTENDANT
3 ☐ BY POLICE
4 ☐ BY FIRE DEPARTMENT
5 ☐ BY PASSERSBY
6 ☐ OTHER

TERRAIN TYPE
1 ☐ LEVEL
2 ☐ HILLY
3 ☐ MOUNTAINOUS

ACCIDENT LOCALE
1 ☐ URBAN
2 ☐ RURAL
3 ☐ UNKNOWN

DRIVER FAMILIAR WITH LOCAL
1 ☐ YES
2 ☐ NO
3 ☐ UNKNOWN

ROAD ALIGNMENT
1 ☐ STRAIGHT ROAD
2 ☐ CURVED
3 ☐ UNKNOWN

BLOOD ALCOHOL CONTENT
TEST TAKEN
1 ☐ YES - TYPE_____ RESULT_____
2 ☐ NO
3 ☐ UNKNOWN

DRUG SCREEN TAKEN
1 ☐ YES - TYPE_____ RESULT_____
2 ☐ NO
3 ☐ UNKNOWN

9 OFFICER'S SIGNATURE AND ID NUMBER | AGENCY | DATE REPORT COMPLETED

†● 01-2705 2/92