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Evaluation of New Mexico Crash Data Reported to MCMIS Crash File

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MCMIS Crash File Evaluation

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16. Abstract

This report is part of a series evaluating the data submitted by the several States to the Motor Carrier Management Information System (MCMIS) Crash File. Earlier studies showed that reporting to the MCMIS Crash File was significantly incomplete. This report examines reporting from the state of New Mexico.

New Mexico Police Accident Report (PAR) files were matched to the MCMIS Crash file to determine the nature and extent of underreporting. In 2003, there were 1,042 vehicles involved in crashes in New Mexico that were reportable to the MCMIS Crash file. Of these vehicles, 94 were actually reported, resulting in a reporting rate of 9.0%. It appears that there are significant problems in following the guidelines for reporting MCMIS reportable cases. In addition, 47 cases, or 32.4% of the 145 MCMIS cases that were reported do not qualify for reporting. Reporting rates vary by crash severity, crash month, road system, vehicle license plate state, county, and reporting agency. The reporting rate for fatal crashes was 27.5%. Of the 94 cases reported, only 4 were reported after July. The reporting rate was greater on rural interstate roads (16.5%) than on urban roads (4.4%), and vehicles with license plates from states outside of New Mexico had a higher reporting rate (12.3%) than vehicles with New Mexico license plates (4.8%). The reporting rate for buses was only 3.3%.

Data quality is also reviewed. The PAR file contains some inconsistencies with respect to vehicle type. The MCMIS file, even though containing only 145 observations, suffers from missing data on several variables.

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1. Introduction

Reporting to the Motor Carrier Management Information System (MCMIS) Crash file is widely acknowledged as incomplete. Nationally, only about two-thirds of reportable truck involvements are reported. The reporting rate for buses is even lower, at about 40% [1]. Reporting is more complete for severe crashes, with about 90% of truck fatal involvements and 65% of bus fatal involvements appearing in the file, but rates are much lower for less severe crashes.

The States are responsible for reporting qualifying crashes, and thus the solution for underreporting must ultimately lie with the individual states. This report is part of a series of evaluations of reporting from each state. Previous reports showed substantial underreporting due in large part to problems police officers experience in applying the reporting criteria. [see, e.g., 2, 3, 4] The problems were more severe in large jurisdictions and police departments. States also have problems specific to the nature of their systems. Some states also have substantial overreporting of cases, often due to technical problems with duplicate records.

In this report, we focus on MCMIS Crash file reporting by New Mexico. Compared with other states, New Mexico accounts for a fairly small percentage of fatal truck involvements. For example, in 2002 New Mexico accounted for 1.2% of all fatal truck involvements in the United States [5]. Nevertheless, for the MCMIS Crash file to serve its intended purpose, substantially complete reporting is necessary from all states.

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

1. The complete computerized police accident report file (PAR file hereafter) from New Mexico was obtained for the most recent year available, which was 2003. This file was processed to identify all cases that qualified for reporting to the MCMIS Crash file.

2. All cases in the New Mexico 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.

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.

New Mexico PAR data from 2003 was used in this analysis. The 2003 PAR data file contains the computerized records of 89,932 vehicles involved in 48,128 crashes that occurred in New Mexico during 2003. The data were obtained from the New Mexico Department of Transportation.

2. Data Preparation

Both files required some preparation before the New Mexico records in the MCMIS Crash file could be matched to the New Mexico PAR file. In the case of the MCMIS Crash file, the only processing necessary was to extract records reported from New Mexico and to check for duplicate records. The New Mexico PAR file required more extensive work, primarily to develop means of identifying cases that should have been reported to the MCMIS Crash file. This section discusses the methods used to prepare each file and some of the problems encountered.

2.1 MCMIS Crash file

The MCMIS Crash file as of April 27, 2004 was used to identify records submitted from New Mexico. For calendar year 2003 there were 145 cases. Due to the small number of MCMIS cases, MCMIS data files from years 2001 and 2002 were inspected to determine if the number of cases submitted in 2003 was consistent with previous years. In fact, there appears to be a downward trend over time. In 2002, 270 cases were submitted, while in 2001, 686 cases were submitted. Over three years, New Mexico has been reporting fewer and fewer cases. It will be shown later in this report that 1,042 cases in the 2003 New Mexico PAR file were determined to be reportable to the MCMIS Crash file. The 698 cases submitted in 2001 suggests that at one time New Mexico may have been following the guidelines for submitting cases more closely, which would result in a substantially higher reporting rate than the one calculated in this report.

An analysis file was constructed using all variables in the 2003 MCMIS Crash file. The file was then examined for duplicate records, which are crash involvements where more than one record was submitted for the same vehicle in the same crash. Using license number and crash date as search variables, no duplicate records were found. License numbers are missing for 10 records in this file. The VIN numbers of these 10 records were checked to detect possible duplicate records, but none were found. Due to the small number of records in the MCMIS file, detection of duplicate records was not a difficult task. In fact, visual inspection was possible and confirmed that the MCMIS file did not contain duplicate records. A total of 145 cases remain for study in the MCMIS Crash file.

2.2 New Mexico PAR files

The New Mexico PAR data for 2003 was obtained from the state of New Mexico. These data were produced under contract by the Division of Government Research, University of New Mexico, for the New Mexico Department of Transportation [6]. The PAR data consists of a collection of three files: a detail (vehicle) file, an accident file, and an occupant file. All three files are dated October 22, 2004. The data contain records for 48,128 crashes involving 89,932 vehicles. Data in the PAR files are coded from the State of New Mexico Uniform Crash Report (SH 10074) [7]. An example of this form is included as an attachment at the end of this document. Police officers fill out these reports according to the *State of New Mexico Uniform Crash Report Instruction Manual* [8], which is a manual prepared by the Transportation Statistics Section under the New Mexico Department of Transportation.

The first step in data preparation is to identify duplicate records. Each record in the New Mexico vehicle file is uniquely determined by a combination of three variables: accident report number (case number), accident date, and vehicle number. These variables are used to merge data from the various PAR files. No duplicate records were found in the PAR file based on these three variables. However, an examination of vehicle license number, city where the crash occurred, month of the crash, day of the crash, and time of the crash uncovered 270 duplicate records. The report numbers and VINs of these records were then checked to verify that these cases were duplicates.

Table 1 provides examples of pairs of duplicate records. In some cases the only difference is due to the report number. In another case, the report numbers are the same, but the VINs are slightly different. In another case, the report numbers and the VINs are slightly different. It appears that for these duplicate records, errors resulted from small typographical errors, either during recording of the information or during computer entry of the information. The 270 duplicate records were removed before the matching process, resulting in 89,662 non-duplicate PAR records.

Table 1 Examples of Pairs of Duplicate Records, New Mexico Par File, 2003

Report number	License	VIN	Veh	City	Month	Day	Time
0001082601	103MKN	1G3NL12E71C257281	2	15	9	25	0552
0010082601	103MKN	1G3NL1SE71C257281	2	15	9	25	0552
0010017640	124KFZ	3C3AA5636RT33N02	1	330	5	30	1215
0010017640	124KFZ	3C3AA5636RT330102	2	330	5	30	1215
0101402404	004KZC	1G3NK12F9C264567	1	0	4	12	1400
0401403072	004KZC	1G3NK12F9C264567	1	0	4	12	1400
0101402241	312LCM	1G1JF5240V7300113	1	285	5	3	0124
0101402673	312LCM	1G1JF5240V730013	1	285	5	3	0124

Table 2 is a breakdown of the duplicate records according to vehicle type. Most of the duplicates in the PAR file are passenger cars (49.3%) or pickup trucks (27.8%). Vans or four wheel drive vehicles account for 17.0%. The effect of duplicate records on this MCMIS evaluation in terms of trucks and buses is relatively small since only eleven vehicles are tractor semitrailers, one vehicle is a bus, and two vehicles fall into the other category. The other category contains many single unit trucks that qualify for MCMIS reporting. Only one duplicate record falls into the unknown vehicle type category.

The next step in data preparation is to identify records that qualified for reporting to the MCMIS Crash file. To do this it was necessary to develop a set of criteria using the variables in the New Mexico PAR file to identify records that should have been reported. The purpose of the criteria 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 is shown in Table 3.

Table 2 Duplicate Records by Vehicle Type, New Mexico Par File, 2003

Vehicle type	N	%
Passenger	133	49.3
Pickup truck	75	27.8
Tractor semitrailer	11	4.1
Bus (school, commercial)	1	0.4
Motorcycle	1	0.4
Other	2	0.7
Van or 4 wheel drive	46	17.0
Unknown	1	0.4
Total	270	100.0

Table 3 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 method used for identifying qualifying trucks was based on the information contained in a combination of five variables, and the procedure is outlined in detail in Appendix 1. This procedure was adopted because there is no single variable in the New Mexico PAR file that can be used to identify qualifying trucks. There is a variable to identify tractor semitrailers, but straight trucks can only be identified using the information contained in several variables. These variables provide information about vehicle type, vehicle body style, vehicle make, and vehicle

trailering. Based on these variables it is possible to identify, for example, dump trucks, garbage trucks, cement mixers, tow trucks, and other straight truck configurations. In addition, while processing these data, some inconsistencies were discovered. For example, a vehicle with a body style for a passenger car had a vehicle make which could only be for a large truck. Therefore, the strategy outlined in Appendix 1 was adopted for identifying qualifying trucks based on a combination of five variables.

Identifying qualifying buses and vehicles displaying a hazardous materials placard was straightforward. The vehicle type variable in the PAR file contains a category for buses which includes church, commercial, private, and school buses. The PAR reference manual indicates that coding for this variable was derived from the vehicle make, vehicle model, and body style variables. The hazardous material placard variable identifies whether a vehicle was displaying a hazardous materials placard.

Table 4 shows frequencies and percentages of vehicles meeting the MCMIS vehicle criteria. In total, 2,573 vehicles were identified as qualifying trucks or buses in the 2003 New Mexico PAR file. The majority of qualifying vehicles are trucks (89.5%), while the remaining 10.5% are buses. Only two vehicles in the entire PAR file were recorded to have been displaying a hazardous materials placard. Both vehicles were qualifying trucks. Therefore, no non-trucks qualified under the hazardous materials criterion.

Table 4 Vehicles Meeting MCMIS Vehicle Criteria, New Mexico PAR file, 2003

Vehicle type	N	%
Trucks	2,303	89.5
Buses	270	10.5
Non-trucks with hazmat placard	0	0.0
Total	2,573	100.0

Of all qualifying vehicles, those in a crash involving a fatality, an injury transported for medical treatment, or a vehicle towed due to disabling damage should have been reported to the MCMIS Crash file. In the New Mexico PAR file, there is an accident severity variable identifying crashes that involved a fatality, a nonfatal injury, or property damage only. There is also an ambulance name variable that describes if ambulance service was provided for the crash. Therefore, injury status and ambulance information can be derived from the PAR file, if it is assumed that an injured person was transported for medical attention if an ambulance service variable is completed. However, in the strict sense of the MCMIS criteria, it is not possible to determine if a crash involved an injury that was transported to a medical facility for immediate medical attention.

A procedure was developed, that is similar to a procedure used in other MCMIS evaluations to satisfy the injured and transported criteria. In the PAR occupant file, injury severity to occupants can be identified based on the KABCO injury scale. From this information, a

maximum injury severity variable can be created at the crash level. Since A-injuries are incapacitating, occupants in crashes involving this injury severity are plausible candidates for immediate medical attention. In fact, the New Mexico occupant file documentation indicates that A-injuries are carried from the scene. A crash involving a B-injury or a C-injury accompanied by a hospital name also suggests that an injured person was transported for immediate medical attention. Therefore, the strategy employed in this report to satisfy the injured and transported criterion is to include all fatalities, all A-injuries, and B-injuries or C-injuries if an ambulance name was recorded.

The last MCMIS criterion specifies that any vehicle involved in a crash in which at least one vehicle was towed due to disabling damage should have been reported to the MCMIS Crash file. In the New Mexico PAR file a maximum vehicle damage variable is coded in which it is possible to determine if any vehicle in the crash could not be driven away due to disabling damage. Any vehicle that caught on fire as a result of the accident is also classified as a vehicle that could not be driven away due to disabling damage. The information contained in this variable is used to satisfy the towed due to disabling damage criterion.

Table 5 is a cross-tabulation of all 2,573 vehicles meeting the vehicle criteria, tabulated by maximum injury severity and disabling damage (vehicle cannot be driven). The percentage of vehicles involved in fatal crashes in which at least one vehicle could not be driven was 92.5%. This percentage decreases to 86.7% for A-injury crashes, decreases to 81.1% for B-injury crashes, and decreases to 52.6% for C-injury crashes. In crashes involving no injury the percentage is 24.7%.

Table 5 Vehicles Meeting Vehicle Criteria by Injury Severity and Disabling Damage (Cannot be Driven), PAR file, 2003

	Disabling damage				
	Yes		No		
Injury severity	N	%	N	%	Total
Fatal	37	92.5	3	7.5	40
A-injury	104	86.7	16	13.3	120
B-injury	185	81.1	43	18.9	228
C-injury	174	52.6	157	47.4	331
No injury	458	24.7	1,396	75.3	1,854
Total	958	37.2	1,615	62.8	2,573

In a previous study involving Ohio, all relevant variables were available to match crash severity criteria. Thus, distributions of injury, transported to a medical facility, and towed due to disabling damage could be determined. Treating Ohio as a standard reference distribution, it is possible to allocate New Mexico cases into the transported to a medical facility and towed due to disabling damage categories.

The reason for pursuing a comparison between the Ohio standard, in which all relevant variables were available, and the New Mexico data is to validate or confirm that the strategy used for defining a MCMIS reportable case in terms of the injured and transported and towed due to disabling damage criteria is consistent with previous known results. It is a method for comparing past results with present results. However, since KABCO injury severity and an ambulance name are coded in the New Mexico PAR file, and since a maximum damage variable is coded in which it is possible to determine if a vehicle could not be driven from the scene of the crash, variables in the PAR file are available for matching the MCMIS criteria closely. A previous MCMIS evaluation for the state of New Jersey shows all calculations for allocating New Jersey cases into the injured and transported and towed due to disabling damage categories according to Ohio proportions in detail [9]. Table 6 shows the adjusted reportable cases based on the Ohio proportions applied to the New Mexico PAR file along with cases that were actually reported. The adjusted reportable cases represent what one would expect when the Ohio proportions are applied to the New Mexico data. There is a large difference between what was actually reported to the MCMIS Crash file and the adjusted reportable cases. Note that only 94 of the estimated 970 cases were reported. All 40 fatal involvements should have been reported, but only 11 actually were. In addition, only 38 of the estimated 303 injured and transported were reported, and only 45 of the estimated 627 towed due to disabling damage were reported. In total, there is a difference of 970-94=876 cases between what was actually reported, and the reportable cases adjusted to the Ohio data.

Table 6 Reported and Estimated Reportable Cases Adjusted to Ohio Data

MCMIS severity class	Actually reported	%	Adjusted reportable cases	%
Fatal	11	11.7	40	4.1
Injured, transported for treatment	38	40.4	303	31.2
Towaway	45	47.9	627	64.6
Total	94	100.0	970	100.0

The adjusted numbers in Table 6 are estimates that are aggregated over two variables based on Ohio proportions, so these cases cannot be identified in the original PAR file. The process of including all crashes involving fatalities, A-injuries, B-injuries or C-injuries with ambulance numbers, along with crashes in which at least one vehicle had disabling damage and could not be driven from the scene produces the results shown in Table 7. Using this procedure, 1,042 records in the New Mexico PAR file should have been reported to the MCMIS Crash file. Table 7 displays the distribution of cases identified in the New Mexico PAR file that met the reporting criteria defined, along with the distribution of records actually reported. Note that the cases adjusted to Ohio data provided in Table 6 match fairly closely the reportable records in the New Mexico PAR file according to the criteria defined in this report. Thus, the established criteria to identify reportable cases in New Mexico produce results consistent with results from previous

MCMIS evaluations. In 2003, approximately 9.0% of reportable cases in the New Mexico PAR file were actually reported to the MCMIS Crash file.

Table 7 Reportable Records in the New Mexico Par file, 2003

	Reportable records in New Mexico PAR file	Records actually reported to MCMIS Crash file	
Crash severity	N	N	Percent reported
Fatal	40	11	27.5%
Injury	344	38	11.0%
Towaway	658	45	6.8%
Total	1,042	94*	9.0%

* Excludes 47 cases not reportable and 4 cases that could not be matched to the PAR file

With an overall reporting rate of only 9.0%, it is clear that New Mexico is not following the appropriate guidelines for submitting cases to the MCMIS Crash file. Appendix 4 shows the New Mexico Truck and Bus Supplemental Accident Report that describes the two conditions for filling out the form [10]. The conditions match the MCMIS criteria for a reportable case almost exactly (see, for example, Table 3). In addition, check boxes are available for identifying buses, single unit trucks, tractors, and other heavy trucks. Therefore, a form is available to assist in the process of gathering information used to report cases to the MCMIS Crash file. The *State of New Mexico Uniform Crash Report Instruction Manual* was created to help police officers obtain necessary data to fill out the Uniform Crash Report. However, there appears to be no mention in this manual about the Truck and Bus Supplemental Accident Report. It appears that police are not filling out the supplemental report either due to lack of information about the procedure, or failure to recognize the two conditions for filling out the report. The former reason seems more plausible. In addition, as described earlier in this report, New Mexico submitted 270 cases in 2002 and 686 cases in 2001. At one time, New Mexico was submitting cases somewhat consistent with the 1,042 reportable cases identified in this study. Yet, in 2003, only 145 cases were submitted.

The remainder of this report describes the procedure for matching the New Mexico PAR file and the MCMIS Crash file, and potential sources of underreporting to the MCMIS Crash file. Even though the reporting rate was approximately 9.0%, reporting rates tended to vary according to severity of the crash, month of the crash, the reporting agency, and location of the crash.

3. Matching Process

After preparation, records from the New Mexico PAR file were matched to records from the MCMIS file. There were 145 records available for matching from the New Mexico MCMIS

file, and after removing duplicates, there were 89,662 records from the New Mexico PAR file. All records from the New Mexico 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 should not have been reported.

Matching records in the two files requires finding common variables that match at the accident level, as well as at the vehicle level within an accident. In addition, candidate variables should not contain, to the extent possible, large amounts of missing data. An examination of both the New Mexico PAR file and the MCMIS Crash file revealed that the license number was a potential candidate for matching. Other variables that were considered for matching included county, crash month, crash day, crash time, and vehicle identification number (VIN). These variables were present in both the PAR and the MCMIS files.

Four separate matches were performed. In the first three match steps, records in either file with duplicate values on the match variables were excluded, along with records containing missing values on the match variables. The first match included the variables license number, county, crash month, crash day, and crash time. Although license number was missing in ten records in the MCMIS file, it helped to account for 124 matches in the first step. Since there were 145 unique MCMIS cases, the majority of matches were made in the first step. In the second step county was removed since it had twelve missing values, resulting in four additional matches. In the third match, license number was removed, and VIN was entered since VIN was present in some cases in which license plate was missing. This match resulted in nine additional matches.

After the third match, eight records remained that were not matched in the MCMIS file. These records were inspected visually, and an attempt was made to match them by hand. Four additional records appear to be matches and are shown in Table 8 according to common variables in both the MCMIS file and the New Mexico PAR file. The four cases match exactly with respect to report number, day, time, and driver date of birth. Some cases do not have license number or VIN recorded. For one case (report number 0010086047) there appear to be small typographical errors in the license number and the VIN. Note that for report numbers 0010057058 and 0000472254, the months are not the same.

Table 8 Four Matches Evaluated by Inspection in Match Step 4

Report number	License number	VIN	Month	Day	Time	Driver DOB
MCMIS Crash file						
NM0000472819			12	6	2325	19510720
NM0010057058	1SA608	1XP5D69X4YD539057	3	11	2126	19510105
NM0000472254	PRK5949	1XP5DB9X21N562653	3	1	0400	19530722
NM0010086047	P387431	1FUYSS2B7WL920608	7	9	1619	19410226
PAR file						
0000472819	A103245	1X95DB9X4JD254633	12	6	2325	07201951
0010057058		1XP5D69X4YD539057	7	11	2126	01051951
0000472254	PRK5949	1XP5DB9X21N562653	2	1	0400	07221953
0010086047	0387431	1FUYSSZB72L920608	7	9	1619	02261941

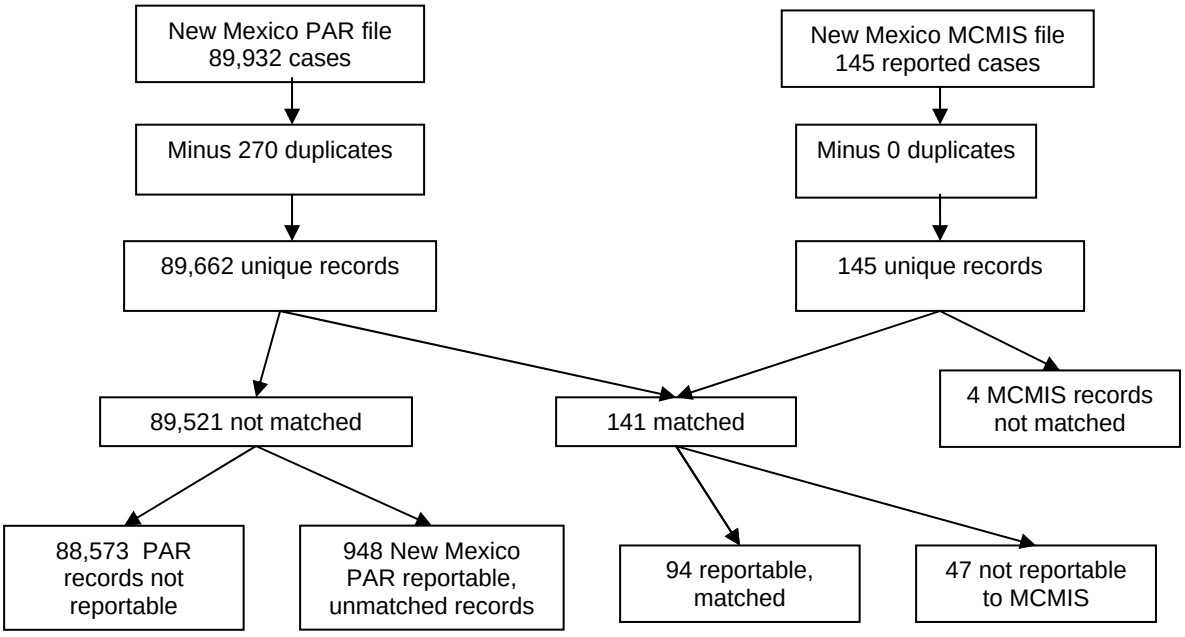
Table 9 displays the variables used in each match step, along with the number of records matched. Matched records were verified on other variables common to the MCMIS and PAR files as a final check to ensure the matches were valid. The above procedure resulted in 141 matches, representing 97.2% of the 145 non-duplicate records reported to MCMIS.

Table 9 Variables Used in MCMIS-New Mexico PAR File Match, 2003

Match step	Matching variables	Cases matched
Match 1	License number, County, Crash month, Crash day, Crash time	124
Match 2	License number, Crash month, Crash day, Crash time	4
Match 3	VIN, Crash month, Crash day, Crash time	9
Match 4	Done by hand	4
Total cases matched		141

Figure 1 shows the case flow during the match. Only 4 (2.8%) MCMIS records could not be matched to the New Mexico PAR file. Of the 1,042 reportable cases in the New Mexico PAR data, 94 were actually reported, resulting in a reporting rate of 9.0%.

Figure 1 Results of MCMIS-New Mexico PAR File Match, 2003



In addition, 47/145=32.4% of reported cases should not have been reported. They did not qualify as reportable either because they did not involve qualifying vehicles or qualifying severity. Table 10 shows why these cases did not meet the reporting criteria. The majority of cases (29) were trucks, but did not qualify due to crash severity. The maximum injury severity in the crash for 26 of the 29 vehicles was no injury. In the remaining 3 cases, the maximum injury severity was C-injury. The one bus did not qualify since maximum injury in the crash was no injury. The remaining 17 cases were not trucks, buses, or placarded hazmat vehicles, even though 13 involved either a fatality, an injury, or disabling damage. Omitting the 4 cases that could not be matched and the 47 MCMIS cases not considered reportable in the PAR file, 94 reportable MCMIS records were matched to the PAR file, which represents 9.0% of the 1,042 cases that should have been reported.

Table 10 Distribution of Non-reportable Cases in MCMIS by Reporting Criteria, PAR File, 2003

	Crash severity				
Vehicle type	Fatal	Transported injury	Tow/disabled	Other crash severity	Total
Truck	0	0	0	29	29
Bus	0	0	0	1	1
Other vehicle (not transporting hazmat)	3	5	5	4	17
Total	3	5	5	34	47

4. Potential Sources of Underreporting

Although only 9.0% of reportable cases were reported, and it appears that underreporting is due to a lack of following guidelines for MCMIS reporting, this section explores sources of underreporting to the MCMIS Crash file. Patterns of underreporting and many of the results are consistent with previous MCMIS evaluations. The approach is to compare reported with unreported cases across several dimensions to search for patterns that might suggest why some cases were reported and others were not. All tables include only reportable cases. Therefore, they exclude the 47 MCMIS cases not considered reportable in the PAR file, and the four MCMIS cases that could not be matched to the PAR file. The reporting rate shown in the following tables is the number of reported cases per 100 reportable cases.

An obvious reason for underreporting could be that all 2003 PAR records have not yet been submitted to the MCMIS Crash file in time for this study. All reportable crash involvements for a calendar year are required to be transmitted to the MCMIS Crash file within 90 days of the end of the year. Even though the overall reporting rate for New Mexico is extremely low (9.0%), an examination of PAR reporting by accident month seems to confirm the hypothesis that cases at the end of the year were not submitted. Table 11 displays reporting rates by accident month. The reporting rates are well above average (for New Mexico) and fairly consistent between January and July. In those months the rates range from 11.8% to 19.3%. However, between August and December the rates decline sharply. In August the reporting rate was 2.5%, while in September it was 1.1%, and in December it was 1.0%. Therefore, almost no cases were being submitted for those months. In addition, no cases were submitted in October or November. The percent of total unreported cases was also slightly greater during the second half of the year, approaching 10% in some months and exceeding 10% in November.

Table 11 Reporting to MCMIS Crash File by Accident Month, PAR File, 2003

Crash month	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
January	66	18.2	54	5.7
February	88	12.5	77	8.1
March	76	11.8	67	7.1
April	83	19.3	67	7.1
May	77	15.6	65	6.9
June	88	13.6	76	8.0
July	108	16.7	90	9.5
August	80	2.5	78	8.2
September	88	1.1	87	9.2
October	95	0.0	95	10.0
November	97	0.0	97	10.2
December	96	1.0	95	10.0
Total	1,042	9.0	948	100.0

In previous investigations concerning other states such as Michigan, Missouri, and Florida, reporting rates have been consistently higher for vehicles involved in more severe crashes. In those studies, states were much more likely to report vehicles involved in fatal crashes to the MCMIS Crash file. This also appears to be the case in New Mexico. Reporting rates based on the MCMIS crash severity criteria are provided in Table 12.

Table 12 Reporting to MCMIS Crash File by Crash Severity, PAR File, 2003

Crash Severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal	40	27.5	29	3.1
Injured	344	11.0	306	32.3
Towaway	658	6.8	613	64.7
Total	1,042	9.0	948	100.0

The reporting rate for crashes involving a fatality is 27.5%, well above the overall average for New Mexico. It is true that fatal outcomes are rare compared to injured and towed involvements, yet the magnitude of the differences in reporting rates is large. Only 40 fatal outcomes are reportable, and of the 948 unreported cases, only 3.1% involve a fatality. In crashes involving at least one injury, or crashes in which at least one vehicle could not be driven, the reporting rates are very similar to the overall rate of 9.0%. Most unreported cases were relatively less serious, with 32.3% involving injury, and 64.7% involving a towed vehicle.

Similar conclusions can be found when crash involvements are considered by the maximum injury severity in the crash. Table 13 shows maximum injury severity in the crash, broken down by disabling damage status. When at least one vehicle in a crash had disabling damage, the fatal reporting rate is 27.0%, the A-injury rate is 12.5%, the B-injury rate is 9.2%, and the C-injury rate is also 9.2%. The reporting rates are much lower for reportable cases that did not have disabling damage. For crashes involving injuries in which no vehicle had disabling damage, the reporting rate is 6.3% for A-injuries, and 0.0% for B-injuries. For crashes involving C-injuries in which no vehicle had disabling damage, the rate is 10.2%. Those 49 cases are reportable since an ambulance name was recorded for the crash. Note that when there was no injury in the crash, and no vehicle had disabling damage, no cases are reportable. Of the unreported cases, 427 (45.0%) were vehicles in crashes with no injury and at least one vehicle with disabling damage. Similarly, 168 (17.7%) were vehicles in crashes involving B-injury and at least one vehicle with disabling damage, and 158 (16.7%) involved a C-injury with at least one vehicle having disabling damage.

Table 13 Reporting to MCMIS Crash File by Crash Severity and Disabling Damage, PAR File, 2003

Maximum injury in crash	Disabling damage	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal	yes	37	27.0	27	2.8
	no	3	33.3	2	0.2
A-injury	yes	104	12.5	91	9.6
	no	16	6.3	15	1.6
B-injury	yes	185	9.2	168	17.7
	no	16	0.0	16	1.7
C-injury	yes	174	9.2	158	16.7
	no	49	10.2	44	4.6
No injury	yes	458	6.8	427	45.0
	no	0	NA	0	0.0
Total		1,042	9.0	948	100.0

Vehicle type is another obvious variable to check for variability among reporting rates. Police officers may more readily recognize crashes with big trucks such as tractor-semitrailers as reportable, than smaller vehicles. Table 14 shows reporting to the MCMIS Crash file by vehicle type. Semitrailers have the highest reporting rate at 10.5%, and also account for the largest percentage of total unreported cases (79.5%). The reporting rate for buses is only 3.3% and buses account for 9.2% of unreported cases. Small numbers of passenger vehicles, pickup trucks, van/four wheel drive, and unknown vehicle types qualify as reportable due to inconsistencies in the PAR data. For example, of the seven passenger vehicles, five have a tractor type designation "D" (see Appendix 1 which explains the vehicle qualifying criteria) and two vehicles have an International vehicle make with model years 1996 and 1998, respectively. The 57 vehicles classified as other vehicles are mostly straight trucks such as dump trucks, tow trucks, cement mixers, or vehicles with a tractor type designation.

Table 14 Reporting to MCMIS Crash File by Vehicle Type, PAR File, 2003

Vehicle type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Passenger †	7	0.0	7	0.7
Pickup†	19	0.0	19	2.0
Semitrailer	842	10.5	754	79.5
Bus	90	3.3	87	9.2
Other	57	3.5	55	5.8
Van/ four wheel drive	21	4.8	20	2.1
Unknown	6	0.0	6	0.6
Total	1,042	9.0	948	100.0

† Some passenger cars and pickup trucks are identified as reportable since other variables indicate that they were actually trucks, and misidentified on the vehicle type variable

In addition to crash month, crash severity, and vehicle type, there can be differences related to where the crash occurs. Crashes in urban locations may be covered by different police agencies with different priorities than crashes in rural areas. Table 15 is a summary of reporting to MCMIS by road system. Reporting rates were greatest in rural areas. On rural interstate roads the reporting rate is 16.5%, while on non-interstate roads the rate is 12.1%. In urban areas with towns of 5,000 people or more, the reporting rate was the lowest at 4.4%. Urban areas also accounted for the highest percentage of total unreported cases (55.4%).

Table 15 Reporting to MCMIS Crash File by Road System, PAR File, 2003

Road system	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Rural non-interstate	256	12.1	225	23.7
Urban (towns of 5,000 or more)	549	4.4	525	55.4
Rural interstate	237	16.5	198	20.9
Total	1,042	9.0	948	100.0

Another possibility considered is that in-state vehicles might be less likely to be reported to the MCMIS Crash file than vehicles from out of state. The hypothesis is that since the MCMIS file is a national file maintained by the Federal Motor Carrier Safety Administration, which has regulatory authority over trucks and buses in interstate commerce, it might be thought that reporting is not required for in-state vehicles. Table 16 shows reporting to MCMIS based on vehicle license plate state. License plate has been divided into two categories: vehicles with New Mexico license plates, and vehicles that do not have New Mexico license plates. There appears to be some evidence supporting the hypothesis. The reporting rate for vehicles without New Mexico license plates is 12.3%, while the rate for vehicles with New Mexico license plates is 4.8%. The percentage of total unreported cases is slightly higher for vehicles with license plates outside New Mexico (54.2%) than for vehicles with New Mexico license plates (45.8%).

Table 16 Reporting to MCMIS Crash File by License Plate State, PAR File, 2003

Vehicle License Plate State	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
New Mexico	456	4.8	434	45.8
Other	586	12.3	514	54.2
Total	1,042	9.0	948	100.0

New Mexico has thirty-three counties and Table 17 is a display of the top ten counties in New Mexico, ordered by the number of unreported cases. Bernalillo County has a reporting rate of 1.8%, and also has the largest percentage of total unreported cases (34.5%). Thus, Bernalillo County has a strong influence on the overall reporting rate of 9.0%. Note that the city of

Albuquerque is located in Bernalillo County. These results are consistent with the results given in Table 15. Other counties with low reporting rates include Lea (0.0%), San Juan (3.5%), Dona Ana (5.0%) and Cibola (5.0%). Guadalupe County and Santa Fe County have the highest reporting rates, though still only 22.6% and 18.3%, respectively.

Table 17 Reporting to MCMIS Crash File by County, PAR File, 2003

County	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Bernalillo	333	1.8	327	34.5
McKinley	88	10.2	79	8.3
Dona Ana	60	5.0	57	6.0
San Juan	57	3.5	55	5.8
Santa Fe	60	18.3	49	5.2
Eddy	46	10.9	41	4.3
Cibola	40	5.0	38	4.0
Guadalupe	31	22.6	24	2.5
Lea	24	0.0	24	2.5
Torrance	26	11.5	23	2.4
Sum of top ten	765	6.3	717	75.6
Total (all counties)	1,042	9.0	948	100.0

Seven reporting agencies can be identified in the New Mexico PAR file. Table 18 shows reporting rates by reporting agency. Results for the Albuquerque police department are similar to results for Bernalillo County given in Table 17. Thus, the Albuquerque police department has a low reporting rate (2.0%), and a high percentage of total unreported cases (26.4%). However, the New Mexico state police have the highest reporting rate (15.5%) and, in addition, the highest percentage of total unreported cases (39.6%). All other city police have a 5.6% reporting rate and account for 19.6% of all unreported cases. County sheriff departments have a 6.3% reporting rate and account for 11.0% of all unreported cases.

Table 18 Reporting to MCMIS Crash File by Reporting Agency, PAR File, 2003

Reporting agency	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Albuquerque police department	255	2.0	250	26.4
New Mexico state police	444	15.5	375	39.6
County sheriff department	111	6.3	104	11.0
Driver report	12	8.3	11	1.2
University or campus police	3	0.0	3	0.3
All other city police	197	5.6	186	19.6
Tribal police	20	5.0	19	2.0
Total	1,042	9.0	948	100.0

5. Data Quality

When recording data, some information has more priority than other information, and some variables are recorded more completely than others. During the data collection process, it is almost certain that there will be missing data with respect to some variables, and methods must be considered for dealing with this situation. In examining missing data, it is usually preferable to work with numeric data, but some variables, such as VIN, contain alphanumeric characters, and must be coded as character variables.

In this section, some issues related to missing data and data quality in both the New Mexico PAR file and the MCMIS Crash file are examined. In this report, problems concerning certain variables have already been addressed. For example, due to inconsistencies in the PAR data, some vehicle types coded as passenger cars have vehicle makes that could only be for large trucks. In other cases, some vehicle types coded as passenger cars have tractor type designations. With respect to the MCMIS Crash file, only 145 records were reported by New Mexico, yet some variables suffer from missing data.

Table 19 lists some of the variables in the MCMIS Crash file, along with percentages of missing data. Fifteen variables have more than 5% missing data. The event one variable has 9.7% missing values, but the percentages increase to 58.6% for event two, 82.1% for event 3, and 94.5% for event 4. It may be that these data are not really missing, but that data are not recorded since these events do not apply. Other variables with fairly high percentages of missing data include DOT number (30.1%), road access (15.9%), and configuration (13.1%).

Of 145 records in the MCMIS Crash file, four were recorded as having a hazardous materials placard, while three were recorded as having release of hazardous material cargo. An examination of all 89,932 records in the New Mexico PAR file, however, indicates that only two vehicles had a hazardous materials placard, and both vehicles were tractor-semitrailers.

Table 19 Unrecorded Rates for Selected Variables, MCMIS File, 2003

Variable	Percent unrecorded	Variable	Percent unrecorded
Accident year	0.0	Event one	9.7
Accident month	0.0	Event two	58.6
Accident day	0.0	Event three	82.1
Accident hour	0.0	Event four	94.5
Accident minute	0.0	Number of vehicles	0.0
Body type	8.3	Officer badge number	5.5
Configuration	13.1	Report number	0.0
County	8.3	Road access	15.9
DOT number *	30.1	Road surface	4.8
Driver date of birth	0.0	Road trafficway	9.7
Driver license number	7.6	Towaway	0.0
Driver license state	5.5	Truck or bus	0.0
Fatal injuries	0.0	Vehicle license number	6.9
Non-fatal injuries	0.0	Vehicle license state	1.4
Interstate	0.0	VIN	3.5
Light	6.2	Weather	4.8

* Counting cases where the carrier is coded interstate

	Hazardous materials placard	Hazardous material release of cargo
No	129	130
Yes	4	3
Missing	12	12
Total	145	145

Errors of translation and formatting can occur when the data are prepared for submission to the MCMIS crash file. The following sets of tables compare the actual data values in the New Mexico PAR file with the values in the MCMIS Crash file to determine if the data are consistent between the two datasets.

For the 94 reportable and matched cases, Table 20 displays the consistency between the vehicle type variable as recorded in the New Mexico PAR file and the coding of configuration in the MCMIS Crash file. With regard to the 94 reportable and matched cases, the vehicle type variable in the PAR file has a category for semitrailers, a category for all buses, a category for other vehicles, and a category for van/four wheel drive vehicles. The majority of truck combination vehicles in the PAR file are either tractor-semitrailers (55.3%) or truck trailers (21.3%) in the MCMIS file. One tractor-semitrailer is coded as a bus in the MCMIS file, a total of five are coded as single unit trucks, one is coded as a tractor double, and nine are coded as unknown. Of the three buses in the PAR file, two are coded as buses in the MCMIS file, and

one is unknown. The three vehicles coded as other or van/four wheel drive vehicles in the PAR file are coded as single unit trucks with 3 or more axles in the MCMIS file.

Table 20 Vehicle Type Coding in New Mexico PAR Compared with MCMIS Crash File, 2003

New Mexico PAR vehicle type variable	MCMIS configuration variable	N	%
Tractor-semitrailer	Bus (seats>15 incl dr)	1	1.1
	SUT 2 axle 6 tire	3	3.2
	SUT 3+ axles	2	2.1
	Truck trailer	20	21.3
	Tractor semitrailer	52	55.3
	Tractor double	1	1.1
	Unknown	9	9.6
Bus	Bus (seats 9-15 incl dr	1	1.1
	Bus (seats>15 incl dr)	1	1.1
	Unknown	1	1.1
Other	SUT 3+ axles	2	2.1
Van/four wheel drive	SUT 3+ axles	1	1.1
Total		94	100.0

Table 21 is a comparison of the number of fatalities in the crash for cases in both the PAR file and the MCMIS file. The files match closely except for two cases. In two cases in which no fatalities were recorded in the PAR file, one case shows one fatality in the MCMIS file, and one case shows two fatalities.

Table 21 Total Fatalities Coding in New Mexico PAR Compared with MCMIS Crash File, 2003

New Mexico PAR fatalities	MCMIS fatalities	N	%
0	0	83	88.3
	1	1	1.1
	2	1	1.1
1	1	8	8.5
2	2	1	1.1
Total		94	100.0

6. Summary and Discussion

The purpose of the present study is to evaluate the completeness and accuracy of data reported from New Mexico to the MCMIS Crash file. To achieve that goal, the New Mexico PAR file for 2003 was obtained, and the data therein was compared with the data reported to the MCMIS Crash file. The New Mexico PAR file contains records for 48,128 crashes involving 89,932 vehicles. In this file, 270 records were identified as duplicate records. The 2003 MCMIS Crash file contains records for 145 vehicles. No duplicate records were found in this file.

The most important finding of this study is that New Mexico only reported approximately 9.0% of reportable cases to the MCMIS Crash file. Based on the criteria developed for identifying reportable cases, 1,042 records in the New Mexico PAR file should have been reported, yet only 94 actually were. It appears that police are having difficulty following the guidelines established for reporting qualifying cases. One likely reason for the low reporting rate is that police are not filling out the Truck and Bus Supplemental Report that defines the conditions for a MCMIS reportable crash. In previous years, such as 2002 and 2001, more cases were submitted to the MCMIS Crash file. In 2002, 270 cases were submitted and in 2001, 686 cases were submitted. Therefore, the number of cases submitted has been decreasing over time.

While underreporting seems to be the larger issue in New Mexico, reporting of cases that should not have been reported is also evident. Of 145 cases in the MCMIS Crash file, 47 or 32.4% do not qualify as MCMIS reportable cases. Of the 47 cases, 26 are trucks that were involved in crashes in which there were no injuries. Three cases are trucks that were involved in crashes in which the maximum injury severity was a C-injury, but no ambulance name was recorded. One case is a bus involved in a crash with no injuries, and the remaining 17 vehicles are not trucks, buses, or hazmat placarded vehicles.

The New Mexico PAR file contained all the variables necessary for identifying cases that qualified as MCMIS reportable. The only minor problem encountered was in identifying qualifying vehicles. No single variable could be used to identify qualifying vehicles. Five variables were used in combination, and the algorithm is described in detail in Appendix 1. The method was derived based on inspection of cross-tabulations of the variables vehicle type, body type, vehicle make, tractor type, and body style. Identifying qualifying buses was straightforward since results were consistent among several variables. Only two vehicles in the New Mexico PAR file were recorded as hazmat placarded vehicles, and these were qualifying trucks. In total, 2,573 vehicles met the MCMIS vehicle criteria. Of these vehicles, 2,303 were trucks, and 270 were buses.

Injury severity and ambulance name variables made it possible to identify vehicles meeting the injured and transported criteria. A maximum damage variable made it possible to identify vehicles involved in crashes in which at least one vehicle could not be driven from the scene. Thus, variables in the New Mexico PAR file were available for matching the MCMIS reporting criteria closely. In addition, proportions were used from the Ohio MCMIS evaluation to estimate New Mexico reportable crashes. The Ohio data serves as a standard reference distribution for comparison to other states since it contains all relevant variables used to identify MCMIS reportable cases. This comparison was pursued in an attempt to validate or confirm methods used in this report to identify cases satisfying the MCMIS reportable threshold. The number of adjusted reportable cases estimated from the Ohio data (970) matches closely the reportable records identified in the New Mexico PAR file (1,042) based on the criteria developed in this study.

Using common variables in the New Mexico PAR file and the MCMIS Crash file, four matches were performed. Variables such as license number, county of the crash, crash month, crash day, crash time, and VIN were used as matching variables. After the third match, eight cases remained in the MCMIS file that could not be matched. These eight cases were inspected visually, and four additional cases were matched by hand. Of the 145 MCMIS cases, it was possible to match 141 cases. Of the 141 matched cases, 94 are reportable, while 47 are not reportable. Of the 89,521 records not matched in the PAR file, 948 are reportable, while 88,573 are not reportable. In total, 948+94=1,042 cases are reportable.

Although the overall reporting rate for New Mexico was only 94/1,042=9.0%, certain patterns emerge and reporting rates varied according to several variables. For example, between January and July, reporting rates varied from 11.8% to 19.3%, well above the overall rate. After July, however, only four cases were reported. Just as in some other states, it appears that cases are not extracted for submission to the MCMIS Crash file in a timely fashion.

New Mexico has adopted a system which rests fundamentally on reporting police officers recognizing that a crash qualifies as reportable to the MCMIS Crash file and then completing the Truck and Bus Supplemental Accident Report. It is apparent that most reporting officers are failing to recognize all the crashes that qualify for reporting. The Truck and Bus Supplemental Accident Report correctly identifies the criteria for a reportable crash involvement. Yet, fewer than one in ten qualifying crashes are reported.

The analysis presented above identifies some of the problems. Crash reporting varies by crash severity, with more severe crashes being more likely to be reported. The reporting rate for crashes involving a fatality was 27.5%. Only 11.0% of reportable injury crashes are reported, and only 6.8% of towaway are reported.

Officers are also less likely to recognize as reportable crashes involving in-state trucks or buses. Even though there is no mention of interstate commerce in the reporting criteria, the reporting rate was much lower for in-state reportable crashes than crashes involving trucks from outside of New Mexico. Based on license plate state, vehicles with license plates outside of New Mexico had a higher reporting rate (12.3%) compared to vehicles with New Mexico license plates (4.8%). Similarly, large trucks such as tractor-semitrailers were much more likely to be reported than smaller straight trucks or buses.

There is some evidence that the level of training or possibly police focus and priorities also play a role. We looked at reporting by the road system, which is a surrogate for urban and rural areas. The orientation of policing in urban areas may be different from rural, as more densely populated areas may devote more resources to routine law enforcement. The reporting rate for crashes on rural interstate roads was 16.5%, while on urban roads the rate was 4.4%. In addition, crashes on urban roads accounted for 55.4% of the unreported cases. Of New

Mexico's thirty-three counties, Bernalillo County had the highest percentage (34.5%) of total unreported cases and also one of the lowest reporting rates (1.8%). Thus, improvements in this county alone would have a positive effect on the overall reporting rate. The city of Albuquerque is located in Bernalillo County. The reporting rate for the Albuquerque police department was only 2.0%, and this police department accounted for 26.4% of the total unreported cases.

Reporting rates also varied by agency type, which may indicate differences in training and focus. City police departments reported 5.6% of reportable cases. County sheriff departments reported at a somewhat higher rate, 6.3%, but one which is not practically different from the police department rate. On the other end of the scale, the New Mexico state police reported 15.5% of reportable cases.

Thus, given New Mexico's approach of relying on officers to identify reportable crashes and properly fill out the supplemental data, it is clear that there are fundamental problems with the officers' ability to identify cases correctly. Only 9.0% of reportable cases are actually reported. And about one-third of the cases that were reported did not qualify reporting.

Yet the very low reporting rates suggest that the problems go well beyond the officers at the crash scene. Other states also rely on officers to identify cases, but realize reporting rates that are much higher, though also well below their own potentials. It is possibly telling that the New Mexico police accident report instruction manual includes no information on filling out the truck and bus supplemental form. Thus, it is unfair to place the onus on the reporting officers alone. Clearly there are many opportunities in the entire police accident reporting system to improve the results.

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Appendix 1: Identifying Qualifying Trucks in New Mexico PAR File

Qualifying trucks were identified based on the information contained in five variables: vehicle type, body type, tractor type, vehicle make, and body style. Cross tabulations among these variables led to the derived algorithm. The algorithm is given below.

If vehicle type is a tractor-semitrailer

Or
((body type is trailer/freight truck Or tractor type is not missing Or vehicle make is one of the following:
(Mack, International, Kenworth, Freightliner, Peterbilt, Sterling))
and vehicle type is not a bus)

Or
vehicle type is one of the following:
(Pickup, Other, Van/4 wheel drive)
and body style is one of the following:
(Tractor truck diesel, Tractor truck gasoline, Tractor truck tanker, Truck commercial 2-ton, Concrete mixer, Dump truck, Garbage truck, Tow/wrecker)

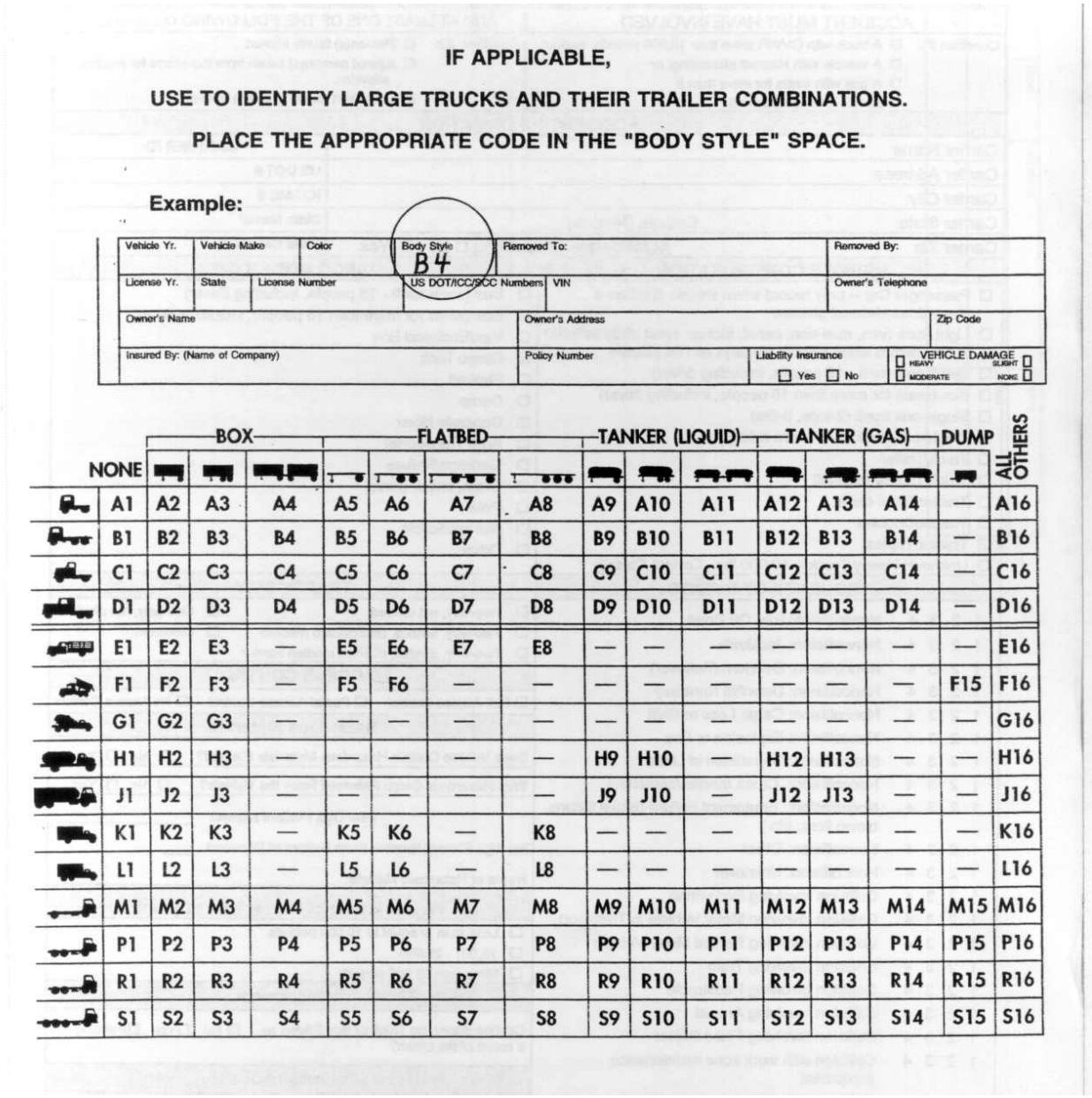
The variables along with frequencies and percentages are shown below. Due to numerous categories, vehicle make is not shown.

Vehicle type	N	%
Passenger	45,948	51.1
Pickup	21,088	23.4
Semitrailer [sic]	2,029	2.3
Bus	271	0.3
Motorcycle	998	1.1
Pedacyclist	276	0.3
Pedestrian	496	0.6
Other	882	1.0
Van/4 wheel drive	14,062	15.6
Unknown	3,882	4.3
Total	89,932	100.0

Body type	N	%
Passenger	45,712	50.8
Truck/RV	34,579	38.5
Farm truck	2	<0.1
School bus	148	0.2
Agriculture bus	1	<0.1
Commercial bus	102	0.1
Trailer/freight truck	1,988	2.2
Travel trailer	24	<0.1
Motorcycle	931	1.0
Off road motorcycle	39	<0.1
Non-profit bus	1	<0.1
Motorized home	40	<0.1
Mobile home	3	<0.1
Ambulance	5	<0.1
Construction equipment	110	0.1
Emergency	16	<0.1
Farm	7	<0.1
NM state highway	7	<0.1
State owned	6	<0.1
Other	94	0.1
Bicycle	204	0.2
Police	140	0.2
Public owned	84	0.1
State police	36	<0.1
Unknown	5,653	6.3
Total	89,932	100.0

Tractor type	N	%
A	34	<0.1
B	36	<0.1
C	29	<0.1
D	1,819	2.0
E	3	<0.1
F	67	0.1
G	36	<0.1
H	2	<0.1
J	7	<0.1
K	60	0.1
L	17	<0.1
M	9	<0.1
P	7	<0.1
R	1	<0.1
S	47	0.1
Unknown	87,758	97.6
Total	89,932	100.0

The New Mexico form used to identify large trucks is shown below. The first letter in these codes corresponds to the tractor type variable shown in the table above.



IF APPLICABLE,

USE TO IDENTIFY LARGE TRUCKS AND THEIR TRAILER COMBINATIONS.

PLACE THE APPROPRIATE CODE IN THE "BODY STYLE" SPACE.

Example:

Vehicle Yr.	Vehicle Make	Color	Body Style	Removed To:	Removed By:
			B4		

License Yr.	State	License Number	US DOT/ICC/SCC Numbers	VIN	Owner's Telephone

Owner's Name	Owner's Address	Zip Code

Insured By: (Name of Company)	Policy Number	Liability Insurance ☐ Yes ☐ No	VEHICLE DAMAGE ☐ HEAVY ☐ MODERATE ☐ SLIGHT ☐ NONE

		BOX			FLATBED				TANKER (LIQUID)			TANKER (GAS)			DUMP	ALL OTHERS
NONE																
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	—	A16
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	—	B16
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	—	C16
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	—	D16
	E1	E2	E3	—	E5	E6	E7	E8	—	—	—	—	—	—	—	E16
	F1	F2	F3	—	F5	F6	—	—	—	—	—	—	—	—	F15	F16
	G1	G2	G3	—	—	—	—	—	—	—	—	—	—	—	—	G16
	H1	H2	H3	—	—	—	—	—	H9	H10	—	H12	H13	—	—	H16
	J1	J2	J3	—	—	—	—	—	J9	J10	—	J12	J13	—	—	J16
	K1	K2	K3	—	K5	K6	—	K8	—	—	—	—	—	—	—	K16
	L1	L2	L3	—	L5	L6	—	L8	—	—	—	—	—	—	—	L16
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16

Body style	N	%
Sedan 2 door	11,614	12.9
Hardtop 2 door	550	0.6
Sedan 4 door	31,024	34.5
Hardtop 4 door	299	0.3
Ambulance	6	<0.1
All terrain vehicle/moped	22	<0.1
Bus (church)	2	<0.1
Bus (private)	111	0.1
Bus (school)	159	0.2
Truck (commercial 2-ton)	51	0.1
Concrete mixer	13	<0.1
Coupe	995	1.1
Construction equipment	52	0.1
Convertible	98	0.1
Dump truck	54	0.1
Tractor truck (diesel)	1,890	2.1
Flatbed (covered)	78	0.1
Fire truck	15	<0.1
Garbage truck	18	<0.1
House trailer	1	<0.1
Hardtop	1	<0.1
Motor home	70	0.1
Pickup	21,088	23.4
Pickup camper	2	<0.1
Panel	49	0.1
Sedan	174	0.2
Stake or rack	3	<0.1
Station wagon	1,088	1.2
Tractor truck (tanker)	11	<0.1
Farm tractor	8	<0.1
Tank	2	<0.1
Tractor Truck (gasoline)	4	<0.1
Tow/wrecker	27	<0.1
Van	4,136	4.6
Four wheel drive	9,881	11.0
Unknown	6,336	7.0
Total	89,932	100.0

Appendix 2: Variables Used From the New Mexico PAR Data to Identify a MCMIS-Reportable Crash

MCMIS Reporting Criteria	Implementation in New Mexico PAR data
Truck with GVWR over 10,000 or GCWR over 10,000	See Appendix 1
***or* Bus with seating for at least nine, including the driver**	The vehicle type variable (typev) identifies buses: typev= 4-bus
***or* Vehicle displaying a hazardous materials placard**	New Mexico has a variable (hzplaq) indicating if a vehicle was displaying a hazardous materials placard: Valid numbers are 1 through 18, 98-99 missing. 0<hzplaq<98
AND	
at least one fatality	New Mexico has an injury severity variable at the accident level reflecting the most serious injury in the crash: severity = 1-fatal
***or* at least one person injured and transported to a medical facility for immediate medical attention**	Maximum injury severity in the crash was calculated and used in conjunction with an ambulance name variable. max_injsev = K-killed, A-incapacitating (carried from the scene), B-visible injury, C-complaint of injury, O-no injury. Ambulance name.
***or* at least one vehicle towed due to disabling damage**	New Mexico has a maximum damage in the crash variable. maxdam = 1-disabling damage (cannot be driven), 2-functional damage (affects operation of vehicle), 3-other vehicle damage (affects only appearance), 4-other property damage (no damage to vehicle), 5-no damage, 6-vehicle caught on fire

Appendix 3: New Mexico Uniform Crash Report Form (PAR) [SAMPLE]

INVESTIGATION
SH 10674
REVISED
APRIL 2002

Santa Fe Police Dept. — REPORTING DEPARTMENT — 359934

☐ ON PRIVATE PROPERTY ☐ FATAL ☒ INJURY PROPERTY DAMAGE ONLY ☐ UNDER $500 ☐ $500 OR MORE ☐ HIT AND RUN

STATE OF NEW MEXICO UNIFORM CRASH REPORT

DATE OF ACCIDENT Mo. Day Year	Military Time	CITY OCCURRED IN	COUNTY	SHEET / OF
01/06/2003	8:30	Santa Fe		1 OF 3 SHEETS

SUN ☐ M ☒ T ☐ W ☐ T ☐ F ☐ SAT ☐ **OCCURRED ON :** (ROUTE NO. or NAME): Route NM 578 — AT INTERSECTION WITH:

OTHER LOCATION ☐ FEET ☐ MILES — PERMANENT LANDMARK-COUNTY LINE -INTERSECTION — N S E W OF: — FOR USE BY ORIGINATOR

MILEPOST LOCATION 10 ☐ FEET ☒ MILES — N ☒ S E ☒ W OF MILEPOST NO: 54

ACCIDENT OCCURRED ☒ On Roadway ☐ Off Roadway

ACCIDENT CLASSIFICATION ☐ Overturned ☐ Other N-Col. ☐ Pedestrian ☒ Other Vehicle ☐ Vehicle On Other Rdwy. ☐ Parked Veh. ☐ R.R. Train ☐ Pedalcyclist ☐ Animal ☐ Fixed Object ☐ Other Object

VEHICLE NO. 1

HEADED East — N S ☒ W ON: Route NM 578 — Posted Speed: 60 — Safe Speed: 60

Driver's Full Name	Address	Zip Code	Phone
Thomlin, Lee	553 Brizzare	55342	(645) 555 4453

Driver License Number	State	Type	Restrictions	Expires	Date of Birth Mo. Day Year
5939402	NM	C	-	01/05/04	08/02/80

Seat Position Code: ☒ DR ☐ LF ☐ CR ☐ CF ☐ RR ☐ RF — 7. OTHER — Social Security Num.: 535394 — Occupation: Business Owner

Seat Pos.	Occupant's Name	Occupant's Address/Zip Code	Seat Belt	Helmet Yes No	Age	Sex	Injury
			3	N	23	M	K2

Vehicle Yr.	Vehicle Make	Color	Body Style	Removed To:	Removed By:
2002	Dodge	Red	Viper	Santa Fe Towing	Santa Fe Towing

License Yr.	State	License Number	US DOT/ICC/PRC Numbers	VIN	Owner's Telephone
2002	NM	39584		25003-3534934-239	Same as above

Owner's Name	Owner's Address	Zip Code
Thomlin, Lee	553 Brizzare	55342

Insured By: (Name of Company)	Policy Number	Liability Insurance	VEHICLE DAMAGE
New Mexico Insurance	5432-38	☒ Yes ☐ No	☒ HEAVY ☐ SLIGHT ☐ MODERATE ☐ NONE

VEHICLE NO. 2- PEDESTRIAN - OTHER

HEADED West — N S E ☒ W ON: Route NM 578 — Posted Speed: 60 — Safe Speed: 60

Driver's or Pedestrian's Full Name	Address	Zip Code	Phone
Bones, Chris	5394 Rancho Serro Collorado	49353	(633) 555-3049

Driver License Number	State	Type	Restrictions	Expires	Date of Birth Mo. Day Year
59340358	NM	C		10/26/03	06/01/50

Seat Position Code: ☒ DR ☐ LF ☐ CR ☐ CF ☐ RR ☐ RF — 7. OTHER — Social Security Num.: 58349485 — Occupation: Doctor

Seat Pos.	Occupant's Name	Occupant's Address/Zip Code	Seat Belt	Helmet Yes No	Age	Sex	Injury
			3	N	53	M	K4

Vehicle Yr.	Vehicle Make	Color	Body Style	Removed To:	Removed By:
1960	Ford	Geren	Pickup	Santa Fe Towing	Santa Fe Towing

License Yr.	State	License Number	US DOT/ICC/PRC Numbers	VIN	Owner's Telephone
2003	NM	3959348		359395-34923-23934	(633) 555-3049

Owner's Name	Owner's Address	Zip Code
Bones, Chris	5394 Rancho Serro Collorado	49353

Insured By (Name of Company)	Policy Number	Liability Insurance	VEHICLE DAMAGE
Santa Fe Insurance	5433-43	☒ Yes ☐ No	☐ HEAVY ☒ SLIGHT ☐ MODERATE ☐ NONE

INJURED First Aid Rendered By: — Injured Taken To: Santa Fe Hospital — By: Police

OTHER PROPERTY INVOLVED — DESCRIPTION OF PROPERTY AND DAMAGE — Owner Phone — Owner's Name — Owner's Address/Zip Code

WITNESS

Name	Age	Address	Telephone

INJURY CODES

K- Killed
K1 Head K3 Neck
K2 Chest K4 Other

A-Incapacitated - Carried From Scene
A1 Head A4 Neck
A2 Chest A5 Arms/Legs
A3 Back

B- Visible Injury
B1 Head B4 Neck
B2 Chest B5 Arms/Legs
B3 Back

C- Complaint- No Visible Injury

O- No Apparent Injury

RESTRAINT CODES

1. Restraints - Not Installed
2. Restraints - Not Used
3. Lap Belts - Used
4. Shoulder Harness - Not Used
5. Shoulder Harness - Used
6. Belt & Harness - Used
7. Ejected From Vehicle
8. Child Restraint Device
   A. Used Properly
   B. Not Used
   C. Used Improperly
9. Airbag Deployed
   A. Other Restraints Not Used
   B. Other Restraints Used

New Mexico Uniform Crash Report Form (Page 2)

ROAD-WEATHER

LIGHTING (Mark 1 with X)	WEATHER (Mark 1 with X)	ROAD COND. (Mark 1 each with X)	ROAD SURFACE (Mark 1 each with X)	TRAFFIC CONTROL (Mark 1 each with X)	ROAD CHARACTER (Mark 1 with X)	ROAD DESIGN (Mark 1 or more for each with X)
☒ Daylight	☒ Clear	☒☒ Dry	☐☐ Paved Unstriped	☐☐ No Passing Zone	☒ Straight	☐☐ 1 Lane
☐ Dawn	☐ Raining	☐☐ Wet	☐☐ Paved Center Stripe	☐☐ Stop Sign	☐ Curve	☐☒ 2 Lanes
☐ Dusk	☐ Snowing	☐☐ Snow	☒☒ Paved Center & Edgeline	☐☐ Traffic Signals	GRADE (Mark 1 with X)	☒☐ 3 Lanes
☐ Dark Lighted	☐ Fog	☐☐ Ice	☐☐ Unpaved	☐☐ Yield Sign	☒ Level	☐☐ 4 Lanes
☐ Dark - Not Lighted	☐ Dust	☐☐ Loose Material		☐☐ R.R. Gate	☐ Hillcrest	☐☐ Undivided
☐ Other	☐ Wind	☐☐ Other		☐☐ 4 Way Stop	☐ On Grade	☐☐ Physical Div.
	☐ Other			☐☐ Flashers	☐ Dip	☒☒ Painted Div.
				☒☒ No Controls		
				☐☐ Other		

ROAD DESIGN (Mark 1 or more for each with X)	
☐☐ One Wa	
☐☐ Ramp	
☒☒ Freewa	
☐☐ Undev.	
☐☐ Alley	
☐☐ Other	
☐☐ Constr. Zone	

EVENT

APPARENT CONTRIBUTING FACTORS (Mark 1 or more for each with X)

☒☐ Excessive speed	☐☐ Following too closely	☐☐ Defective steering
☐☐ Speed too fast for conditions	☐☐ Made improper turn	☐☐ Defective tires
☐☐ Failed to yield right of way	☒☐ Driver inattention	☐☐ Other mechanical defect
☐☐ Passed stop sign	☐☐ Under influence of alcohol	☐☐ Road defect
☐☐ Disregarded traffic signal	☒☐ Other improper driving	☐☐ Other - No driver error
☐☐ Drove left of center	☐☐ Pedestrian error	☐☐ Traffic control not functioning
☐☐ Improper overtaking	☐☐ Inadequate brakes	☐☐ Improper lane change
☐☐ Avoid no contact vehicle	☐☐ Driverless moving vehicle	☐☐ Improper backing
☐☐ Avoid no contact - other	☐☐ Failed to yield - Police Vehicle(s)	☐☒ None
☐☐ Cell Phone	☐☐ Failed to yield - Emergency Vehicle(s)	

WHAT DRIVERS WERE DOING (Mark 1 or more for each with X)

☐☒ Going Straight	☐☐ Stopped for traffic
☐☐ Overtaking-Passing	☐☐ Stopped for sign/signal
☐☐ Right Turn	☐☐ Start in traffic ln
☐☐ Left Turn	☐☐ Start from Park
☐☐ U Turn	☐☐ Parked
☐☐ Slowing	☒☐ Other
☐☐ Backing	

DRIVER

DRIVER OR PEDESTRIAN SOBRIETY (Mark 1 or more for each with X)

- ☐☐ Consumed Alcohol
- ☐☐ Consumed a Controlled Substance
- ☒☒ Had Not Consumed Alcohol
- ☐☐ Sobriety Unknown
- ☐☐ Consumed Medication
- ☐☐ Tested by Instrument
- ☐☐ Breath Test Administered
  ____ gms / 210L ____ gms / 210L
- ☐☐ Blood Test Administered
- ☐☐ Field Sobriety Test
- ☐☐ Eye Gaze / Nystagmus

DRIVER OR PEDESTRIAN PHYSICAL CONDITION (Mark 1 or more for each with X)

☐☐ Fatigue-Asleep	☐☐ Medication
☐☐ Eyesight Imp.	☐☐ Amputee
☐☐ Hearing Imp.	☒☒ No App. Defects
☐☐ ILL	☐☐ Other Physical Impairment*

*Specify _____

PEDESTRIAN

PEDESTRIAN ACTION

At Intersection	Not At Intersection	
☐☐ With Signal	☐☐ From Behind Obstruction	☐☐ Walking Against Traffic
☐☐ Against Signal	☐☐ No Crosswalk	☐☐ Standing
☐☐ No Signal	☐☐ Crosswalk	☐☐ Pushing or Working on Vehicle
☐☐ Diagonal	☐☐ Walking W/Tr	☐☐ Playing in Road
	☐☐ Other	

*Specify _____

Diagram Drawn By:	Measurements By	Leave Blank
John Fredrickson	John Fredrickson	

DIAGRAM

Use Supplemental Diagram/Narrative Sheet for additional Information

NARRATIVE (Describe how accident occurred.)

Thomlin was excessively speeding and was not paying attention to the road. He was swerving infront of Bone. Bones hit Thomlin's driver side door. Thomlin was rushed to the hospital

TRAILER OR TOWED VEHICLES		Year	Make	Lic Yr - State - Number	Type
	TOWED BY VEH. #1				
	TOWED BY VEH. #2				

ENFORCEMENT ACTION

	Name	Violation	W	B	C	Citation No.
VEH. NO. 1	Thomlin, Lee	Excessive Speed				443
VEH. NO.	Name	Violation	W	B	C	Citation No.
VEH. NO.	Name	Violation	W	B	C	Citation No.

Time Notified	Time Arrived	Notified By	Supvr. at Scene	Checked By
8:40	8:45	Dispatch		

Officer's Signature	Rank	ID No.	District	Date of Report
	Officer	359	SF	01/06/03

Appendix 4: New Mexico Truck and Bus Supplemental Accident Report

MTD - 11191
INT. 08/93

STATE OF NEW MEXICO - MOTOR TRANSPORTATION DIVISION

Truck and Bus Supplemental Accident Report

UAR Accident Report # _____

Date _____

ONLY COMPLETE THIS FORM IF TWO CONDITIONS ARE MET

ACCIDENT MUST HAVE INVOLVED	AND AT LEAST ONE OF THE FOLLOWING OCCURRED:
Condition #1: ❑ A truck with at least 2 axles or 6 tires; and/or ❑ A vehicle with Hazmat placarding; or ❑ A bus with seats for more than 15 people (including driver).	Condition #2: ❑ Person(s) fatally injured. ❑ Injured person(s) taken from the scene for medical attention. ❑ Vehicle(s) towed from the scene.

ACCIDENT INFORMATION

Carrier Name				Source: ❑ Vehicle Side ❑ Shipping Papers ❑ Driver
Carrier Address				
Carrier ID #	US DOT #	ICC MC #	State Name	State #

VEHICLE CONFIGURATION	CARGO BODY TYPE
❑ Bus ❑ Single unit truck, 2 axle, 6 tire ❑ Single unit truck, 3 or more axles ❑ Truck / Trailer ❑ Truck Tractor (bobtail) ❑ Tractor / Semitrailer ❑ Tractor / Doubles ❑ Unknown heavy truck	❑ Bus ❑ Van or Enclosed Box ❑ Cargo Tank ❑ Flatbed ❑ Dump ❑ Concrete Mixer ❑ Auto Transport ❑ Garbage or Refuse ❑ Unknown heavy truck

Gross Vehicle Weight Rating lbs.	Axles on Vehicle Including Trailer	Number of Injuries	Number of Fatalities
HAZMAT: Was Hazardous **Cargo** Released from the Vehicle? ❑ YES ❑ NO	From Placard, Indicate 4 Digit Placard Number	Indicate Name from Diamond or Box	Indicate Single Digit Number from Bottom of Diamond

SEQUENCE OF EVENTS

1 2 3 4	Ran Off the Road
1 2 3 4	Jackknifed
1 2 3 4	Overturned
1 2 3 4	Downhill Runaway
1 2 3 4	Cargo Lost or Shifted
1 2 3 4	Explosion or Fire
1 2 3 4	Separation of Units
1 2 3 4	Collision Involving Pedestrian
1 2 3 4	Collision Involving Vehicle in Transport
1 2 3 4	Collision Involving Parked Vehicle
1 2 3 4	Collision Involving Train
1 2 3 4	Collision Involving Pedalcycle
1 2 3 4	Collision Involving Animal
1 2 3 4	Collision Involving Fixed Object
1 2 3 4	Collision Involving Other Object
1 2 3 4	Other

TRAFFICWAY

❑ Not physically divided
❑ Divided highway, median strip, no traffic barrier
❑ Divided highway, median strip, *with* traffic barrier
❑ One way traffic

ACCESS CONTROL

❑ No control, unlimited access
❑ Full control, only ramp entry and exit

COMMENTS AND OTHER INFORMATION