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EVALUATION OF 2005 OHIO CRASH DATA REPORTED TO MCMIS CRASH FILE

PAUL E. GREEN
ANNE MATTESON

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Paul E. Green

Anne Matteson

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Center for National Truck and Bus Statistics
University of Michigan Transportation Research Institute
2901 Baxter Road
Ann Arbor, Michigan 48109-2150

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16. Abstract

This report is part of a series of reports 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 the factors that are associated with reporting rates for the state of Ohio. This is the second MCMIS evaluation for the state of Ohio.

Using 2005 data, MCMIS Crash file records were matched to the Ohio Police Accident Report (PAR) file to determine the nature and extent of underreporting. Based on this procedure, it is estimated that Ohio is reporting 42.5 percent of crash involvements that should be reported to the Crash file. This represents an improvement over the 35.8 percent reported in the first evaluation using 2000 data.

Although the overall reporting rate was 42.5 percent, the reporting rate for carriers operating in interstate commerce was 79.1 percent, compared to 17.0 percent for intrastate carriers. Reporting rates also varied by crash severity, vehicle type, and reporting agency. The reporting rate for fatal involvements was 85.4 percent, compared to 52.7 percent for injured and transported involvements, and 32.3 percent for towaway. Crashes involving large trucks such as tractor semitrailers were more likely to be reported than single-unit trucks or buses. Crashes covered by the Ohio State Patrol were more likely to be reported than those covered by sherriff's offices or local police departments. Ohio overreported 1,094 vehicles, or about 22 percent, to the MCMIS Crash file.

Missing data rates are low for most variables, except in a few cases such as driver condition, road access, road trafficway, and Vehicle Identification Number (VIN). Comparison of the vehicle configuration variable between the MCMIS Crash file and the Ohio Crash file is generally good.

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1. Introduction

It is essential to assess the magnitude and characteristics of motor carrier crashes so that effective safety measures can be designed to prevent such crashes. For this purpose, the Motor Carrier Management Information System (MCMIS) Crash file was developed by the Federal Motor Carrier Safety Administration (FMCSA) to serve as a file of traffic crashes of specified severity involving trucks and buses. Its usefulness 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. However, the MCMIS Crash file is known to be incomplete. Preliminary studies conducted during earlier phases of MCMIS evaluations suggested that nationally, only about two-thirds of qualifying truck involvements were reported. The reporting rate for buses was found to be even lower, at about 40% [1]. Reporting was more complete for severe crashes, with about 90% of truck fatal involvements and 65% of bus fatal involvements appearing in the file, but rates were much lower for less severe crashes.

Since the states are responsible for reporting qualifying crashes, the solution for underreporting must ultimately reside with the individual states. This report is part of a series of evaluations of reporting from each state. Previous reports on a number of states showed underreporting due in large part to problems police officers experience in interpreting and applying the reporting criteria [2, 3, 4, 5, 6, 7, 8, 9, 10, 11]. 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 some overreporting of cases, often due to technical problems with duplicate records.

In this report, we focus on MCMIS Crash file reporting by Ohio. In recent years, Ohio has reported from 4,700 to 5,200 involvements annually to the MCMIS Crash file. According to the 2002 Vehicle Inventory and Use Survey, Ohio had over 222,000 medium and heavy trucks (GVWR > 10,000 pounds) registered, accounting for 4.1 percent of all truck registrations, ranking it 6th among the states [12]. In the years from 2000 to 2005 inclusive, Ohio consistently ranks 7th in terms of state population each year [13], and in the five years from 1999 to 2003 had the 6th largest number of total truck fatal involvements [14].

The first MCMIS evaluation of a state was conducted for Ohio using data collected during year 2000. This report represents the second evaluation using data collected during 2005. Although the overall reporting rate seems to have improved from approximately 35 percent in 2000 to about 43 percent in 2005, many of the same factors that resulted in overreporting and underreporting in the previous evaluation have been identified as sources of overreporting and underreporting in this current evaluation.

In 2000, about 20 percent of cases reported from Ohio did not qualify under a strict interpretation of the severity criteria. In this analysis, using 2005 data, the percentage is about 22 percent. Thus, the percentage has not changed much and Ohio is still experiencing some issues related to overreporting. Another similarity between the studies is that the reporting rate has been significantly greater for trucks operating in interstate commerce. It seems that police officers continue to report trucks operated by carriers that cross state lines. In addition, large trucks such as tractor semitrailers continue to be reported at higher rates than single-unit trucks with two axles and six tires. Finally, the state police are more likely to report a reportable vehicle than either sheriff's offices or local police departments.

Since the first MCMIS evaluation, improvements have been made in the matching process and the methods for identifying reportable cases, but the central ideas are essentially the same. The method employed in this study to evaluate reporting to the MCMIS Crash file for the state of Ohio is similar to the method used in previous studies:

1. The complete police accident report file (PAR file hereafter) from Ohio 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 Ohio 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 Ohio.

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 Ohio's statewide files as of August 18, 2006, were used in this analysis. The 2005 PAR file contains the computerized records of 639,870 vehicles involved in 358,127 crashes that occurred in Ohio.

2. Data Preparation

The Ohio PAR file and MCMIS Crash file each required some preparation before the Ohio records in the MCMIS Crash file could be matched to the Ohio PAR file. In the case of the MCMIS Crash file, the only processing necessary was to extract records reported from Ohio and to eliminate duplicate records. The Ohio 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 Ohio. For calendar year 2005 there were 5,044 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). No such duplicate pairs were found.

In addition, records were examined for identical values for accident date, time, crash county, crash city code, officer badge number, vehicle license plate number, and driver date of birth, even though their case numbers were perhaps different. One would not expect all of these variables to be identical between two cases. Seven such duplicate instances were found.

Further examination revealed that a few of the variables had different values among the two records. Although Report Number differed, it is possible one record may have been intended as an update, however, in most cases the Upload and Change Dates were identical between the two records. The member of the pair that appeared on the PAR file was kept, and the other member was excluded. After eliminating the seven duplicate records identified above, the resulting MCMIS file contained 5,037 records.

2.2 Ohio Police Accident Report File

The Ohio PAR data for 2005 (dated August 18, 2006) was obtained from the state of Ohio. The data were contained in a set of three text files representing accident, vehicle, and person records. The combined files contain records for 358,127 crashes involving 639,870 vehicles. Data for the PAR file are coded from the Traffic Crash Report (Ohio Department of Public Safety) completed by police officers. The Ohio Crash Report form is reproduced in 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 20050164231 and 2005-164231, 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, city, reporting officer’s badge number, driver’s age, and vehicle license plate number. A total of 1,335 duplicate instances were found, representing 660 unique occurrences of the examined variables.

Duplicate pairs (triplicates) were examined more closely for any patterns that might explain why they were occurring. In the majority of cases, where crash time, location, vehicle and driver

variables were the same, but Accident Number differed, 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 couple of minutes or longer. However, in the case of these records, accident hour and minute are identical, suggesting they are in fact duplicate records. Further examination of the records indicated that perhaps one record was meant to be an update, since a few of the variables differed between the two cases.

Thus, the pairs identified above were considered to be duplicates and one (or more) member(s) of each pair was excluded. Since there was no variable indicating a date the record was updated or processed, the second member of each pair was excluded, resulting in deletion of 675 records. The resulting PAR file has 639,195 records.

3. Matching Process

The next step involved matching records from the Ohio PAR file to corresponding records from the MCMIS file. After removing duplicates, there were 5,037 Ohio records from the MCMIS file available for matching, and 639,195 records from the Ohio PAR file. All records from the Ohio 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 combinations of variables common to the two files that have a high probability of uniquely identifying accidents as well as specific vehicles within an accident. Document Number, which is the identifier used to uniquely identify a crash in the Ohio PAR data, and Report Number in the MCMIS Crash file, are obvious first choices. Indeed, there appeared to be a correspondence between the two numbers, and case number was never unrecorded in either file. Document Number in the Ohio PAR file is an eleven-digit character 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 (OH, in this case), followed by ten digits. Since seven of these digits were consistent with the PAR Case Number, the last seven digits of the MCMIS Report Number and PAR Case Number were extracted, and these two variables were used in the match. Other variables that were available for matching at the accident level included crash date, crash time (hour/minute), crash county and city code, and reporting officer’s badge number.

Variables in the MCMIS file that could distinguish one vehicle from another within the same accident included vehicle sequence number, vehicle license plate number, driver license number,

vehicle identification number (VIN), driver age, and driver last name. VIN was unrecorded in 100% of PAR cases, and thus could not be used for the match. Vehicle sequence number was always recorded in both files. Driver age was unrecorded 10.9% of the time in PAR data and 2.8% of the time in MCMIS. Driver's license number was unrecorded in 12.5% of PAR cases and in 4.7% of MCMIS cases. Of the available variables, vehicle license plate was the most reliable, as it was unrecorded 6.5% of the time in the PAR file, and in only 1.4% of MCMIS cases.

Four separate matches were performed using the available variables. In each match 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, vehicle number, crash date (month, day), crash time (hour, minute), crash city, officer badge number, license plate number and driver's license number. The second match step dropped officer badge number and driver's license number, but added driver last name. The third match step matched on case number, vehicle number, crash date, crash time, crash city, officer badge number and license plate number (eliminating driver's license number and driver's last name, since these were frequently both unrecorded on the same record). After reviewing the remaining non-matched cases, the fourth match just used case number, driver age, and license plate number. Each of the matched cases resulting from the fourth match attempt was examined in detail to ensure the match was valid. This process resulted in matching 98.0% of the MCMIS records to the PAR file.

Table 1 shows the variables used in each match step along with the numbers of records matched at each step. Matched records were verified using other variables common to the MCMIS

Table 1 Steps in MCMIS/Ohio PAR File Match, 2004

Match step	Matching variables	Cases matched
Match 1	case number, vehicle number, crash date, crash time, crash city, officer badge number, license plate number, and driver license number	4,649
Match 2	case number, vehicle number, crash date, crash time, crash city, license plate number, and driver last name	141
Match 3	case number, vehicle number, crash date, crash time, crash city, officer badge number, and license plate number	117
Match 4	case number, driver age, license plate number	30
Total cases matched		4,937

and PAR file as a final check to ensure the match was valid. The above procedure resulted in 4,937 matches, representing 98.0% of the 5,037 non-duplicate records reported to MCMIS. Figure 1 shows the flow of cases in the matching process.

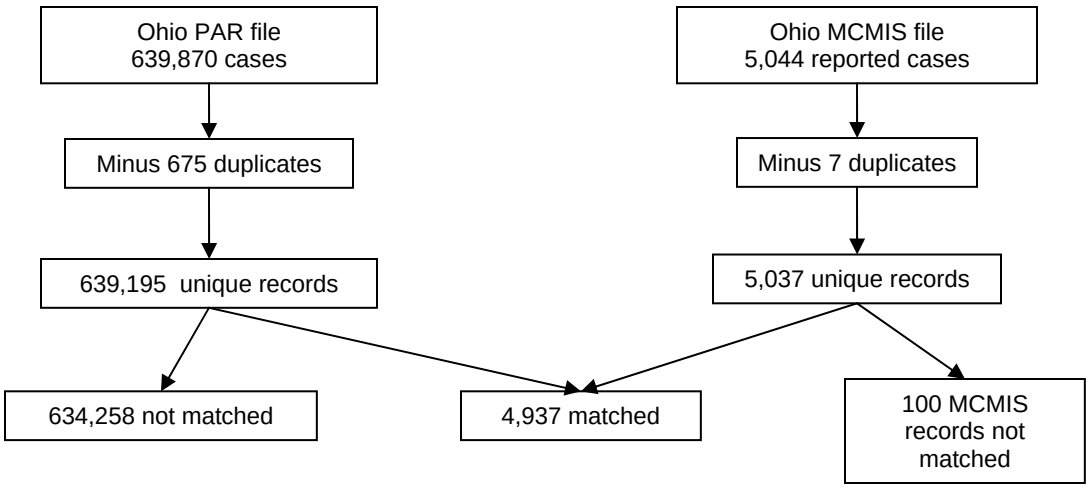

Figure 1 Case Flow in MCMIS/Ohio Crash File Match

Of the 4,937 matched cases, 1,094 are not reportable and 3,843 are reportable. The next section discusses the process of identifying cases that qualify for reporting to the MCMIS Crash file.

4 Identifying Reportable Cases

To evaluate the completeness of reporting to the crash file, it is necessary to identify records in the Ohio PAR file that qualified for reporting to the MCMIS Crash file. Reportable cases are identified using the variables available in the Ohio PAR file. The purpose of this 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 is fairly straightforward in the Ohio PAR file because Ohio crash data includes variables that are compatible with the definitions shown above in Table 2 at both the vehicle and accident levels. In some cases, the definitions do not match exactly, but reasonable surrogates can be developed and applied.

According to the Ohio Traffic Crash Procedure Manual [15], officers are instructed to complete the Truck/Bus area located on page three of the Ohio Traffic Crash Report form (appendix B). Figure 2 shows the instructions designed to help officers identify qualifying crashes. Except for a

few minor differences, the instructions match the vehicle and crash severity outlined in Table 2. For example, the hazardous materials criterion in Table 2 applies to *any* vehicle displaying a hazardous materials placard, but the instruction to officers applies only to trucks. In addition, the bus criterion is for busses with seating for at least nine, including the driver, but the instruction for officers specifies seating for eight, including the driver. Overall, differences between Table 2 and Figure 2 are small. Note that the crash severity criteria match almost exactly. In both, an injury requires transportation to a medical facility for immediate medical attention, and a towed vehicle must have been towed due to disabling damage. For a towed vehicle, the instructions to officers also include a vehicle requiring intervening assistance before proceeding under its own power. Other than these minor differences, the criteria are very consistent.

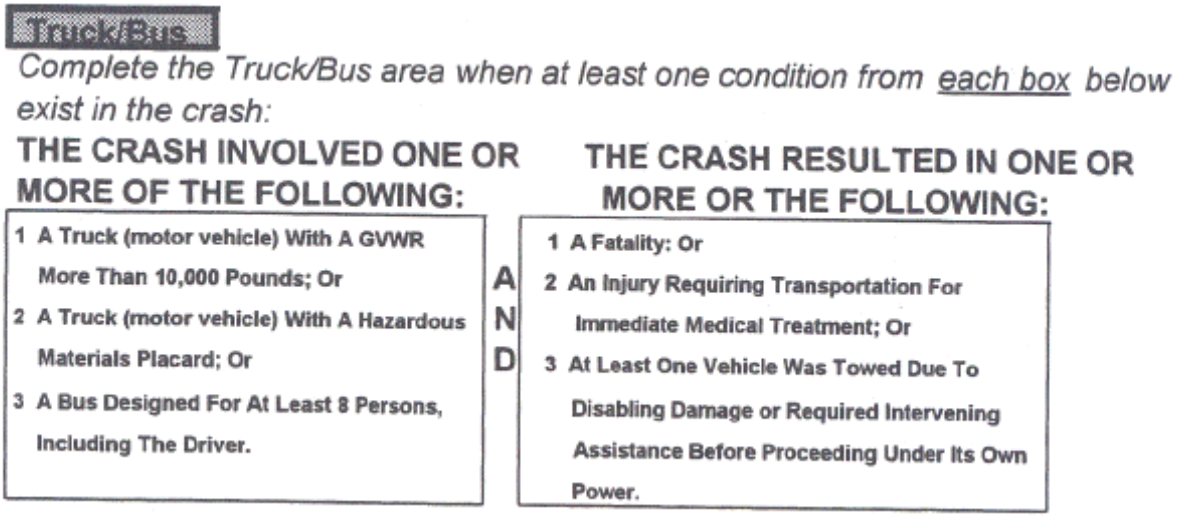

Figure 2 Truck/Bus Section from Ohio Traffic Crash Report Form

Reportable vehicles can be identified using the "unit type" variable and a hazmat placard variable. The classifications of trucks and buses in the Ohio PAR file match those in the MCMIS Crash file almost exactly. Table 3 shows the Ohio PAR file classifications. For trucks, the classifications are the same as those in MCMIS except that the PAR file includes classifications for tractor double long and fifth wheel/converter dolly. One other difference is that MCMIS has a classification for unknown heavy trucks, while the PAR file does not. For buses, MCMIS has one classification for buses with seats for more than fifteen people including the driver, while the PAR file distinguishes school, church, public, and other buses separately.

Table 3 Relevant Vehicle Body Type Codes used in Ohio PAR data

Single unit truck (2 axle, 6 tire)
Single unit truck (3+ axles)
Truck/Trailer
Truck Tractor (Bobtail)
Tractor semitrailer
Tractor double trailer
Tractor double long
Fifth Wheel / Converter Dolly
Tractor triple
School bus
Church bus
Public bus
Other bus

There are three variables related to hazmat information: hazmat placard, hazmat release, and hazmat placard number. The hazmat placard and hazmat release variables are Yes/No variables indicating the presence or absence of a placard, and whether any hazardous materials were spilled, respectively. The hazmat placard number variable is a character variable giving the 4-digit placard number. In the entire PAR file of 639,195 records, 258 vehicles are recorded with a hazmat placard, 282 are recorded with a hazmat placard number, and 89 are recorded to have spilled some type of hazardous materials. However, some of the 4-digit numbers, such as 0000 and 0001, appear to be invalid and 258 seems to be the closest representation of hazmat placarded vehicles.

It is interesting to note that on the Ohio Traffic Crash Report Form, information about the three hazmat variables is recorded by the officer in the Truck/Bus section. This suggests that hazmat information would not be recorded for nontrucks, such as passenger vehicles. However, a cross-tabulation of the variables hazmat placard and unit type shows that 12 nontrucks were recorded as hazmat placarded vehicles.

In total, there were 30,919 vehicles identified as trucks, buses, or vehicles with a hazardous materials placard in the Ohio PAR file (Table 4). Note that 88.2 percent of these vehicles are qualifying trucks, and 12 are nontrucks with a hazmat placard, as described above.

Table 4 Vehicles Meeting Vehicle Criteria, Ohio PAR File, 2005

Vehicle Type	N	%
Trucks	27,257	88.2
Buses	3,650	11.8
Non-trucks with hazmat placard	12	0.0
Total	30,919	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. The Ohio PAR data appear to contain all the variables necessary for matching the MCMIS criteria fairly well.

The 2005 Ohio Occupant File contains an "Injuries" variable with the standard categories for KABCOU. In addition, a "Medical Transported By" variable describes the agency responsible for transporting occupants from the scene of the crash and has five levels: Not Transported, EMS, Police, Other, and Unknown. For this analysis, occupants are considered transported if they were coded into the categories EMS, Police, or Other. A new variable was created at the occupant level according to Table 5 to classify occupants into the following categories: 1=fatal, 2=injured and transported, 3=not injured and transported, and 4=unknown.

Table 5 Determination of Fatal and Injured and Transported Criteria

Injury	Transported	New variable
K	Yes	1
K	No	1
K	Unknown	1
A	Yes	2
A	No	3
A	Unknown	2
B	Yes	2
B	No	3
B	Unknown	2
C	Yes	2
C	No	3
C	Unknown	3
O	Yes	3
O	No	3
O	Unknown	3
U	Yes	4
U	No	4
U	Unknown	4

The minimum value of the new variable was calculated at the crash level, and the resulting data were merged with the vehicle-level data to produce the distribution shown in Table 6 for the 30,919 qualifying vehicles. Table 6 shows that 205 qualifying vehicles were involved in fatal crashes, while 3,988 were involved in injured and transported crashes. Only 1.7 percent of vehicles fall into the unknown category.

Table 6 Injury Status for Qualifying Vehicles, Ohio PAR File 2005

Injury status	N	%
Fatal	205	0.7
Injured/transported	3,988	12.9
Not injured/transported	26,199	84.7
Unknown	527	1.7
Total	30,919	100.0

At the vehicle level the Ohio PAR file contains a damage scale variable for determining if a vehicle was disabled, and a towed variable for assessing towed status. A similar procedure to the one used for calculating injury status was used for the towed and disabled criteria. A new variable was coded at the vehicle level according to the damage scale and towed variables as shown in Table 7: 1=towed and disabled, 2=not towed and disabled, and 3=unknown.

Table 7 Determination of Towed and Disabled Criteria

Damage scale	Towed	New variable
None	Yes	2
None	No	2
Non-functional	Yes	2
Non-functional	No	2
Functional	Yes	2
Functional	No	2
Disabling	Yes	1
Disabling	No	2
Severe	Yes	1
Severe	No	2
Unknown	Yes	3
Unknown	No	3

The minimum value of the new variable was calculated at the crash level, and the resulting data were merged with the vehicle-level data to produce the distribution shown in Table 8 for the 30,919 qualifying vehicles. About 25 percent of qualifying vehicles were involved in crashes where at least one vehicle was towed due to disabling damage. Note that once again, the percentage of unknowns is relatively small.

Table 8 Towaway Status for Qualifying Vehicles, Ohio PAR File 2005

Towaway status	N	%
Towed/disabled	7,770	25.1
Not towed/disabled	22,901	74.1
Unknown	248	0.8
Total	30,919	100.0

Table 9 shows the numbers of qualifying vehicles that meet the threshold for a MCMIS reportable crash according to the MCMIS criteria. The 205 vehicles meeting the fatal criterion and the 3,988 vehicles meeting the injured and transported criterion are identified in Table 6. Furthermore, even though 7,770 vehicles were identified as meeting the towed due to disabling damage criteria in Table 8, many of those vehicles are included in the injured and transported category, and the difference, shown in Table 9, results in 4,852 vehicles. In total, it is estimated that 9,045 vehicles were reportable to the MCMIS Crash file.

Table 9 Reportable Records in the Ohio Crash File, 2005

Crash Severity	Reportable Involvements	%
Fatal	205	2.3
Injury, transported for treatment	3,988	44.1
Towaway	4,852	53.6
Total	9,045	100.0

5. Factors Associated with Reporting

The procedure described in the previous section identified 9,045 vehicles involved in crashes as reportable to the MCMIS Crash file. The match process described in Section 3 determined that 5,037 unique cases were reported to the MCMIS Crash file, of which 4,937 could be matched to the Ohio Crash file. And of the 4,937, 3,843 were determined to meet the MCMIS Crash file reporting criteria. Accordingly, of the 9,045 reportable crashes in 2005, Ohio reported 3,843, for an overall reporting rate of 42.5 percent. In this section, we will identify and discuss the factors that affected the chance that a qualifying crash would be submitted through the SafetyNet system and appear in the MCMIS Crash file. The results are presented in three subsections: case processing, reporting criteria, and reporting agency and area. Case processing deals with timing issues such as crash month and time lag between crash dates and uploading dates to the MCMIS Crash file. Reporting criteria include factors such as vehicle type, crash severity, carrier type, and vehicle license plate state. Finally, reporting agency is associated with differences in reporting rates due to the agency, such as state police or local police, while area deals with reporting by location, such as the county where the crash occurred.

However, before proceeding, we note that 1,094 of the 5,037 unique cases reported to the MCMIS Crash file, or 21.7 percent, were not reportable and should not have been reported. While most MCMIS evaluations tend to focus on the nature of underreporting, it appears that Ohio is also faced with issues related to overreporting. Thus, in addition to the usual presentations designed to assess sources of underreporting, the following is devoted to a brief analysis of overreporting. Table 10 shows a two-way classification of vehicle type and crash severity, and provides some explanation why these vehicles should not have been reported to the MCMIS Crash file. Note that all 1,094 vehicles do not meet the crash severity threshold for a

MCMIS reportable crash. The 860 trucks and the 46 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. Regardless of crash severity, the remaining 188 vehicles are not trucks, buses, or hazmat placarded vehicles, and do not meet the vehicle criteria for reporting to the MCMIS Crash file.

Table 10 Distribution of Non-reportable Vehicles in MCMIS Crash File, Ohio 2005

Vehicle type	Crash severity				
	Fatal	Transported injury	Towed/disabled	Other crash severity	Total
Truck	0	0	0	860	860
Bus	0	0	0	46	46
Other vehicle (not transporting hazmat)	0	0	0	188	188
Total	0	0	0	1,094	1,094

5.1 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 MCMIS file used in this evaluation was dated August 21, 2006, so all 2005 cases should have been reported by that date. Table 11 shows that reporting rates as well as percentages of total unreported cases were very consistent with regard to crash month. There appears to be no overall seasonal trend in the numbers reported. The minimum reporting rate of 38.5 occurred in May, while the maximum rates of 46.9 occurred in August. Neither of these values deviates markedly from the overall rate of 42.5. Similarly, the minimum percentage of unreported cases is 7.4 percent, while the maximum is 10.6 percent. The consistency of the values reported in Table 11 suggests that crash month does not account for significant differences in reporting to the MCMIS Crash file.

Table 11 Reporting Rate by Accident Month, Ohio 2005

Crash month	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
January	935	41.0	552	10.6
February	686	40.2	410	7.9
March	785	42.4	452	8.7
April	686	41.5	401	7.7
May	691	38.5	425	8.2
June	716	43.6	404	7.8
July	657	41.4	385	7.4
August	749	46.9	398	7.7
September	752	44.9	414	8.0
October	767	42.1	444	8.5
November	833	43.3	472	9.1
December	788	43.5	445	8.6
Total	9,045	42.5	5,202	100.0

Figure 3 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. The overall average based on the 3,843 matched and reported cases is 7 days, suggesting that on average, cases were submitted just slightly after the 90-day grace period. However, the plot shows a clear downward trend beginning in January and ending in December. After July, as indicated by the negative numbers, cases tended to be submitted within 90 days. From January through July, however, cases tended to be submitted after the 90-day grace period. Note that on average, cases with crash dates in December were uploaded to the MCMIS Crash file 59 days later (90-31), or sometime around February, 2006.

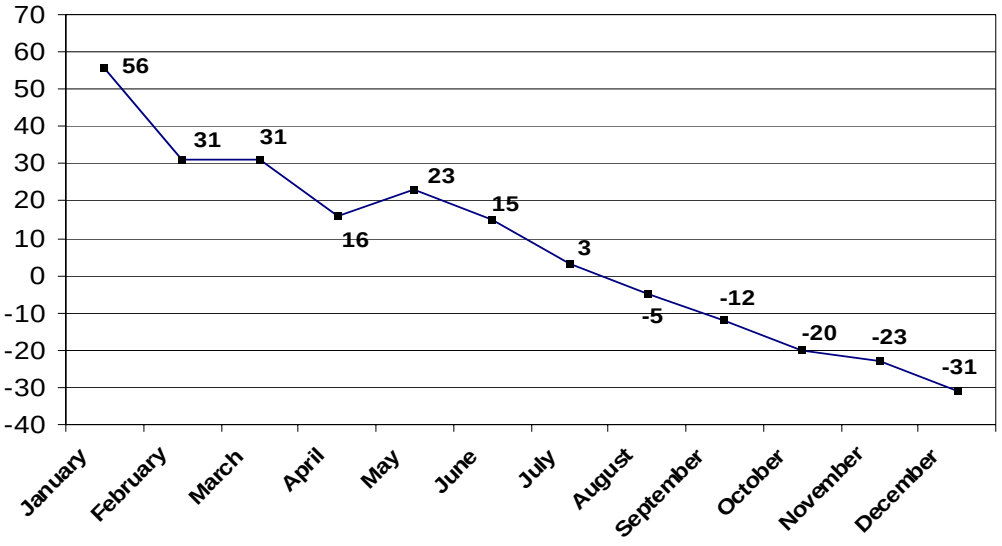

Figure 3 Average Latency (in Days, Minus 90) in Reporting to the MCMIS Crash File, Ohio Reported Cases, 2005

5.2 Reporting Criteria

As discussed in Section 4, the Ohio Traffic Crash Report form has a Truck/Bus area that officers are instructed to complete when the conditions described in Figure 2 are satisfied. The conditions, except for minor differences, match the MCMIS criteria for a reportable vehicle closely. In addition, other commercial vehicle-related information should be recorded in the Truck/Bus area of the form such as U.S. DOT census number, ICC MC number, CDL class, and hazardous materials information. In this section, vehicle type, crash severity, carrier type, and vehicle license state will be investigated to determine some of the factors associated with underreporting.

The reporting rates varied by the type of vehicle involved, with truck involvements in qualifying crashes more likely to be reported than bus involvements. Table 12 shows that the reporting rate for trucks was 43.4 percent, while the reporting rate for buses was 33.3 percent. The rate for vehicles transporting hazardous materials is 62.5 percent, but only eight vehicles are identified as reportable. Note that the hazmat vehicles in this table are not trucks, but are being used to transport hazardous materials. Trucks accounted for 89.7 percent of the unreported cases, simply due to their large numbers in reporting, relative to buses and hazmat vehicles.

Table 12 Reporting Rate by Vehicle Type, Ohio 2005

Vehicle type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck	8,236	43.4	4,665	89.7
Bus	801	33.3	534	10.3
Transporting hazardous materials	8	62.5	3	0.1
Total	9,045	42.5	5,202	100.0

Table 13 shows variation in reporting rates by detailed classification of vehicle body type. As shown in other MCMIS evaluations, larger trucks are generally more likely to be reported to the MCMIS Crash file. The reporting rate for tractor-semitrailers was 60.0 percent. Ohio distinguishes doubles as short and long, and the reporting rates for these configurations were 66.3 percent and 62.5 percent, respectively, although the numbers of reportable cases were much smaller than for tractor-semitrailers. A large discrepancy exists in reporting between single-unit trucks (SUT) with two axles, and those with three or more axles. The reporting rate for SUTs with three or more axles was 45.5 percent, while the reporting rate for SUTs with two axles was only 19.1 percent. In addition, the reporting rate for trucks with a trailer was 22.1 percent.

Table 13 Reporting Rate by Detailed Vehicle Body Type, Ohio 2005

Vehicle body type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Compact	1	100.0	0	0.0
Midsize	2	100.0	0	0.0
Fullsize	1	100.0	0	0.0
SUV	1	0.0	1	0.0
Pickup	1	100.0	0	0.0
Panel Van	1	0.0	1	0.0
SUT, 2 axles, 6 tires	2,117	19.1	1,712	32.9
SUT, 3+ axles	849	45.5	463	8.9
Truck / trailer	950	22.1	740	14.2
Truck-tractor, no trailer	122	41.8	71	1.4
Truck -tractor w/one unit	4,066	60.0	1,626	31.3
Truck-tractor w/two units short	86	66.3	29	0.6
Truck tractor w/two units long	24	62.5	9	0.2
Fifth wheel or dolly	8	0.0	8	0.2
Truck-tractor w/three units	14	50.0	7	0.1
School bus	412	35.2	267	5.1
Church bus	11	18.2	9	0.2
Public Bus	270	31.9	184	3.5
Other Bus	108	31.5	74	1.4
All Others	1	0.0	1	0.0
Total	9,045	42.5	5,202	100.0

It appears that officers recognize that large trucks meet the MCMIS reporting criteria. Furthermore, SUTs with two axles accounted for 32.9 percent of unreported cases, and trucks with a trailer accounted for 14.2 percent. School buses, with a reporting rate of 35.2 percent, were slightly more likely to be reported than the other types of buses. There were only eleven reportable church buses.

In several previous investigations concerning other states such as Michigan, Missouri, Florida, Illinois, and New Mexico, 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. Table 14 shows that the reporting rate for fatal involvements was 85.4 percent, considerably higher than the overall 42.5 percent. The rate for the injured and transported criteria was 52.7 percent, and the rate for the towed and disabled criteria was 32.3 percent. The injured and transported reportable cases include many cases that also meet the towed and disabled criteria. The towed and disabled reportable cases, however, do not meet the injured and transported criteria, and are reportable because they only meet the towed and disabled criteria. Note that 63.2 percent of unreported cases fall into the towed and disabled category.

Table 14 Reporting Rate by Crash Severity, Ohio 2005

Crash severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal	205	85.4	30	0.6
Injured/Transported	3,988	52.7	1,886	36.3
Towed/Disabled	4,852	32.3	3,286	63.2
Total	9,045	42.5	5,202	100.0

Table 15 shows reporting rates broken down by more detailed injury severity. The injury severity in Table 15 denotes the most severe injury in the crash. The reporting rates tend to decrease as severity decreases. The property damage crashes have the largest percentages of unreported cases, and these are less likely to be reported.

Table 15 Reporting Rate by Detailed Injury Severity, Ohio 2005

Crash severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal	205	85.4	30	0.6
Disabling injury (A)	725	63.2	267	5.1
Evident injury (B)	2,505	55.3	1,119	21.5
Probable injury (C)	1,826	45.6	994	19.1
Property Damage	3,736	26.3	2,753	52.9
Unknown	48	18.8	39	0.7
Total	9,045	42.5	5,202	100.0

In the Missouri MCMIS evaluation it was hypothesized that reporting officers may more easily recognize an out-of-state vehicle as meeting the criteria for reporting because some may be under the impression that since the data are reported to the Federal government, only vehicles in interstate commerce are included. Table 16 shows reporting rates by vehicle license state and it appears that vehicles licensed in other states have a higher rate than vehicles licensed in Ohio. In the Missouri evaluation, however, it was discovered that the difference could largely be explained due to vehicle size, and in particular, to the large number of reportable two axle/six tire SUTs that are reported at a lower rate than large trucks.

Table 16 Reporting Rate by Vehicle License State, Ohio 2005

Vehicle license state	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Ohio	5,599	37.8	3,484	67.0
Other state	3,446	50.1	1,718	33.0
Total	9,045	42.5	5,202	100.0

As in the Missouri study, the results in Table 17 support the idea that vehicle size is largely responsible for the differences in rates shown in Table 16. For example, there were 2,460

Table 17 Reporting Rate by Vehicle Body Type and Vehicle License State, Ohio 2005

	Vehicle licensed in Ohio		Vehicles licensed in Other State		All vehicles	
Vehicle body type	Reporting rate	Reportable cases	Reporting rate	Reportable cases	Overall rate	Total reportable
Compact	100.0	1	NA	0	100.0	1
Midsize	100.0	2	NA	0	100.0	2
Fullsize	100.0	1	NA	0	100.0	1
SUV	0.0	1	NA	0	0.0	1
Pickup	100.0	1	NA	0	100.0	1
Panel van	0.0	1	NA	0	0.0	1
SUT, 2 axles, 6 tires	18.6	1,809	22.1	308	19.1	2,117
SUT 3+ axles	47.5	760	28.1	89	45.5	849
Truck / trailer	18.8	645	29.2	305	22.1	950
Truck-tractor, no trailer	38.5	65	45.6	57	41.8	122
Truck-tractor w/one unit	63.6	1,606	57.6	2,460	60.0	4,066
Truck-tractor w/two units short	42.1	19	73.1	67	66.3	86
Truck-tractor w/two units long	58.3	12	66.7	12	62.5	24
Fifth wheel or dolly	0.0	6	0.0	2	0.0	8
Truck-tractor w/three units	0.0	4	70.0	10	50.0	14
School bus	37.1	329	27.7	83	35.2	412
Church bus	11.1	9	50.0	2	18.2	11
Public bus	32.6	239	25.8	31	31.9	270
Other bus	31.8	88	30.0	20	31.5	108
All others	0.0	1	NA	0	0.0	1
Total	37.8	5,599	50.1	3,446	42.5	9,045

reportable tractor-semitrailers licensed outside of Ohio. This represents the largest number of reportable cases shown in Table 17, and tractor-semitrailers tend to have a high reporting rate. On the other hand, there were 1,809 two axle/six tire SUTs licensed inside Ohio. This represents the second largest number of reportable cases in the table, and two axle/six tire SUTs tend to have a low reporting rate. Note also that there were only 308 reportable two axle SUTs with license plates outside of Ohio.

Reporting rates may also be related to misunderstanding that intrastate vehicles are to be included, not just those involved in interstate commerce. Carriers operating in interstate commerce, as well as those carrying hazardous materials, are required to register with the Federal Motor Carrier Safety Administration. They are issued a Department of Transportation Number, and their name and DOT number must be displayed on the side of their trucks. The Ohio PAR file contains information about the carrier's DOT number and the ICC number, indicating the carrier is authorized for interstate commerce. Large differences were found based on this comparison. As shown in Table 18, the reporting rate for vehicles with either an ICC or DOT number was 79.1 percent, while the corresponding rate for vehicles without either number was only 17.0 percent. The percentage of total unreported cases is 85.1 for vehicles without either number.

Table 18 Reporting Rate by Interstate/intrastate Status, Ohio 2005

Carrier type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Interstate	3,712	79.1	777	14.9
Intrastate	5,333	17.0	4,425	85.1
Total	9,045	42.5	5,202	100.0

5.3 Reporting Agency and Area

Beyond the application of the reporting criteria, there can be differences related to where the crash occurs or the type of agency that covered the crash. More densely populated areas with a large number of traffic accidents may not report as completely as areas with a lower work load. The level and frequency of training or the intensity of supervision can also vary. If there are such differences, they may serve as a guide to focus resources in areas and at levels that will produce the greatest improvement. The next set of tables examines areas of the state to see if there are inconsistencies in reporting patterns.

Reporting rates for Ohio's 88 counties ranged from 24.4 % of reportable cases (Logan County) to 80.0 % (Monroe County), although Monroe County only had 10 reportable cases. Table 19 shows the top fifteen counties in Ohio, ordered in descending order by the number of reportable cases. Together, these fifteen counties accounted for 60.8 % (3,165) of the total unreported cases

in Ohio for 2005. Counties with large cities tended to have the most reportable cases, and lower than average reporting rates. For example, the city of Columbus is in Franklin County, and Franklin County had the largest number of reportable cases and a reporting rate of 27.5 percent. Similarly, Cincinnati is in Hamilton County, and Hamilton County had the second largest number of reportable cases and a reporting rate of 27.3 percent. Cleveland is in Cuyahoga County which had 650 reportable cases and a reporting rate of 36.5%. It appears that counties with large cities that are densely populated tended to have lower than average reporting rates. Note that the reporting rate for the top fifteen counties shown in Table 19 is 37.1 percent, which is less than the 49.2 percent reporting rate for the remaining counties. The decreasing trend in the percentages of total unreported cases is also clear.

Table 19 Reporting Rate by County of Crash, Ohio 2005

County	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Franklin	764	27.5	554	10.6
Hamilton	722	27.3	525	10.1
Cuyahoga	650	36.5	413	7.9
Montgomery	423	40.2	253	4.9
Lucas	380	37.6	237	4.6
Summit	353	31.4	242	4.7
Butler	261	36.4	166	3.2
Stark	230	41.3	135	2.6
Mahoning	218	45.0	120	2.3
Wood	194	58.8	80	1.5
Lorain	183	44.3	102	2.0
Richland	175	49.1	89	1.7
Medina	168	44.6	93	1.8
Portage	160	51.9	77	1.5
Trumbull	154	48.7	79	1.5
Top 15 Counties	5,035	37.1	3,165	60.8
All Other Counties	4,010	49.2	2,037	39.2

It is also possible that reporting rates could be related to the level of reporting agency. Here, agency type may be taken as an indicator of the focus and training of the department. The Ohio PAR file identifies three types of reporting agencies: State Highway Patrol, sheriff's offices, and police departments.

As shown in Table 20, reporting rates varied between the three agency types in 2005. The State Highway Patrol had a reporting rate of 54.6 percent, which is the largest rate among the three. Police departments had the lowest reporting rate at 31.6 percent. In addition, police departments were responsible for 1,766 (55.0 percent) of cases not reported to the MCMIS Crash file, so improved reporting from such agencies would contribute to improved reporting from Ohio.

These differences may be the result of differences in focus, training, and supervision. These same trends, although to varying degrees, were discovered in other MCMIS evaluations.

Table 20 Reporting Rate by Responsible Agency, Ohio 2005

Reporting agency	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Sherriff	958	40.8	567	10.9
Local police	4,180	31.6	2,859	55.0
State police	3,892	54.6	1,766	33.9
Other/unknown	15	33.3	10	0.2
Total	9,045	42.5	5,202	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 Ohio Crash 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 21 shows missing data rates for selected, important variables in the MCMIS Crash file. Missing data rates are generally quite low, with a few exceptions. For most fundamental and structural variables, such as date, time, number of fatalities, and number of injuries, missing data rates are either zero or extremely low. Missing data rates for some other variables are higher. Rates for driver date of birth, driver license number, and driver license state are 2.8 percent, 4.7 percent, and 2.8 percent, respectively. Driver condition is missing for all cases, as are road access and road traffic way, for all practical purposes. Vehicle Identification Number (VIN) is missing for 60.5 percent of cases, driver license class is missing for 13.5 percent of cases, and GVWR is missing for 8.5 percent of cases.

The second section of the table shows missing data rates for the hazardous materials (hazmat) variables. Hazmat placard was unrecorded in only 0.4 percent of cases. However, rates for the variables describing the hazardous material (where present) were higher. The percentages only pertain to cases in which it was coded that the vehicle displayed a hazmat placard. The 1-digit hazmat class code was missing in 99.3 percent of these cases, the 4-digit class code was missing in 16.4 percent of cases, and the hazmat name was missing in 87.1 percent of cases. It should be noted that 4,878 vehicles were coded as not displaying a hazmat placard, yet sixty of these vehicles were coded as having hazardous cargo release, and seventeen were coded with a 4-digit class code.

Table 21 Missing Data Rates for Selected MCMIS Crash File Variables, Ohio 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	0.2	Event one	<0.1
Accident minute	0.2	Event two	0.2
County	0.0	Event three	0.3
Body type	5.6	Event four	0.4
Configuration	0.0	Number of vehicles	0.0
GVWR class	8.5	Officer badge number	0.6
DOT number*	2.2	Road access	99.9
Carrier state	0.0	Road surface	0.0
Citation issued	2.6	Road trafficway	99.9
Driver condition	100.0	Towaway	0.0
Driver date of birth	2.8	Truck or bus	0.0
Driver license number	4.7	Vehicle license number	1.4
Driver license state	2.8	Vehicle license state	0.0
Driver license class	13.5	VIN	60.5
Driver license valid	2.6	Weather	0.0

* Counting cases where the carrier is coded interstate.

Hazardous materials variable	Percent unrecorded
Hazardous materials placard	0.4
Percentages of hazmat placarded vehicles only:	
Hazardous cargo release	0.0
Hazardous materials class (1-digit)	99.3
Hazardous materials class (4-digit)	16.4
Hazardous materials name	87.1

The following table compares the actual data values in the Ohio PAR file with the values in the MCMIS Crash file to determine if the data are consistent between the two datasets. It is possible that errors of translation and formatting can occur when the data are prepared for submission to the MCMIS crash file. Table 22 displays the consistency between the vehicle type variable as recorded in the Ohio PAR file and the coding of configuration in the MCMIS Crash file. The levels of the variables are not exactly the same. For example, Ohio codes buses as school, church, public, and other buses, whereas the MCMIS file designates buses according to number of seats. However, the goal is to detect major inconsistencies when, for example, a bus is coded as a large truck.

In general, overall consistency of the vehicle configuration variables between the two files is good. Except for one vehicle coded as a snowmobile, all buses in the Ohio Crash file are coded as one of the types of buses in the MCMIS Crash file. As shown in Table 22, except for a few minor differences, SUTs with two axles and six tires, and SUTs with three or more axles match closely. Similarly, truck trailers match closely, and tractor bobtails match exactly. Tractor

Table 22 Comparison of Vehicle Configuration in MCMIS and Ohio Crash Files, 2005

Vehicle Configuration			
MCMIS Crash file	Ohio Crash file	Cases	%
Light truck (only if HM placard)	Panel/Van	1	100.0
Bus (seats 9-15, including driver)	School bus	53	55.8
	Church bus	1	1.1
	Public bus	24	25.3
	Other bus	16	16.8
	Snowmobile	1	1.1
Small bus subtotal		95	100.0
Bus (seats>15, including driver)	School bus	117	53.4
	Church bus	1	0.5
	Public bus	74	33.8
	Other bus	27	12.3
Large bus subtotal		219	100.0
SUT, 2-axle, 6-tire	Minivan	1	0.0
	SUV	1	0.0
	Pickup	1	0.0
	Panel/Van	1	0.0
	SUT, 2-axles, 6-tires	173	3.7
SUT, 3+ axles	Midsize	1	0.0
	SUT, 3+ axles	468	10.1
Truck trailer	Compact	1	0.0
	SUV	1	0.0
	Pickup	1	0.0
	Truck trailer	288	6.2
Truck tractor (bobtail)	Truck tractor (bobtail)	73	1.6
Tractor/semitrailer	Compact	1	0.0
	Tractor semitrailer	2,999	64.9
Tractor/double	Tractor double short	78	1.7
	Tractor double long	19	0.4
Tractor/triple	Tractor/triple	9	0.2
Unk. Heavy truck, >10,000 lbs. GVWR	Subcompact	6	0.1
	Compact	11	0.2
	Midsize	29	0.6
	Full size	11	0.2
	Minivan	6	0.1
	SUV	8	0.2
	Pickup	28	0.6
	Panel/Van	21	0.5
	SUT, 2-axles, 6-tires	321	6.9
	Tractor semitrailer	3	0.1
	Motorcycle	1	0.0
	Police vehicle	1	0.0
	Fire truck	6	0.1
	Ambulance/rescue	3	0.1
	Train	1	0.0
	Construction equipment	6	0.1
	All others	26	0.6
	Unknown	18	0.4
Truck Subtotal		4,622	100.0
Total, All vehicles		4,937	

semitrailers are in good agreement except for one vehicle classified as a compact, and tractor doubles and triples match exactly. Note that the Ohio Crash file distinguishes short doubles and long doubles. The greatest difference between the two variables occurs when the MCMIS file categorizes vehicles as unknown heavy trucks greater than 10,000 lbs. GVWR. Table 22 shows that in this situation, 321 vehicles in the Ohio file are SUTs with 2 axles and six tires. However, some vehicles are also classified as midsize passenger cars, pickup trucks, panel vans, as well as compact passenger cars, full size cars, minivans, and SUVs.

7. Summary and Discussion

This is the second evaluation of Ohio crash data reported to the MCMIS Crash file. The first evaluation was based on year 2000 data. This current evaluation uses data collected during 2005. Since the first evaluation, the overall reporting rate has increased from about 35 percent to about 43 percent. Even though the reporting rate improved slightly over time, many of the same factors found to be related to reporting rates in the first evaluation were found to be relevant in this more recent evaluation.

In the first MCMIS study of Ohio, it was estimated that about 20 percent of cases that did not qualify for reporting were in fact reported. In this study, the percentage is about 22 percent, suggesting that overreporting of cases continues to be an issue. An examination of the 1,094 overreported vehicles (see Table 10) shows that 860 were qualifying trucks and 46 were qualifying buses, but none of the crashes involved a fatality, an injured and transported person, or a towed and disabled vehicle. Therefore, the MCMIS crash severity threshold for a reportable crash was not met. The remaining 188 vehicles were not trucks, buses, or hazmat placarded vehicles.

With respect to reporting rates, the difference between reporting for vehicles designated as interstate carriers and intrastate carriers was large. In this study, interstate carriers were defined as vehicles with either ICC or DOT numbers. The reporting rate for vehicles with either number was found to be 79.1 percent, while the reporting rate for vehicles without a number was 17.0 percent (Table 18). Note that intrastate carriers accounted for 85.1 percent of unreported cases.

Some of the other factors related to underreporting of cases in Ohio follow patterns found in MCMIS evaluations of other states. For example, large trucks were more likely to be reported than smaller trucks or buses. The reporting rate for tractor semitrailers was 60.0 percent, but the reporting rate for SUTs with two axles and six tires was 19.1 percent. In addition, SUTs with two axles and six tires accounted for 32.9 percent of total unreported cases. However, the reporting rate for SUTs with three or more axles was 45.5 percent. The reporting rates for school buses and public buses were 35.2 percent and 31.9 percent, respectively.

Another common pattern found in this and other MCMIS evaluations is that vehicles involved in more severe crashes were more likely to be reported than those in less severe crashes. The

reporting rate was 85.4 percent for fatal involvements, 52.7 percent for injured and transported involvements, and 32.3 percent for towed and disabled involvements. Moreover, for crashes involving injury, the rates increased as level of injury increased. The reporting rate was 45.6 percent for C-injury involvements, 55.3 percent for B-injury involvements, and 63.2 percent for A-injury involvements.

Reporting rates by vehicle license state were investigated and it was found that vehicles with Ohio plates had a lower reporting rate than vehicles with license plates from other states. Stratification of license state by vehicle type (see Table 17) showed that much of this observed effect could be explained by the fact that a large number of reportable cases in Ohio are SUTs with two axles and six tires, and these smaller trucks tend to have a lower reporting rate. In addition, the majority of tractor semitrailers had license plates from states other than Ohio, and these vehicles tend to have a higher reporting rate.

With respect to the county of the crash, counties with big cities tended to have lower than average reporting rates. For example, Franklin County which contains Columbus had a reporting rate of 27.5 percent. The reporting rate for Hamilton County, which contains Cincinnati, had a reporting rate of 27.3 percent, and Cuyahoga County, which contains Cleveland, had a reporting rate of 36.5 percent. These counties with large cities also had the largest numbers of unreported cases.

With respect to three reporting agencies, local police departments had the lowest reporting rate. In addition, they accounted for 55.0 percent of the total unreported cases. By agency, the reporting rates were 54.6 percent for the state highway patrol, 40.8 percent for sheriff's offices, and 31.6 percent for police departments.

There appears to have been no trend in reporting based on month of the crash. There is no time of the year in which reporting rates deviated from the overall average. However, there is a clear downward trend beginning in January and ending in December of the average number of days between the crash date and the date the case was uploaded to the MCMIS Crash file. After July, cases tended to be submitted within 90 days. Before that time, cases tended to be uploaded after the 90-day grace period (Figure 3).

Overall, data quality was good. A few variables in the MCMIS Crash file such as driver condition, road access, road trafficway, and Vehicle Identification Number (VIN) suffer from missing data. Hazardous materials information is inconsistent in a small number of cases. A check of the vehicle configuration variables between the Ohio PAR file and the MCMIS Crash file indicates that the variables match fairly well. Most of the unknown trucks greater than 10,000 lbs. GVWR in the MCMIS file are coded as SUTs with two axles and six tires in the Ohio PAR file.

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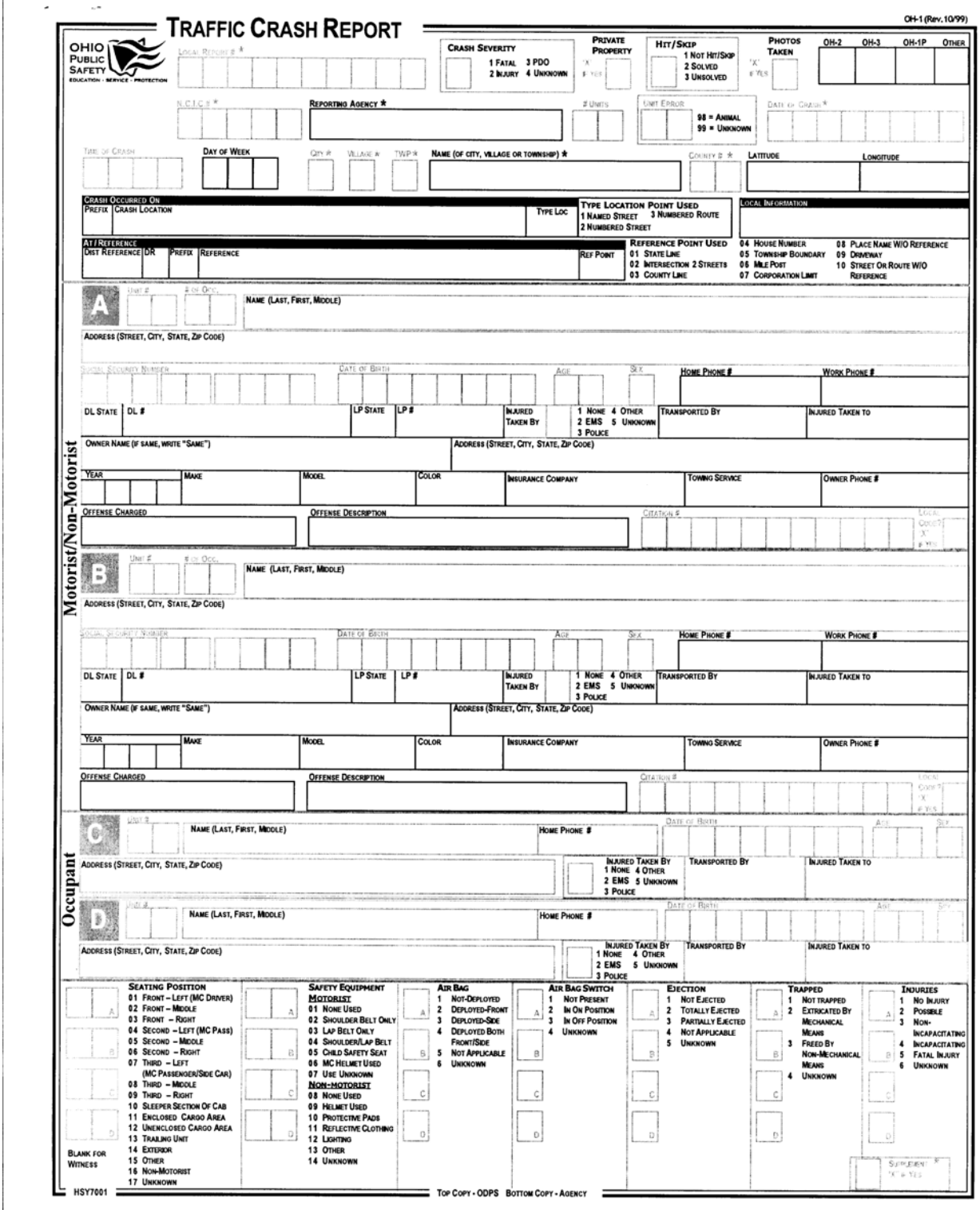
Appendix A:Variables Used from Ohio PAR Data to Identify a MCMIS-Reportable Crash.

MCMIS Reporting Criteria	Implementation in Ohio PAR Data
Truck with GVWR over 10,000 or GCWR over 10,000	Unit Type was available for identifying vehicle body type. In the Truck/Bus section of the crash report the officer can record weight (GVWR) and cargo body type, but weight had many missing values. Cross-tabulations of these three variables suggests that unit type best captures the MCMIS criteria for trucks and buses: unit_type = 9 – SUT,2axles/6tires 10 – SUT 3+axles 11 – Truck/Trailer 12 – Truck tractor (Bobtail) 13 – Tractor / Semitrailer 14 – Tractor / Double Trailer 15 – Tractor / Double Long 16 – Fifth Wheel or Dolly 17 – Tractor Triples
***or* Bus with seating for at least nine, including the driver**	The following codes were used to identify eligible buses: Body_type = 20 – School Bus 21 – Church Bus 22 – Public Bus 23 – Other Bus It is also possible that some other vehicles, such as vans, could qualify as buses. They would qualify if they have seats for nine or more passengers and are used for transporting passengers, and not personal transport. However, since number of seats and a description of vehicle use were not available, the decision was made not to include any other vehicles as qualifying buses.
***or* Vehicle displaying a hazardous materials placard**	There are four variables related to hazmat information: diamond placard number, hazmat placard, hazmat release, and hazmat number. The hazmat placard variable was used because it is a numeric variable that indicates whether a placard was present or not. The other variables were character variables with some missing values or not as reliable as the hazmat placard variable.
AND	
at least one fatality	The Ohio occupant file contains an injuries variable based on the usual KABCOU scale. A maximum injury severity variable was created to determine the maximum injury severity in the crash. A crash involving a fatality was determined from this created variable. Injuries = 5 denotes a fatal outcome

MCMIS Reporting Criteria	Implementation in Ohio 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 agencies transporting occupants for medical attention. An occupant was considered transported if the agency was EMS, police, or other. Transported was missing for a small percentage of vehicles. Thus, this criteria was met by the following conditions: Maximum injury severity =(A or B or C) and transported =yes OR Maximum injury severity=(A or B) and transported =unknown
***or* at least one vehicle towed due to disabling damage**	Two variables were used in combination to identify vehicles satisfying this criterion: damage extent, and towed flag. Damage extent has levels 1=None, 2=Non-functional, 3=functional,4=disabling, 5=severe, 6=unknown. The towed flag has two levels: yes and no. This criteria was met by the following condition: Damage extent=(4 or 5) and towed flag=yes. Damage extent unknown was ignored since 97 percent of those were not towed.

Appendix B: Ohio Crash Report Form



TRAFFIC CRASH REPORT

OH-1 (Rev. 10/99)

OHIO PUBLIC SAFETY — EDUCATION · SERVICE · PROTECTION

LOCAL REPORT # *

CRASH SEVERITY: 1 FATAL 3 PDO 2 INJURY 4 UNKNOWN

PRIVATE PROPERTY: "X" IF YES

HIT/SKIP: 1 NOT HIT/SKIP 2 SOLVED 3 UNSOLVED

PHOTOS TAKEN: "X" IF YES — OH-2 OH-3 OH-1P OTHER

N.C.I.C. # *

REPORTING AGENCY *

UNITS

UNIT ERROR: 98 = ANIMAL 99 = UNKNOWN

DATE OF CRASH *

TIME OF CRASH

DAY OF WEEK

QTY # VILLAGE * TWP * NAME (OF CITY, VILLAGE OR TOWNSHIP) *

COUNTY # *

LATITUDE LONGITUDE

CRASH OCCURRED ON: PREFIX | CRASH LOCATION | TYPE LOC

TYPE LOCATION POINT USED: 1 NAMED STREET 3 NUMBERED ROUTE 2 NUMBERED STREET

LOCAL INFORMATION

AT / REFERENCE: DIST REFERENCE | DR | PREFIX | REFERENCE | REF POINT

REFERENCE POINT USED: 01 STATE LINE 02 INTERSECTION 2 STREETS 03 COUNTY LINE 04 HOUSE NUMBER 05 TOWNSHIP BOUNDARY 06 MILE POST 07 CORPORATION LIMIT 08 PLACE NAME W/O REFERENCE 09 DRIVEWAY 10 STREET OR ROUTE W/O REFERENCE

Motorist/Non-Motorist

A — UNIT # | # OF OCC. | NAME (LAST, FIRST, MIDDLE)

ADDRESS (STREET, CITY, STATE, ZIP CODE)

SOCIAL SECURITY NUMBER | DATE OF BIRTH | AGE | SEX | HOME PHONE # | WORK PHONE #

DL STATE | DL # | LP STATE | LP # | INJURED TAKEN BY (1 NONE 4 OTHER 2 EMS 5 UNKNOWN 3 POLICE) | TRANSPORTED BY | INJURED TAKEN TO

OWNER NAME (IF SAME, WRITE "SAME") | ADDRESS (STREET, CITY, STATE, ZIP CODE)

YEAR | MAKE | MODEL | COLOR | INSURANCE COMPANY | TOWING SERVICE | OWNER PHONE #

OFFENSE CHARGED | OFFENSE DESCRIPTION | CITATION # | LOCAL CODE? "X" IF YES

B — UNIT # | # OF OCC. | NAME (LAST, FIRST, MIDDLE)

ADDRESS (STREET, CITY, STATE, ZIP CODE)

SOCIAL SECURITY NUMBER | DATE OF BIRTH | AGE | SEX | HOME PHONE # | WORK PHONE #

DL STATE | DL # | LP STATE | LP # | INJURED TAKEN BY (1 NONE 4 OTHER 2 EMS 5 UNKNOWN 3 POLICE) | TRANSPORTED BY | INJURED TAKEN TO

OWNER NAME (IF SAME, WRITE "SAME") | ADDRESS (STREET, CITY, STATE, ZIP CODE)

YEAR | MAKE | MODEL | COLOR | INSURANCE COMPANY | TOWING SERVICE | OWNER PHONE #

OFFENSE CHARGED | OFFENSE DESCRIPTION | CITATION # | LOCAL CODE? "X" IF YES

Occupant

C — UNIT # | NAME (LAST, FIRST, MIDDLE) | HOME PHONE # | DATE OF BIRTH | AGE | SEX

ADDRESS (STREET, CITY, STATE, ZIP CODE) | INJURED TAKEN BY (1 NONE 4 OTHER 2 EMS 5 UNKNOWN 3 POLICE) | TRANSPORTED BY | INJURED TAKEN TO

D — UNIT # | NAME (LAST, FIRST, MIDDLE) | HOME PHONE # | DATE OF BIRTH | AGE | SEX

ADDRESS (STREET, CITY, STATE, ZIP CODE) | INJURED TAKEN BY (1 NONE 4 OTHER 2 EMS 5 UNKNOWN 3 POLICE) | TRANSPORTED BY | INJURED TAKEN TO

SEATING POSITION: 01 FRONT – LEFT (MC DRIVER) 02 FRONT – MIDDLE 03 FRONT – RIGHT 04 SECOND – LEFT (MC PASS) 05 SECOND – MIDDLE 06 SECOND – RIGHT 07 THIRD – LEFT (MC PASSENGER/SIDE CAR) 08 THIRD – MIDDLE 09 THIRD – RIGHT 10 SLEEPER SECTION OF CAB 11 ENCLOSED CARGO AREA 12 UNENCLOSED CARGO AREA 13 TRAILING UNIT 14 EXTERIOR 15 OTHER 16 NON-MOTORIST 17 UNKNOWN — BLANK FOR WITNESS

SAFETY EQUIPMENT — MOTORIST: 01 NONE USED 02 SHOULDER BELT ONLY 03 LAP BELT ONLY 04 SHOULDER/LAP BELT 05 CHILD SAFETY SEAT 06 MC HELMET USED 07 USE UNKNOWN — NON-MOTORIST: 08 NONE USED 09 HELMET USED 10 PROTECTIVE PADS 11 REFLECTIVE CLOTHING 12 LIGHTING 13 OTHER 14 UNKNOWN

AIR BAG: 1 NOT-DEPLOYED 2 DEPLOYED-FRONT 3 DEPLOYED-SIDE 4 DEPLOYED BOTH FRONT/SIDE 5 NOT APPLICABLE 6 UNKNOWN

AIR BAG SWITCH: 1 NOT PRESENT 2 IN ON POSITION 3 IN OFF POSITION 4 UNKNOWN

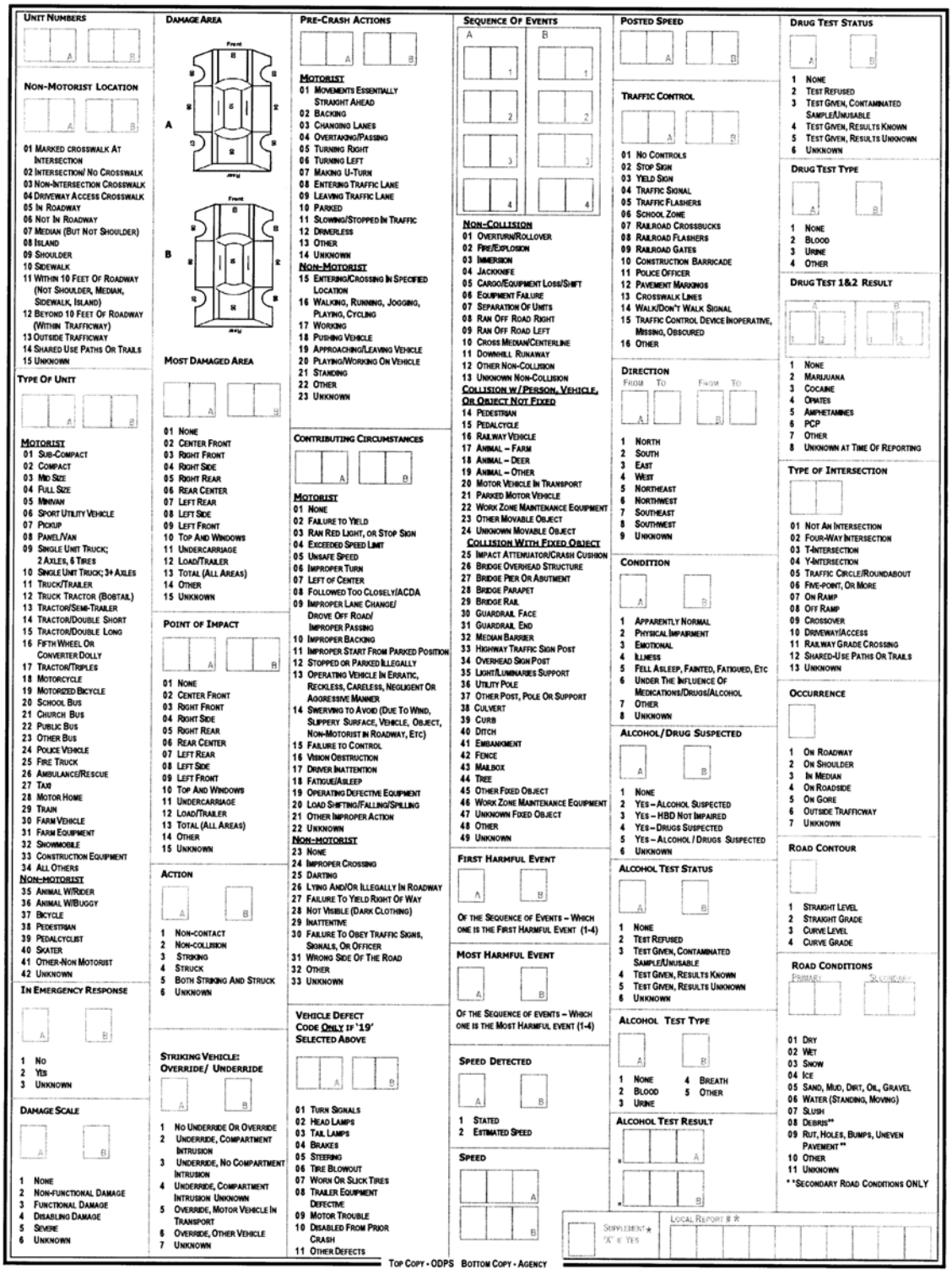
EJECTION: 1 NOT EJECTED 2 TOTALLY EJECTED 3 PARTIALLY EJECTED 4 NOT APPLICABLE 5 UNKNOWN

TRAPPED: 1 NOT TRAPPED 2 EXTRICATED BY MECHANICAL MEANS 3 FREED BY NON-MECHANICAL MEANS 4 UNKNOWN

INJURIES: 1 NO INJURY 2 POSSIBLE 3 NON-INCAPACITATING 4 INCAPACITATING 5 FATAL INJURY 6 UNKNOWN

SUPPLEMENT # "X" IF YES

HSY7001 TOP COPY - ODPS BOTTOM COPY - AGENCY



UNIT NUMBERS

A B

NON-MOTORIST LOCATION

A B

01 MARKED CROSSWALK AT INTERSECTION
02 INTERSECTION/ NO CROSSWALK
03 NON-INTERSECTION CROSSWALK
04 DRIVEWAY ACCESS CROSSWALK
05 IN ROADWAY
06 NOT IN ROADWAY
07 MEDIAN (BUT NOT SHOULDER)
08 ISLAND
09 SHOULDER
10 SIDEWALK
11 WITHIN 10 FEET OF ROADWAY (NOT SHOULDER, MEDIAN, SIDEWALK, ISLAND)
12 BEYOND 10 FEET OF ROADWAY (WITHIN TRAFFICWAY)
13 OUTSIDE TRAFFICWAY
14 SHARED USE PATHS OR TRAILS
15 UNKNOWN

TYPE OF UNIT

A B

MOTORIST
01 SUB-COMPACT
02 COMPACT
03 MID SIZE
04 FULL SIZE
05 MINIVAN
06 SPORT UTILITY VEHICLE
07 PICKUP
08 PANEL/VAN
09 SINGLE UNIT TRUCK; 2 AXLES, 6 TIRES
10 SINGLE UNIT TRUCK; 3+ AXLES
11 TRUCK/TRAILER
12 TRUCK TRACTOR (BOBTAIL)
13 TRACTOR/SEMI-TRAILER
14 TRACTOR/DOUBLE SHORT
15 TRACTOR/DOUBLE LONG
16 FIFTH WHEEL OR CONVERTER DOLLY
17 TRACTOR/TRIPLES
18 MOTORCYCLE
19 MOTORIZED BICYCLE
20 SCHOOL BUS
21 CHURCH BUS
22 PUBLIC BUS
23 OTHER BUS
24 POLICE VEHICLE
25 FIRE TRUCK
26 AMBULANCE/RESCUE
27 TAXI
28 MOTOR HOME
29 TRAIN
30 FARM VEHICLE
31 FARM EQUIPMENT
32 SNOWMOBILE
33 CONSTRUCTION EQUIPMENT
34 ALL OTHERS
NON-MOTORIST
35 ANIMAL W/RIDER
36 ANIMAL W/BUGGY
37 BICYCLE
38 PEDESTRIAN
39 PEDALCYCLIST
40 SKATER
41 OTHER-NON MOTORIST
42 UNKNOWN

IN EMERGENCY RESPONSE

A B

1 NO
2 YES
3 UNKNOWN

DAMAGE SCALE

A B

1 NONE
2 NON-FUNCTIONAL DAMAGE
3 FUNCTIONAL DAMAGE
4 DISABLING DAMAGE
5 SEVERE
6 UNKNOWN

DAMAGE AREA

MOST DAMAGED AREA

A B

01 NONE
02 CENTER FRONT
03 RIGHT FRONT
04 RIGHT SIDE
05 RIGHT REAR
06 REAR CENTER
07 LEFT REAR
08 LEFT SIDE
09 LEFT FRONT
10 TOP AND WINDOWS
11 UNDERCARRIAGE
12 LOAD/TRAILER
13 TOTAL (ALL AREAS)
14 OTHER
15 UNKNOWN

POINT OF IMPACT

A B

01 NONE
02 CENTER FRONT
03 RIGHT FRONT
04 RIGHT SIDE
05 RIGHT REAR
06 REAR CENTER
07 LEFT REAR
08 LEFT SIDE
09 LEFT FRONT
10 TOP AND WINDOWS
11 UNDERCARRIAGE
12 LOAD/TRAILER
13 TOTAL (ALL AREAS)
14 OTHER
15 UNKNOWN

ACTION

A B

1 NON-CONTACT
2 NON-COLLISION
3 STRIKING
4 STRUCK
5 BOTH STRIKING AND STRUCK
6 UNKNOWN

STRIKING VEHICLE: OVERRIDE/ UNDERRIDE

A B

1 NO UNDERRIDE OR OVERRIDE
2 UNDERRIDE, COMPARTMENT INTRUSION
3 UNDERRIDE, NO COMPARTMENT INTRUSION
4 UNDERRIDE, COMPARTMENT INTRUSION UNKNOWN
5 OVERRIDE, MOTOR VEHICLE IN TRANSPORT
6 OVERRIDE, OTHER VEHICLE
7 UNKNOWN

PRE-CRASH ACTIONS

A B

MOTORIST
01 MOVEMENTS ESSENTIALLY STRAIGHT AHEAD
02 BACKING
03 CHANGING LANES
04 OVERTAKING/PASSING
05 TURNING RIGHT
06 TURNING LEFT
07 MAKING U-TURN
08 ENTERING TRAFFIC LANE
09 LEAVING TRAFFIC LANE
10 PARKED
11 SLOWING/STOPPED IN TRAFFIC
12 DRIVERLESS
13 OTHER
14 UNKNOWN
NON-MOTORIST
15 ENTERING/CROSSING IN SPECIFIED LOCATION
16 WALKING, RUNNING, JOGGING, PLAYING, CYCLING
17 WORKING
18 PUSHING VEHICLE
19 APPROACHING/LEAVING VEHICLE
20 PLAYING/WORKING ON VEHICLE
21 STANDING
22 OTHER
23 UNKNOWN

CONTRIBUTING CIRCUMSTANCES

A B

MOTORIST
01 NONE
02 FAILURE TO YIELD
03 RAN RED LIGHT, OR STOP SIGN
04 EXCEEDED SPEED LIMIT
05 UNSAFE SPEED
06 IMPROPER TURN
07 LEFT OF CENTER
08 FOLLOWED TOO CLOSELY/ACDA
09 IMPROPER LANE CHANGE/ DROVE OFF ROAD/ IMPROPER PASSING
10 IMPROPER BACKING
11 IMPROPER START FROM PARKED POSITION
12 STOPPED OR PARKED ILLEGALLY
13 OPERATING VEHICLE IN ERRATIC, RECKLESS, CARELESS, NEGLIGENT OR AGGRESSIVE MANNER
14 SWERVING TO AVOID (DUE TO WIND, SLIPPERY SURFACE, VEHICLE, OBJECT, NON-MOTORIST IN ROADWAY, ETC)
15 FAILURE TO CONTROL
16 VISION OBSTRUCTION
17 DRIVER INATTENTION
18 FATIGUE/ASLEEP
19 OPERATING DEFECTIVE EQUIPMENT
20 LOAD SHIFTING/FALLING/SPILLING
21 OTHER IMPROPER ACTION
22 UNKNOWN
NON-MOTORIST
23 NONE
24 IMPROPER CROSSING
25 DARTING
26 LYING AND/OR ILLEGALLY IN ROADWAY
27 FAILURE TO YIELD RIGHT OF WAY
28 NOT VISIBLE (DARK CLOTHING)
29 INATTENTIVE
30 FAILURE TO OBEY TRAFFIC SIGNS, SIGNALS, OR OFFICER
31 WRONG SIDE OF THE ROAD
32 OTHER
33 UNKNOWN

VEHICLE DEFECT CODE ONLY IF '19' SELECTED ABOVE

A B

01 TURN SIGNALS
02 HEAD LAMPS
03 TAIL LAMPS
04 BRAKES
05 STEERING
06 TIRE BLOWOUT
07 WORN OR SLICK TIRES
08 TRAILER EQUIPMENT DEFECTIVE
09 MOTOR TROUBLE
10 DISABLED FROM PRIOR CRASH
11 OTHER DEFECTS

SEQUENCE OF EVENTS

A	B
1	1
2	2
3	3
4	4

NON-COLLISION
01 OVERTURN/ROLLOVER
02 FIRE/EXPLOSION
03 IMMERSION
04 JACKKNIFE
05 CARGO/EQUIPMENT LOSS/SHIFT
06 EQUIPMENT FAILURE
07 SEPARATION OF UNITS
08 RAN OFF ROAD RIGHT
09 RAN OFF ROAD LEFT
10 CROSS MEDIAN/CENTERLINE
11 DOWNHILL RUNAWAY
12 OTHER NON-COLLISION
13 UNKNOWN NON-COLLISION
COLLISION W/PERSON, VEHICLE, OR OBJECT NOT FIXED
14 PEDESTRIAN
15 PEDALCYCLE
16 RAILWAY VEHICLE
17 ANIMAL – FARM
18 ANIMAL – DEER
19 ANIMAL – OTHER
20 MOTOR VEHICLE IN TRANSPORT
21 PARKED MOTOR VEHICLE
22 WORK ZONE MAINTENANCE EQUIPMENT
23 OTHER MOVABLE OBJECT
24 UNKNOWN MOVABLE OBJECT
COLLISION WITH FIXED OBJECT
25 IMPACT ATTENUATOR/CRASH CUSHION
26 BRIDGE OVERHEAD STRUCTURE
27 BRIDGE PIER OR ABUTMENT
28 BRIDGE PARAPET
29 BRIDGE RAIL
30 GUARDRAIL FACE
31 GUARDRAIL END
32 MEDIAN BARRIER
33 HIGHWAY TRAFFIC SIGN POST
34 OVERHEAD SIGN POST
35 LIGHT/LUMINARIES SUPPORT
36 UTILITY POLE
37 OTHER POST, POLE OR SUPPORT
38 CULVERT
39 CURB
40 DITCH
41 EMBANKMENT
42 FENCE
43 MAILBOX
44 TREE
45 OTHER FIXED OBJECT
46 WORK ZONE MAINTENANCE EQUIPMENT
47 UNKNOWN FIXED OBJECT
48 OTHER
49 UNKNOWN

FIRST HARMFUL EVENT

A B

OF THE SEQUENCE OF EVENTS – WHICH ONE IS THE FIRST HARMFUL EVENT (1-4)

MOST HARMFUL EVENT

A B

OF THE SEQUENCE OF EVENTS – WHICH ONE IS THE MOST HARMFUL EVENT (1-4)

SPEED DETECTED

A B

1 STATED
2 ESTIMATED SPEED

SPEED

A
B

POSTED SPEED

A B

TRAFFIC CONTROL

A B

01 NO CONTROLS
02 STOP SIGN
03 YIELD SIGN
04 TRAFFIC SIGNAL
05 TRAFFIC FLASHERS
06 SCHOOL ZONE
07 RAILROAD CROSSBUCKS
08 RAILROAD FLASHERS
09 RAILROAD GATES
10 CONSTRUCTION BARRICADE
11 POLICE OFFICER
12 PAVEMENT MARKINGS
13 CROSSWALK LINES
14 WALK/DON'T WALK SIGNAL
15 TRAFFIC CONTROL DEVICE INOPERATIVE, MISSING, OBSCURED
16 OTHER

DIRECTION

FROM	TO	FROM	TO
A		B	

1 NORTH
2 SOUTH
3 EAST
4 WEST
5 NORTHEAST
6 NORTHWEST
7 SOUTHEAST
8 SOUTHWEST
9 UNKNOWN

CONDITION

A B

1 APPARENTLY NORMAL
2 PHYSICAL IMPAIRMENT
3 EMOTIONAL
4 ILLNESS
5 FELL ASLEEP, FAINTED, FATIGUED, ETC
6 UNDER THE INFLUENCE OF MEDICATIONS/DRUGS/ALCOHOL
7 OTHER
8 UNKNOWN

ALCOHOL/DRUG SUSPECTED

A B

1 NONE
2 YES – ALCOHOL SUSPECTED
3 YES – HBD NOT IMPAIRED
4 YES – DRUGS SUSPECTED
5 YES – ALCOHOL / DRUGS SUSPECTED
6 UNKNOWN

ALCOHOL TEST STATUS

A B

1 NONE
2 TEST REFUSED
3 TEST GIVEN, CONTAMINATED SAMPLE/UNUSABLE
4 TEST GIVEN, RESULTS KNOWN
5 TEST GIVEN, RESULTS UNKNOWN
6 UNKNOWN

ALCOHOL TEST TYPE

A B

1 NONE
2 BLOOD
3 URINE
4 BREATH
5 OTHER

ALCOHOL TEST RESULT

A
B

DRUG TEST STATUS

A B

1 NONE
2 TEST REFUSED
3 TEST GIVEN, CONTAMINATED SAMPLE/UNUSABLE
4 TEST GIVEN, RESULTS KNOWN
5 TEST GIVEN, RESULTS UNKNOWN
6 UNKNOWN

DRUG TEST TYPE

A B

1 NONE
2 BLOOD
3 URINE
4 OTHER

DRUG TEST 1&2 RESULT

A 1 2 B 1 2

1 NONE
2 MARIJUANA
3 COCAINE
4 OPIATES
5 AMPHETAMINES
6 PCP
7 OTHER
8 UNKNOWN AT TIME OF REPORTING

TYPE OF INTERSECTION

01 NOT AN INTERSECTION
02 FOUR-WAY INTERSECTION
03 T-INTERSECTION
04 Y-INTERSECTION
05 TRAFFIC CIRCLE/ROUNDABOUT
06 FIVE-POINT, OR MORE
07 ON RAMP
08 OFF RAMP
09 CROSSOVER
10 DRIVEWAY/ACCESS
11 RAILWAY GRADE CROSSING
12 SHARED-USE PATHS OR TRAILS
13 UNKNOWN

OCCURRENCE

1 ON ROADWAY
2 ON SHOULDER
3 IN MEDIAN
4 ON ROADSIDE
5 ON GORE
6 OUTSIDE TRAFFICWAY
7 UNKNOWN

ROAD CONTOUR

1 STRAIGHT LEVEL
2 STRAIGHT GRADE
3 CURVE LEVEL
4 CURVE GRADE

ROAD CONDITIONS

PRIMARY SECONDARY

01 DRY
02 WET
03 SNOW
04 ICE
05 SAND, MUD, DIRT, OIL, GRAVEL
06 WATER (STANDING, MOVING)
07 SLUSH
08 DEBRIS**
09 RUT, HOLES, BUMPS, UNEVEN PAVEMENT **
10 OTHER
11 UNKNOWN
** SECONDARY ROAD CONDITIONS ONLY

SUPPLEMENT * "X" IF YES

LOCAL REPORT # *

TOP COPY - ODPS BOTTOM COPY - AGENCY

Narrative

MANNER OF COLLISION OR IMPACT
1 NOT COLLISION BETWEEN TWO VEHICLES IN TRANSPORT
2 REAR-END
3 HEAD-ON
4 REAR-TO-REAR
5 BACKING
6 ANGLE
7 SIDESWIPE, SAME DIRECTION
8 SIDESWIPE, OPPOSITE DIRECTION
9 UNKNOWN

WEATHER
01 CLEAR
02 CLOUDY
03 FOG, SMOG, SMOKE
04 RAIN
05 SLEET, HAIL (FREEZING RAIN DRIZZLE)
06 SNOW
07 SEVERE CROSSWINDS
08 BLOWING SAND, SOIL, DIRT, SNOW
09 OTHER
10 UNKNOWN

LIGHT CONDITIONS
PRIMARY SECONDARY
1 DAYLIGHT
2 DAWN
3 DUSK
4 DARK – LIGHTED ROADWAY
5 DARK –NOT LIGHTED
6 DARK – UNKNOWN LIGHTING
7 GLARE
8 OTHER
9 UNKNOWN

SCHOOL BUS RELATED
1 NO
2 YES, DIRECTLY INVOLVED
3 YES, INDIRECTLY INVOLVED
4 UNKNOWN

WORK ZONE RELATED
1 NO
2 YES
3 UNKNOWN

TYPE OF WORK ZONE
1 LANE CLOSURE
2 LANE SHIFT/CROSSOVER
3 WORK ON SHOULDER OR MEDIAN
4 INTERMITTENT/ MOVING WORK
5 OTHER

LOCATION OF CRASH IN WORK ZONE
1 BEFORE FIRST WORK ZONE WARNING SIGN
2 ADVANCE WARNING AREA
3 TRANSITION AREA
4 ACTIVITY AREA

WORKERS PRESENT
1 NO
2 YES
3 UNKNOWN

Diagram

Write an "N" on the compass diagram to indicate the direction of north.

Truck/Bus

UNIT #

THE CRASH INVOLVED ONE OR MORE OF THE FOLLOWING:
A TRUCK (MOTOR VEHICLE) WITH A GVWR MORE THAN 10,000 POUNDS; OR
A TRUCK (MOTOR VEHICLE) WITH A HAZARDOUS MATERIALS PLACARD; OR
A BUS DESIGNED FOR AT LEAST 8 PERSONS, INCLUDING DRIVER.

AND

THE CRASH RESULTED IN ONE OR MORE OF THE FOLLOWING:
A FATALITY; OR
AN INJURY REQUIRING TRANSPORTATION FOR IMMEDIATE MEDICAL TREATMENT; OR
AT LEAST ONE VEHICLE WAS TOWED DUE TO DISABLING DAMAGE OR REQUIRED INTERVENING ASSISTANCE BEFORE PROCEEDING UNDER ITS OWN POWER.

COMPANY (FROM SHIPPING PAPERS) | COMPANY PHONE

ADDRESS (STREET, CITY, ST, ZIP CODE)

US DOT | ICC MC | PUCO | TRAILER LP ST. | TRAILER LP YEAR | TRAILER LP #

CARGO BODY TYPE
01 NOT APPLICABLE
02 BUS (9-15 INCLUDING DRIVER)
03 VAN/ENCLOSED BOX
04 GRAIN/CHIPS/GRAVEL
05 POLE
06 CARGO TANK
07 FLATBED
08 DUMP
09 CONCRETE MIXER
10 AUTO TRANSPORTER
11 GARBAGE/REFUSE
12 OTHER
13 UNKNOWN

Weight (GVWR)
1 LESS/EQUAL 10,000
2 10,001 - 26,000
3 MORE THAN 26,000

CDL Class
1 CLASS A
2 CLASS B
3 CLASS C
4 CLASS M
5 CLASS D

Hazardous Materials Placard
1 NO
2 YES
3 UNKNOWN

Hazardous Material Released
1 NO
2 YES
3 NOT APPLICABLE
4 UNKNOWN

Police Action

DATE CRASH REPORTED | TIME REC'D | DISPATCH | ARRIVED | CLEARED | OTHER | TOTAL MINUTES

OFFICER'S NAME * | BADGE # * | CHECKED BY | DATE REPORT FILED *

REPORT TAKEN BY
1 POLICE AGENCY
2 MOTORIST

REPORT TAKEN AT
1 SCENE
2 STATION
3 OTHER

SUPPLEMENT * (X = YES) | LOCAL REPORT # *

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