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EVALUATION OF 2005 INDIANA CRASH DATA REPORTED TO MCMIS CRASH FILE

PAUL E. GREEN
ANNE MATTESON

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Paul E. Green
Anne Matteson

The University of Michigan
Transportation Research Institute
Ann Arbor, MI 48109-2150
U.S.A.

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16. Abstract

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

MCMIS Crash File records were matched to the Indiana Crash file to determine the nature and extent of underreporting. Overall, it appears that Indiana is reporting 80.5 percent of crash involvements that should be reported to the MCMIS Crash file.

Based on crash severity, the reporting rate is 90.3 percent for fatal crashes, 81.9 percent for injured/transported crashes, and 79.6 percent for towed crashes. It appears that at least two different crash report forms are in use in Indiana, resulting in a reported injury severity distribution that differs considerably from those reported in other states.

The reporting rate for trucks is 81.0 percent, and the rate for buses is 73.4 percent. The reporting rate for the State Police is 87.6 percent, while the rate for the Indianapolis Police Department is 66.0 percent. It appears that 97 of the 7,193 reportable cases involved explosion or fire and 11 of these were not reported. Of the 97 vehicles, at least 46 involved no injury (7 vehicles unknown).

Missing data rates are low for most variables, except as noted. Some inconsistencies between data reported to the MCMIS file and data recorded in the Indiana file were also noted.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

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

APPROXIMATE CONVERSIONS FROM SI UNITS

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

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

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

1. Introduction

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

The present report is part of a series evaluating the completeness and accuracy of the data in the MCMIS Crash file. Previous reports on a number of states showed underreporting due in large part to problems in interpreting and applying the reporting criteria. The problems were more severe in large jurisdictions and police departments. Each state also had problems specific to the nature of its system. Some states also had overreporting of cases, often due to technical problems with duplicate records. [See references 1 to 20.] The states are responsible for identifying and reporting qualifying crash involvements. Accordingly, improved completeness and accuracy must ultimately reside with the individual states.

In this report, we focus on MCMIS Crash file reporting by Indiana. In recent years, Indiana has reported from 3,420 to 5,250 involvements annually to the MCMIS Crash file. According to the 2002 Vehicle Inventory and Use Survey, Indiana had over 187,000 trucks registered, ranking 7th among the states and accounting for 3.5 percent of all truck registrations [21]. Indiana is the 15th largest state by population [22] and generally ranks 9th in terms of the number of annual truck fatal involvements [23].

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

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

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 Indiana's statewide files as of September 1, 2006 were used in this analysis. The 2005 PAR file contains the computerized records of 362,792 vehicles involved in 208,397 crashes that occurred in Indiana.

2. Data Preparation

The Indiana PAR file and MCMIS Crash file each required some preparation before the Indiana records in the MCMIS Crash file could be matched to the Indiana PAR file. In the case of the MCMIS Crash file, the only processing necessary was to extract records reported from Indiana and to eliminate duplicate records. The Indiana 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 Indiana. For calendar year 2005 there were 5,880 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, officer badge number, vehicle license plate number, and driver license number, even though their case numbers were perhaps different. One would not expect all of these variables to be identical between two cases. Ten such duplicates were found, representing five unique occurrences of the examined variables. In four pairs, accident number, as well as the vehicles and drivers were identical.

In one pair, case numbers differed, but the vehicles and drivers involved were identical. In all five duplicate instances one record may have been entered erroneously during the process of updating information on the original record. The record with the latest 'Change date' was kept, and the earlier one was deleted. After deletion of five records, the resulting file contains 5,875 unique records.

2.2 Indiana Police Accident Report File

The Indiana PAR data for 2005 (dated September 1, 2006) was obtained from the state of Indiana. The data were stored as fifteen different record types, and were contained in one non-delimited text file. Records were then combined into accident, vehicle, and person-level data files. The combined files contain records for 208,397 crashes involving 362,792 vehicles. Data for the PAR file are coded from the Indiana Officer's Standard Crash Report (state form 23558) completed by police officers (Appendix B). Examination of filled out PAR's that are available for viewing from the Trucks Involved in Fatal Accidents study conducted by the University of Michigan Transportation Research Institute, suggests that several versions of PAR forms are being used in different jurisdictions in Indiana. It appears that older versions of the PAR differ from the newer version. This can affect consistency in recorded information and will be discussed in further detail in Section 4 when identifying cases that should be reported to the MCMIS Crash file. The PAR form shown in Appendix B is dated February 2003.

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 1160613 and 116-613, 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, crash county, city, officer id, vehicle license plate number, and driver license number. A total of 464 duplicate instances were found, representing 224 unique occurrences of the examined variables.

Duplicate pairs (triplicates) were examined more closely for any patterns that might explain why they were occurring. In all but a few cases, members of the duplicate pair had different accident numbers, but vehicles and drivers were the same. A few other variables differed, but most were identical between both members of the pair. One member of each duplicate was kept, and the others excluded, resulting in the deletion of 240 cases. The resulting PAR file has 362,552 records.

3. Matching Process

The next step involved matching records from the Indiana PAR file to corresponding records from the MCMIS file. After removing duplicates, there were 5,875 Indiana records from the MCMIS file available for matching, and 362,552 records from the Indiana PAR file. All records from the Indiana PAR data file were used in the match, even those that were not reportable to the MCMIS Crash file. This allowed the identification of cases in the MCMIS Crash file that did not meet the MCMIS Crash file reporting criteria.

Matching records in the two files requires finding combinations of variables common to the two files that have a high probability of uniquely identifying accidents and specific vehicles within the accidents. Master Record Number, which is the identifier used to uniquely identify a crash in the Indiana PAR data, and Report Number in the MCMIS Crash file, are obvious first choices. Indeed, there is a correspondence between the two numbers, and case number was never unrecorded in either file. Master Record Number in the Indiana PAR file is a nine-digit numeric value, while in the MCMIS Crash file Report Number is stored as a 12-character alphanumeric value, a combination of alphabetic characters and numbers. It appears that the report number in the MCMIS Crash file is constructed as follows: The first two columns contain the state abbreviation (IN, in this case), followed by ten digits. Since these digits were consistent with the PAR Master Record Number, the last nine digits of the MCMIS Report Number were extracted and these two variables were used in the match.

Other variables available for matching at the crash level include Crash Date, Crash Time (stored in military time as hour/minute), Crash County, Crash City, and Reporting Officer's Identification number. Since crash hour was stored incorrectly in the MCMIS file as values 1-12 instead of 1-24, crash hour was not used as a match variable.

Variables in the MCMIS file that distinguish one vehicle from another within the same crash include vehicle license plate number, driver license number, vehicle identification number

(VIN), and driver last name. VIN was used for two match attempts, but it was unrecorded in 97% of PAR cases (recorded for commercial vehicles only) and in 25 percent of MCMIS cases. However, where unique values existed, this variable was used to verify cases were accurately matched. Vehicle license number, driver license number, and driver last name were all present in the PAR file.

Four separate matches were performed using the available variables. At each step, records in either file with duplicate values on all the match variables were excluded, along with records that were missing values on the match variables. The first match included the variables case number, crash date (month, day), crash minute, crash county, crash city, officer ID, VIN, vehicle license number, driver license number, and driver last name. The second match step dropped minute, county, officer ID, VIN, and driver license number, but retained the other variables. The third match step matched on case number, crash date, VIN, and driver license number. After some experimentation, the fourth match included variables case number, crash day, and vehicle license number. This process resulted in matching 99.5 percent of the MCMIS records to the PAR file.

See Table 1 for the variables used in each match step along with the number of records matched at each step. Matched records were verified using other variables common to the MCMIS and PAR file as a final check to ensure the match was valid. The above procedure resulted in 5,848 matches, representing 99.5 percent of the 5,875 non-duplicate records reported to MCMIS.

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

Step	Matching variables	Cases matched
Match 1	Case number, crash date, crash minute, crash county, crash city, officer ID, VIN, vehicle license number, driver license number, and driver last name	3,864
Match 2	Case number, crash date, city, vehicle license number, and driver last name	1,296
Match 3	Case number, crash date, VIN, and driver license number	407
Match 4	Case number, crash day, and vehicle license number	281
Total cases matched		5,848

Figure 1 shows the flow of cases in the matching process. Of the 5,848 matched cases, 59 are not reportable and 5,789 are reportable. The method of identifying cases reportable to the MCMIS Crash file is discussed in the next section.

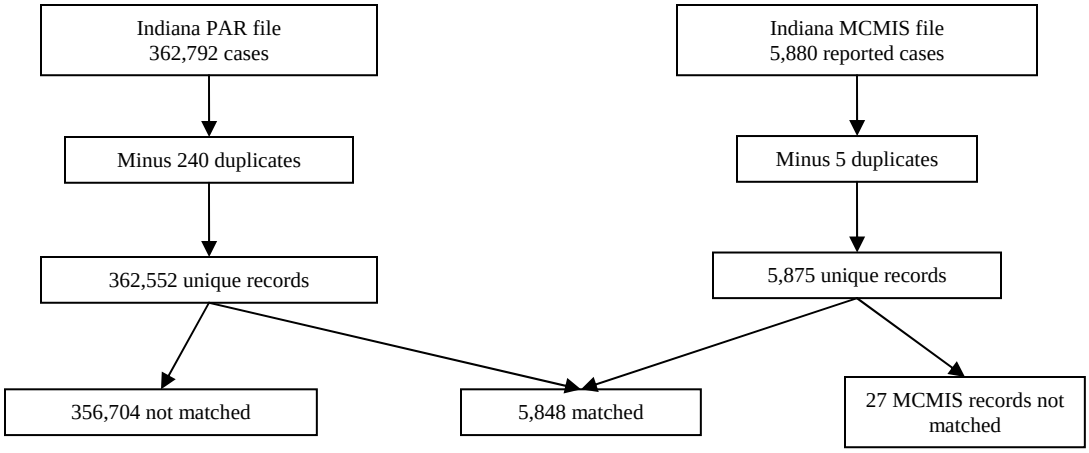


Figure 1 Case Flow in MCMIS/Indiana Crash File Match

4. Identifying Reportable Cases

The next step in data preparation is to identify records in the Indiana data that qualified for reporting to the MCMIS Crash file. Records are identified using the information available in the computerized crash files that were sent by Indiana. To identify reportable records, we use the information that is completed by the officers for all vehicles. That is, in some states certain data elements that are to be collected for the MCMIS file are located in a special section or supplemental form, with the instruction to the officer to complete that section if the vehicle and crash meets the MCMIS reporting criteria. But since our goal is to evaluate the completeness of reporting, we attempt to identify all reportable cases, even those an officer may have overlooked. For this purpose, we use the data that is completed for all cases. In Indiana, all information is recorded on the main form (Appendix B). Certain sections on the form pertain to specialized information, but there is not a supplemental form separate from the main form. Table 2 shows the vehicle and crash severity threshold for reporting a crash to the MCMIS Crash file.

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.

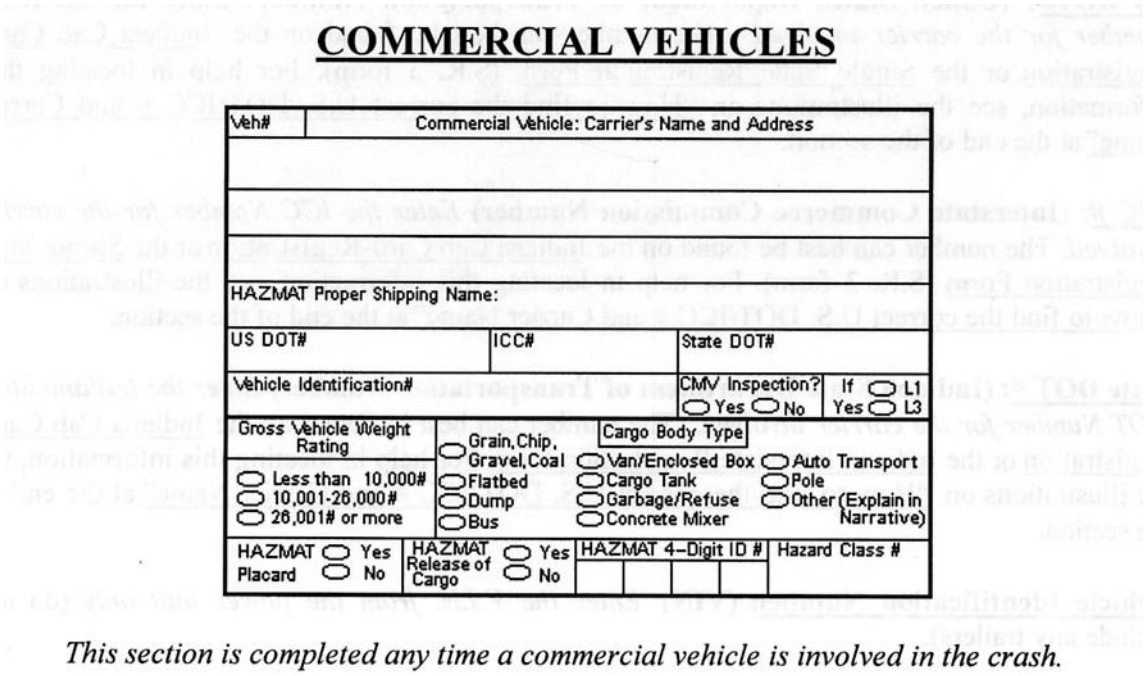
Identifying qualifying vehicles is fairly straightforward because the third page of the Indiana PAR form (Appendix B) contains a list of vehicles that officers can choose from, and these vehicle types are consistent with the types recorded in the Indiana PAR file. Table 3 shows

relevant body styles that can be identified that qualify as reportable vehicle types to the MCMIS Crash file. In addition to the medium and heavy truck descriptions, the descriptions for buses also match those described in Table 2 closely.

Table 3 Relevant Vehicle Body Style Codes on Indiana Accident Report

Single Unit Truck, 2 axle, 6 tires
Single Unit Truck, 3 or more axles
Truck Trailer
Tractor/One Semi Trailer
Tractor/Double Trailers
Tractor/Triple Trailers
Tractor/No Trailer
Bus/Seats 9-15 Persons incl driver
Bus/Seats 15+ Persons incl driver
School Bus

Furthermore, a commercial vehicle section (not separate from the main form) is available for officers to record specific information about commercial vehicles. Figure 2 shows this section along with instructions to the officer that this section is completed anytime a commercial vehicle is involved in the crash. There are places reserved for recording information about hazardous material, GVWR, DOT and ICC numbers, VIN, cargo body type, and the carrier. Therefore, the PAR file appears to have adequate information for identifying qualifying vehicles.



COMMERCIAL VEHICLES

Veh# | Commercial Vehicle: Carrier's Name and Address

HAZMAT Proper Shipping Name:

US DOT# | ICC# | State DOT#

Vehicle Identification# | CMV Inspection? Yes No | If Yes L1 L3

Gross Vehicle Weight Rating
- Less than 10,000#
- 10,001-26,000#
- 26,001# or more

Cargo Body Type
- Grain, Chip, Gravel, Coal
- Flatbed
- Dump
- Bus
- Van/Enclosed Box
- Cargo Tank
- Garbage/Refuse
- Concrete Mixer
- Auto Transport
- Pole
- Other (Explain in Narrative)

HAZMAT Placard Yes No | HAZMAT Release of Cargo Yes No | HAZMAT 4-Digit ID # | Hazard Class #

This section is completed any time a commercial vehicle is involved in the crash.

Figure 2 Commercial Vehicle Section in the Indiana PAR form

In total, there were 19,153 vehicles identified as trucks, buses, or non-trucks displaying a hazardous materials placard in the Indiana PAR file. Table 4 shows the distribution of vehicle

type. About 90 percent are trucks and close to 10 percent are buses, which is consistent with percentages from previous MCMIS evaluations. As usual, non-trucks displaying a hazmat placard account for a small fraction of qualifying vehicles. The 19,153 eligible vehicles represent 5.3 percent of all 362,552 vehicles in the PAR file. This result is also consistent with other MCMIS evaluations in which the percentage of eligible vehicles has ranged from 2.6 percent to 6.1 percent.

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

Vehicle type	N	%
Trucks	17,248	90.1
Buses	1,901	9.9
Non-trucks with hazmat placard	4	0.0
Total	19,153	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 those involving a fatality, an injury transported for immediate medical attention, or a vehicle towed from the scene due to disabling damage.

The Indiana Person file contains an injury variable and an emergency number variable. These two variables were used to create an injured and transported variable at the crash level. However, before creating this variable, it was observed that the Person file has fewer records than the Vehicle file. Table 5 shows a comparison between numbers of crashes, vehicles, and persons in the Indiana PAR file and the PAR files from three recently completed MCMIS evaluations. The ratio of vehicles to crashes in Indiana seems consistent with the other states, but the Person file seems to have too few records.

Table 5 Comparison of Crashes, Vehicles, and Persons in Four State PAR Files

State	Crash	Vehicle	Person	Veh/Crsh	Per/Crsh	Per/Veh
Indiana	208,397	362,792	344,857	1.74	1.65	0.95
Arizona	139,776	268,774	399,826	1.92	2.86	1.49
Tennessee	142,058	247,255	333,895	1.74	2.35	1.35
Ohio 2005	358,127	639,870	810,853	1.79	2.26	1.27

The major question to be answered is whether a valid injured and transported variable can be created from the Person file. Table 6 shows the injury variables from the Ohio 2005, Tennessee 2004, and Arizona 2005 Person files. The percentages are fairly consistent.

Table 6 Distributions of Injury Severity from Ohio 2005, Tennessee 2004, and Arizona 2005 Person Files

Ohio 2005	N	%
K	1,326	0.2
A	11,051	1.4
B	52,599	6.5
C	67,595	8.3
O	636,642	78.5
U	41,640	5.1
Total	810,853	100.0

Tennessee	N	%
K	1,341	0.4
A	6,475	1.9
B	20,892	6.3
C	39,130	11.7
O	257,088	77.0
U	8,969	2.7
Total	333,895	100.0

Arizona	N	%
K	1,184	0.3
A	6,964	1.7
B	25,205	6.3
C	38,412	9.6
O	304,309	76.1
U	23,752	5.9
Total	399,826	100.0

Table 7 shows the injury variable from the Indiana Person file. Many of the missing values (.) are likely O-injuries, but compared to Table 6, A-injuries appear underrepresented, B-injuries are overrepresented by about a factor of two, and C-injuries are underrepresented by about a factor of three. The process of recording injury status in Indiana is not consistent with the other states. It may also be not clear what the category 'Refused' refers to in the context of injury severity.

Table 7 Distribution of Injury Severity, Indiana 2005 Person File

Indiana	N	%
K	938	0.3
A	3,835	1.1
B	44,876	13.0
C	10,666	3.1
.	249,957	72.5
U	4,667	1.4
Not reported	5,169	1.5
Refused	24,749	7.2
Total	344,857	100.0

In order to investigate the discrepancy in injury status, several PARs from the Trucks Involved in Fatal Accidents (TIFA) study conducted at the University of Michigan Transportation Research Institute were pulled from the state of Indiana. Two different versions of the Indiana PAR form were found. In one version, there is no space for recording a C-injury, which explains the low percentage of C-injuries shown in Table 7. In the Indiana Officer's Standard Crash Report Manual [24], officers are instructed to select the option that best describes the person's injury status from the available choices. In the absence of an entry for a C-injury, it is likely many officers are recording B-injuries, which explains the relatively high percentage of B-injuries in Table 7. Furthermore, a software client, Automated Reporting Information Exchange System (ARIES), has been developed so officers can complete the Indiana Crash Report Form electronically [25]. Although it appears that the Indiana Person File has too few records, this evaluation focuses on injury involvements, and most of the missing cases are likely O-injuries[1]. Furthermore, from Table 6, the percentages of injured (A,B,C) in Ohio, Tennessee, and Arizona are 16.2, 19.9, and 17.6, respectively. From Table 7, the percentage in Indiana is 17.2.

The emergency number variable in the Indiana PAR file for assessing the transported criterion was also checked. A transported variable was created after removing invalid codes such as 'Refused', 'None', 'NA', and 'Notransport'. Table 8 shows a comparison in which the percentages of transported are 12.2, 13.1, and 10.1 for Indiana, Tennessee, and Ohio, respectively. Since only the percentage 'Yes' is relevant for the MCMIS evaluation, it is not important that the percentages of 'No' or 'Unknown' differ among states.

[1] The Vehicle file contains a number dead variable and a number injured variable. A maximum injury severity in the crash variable was created from the Person file and it compares exactly with the number dead variable (154 K involvements for qualifying vehicles), and it almost compares exactly with the number injured variable (3,155 A, B, C involvements for the maximum injury severity compared to 3,238 involvements for the number injured, a difference of 83).

Table 8 Comparison of Transport Variables Between Indiana 2005, Tennessee 2004, and Ohio 2005

	Indiana		Tennessee		Ohio 2005	
Transported	N	%	N	%	N	%
Yes	41,915	12.2	43,591	13.1	83,106	10.2
No	302,942	87.8	268,913	80.5	458,188	56.5
Unknown	0	0.0	21,391	6.4	269,559	33.2
Total	344,857	100.0	333,895	100.0	810,853	100.0

Following the strict sense of the definition, an injured and transported variable was created from the injury severity and transported variables in the Person file. This variable was merged into the Vehicle file to be used for estimating the number of qualifying vehicles satisfying the injured and transported criterion.

With respect to towed vehicles, there is a towed (yes, no) variable in the PAR file at the vehicle level. There is also a damage estimate variable, but it is a dollar amount estimate of the crash. A property damage variable is coded, but it does not appear to help in the sense of a usual extent of damage variable. It seems only the towed flag is available. However, it can be noted that at the vehicle level, the percentage of vehicles towed in the Indiana PAR file is about 30 percent. This is consistent with the percentage of towed due to disabling damage in the 2005 GES file [26] and the towed due to disabling damage in the recently completed Arizona MCMIS study [20]. Therefore, a towed flag variable was created at the crash level from the towed variable to be used for estimating the number of qualifying vehicles satisfying this criterion.

Table 9 shows the numbers of qualifying vehicles that meet the threshold for a MCMIS reportable crash according to the MCMIS criteria. In total, it is estimated that 7,193 vehicles were reportable to the MCMIS Crash file. Of these, 154 were involved in fatal crashes and 2,129 or about 30 percent were involved in crashes where at least one person was transported for medical attention. Based on the towed flag variable described above, it is estimated that 4,910 or about 68 percent of qualifying vehicles were involved in crashes where at least one vehicle was towed due to disabling damage.

Table 9 Reportable Records in Indiana Crash File, 2005

Crash type	N	%
Fatal	154	2.1
Injury transported for treatment	2,129	29.6
Vehicle towed due to damage	4,910	68.3
Total	7,193	100.0

5. Factors Associated with Reporting

The procedure described in the previous section identified 7,193 vehicles involved in crashes as reportable to the MCMIS Crash file. The match process described in Section 3 determined that 5,875 unique cases were reported to the MCMIS Crash file, of which 5,848 could be matched to the Indiana PAR data. Of the 5,848 cases that could be matched, 5,789 were determined to meet the MCMIS Crash file reporting criteria. Therefore, of the 7,193 reportable crashes in 2005, Indiana reported 5,789, for an overall reporting rate of 80.5 percent. In this section, some of the factors that affect the chance that a qualifying crash would be submitted through the SafetyNet

system and appear in the MCMIS Crash file are identified. The results are presented in five subsections: overreporting, case processing, reporting criteria, reporting agency and area, and truck/bus fire and explosion occurrence. Analysis of overreporting attempts to identify why cases were submitted that do not meet the MCMIS reporting criteria as defined by Table 2. Case processing deals with timing issues in reporting such as crash month and time lag between crash date and uploading date to the MCMIS Crash file. Reporting criteria includes factors such as vehicle type and crash severity. Reporting agency is associated with differences in reporting rates due to the agency, such as state police or local police, while area investigates reporting by location, such as the county or city where the crash occurred. Truck/bus fire occurrence examines reportable cases of crashes involving fire or explosion.

5.1 Overreporting

MCMIS evaluations tend to focus on underreporting because sources of underreporting tend to be more prevalent than overreporting. However, almost all states overreport cases to some degree. Overreporting results when cases are submitted to the MCMIS Crash file that do not meet the criteria for a reportable crash. Since 5,848 MCMIS cases could be matched to the Indiana PAR data, and 5,789 were determined to meet the reporting criteria, the difference, or 59 cases, were not reportable, and should not have been reported.

Table 10 shows a two-way classification of vehicle type and crash severity, and provides some explanation as to why these vehicles should not have been reported to the MCMIS Crash file. Note that all 59 vehicles do not meet the crash severity threshold for a MCMIS reportable crash. In addition, 33 vehicles do not meet the vehicle criteria since they are not trucks, buses, or hazmat placarded vehicles. The 20 trucks and 6 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 from the scene.

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

Vehicle type	Crash severity				
	Fatal	Transported injury	Towed/disabled	Other crash severity	Total
Truck	0	0	0	20	20
Bus	0	0	0	6	6
Other vehicle (not transporting hazmat)	0	0	0	33	33
Total	0	0	0	59	59

5.2 Case Processing

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

Table 11 shows reporting rates according to month of the crash. The rates are very consistent and close to the overall average of 80.5 percent, except for September and October where rates are about 10 percentage points below average. January, September, and October are months where the percentage of total unreported cases exceeds 10 percent. Other than these differences, reporting by crash month is fairly consistent.

Table 11 Reporting Rate by Accident Month, Indiana 2005

Crash month	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
January	799	81.4	149	10.6
February	566	85.0	85	6.1
March	589	82.9	101	7.2
April	549	82.0	99	7.1
May	559	84.3	88	6.3
June	608	81.1	115	8.2
July	535	80.9	102	7.3
August	608	80.4	119	8.5
September	514	69.6	156	11.1
October	559	72.6	153	10.9
November	630	83.0	107	7.6
December	677	80.8	130	9.3
Total	7,193	80.5	1,404	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. Therefore, a positive number for a month gives the average number of days that cases were submitted after the 90-day grace period. Negative numbers indicate that on average, cases were submitted within the 90-day grace period for a month. Since all numbers in Figure 3 are negative, the plot shows that on average Indiana cases were uploaded to the MCMIS Crash file within the 90-day grace period. Even in October, which represents the month in which cases were uploaded the latest, the average latency was -15 days, suggesting that on average, cases were uploaded about 15 days prior to the end of the grace period.

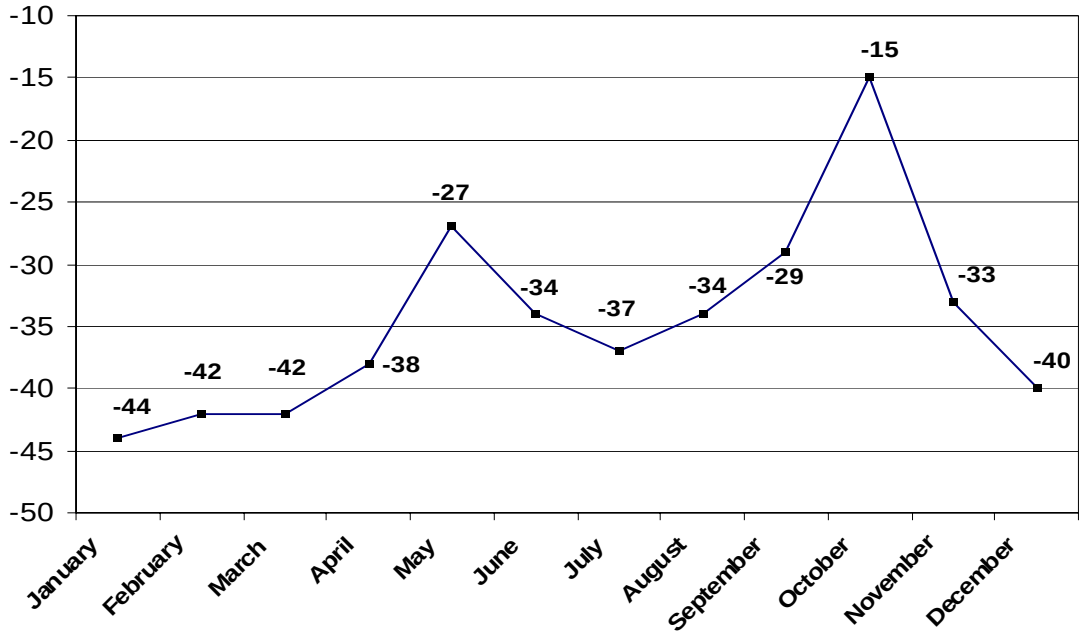


Figure 3 Average Latency (in Days, Minus 90) in Reporting to the MCMIS Crash File, Indiana Reported Cases, 2005

5.3 Reporting Criteria

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

Table 12 shows reporting rates by vehicle type. The reporting rates follow the usual trends found in previous studies. Trucks have a higher rate than buses. Since trucks are the dominant vehicle type, the reporting rate of 81.0 percent is very close to the overall rate of 80.5 percent. Note that trucks account for 90.3 percent of the total unreported cases. Buses have a reporting rate of 73.4 percent and account for 9.6 percent of the unreported cases. Only one reportable vehicle was identified as a hazmat placarded vehicle that is neither a truck nor a bus, and this vehicle was not

Table 12 Reporting Rate by Vehicle Type, Indiana 2005

Vehicle type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck	6,684	81.0	1,268	90.3
Bus	508	73.4	135	9.6
Transporting hazardous materials	1	0.0	1	0.1
Total	7,193	80.5	1,404	100.0

reported.

Table 13 shows reporting rates in greater detail according to vehicle body type. As is often the case, large trucks are more likely reported than medium size trucks. The reporting rates for tractors pulling one or two trailers are greater than 90 percent, while the reporting rate for single unit trucks (SUTs) with 3 or more axles falls to 84.7 percent, and the rate for SUTs with 2-axles and 6 tires declines even further to 59.9 percent. Note that the greatest percentage of unreported cases is 45.2 percent for SUTs with 2-axles and 6 tires, and therefore, has a negative impact on the overall reporting rate. The rate for SUTs pulling a trailer is also well below average at 55.1 percent, and this vehicle configuration accounts for 7.9 percent of unreported cases. At 92.8 percent, school buses have a higher rate than buses with more than 15 seats including the driver, but none of the 92 reportable buses with 9-15 seats including the driver were reported. These 92 cases account for 6.6 percent of the unreported cases. It can be seen that one reportable case that was not reported is a farm vehicle. This vehicle is reportable because it corresponds to the hazmat placarded vehicle identified in Table 12.

Table 13 Reporting Rate by Detailed Vehicle Body Style, Indiana 2005

Vehicle body type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck (single 2 axle, 6 tires)	1,582	59.9	635	45.2
Truck (single 3 or more axles)	721	84.7	110	7.8
Truck/trailer (not semi)	247	55.1	111	7.9
Tractor/1 semi trailer	3,881	90.3	375	26.7
Tractor/double trailer	113	91.2	10	0.7
Tractor/triple trailer	7	42.9	4	0.3
Tractor (cab only, no trailer)	133	82.7	23	1.6
Bus (9-15 seats inc drvr)	92	0.0	92	6.6
Bus (15+ seats inc drvr)	152	84.2	24	1.7
School bus	264	92.8	19	1.4
Farm vehicle	1	0.0	1	0.1
Total	7,193	80.5	1,404	100.0

Along with vehicle type, crash severity is another characteristic of a crash that can be considered when determining if a crash meets the threshold for reporting to the MCMIS Crash file. Previous MCMIS evaluations have shown that serious injury crashes tend to be reported at a higher rate than those involving less injury. Table 14 shows reporting rates by crash severity criteria. Even though fatal crashes represent a small fraction of reportable cases, the reporting rate is 90.3 percent. The reporting rate for the injured/transported criterion is 81.9 percent, and the rate for the towed criterion is 79.6 percent. Therefore, the rates for these two criteria do not differ greatly. However, as shown in Table 14, the total percentage of unreported cases is 71.4 percent for the towed criterion, and due to the large numbers of reportable and unreported cases, it largely influences the overall rate of 80.5 percent.

Table 14 Reporting Rate by Crash Severity, Indiana 2005

Crash severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal	154	90.3	15	1.1
Injured/Transported	2,129	81.9	386	27.5
Towed/Disabled	4,910	79.6	1,003	71.4
Total	7,193	80.5	1,404	100.0

Table 15 shows reporting rates to the MCMIS Crash file by maximum injury severity in the crash. The fatal involvement results are identical to those shown in Table 14. In addition to the usual KABCOU scale for recording injury, Indiana also has categories for 'Refused' and 'Not reported'. As described in Section 4, it appears that several versions of the Indiana PAR form are in use. This was verified by pulling forms from the Trucks Involved in Fatal Accidents (TIFA) study. On one form there is no space for recording C-injuries, while on another form the option is available. Therefore, C-injuries are most likely underreported, whereas B-injuries are most likely overreported since officers are most likely recording C-injuries as B-injuries on forms where the C-injury option is not available. If this is the case, then the total of all injuries (A,B,C) should still be accurate[2].

The reporting rates for A, B, and C-injuries are very similar and close to the overall average. The reporting rate for property damage crashes is 80.5 percent and equals the overall average. These results generally differ from other MCMIS evaluations where reporting rates tend to increase with increasing severity. However, the results are consistent with the situation described above in which different PAR forms are in use in Indiana with different categories for recording injury severity. Similarly, based on other evaluations the percentage of total unreported cases tends to increase with decreasing injury severity. Since C-injuries are believed to be underreported, the percentage of total unreported cases, 5.5 percent, is most likely too small. Furthermore, since B-injuries are believed to be overreported, the 28.9 percent of unreported cases is most likely too large. The reporting rates for the Refused, Not reported, and Unknown categories are generally low, but percentages of unreported cases in these categories are also generally low.

[2] It is shown in Section 4 that the total of A, B, and C injuries in the Indiana Person file is comparable to totals obtained from recently completed MCMIS evaluations in Ohio, Tennessee, and Arizona.

Table 15 Reporting Rate by Detailed Injury Severity, Indiana 2005

Crash severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal (K)	154	90.3	15	1.1
Disabling injury (A)	295	82.7	51	3.6
Evident injury (B)	2,126	80.9	406	28.9
Probable injury (C)	411	81.3	77	5.5
Property damage (O)	3,842	80.5	749	53.3
Refused	268	75.0	67	4.8
Not reported	34	64.7	12	0.9
Unknown (U)	63	57.1	27	1.9
Total	7,193	80.5	1,404	100.0

5.4 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.

In the 92 counties in Indiana, the number of reportable cases ranges from 2 to 1,171. Therefore, some of the counties in Indiana are much more densely populated than others and additionally, traffic density is also greater in certain counties compared to others. Table 16 shows the top twelve counties in Indiana, ordered in descending order by the number of reportable cases. It is not too surprising that the largest numbers of reportable cases are associated with counties containing the larger cities. For example, Indianapolis is located in Marion County and Gary is located in Lake County. As shown in Table 16, these two counties rank first and second in terms of reportable cases. After considering these two counties, the numbers of reportable cases declines rapidly.

The reporting rate for the top twelve counties is 78.0 percent, and for the remaining counties it is 83.5 percent, suggesting that the smaller counties tend to have slightly higher reporting rates. It can also be seen that the top twelve counties account for 62.3 percent of the unreported cases. The reporting rate in Marion County is 75.8 percent, which is about 5 percentage points below average, and this county accounts for 20.2 percent of unreported cases. The top two counties in terms of unreported cases, Marion and Lake, account for 30.5 percent of total unreported cases. Of the top twelve counties, Hamilton had the highest reporting rate at 86.2 percent, and St. Joseph had the lowest rate at 70.9 percent.

Table 16 Reporting Rate by County, Indiana 2005

County	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Marion	1,171	75.8	283	20.2
Lake	752	80.9	144	10.3
Allen	335	74.3	86	6.1
Porter	271	83.8	44	3.1
Elkhart	262	77.9	58	4.1
St Joseph	244	70.9	71	5.1
La Porte	194	83.5	32	2.3
Tippecanoe	176	77.8	39	2.8
Vanderburgh	153	77.1	35	2.5
Hamilton	152	86.2	21	1.5
Clark	151	72.8	41	2.9
Hendricks	125	83.2	21	1.5
Top 12 counties	3,986	78.0	875	62.3
Other counties	3,207	83.5	529	37.7
Total	7,193	80.5	1,404	100.0

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. Table 17 shows reporting rates by reporting agency. The data in the Indiana PAR file combines police departments and sheriff's offices into one category and has a separate category for the Indianapolis Police Department. Among the three agencies shown, the State Police have the highest reporting rate at 87.6 percent. The Indianapolis Police Department has the lowest rate at 66.0 percent, but account for 7.9 percent of unreported cases. The majority of cases are handled by other police departments or sheriff's offices and this group has a reporting rate of 78.4 percent and accounts for 73.6 percent of unreported cases.

Table 17 Reporting Rate by Reporting Agency, Indiana 2005

Reporting agency	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Indianapolis PD	326	66.0	111	7.9
PD or sheriff	4,778	78.4	1,034	73.6
State police	2,082	87.6	258	18.4
Unknown	7	85.7	1	0.1
Total	7,193	80.5	1,404	100.0

5.5 Truck/Bus Fire or Explosion

There are two variables in the Indiana PAR file for identifying the occurrence of fire or explosion. One variable is a fire indicator (yes, no), and the other variable is part of an event variable in which fire/explosion is one of several categories. There is space on the PAR form for recording the information for both of these variables (see Appendix B, page 3 of the PAR). Table 18 shows reporting rates by fire/explosion under the assumption that fire or explosion occurred if

it was coded for either of the two variables[3]. There were 95 reportable trucks and 2 reportable buses involved in fire/explosion-related crashes. The rate for trucks involved in fire/explosion-related crashes is 88.4 percent, about 8 percentage points higher than average. Both reportable buses were reported. As shown in Table 18, fire/explosion accounts for a small percentage of unreported cases.

Table 18 Reporting Rate by Fire/explosion, Indiana 2005

Event	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck				
Fire/explosion	95	88.4	11	0.8
Other/unknown	6,589	80.9	1,257	89.6
Bus				
Fire/explosion	2	100.0	0	0.0
Other/unknown	506	73.3	135	9.6
Total	7,192	80.5	1,403	100.0

Table 19 shows percentages of fire/explosion occurrence by injury severity. The A, B, and C-injuries are combined into one category. Although there were only 5 reportable fatal cases, fatal crashes have the highest percentage of fire/explosion involvement at 3.2 percent. The percentages for injury and property damage are similar at 1.4 percent and 1.2 percent, respectively.

Table 19 Fire/explosion and Injury Severity, Indiana 2005

	Fire/explosion				
Injury severity	Yes	%	No	%	Total
Fatal (K)	5	3.2	149	96.8	154
Injury (A,B,C)	39	1.4	2,793	98.6	2,832
None (O)	46	1.2	3,796	98.8	3,842
Other/unknown	7	1.9	358	98.1	365
Total	97	1.3	7,096	98.7	7,193

6. Data Quality of Reported Cases

In this section, the quality of data reported to the MCMIS crash file is considered. 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 Indiana 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.

[3] The total reportable cases shown is 7,192 instead of 7,193 since one reportable vehicle is a hazmat placarded farm vehicle which is not considered as a truck or bus. The farm vehicle was not reported to the MCMIS Crash file.

Table 20 shows missing data rates for selected, important variables in the MCMIS Crash file. The Indiana MCMIS Crash file has a total of 5,875 unique observations (Figure 1). Missing data rates are generally quite low, with a handful of exceptions. On most fundamental, structural variables, such as date, time, number of fatalities and number of injuries, missing data rates are zero. Missing data rates for some other variables are higher. Body type is missing 14.5 percent, DOT number 11.6 percent, driver license class is missing 24.8 percent, and VIN is missing 25.5 percent. The VIN is often an important variable to use in the matching process of MCMIS evaluations. All four event variables are entirely missing. It is not unusual that events two through four are missing data since most crashes consist of a single impact, however, it is unusual that event one is also missing 100 percent of data.

Table 20 Missing Data Rates for Selected MCMIS Crash File Variables, Indiana 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	<0.1
Accident hour	0.0 *	Event one	100.0
Accident minute	0.0	Event two	100.0
County	0.0	Event three	100.0
Body type	14.5	Event four	100.0
Configuration	0.0	Number of vehicles	0.0
GVWR class	5.5	Road access	<0.1
DOT number**	11.6	Road surface	<0.1
Carrier state	0.0	Road trafficway	0.1
Citation issued	2.3	Towaway	0.0
Driver date of birth	2.4	Truck or bus	0.0
Driver license number	2.4	Vehicle license number	0.5
Driver license state	2.4	Vehicle license state	0.2
Driver license class	24.8	VIN	25.5
Driver license valid	2.3	Weather	0.0
* Hour should be in military format (1-24), but values range from 1-12 only.			
** Counting cases where the carrier is coded interstate.			

Hazardous materials variable	Percent unrecorded
Hazardous materials placard	0.0
Percentages of hazmat placarded vehicles only:	
Hazardous cargo release	0.0
Hazardous materials class (1-digit)	9.5
Hazardous materials class (4-digit)	10.1
Hazardous materials name	23.0

Of 5,875 observations, the hazardous materials placard variable has no missing values. Of these, 148 vehicles were recorded as displaying a hazmat placard. The table above shows information about the recording of four hazmat variables only for those vehicles coded with a hazmat placard. The 1-digit and 4-digit hazardous materials class variables are missing about 10 percent of 148 cases, while hazardous materials name is missing 23.0 percent.

Values of variables in the MCMIS Crash file were also compared with the values of comparable variables in the Indiana crash file. The purpose of this comparison is to identify any errors in translating variables from the values in the state crash file to the values required for Safetynet. Indiana has adopted in many instances the same code levels for certain variables as are used in the MCMIS Crash file.

Table 21 shows the coding of vehicles in the MCMIS Crash file and the record as it appears in the Indiana Crash file. This comparison is between the 5,848 observations that were matched between the two files (Figure 1). Differences in coding are highlighted by the shaded regions. Consistency between coding in the two files is generally good, due in part to the similar descriptions of the configuration code levels. In the Indiana Crash file, 110 vehicles coded as tractor (cab only, no trailer), or bobtails, were coded as truck trailers in the MCMIS Crash file. One vehicle coded as a pickup in the Indiana Crash file was coded as an SUT with 2-axles and 6 tires. This case may not be inconsistent. Note that no vehicles are coded as buses with seats for 9-15 including the driver. This is consistent with Table 13 in which 92 of these vehicles were reportable, but none were reported.

Table 21 Vehicle Configuration in Indiana and MCMIS Crash Files, 2005

Vehicle configuration			
MCMIS Crash file	Indiana Crash File	N	%
Bus (seats>15,incl dr)	Bus (15+ seats incl dr)	130	2.2
Bus (seats>15,incl dr)	School bus	249	4.3
SUT, 2-axle, 6-tire	Pickup	1	0.0
SUT, 2-axle, 6-tire	Truck (single 2 axle, 6 tires)	954	16.3
SUT, 3+ axles	Truck (single 3 or more axles	612	10.5
Truck trailer	Truck/trailer (not semi)	139	2.4
Truck trailer	Tractor (cab only, no trailer)	110	1.9
Tractor/semitrailer	Tractor/ 1 semi trailer	3,513	60.1
Tractor/double	Tractor/double trailer	105	1.8
Tractor/triple	Tractor/triple trailer	3	0.1
Unk heavy truck>10,000	Combination veh	32	0.5
Total		5,848	100.0

Finally, Table 22 shows a comparison between recording the numbers of fatals in the crash in the two files. Except for a total of 5 cases, there appears to be agreement between matched vehicles in both files.

Table 22 Comparison of Fatals in Crash in MCMIS and Indiana Crash Files, 2005

Number of fatals in crash			
MCMIS Crash file	Indiana Crash file	N	%
0	0	5,705	97.6
0	1	3	0.1
1	0	2	0.0
1	1	129	2.2
2	2	5	0.1
3	3	3	0.1
4	4	1	0.0
Total		5,848	100.0

7. Summary and Discussion

This report is an evaluation of reporting to the MCMIS Crash file by the state of Indiana in 2005. Records were matched between the Indiana PAR file and the MCMIS Crash file using variables common to both files with low percentages of missing data. After removing duplicate records from both files, 362,552 unique records remained for matching from the PAR file and 5,875 unique records remained for matching from the MCMIS file. In total, 5,848, or 99.5 percent of the MCMIS records were matched (Figure 1).

The next step in the evaluation process focused on identifying reportable cases using the Indiana PAR file according to established vehicle and crash severity criteria. Overall, 19,153 vehicles were identified as qualifying trucks or buses. Of qualifying vehicles, 90.1 percent are trucks and 9.9 percent are buses. In total, 314 vehicles were identified as hazmat placarded vehicles, but only four of these were non-trucks (Table 4). One of the hazmat placarded vehicles is coded as a farm truck.

After identifying qualifying vehicles, it is necessary to determine which of these vehicles meet the crash severity criteria for reporting to MCMIS. The Indiana Person file has an injury variable and an emergency number variable. These two variables were used to create an injured and transported variable at the crash level. While examining the injury variable, it became evident that the distribution was not consistent with the distributions of injury variables from other states. Compared to other states, the proportion of B-injuries was large and the proportion of C-injuries was small. Examination of crash report forms revealed that at least two different forms are in use in Indiana. One of the forms does not contain a check box for recording C-injuries. Since the Officer's Standard Crash Report Manual [24] instructs officers to check the box that best describes injury status, it is likely that officers are choosing B-injury in the absence of a space for recording C-injury. This would explain the low percentage of recorded C-injuries (Table 7). However, the total percentage of A, B, and C-injuries in the Indiana Person file is 17.2 percent, which is consistent with percentages from other states.

The emergency number variable was also checked for assessing the transported criterion. After removing invalid codes from this variable such as 'Refused' and 'NA', it is estimated that 12.2 percent of persons were transported for medical treatment. This percentage is consistent with findings in other recent MCMIS evaluations (Table 8). In summary, the injured and transported

criterion was satisfied if at least one person in the crash had injury severity equal to A or B or C, and the emergency number was recorded with a valid entry.

With respect to towed vehicles, the Indiana PAR file has a towed (yes,no) variable. An extent of damage variable could not be found to apply the definition of towed due to disabling damage exactly. However, the number of vehicles towed in the Indiana PAR file is about 30 percent. This is consistent with the percentage of towed due to disabling damage in the 2005 GES file [26], and the towed due to disabling damage in the recently completed Arizona MCMIS study [20]. Therefore, a towed flag variable created at the crash level from the towed variable at the vehicle level was used to estimate the number of vehicles satisfying this criterion.

Using the procedure described above resulted in identification of 7,193 vehicles involved in crashes that were reportable to the MCMIS Crash file. Of these, 154 were involved in fatal crashes, 2,129 were involved in injury crashes where at least one person was transported for medical attention, and 4,910 were involved in crashes where at least one vehicle was towed from the scene. Of the 5,848 records that were matched between the Indiana PAR file and the MCMIS Crash file, 5,789 were determined to meet the MCMIS Crash file reporting criteria. Therefore, the overall reporting rate in Indiana in 2005 is estimated at 5,789/7,193 = 80.5 percent. The difference between 5,848 and 5,789 suggests that 59 cases were overreported to the MCMIS Crash file. According to this analysis, all 59 cases did not meet the crash severity threshold for reporting to MCMIS.

Since the overall reporting rate is estimated at 80.5 percent, specific variables were examined to identify sources of underreporting. Reporting rates were calculated and presented in four groups. The four groups are case processing, reporting criteria, reporting agency and area, and fire/explosion. Case processing considers timing issues, reporting criteria deals with vehicle and crash severity issues, agency and area are related to the reporting agency and the county of the crash, and fire/explosion considers fire or explosions in reportable vehicles.

Except for September and October, there was not much variability in reporting rates according to month of the crash. The reporting rates in September and October were about 10 percent below the 80.5 percent overall average. In addition, January, September, and October are months where the percentage of total unreported cases exceeds 10 percent. Other than these differences, reporting by crash month is fairly consistent. The lag time between crash date and the date crashes were uploaded to the MCMIS Crash file were within the 90-day grace period for all twelve months in Indiana. Even in October, which represents the month in which cases were generally uploaded the latest, cases were uploaded about 15 days prior to the end of the grace period. In January, which represents the month with the shortest lag time, cases were uploaded about 44 days before the end of the grace period.

The Indiana PAR file has a vehicle configuration variable that defines trucks and buses of interest for identifying MCMIS qualifying vehicles. The categories are similar to those found in the MCMIS Crash file. Overall, the reporting rate is 81.0 percent for trucks, and 73.4 percent for buses. Tractors pulling one trailer, two trailers, and school buses have the highest rates at 90.3 percent, 91.2 percent, and 92.8 percent, respectively. SUTs with 3 or more axles, bobtails, and buses with 15+ seats have similar rates of 84.7 percent, 82.7 percent, and 84.2 percent, respectively. Lower rates of 59.9 percent were observed for SUTs with 2 axles and 6 tires, and 55.1 percent for truck trailers. It can be noted that 45.2 percent of the unreported cases are

attributable to SUTs with 2 axles and 6 tires. For buses with seats for 9-15 including the driver, all 92 reportable cases were not reported.

Based on crash severity, the reporting rate is 90.3 percent for fatal crashes, 81.9 percent for injured/transported crashes, and 79.6 percent for towed crashes. A frequency table of the injury variable in the Indiana Person file shows that C-injuries tend to be underestimated and B-injuries tend to be overestimated compared to results found in other states. Inspection of Indiana crash reports shows that at least two versions of the form are in use. On one form there is no place for officers to record C-injuries. In this case, when a C-injury occurs it is likely officers are recording B-injuries in place of C-injuries. In addition to the categories of KABCOU for injury severity, the Indiana injury variable also has categories for 'Refused' and 'Not reported'.

There are 92 counties in Indiana. By the number of reportable cases, the top 12 counties have a reporting rate of 78.0 percent, while the remaining counties have a rate of 83.5 percent. This suggests that counties that are more densely populated tend to have lower reporting rates. The reporting rate in Marion County, in which Indianapolis is located, is 75.8 percent. In addition, this county accounts for 20.2 percent of the unreported cases. The top 12 counties account for 62.3 percent of the unreported cases, while the remaining 80 counties account for 37.7 percent. The highest reporting rate is in Hamilton County where the reporting rate is 86.2 percent, and the lowest rate is in St. Joseph County where the reporting rate is 70.9 percent. With respect to agency, the Indiana State Police has a reporting rate of 87.6 percent, and police departments and sheriff's offices have a rate of 78.4 percent. The lowest rate was found for the Indianapolis Police Department at 66.0 percent.

An events variable along with a fire indicator flag were used to assess fire/explosion in the vehicle. One of the categories of the events variable is for fire/explosion. It was assumed that a case involved explosion or fire if either the flag variable or the events variable were coded. Of the 7,192 reportable trucks or buses, it could be determined that 97 cases involved explosion or fire. Of these, 95 are trucks and 2 are buses. Both buses were reported, but 11 of the trucks were not reported.

Except for a few variables, missing data rates are low in the MCMIS Crash file. Variables such as VIN, driver license class, and body type are missing more than 10 percent. All four event variables are entirely missing. This is not so unusual for events two through four, but it is unusual for the first event. Comparison of the vehicle configuration variable in the PAR file and the MCMIS file shows general agreement between the two variables. The comparison is between the 5,848 vehicles that were matched between the two files. Of these vehicles, 110 bobtails in the Indiana PAR file were classified as truck trailers in the MCMIS Crash file.

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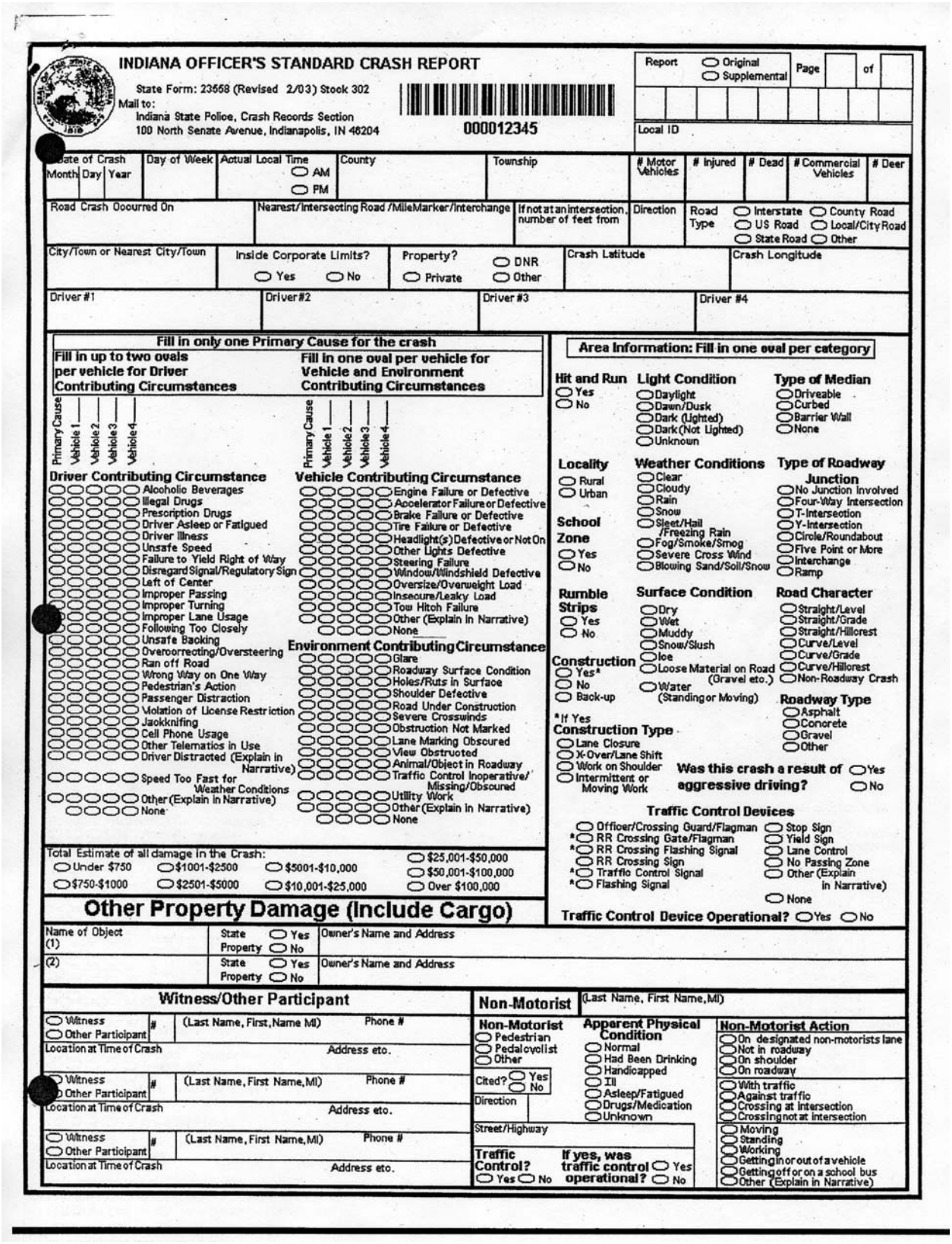
Appendix Variables from Indiana PAR Data to Identify a MCMIS-Reportable Crash

MCMIS Reporting Criteria	Implementation in Indiana PAR Data
Truck with GVWR over 10,000 or GCWR over 10,000	The unity type variable in the Indiana PAR file was used to identify medium/heavy trucks with GVWR 10,000 lbs or greater unit type = 5 – SUT, 2 axles, 6 tires; 6 – SUT, 3+ axles; 7 – Truck trailer (not semi); 8 – Tractor/semi; 9 – Tractor/double; 10 – Tractor/triple; 11 – Tractor / no trailer (bobtail)
***or* Bus with seating for at least nine, including the driver**	The following codes were used to identify eligible buses: unit type = 14 – Bus (9-15 seats incl driver); 15 – Bus (15+ seats incl driver); 16 – School bus
***or* Vehicle displaying a hazardous materials placard**	These vehicles were identified using the hazardous placard variable. In total, 314 vehicles were identified. Of these, 4 are non-trucks.
AND	
at least one fatality	The Indiana Person file contains an injury variable coded according to the usual KABCOU scale. It also has categories for 'Not reported' and 'Refused'. (.) denotes missing. See Section 4 for a discussion related to issues associated with this variable. The codes are Injury = 1 – Fatal (K); 2 – Incapacitating (A); 3 – Non-incapacitating (B); 4 – Possible (C); (.) – No Injury (O); 5 – Not reported; 6 – Unknown; 7 - Refused

MCMIS Reporting Criteria	Implementation in Indiana PAR Data
***or* at least one person injured and transported to a medical facility for immediate medical attention**	A maximum injury severity in the crash variable was created from the injury variable in the Person file. In addition, the emergency number variable was used to create a transported variable. The injured/transported criterion was met by the following condition: Injured/transported = (maximum injury severity in (A or B or C) and (transported =yes)
***or* at least one vehicle towed due to disabling damage**	A towed flag at the crash level was created from a towed flag variable at the vehicle level. See Section 4 for a detailed discussion of this variable. This criterion was met if at least one vehicle in the crash was towed.

Appendix B Indiana Officer's Standard Crash Report (02/03)



INDIANA OFFICER'S STANDARD CRASH REPORT

State Form: 23568 (Revised 2/03) Stock 302
Mail to:
Indiana State Police, Crash Records Section
100 North Senate Avenue, Indianapolis, IN 46204

000012345

Report ○ Original ○ Supplemental | Page | of

Local ID

Date of Crash Month | Day | Year | Day of Week | Actual Local Time ○ AM ○ PM | County | Township | # Motor Vehicles | # Injured | # Dead | # Commercial Vehicles | # Deer

Road Crash Occurred On | Nearest/Intersecting Road /MileMarker/Interchange | If not at an intersection, number of feet from | Direction | Road Type ○ Interstate ○ County Road ○ US Road ○ Local/City Road ○ State Road ○ Other

City/Town or Nearest City/Town | Inside Corporate Limits? ○ Yes ○ No | Property? ○ Private ○ DNR ○ Other | Crash Latitude | Crash Longitude

Driver #1 | Driver #2 | Driver #3 | Driver #4

Fill in only one Primary Cause for the crash

Fill in up to two ovals per vehicle for Driver Contributing Circumstances

Fill in one oval per vehicle for Vehicle and Environment Contributing Circumstances

Primary Cause | Vehicle 1 | Vehicle 2 | Vehicle 3 | Vehicle 4

Driver Contributing Circumstance
- Alcoholic Beverages
- Illegal Drugs
- Prescription Drugs
- Driver Asleep or Fatigued
- Driver Illness
- Unsafe Speed
- Failure to Yield Right of Way
- Disregard Signal/Regulatory Sign
- Left of Center
- Improper Passing
- Improper Turning
- Improper Lane Usage
- Following Too Closely
- Unsafe Backing
- Overcorrecting/Oversteering
- Ran off Road
- Wrong Way on One Way
- Pedestrian's Action
- Passenger Distraction
- Violation of License Restriction
- Jackknifing
- Cell Phone Usage
- Other Telematics in Use
- Driver Distracted (Explain in Narrative)
- Speed Too Fast for Weather Conditions
- Other (Explain in Narrative)
- None

Vehicle Contributing Circumstance
- Engine Failure or Defective
- Accelerator Failure or Defective
- Brake Failure or Defective
- Tire Failure or Defective
- Headlight(s) Defective or Not On
- Other Lights Defective
- Steering Failure
- Window/Windshield Defective
- Oversize/Overweight Load
- Insecure/Leaky Load
- Tow Hitch Failure
- Other (Explain in Narrative)
- None

Environment Contributing Circumstance
- Glare
- Roadway Surface Condition
- Holes/Ruts in Surface
- Shoulder Defective
- Road Under Construction
- Severe Crosswinds
- Obstruction Not Marked
- Lane Marking Obscured
- View Obstructed
- Animal/Object in Roadway
- Traffic Control Inoperative/ Missing/Obscured
- Utility Work
- Other (Explain in Narrative)
- None

Area Information: Fill in one oval per category

Hit and Run: ○ Yes ○ No

Light Condition: ○ Daylight ○ Dawn/Dusk ○ Dark (Lighted) ○ Dark (Not Lighted) ○ Unknown

Type of Median: ○ Driveable ○ Curbed ○ Barrier Wall ○ None

Locality: ○ Rural ○ Urban

Weather Conditions: ○ Clear ○ Cloudy ○ Rain ○ Snow ○ Sleet/Hail /Freezing Rain ○ Fog/Smoke/Smog ○ Severe Cross Wind ○ Blowing Sand/Soil/Snow

Type of Roadway Junction: ○ No Junction Involved ○ Four-Way Intersection ○ T-Intersection ○ Y-Intersection ○ Circle/Roundabout ○ Five Point or More ○ Interchange ○ Ramp

School Zone: ○ Yes ○ No

Rumble Strips: ○ Yes ○ No

Surface Condition: ○ Dry ○ Wet ○ Muddy ○ Snow/Slush ○ Ice ○ Loose Material on Road (Gravel etc.) ○ Water (Standing or Moving)

Road Character: ○ Straight/Level ○ Straight/Grade ○ Straight/Hillcrest ○ Curve/Level ○ Curve/Grade ○ Curve/Hillcrest ○ Non-Roadway Crash

Construction: ○ Yes* ○ No ○ Back-up

*If Yes **Construction Type**: ○ Lane Closure ○ X-Over/Lane Shift ○ Work on Shoulder ○ Intermittent or Moving Work

Roadway Type: ○ Asphalt ○ Concrete ○ Gravel ○ Other

Was this crash a result of aggressive driving? ○ Yes ○ No

Traffic Control Devices
- ○ Officer/Crossing Guard/Flagman
- *○ RR Crossing Gate/Flagman
- *○ RR Crossing Flashing Signal
- ○ RR Crossing Sign
- *○ Traffic Control Signal
- *○ Flashing Signal
- ○ Stop Sign
- ○ Yield Sign
- ○ Lane Control
- ○ No Passing Zone
- ○ Other (Explain in Narrative)
- ○ None

Traffic Control Device Operational? ○ Yes ○ No

Total Estimate of all damage in the Crash:
○ Under $750 ○ $750-$1000 ○ $1001-$2500 ○ $2501-$5000 ○ $5001-$10,000 ○ $10,001-$25,000 ○ $25,001-$50,000 ○ $50,001-$100,000 ○ Over $100,000

Other Property Damage (Include Cargo)

Name of Object (1) | State Property ○ Yes ○ No | Owner's Name and Address

(2) | State Property ○ Yes ○ No | Owner's Name and Address

Witness/Other Participant

○ Witness ○ Other Participant | # | (Last Name, First, Name MI) | Phone # | Location at Time of Crash | Address etc.

○ Witness ○ Other Participant | # | (Last Name, First, Name MI) | Phone # | Location at Time of Crash | Address etc.

○ Witness ○ Other Participant | # | (Last Name, First, Name MI) | Phone # | Location at Time of Crash | Address etc.

Non-Motorist

(Last Name, First Name, MI)

Non-Motorist: ○ Pedestrian ○ Pedalcyclist ○ Other

Cited? ○ Yes ○ No

Direction

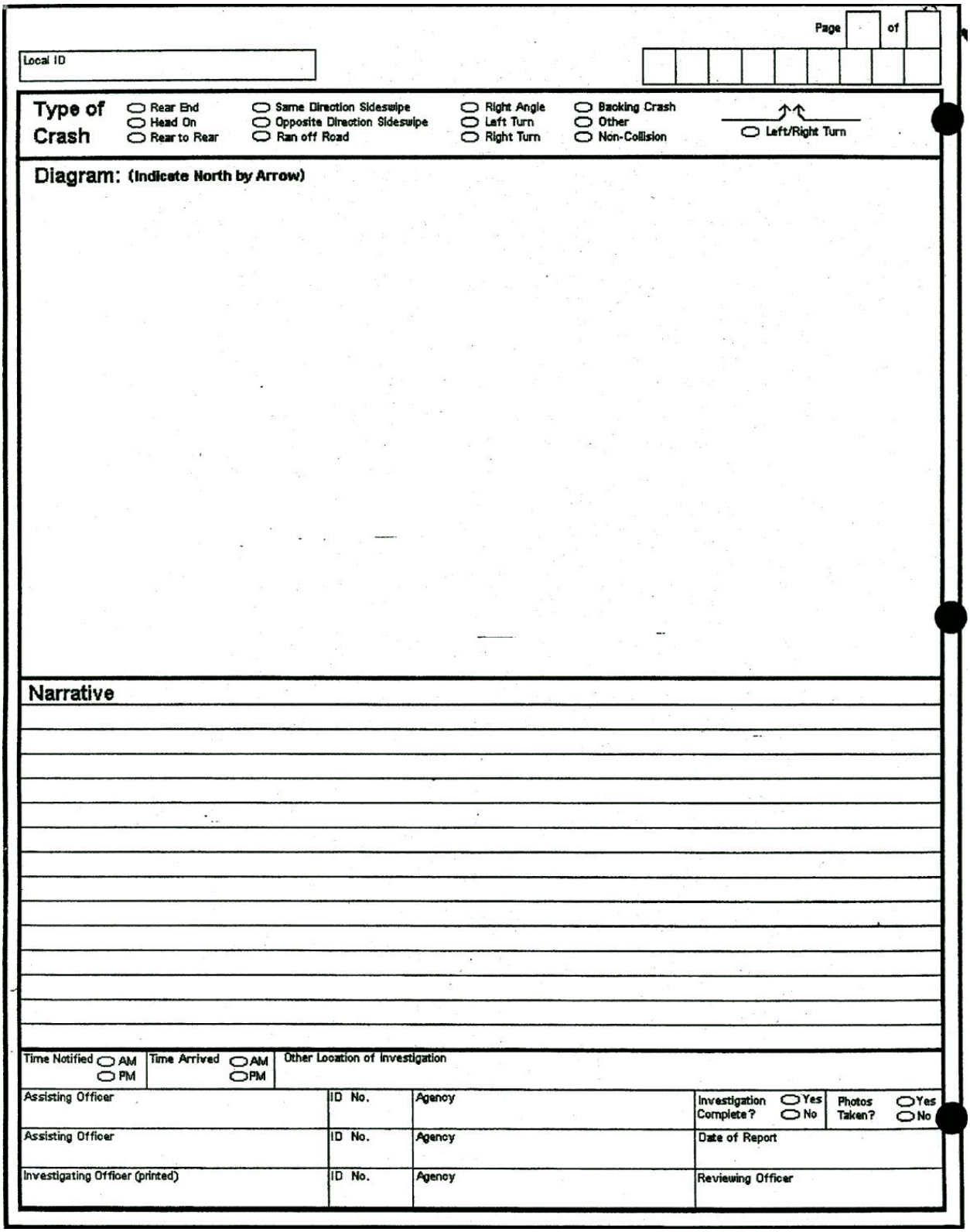
Apparent Physical Condition: ○ Normal ○ Had Been Drinking ○ Handicapped ○ Ill ○ Asleep/Fatigued ○ Drugs/Medication ○ Unknown

Street/Highway

Traffic Control? ○ Yes ○ No

If yes, was traffic control operational? ○ Yes ○ No

Non-Motorist Action
- ○ On designated non-motorists lane
- ○ Not in roadway
- ○ On shoulder
- ○ On roadway
- ○ With traffic
- ○ Against traffic
- ○ Crossing at intersection
- ○ Crossing not at intersection
- ○ Moving
- ○ Standing
- ○ Working
- ○ Getting in or out of a vehicle
- ○ Getting off or on a school bus
- ○ Other (Explain in Narrative)



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Local ID

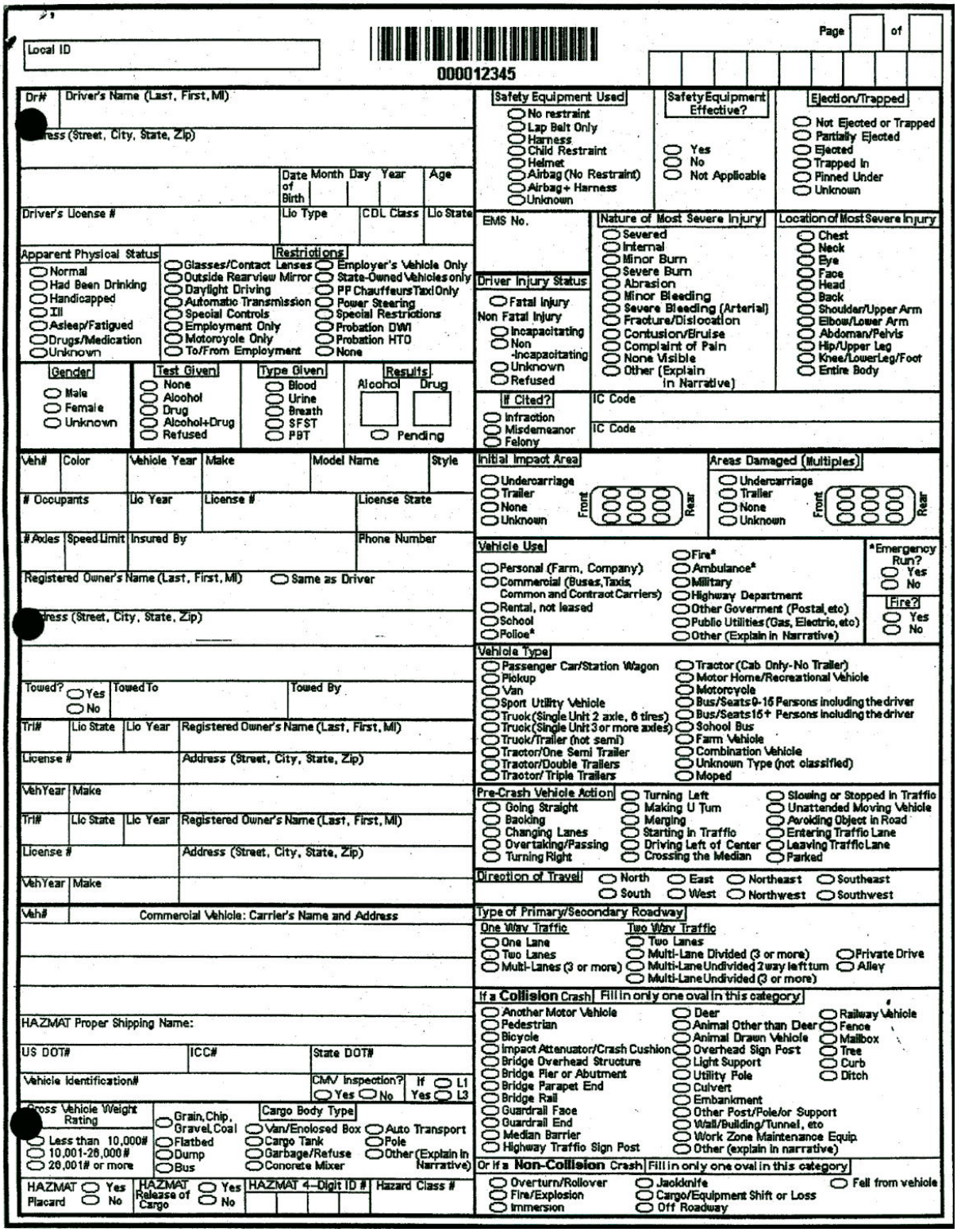
Type of Crash

- Rear End
- Head On
- Rear to Rear
- Same Direction Sideswipe
- Opposite Direction Sideswipe
- Ran off Road
- Right Angle
- Left Turn
- Right Turn
- Backing Crash
- Other
- Non-Collision
- Left/Right Turn

Diagram: (Indicate North by Arrow)

Narrative

Time Notified AM PM	Time Arrived AM PM	Other Location of Investigation		
Assisting Officer	ID No.	Agency	Investigation Complete? Yes No	Photos Taken? Yes No
Assisting Officer	ID No.	Agency	Date of Report	
Investigating Officer (printed)	ID No.	Agency	Reviewing Officer	



Local ID

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Dr# Driver's Name (Last, First, MI)

Address (Street, City, State, Zip)

Date of Birth Month Day Year | Age

Driver's License # | Lic Type | CDL Class | Lic State

Apparent Physical Status: Normal; Had Been Drinking; Handicapped; Ill; Asleep/Fatigued; Drugs/Medication; Unknown

Restrictions: Glasses/Contact Lenses; Outside Rearview Mirror; Daylight Driving; Automatic Transmission; Special Controls; Employment Only; Motorcycle Only; To/From Employment; Employer's Vehicle Only; State-Owned Vehicles only; PP Chauffeurs Taxi Only; Power Steering; Special Restrictions; Probation DWI; Probation HTO; None

Gender: Male; Female; Unknown

Test Given: None; Alcohol; Drug; Alcohol+Drug; Refused

Type Given: Blood; Urine; Breath; SFST; PBT

Results: Alcohol | Drug; Pending

Veh# | Color | Vehicle Year | Make | Model Name | Style

Occupants | Lic Year | License # | License State

Axles | Speed Limit | Insured By | Phone Number

Registered Owner's Name (Last, First, MI) Same as Driver

Address (Street, City, State, Zip)

Towed? Yes No | Towed To | Towed By

Trl# | Lic State | Lic Year | Registered Owner's Name (Last, First, MI)

License # | Address (Street, City, State, Zip)

VehYear | Make

Trl# | Lic State | Lic Year | Registered Owner's Name (Last, First, MI)

License # | Address (Street, City, State, Zip)

VehYear | Make

Veh# Commercial Vehicle: Carrier's Name and Address

HAZMAT Proper Shipping Name:

US DOT# | ICC# | State DOT#

Vehicle Identification# | CMV Inspection? Yes No | If Yes L1 L3

Gross Vehicle Weight Rating: Less than 10,000#; 10,001-26,000#; 26,001# or more

Cargo Body Type: Grain, Chip, Gravel, Coal; Flatbed; Dump; Bus; Van/Enclosed Box; Cargo Tank; Garbage/Refuse; Concrete Mixer; Auto Transport; Pole; Other (Explain in Narrative)

HAZMAT Placard Yes No | HAZMAT Release of Cargo Yes No | HAZMAT 4-Digit ID # | Hazard Class #

Safety Equipment Used: No restraint; Lap Belt Only; Harness; Child Restraint; Helmet; Airbag (No Restraint); Airbag + Harness; Unknown

Safety Equipment Effective? Yes; No; Not Applicable

Ejection/Trapped: Not Ejected or Trapped; Partially Ejected; Ejected; Trapped In; Pinned Under; Unknown

EMS No.

Nature of Most Severe Injury: Severed; Internal; Minor Burn; Severe Burn; Abrasion; Minor Bleeding; Severe Bleeding (Arterial); Fracture/Dislocation; Contusion/Bruise; Complaint of Pain; None Visible; Other (Explain in Narrative)

Location of Most Severe Injury: Chest; Neck; Eye; Face; Head; Back; Shoulder/Upper Arm; Elbow/Lower Arm; Abdoman/Pelvis; Hip/Upper Leg; Knee/LowerLeg/Foot; Entire Body

Driver Injury Status: Fatal Injury; Non Fatal Injury: Incapacitating; Non-Incapacitating; Unknown; Refused

If Cited? Infraction; Misdemeanor; Felony

IC Code

IC Code

Initial Impact Area: Undercarriage; Trailer; None; Unknown

Areas Damaged (Multiples): Undercarriage; Trailer; None; Unknown

Vehicle Use: Personal (Farm, Company); Commercial (Buses, Taxis, Common and Contract Carriers); Rental, not leased; School; Police*; Fire*; Ambulance*; Military; Highway Department; Other Goverment (Postal, etc); Public Utilities (Gas, Electric, etc); Other (Explain in Narrative)

*Emergency Run? Yes No

Fire? Yes No

Vehicle Type: Passenger Car/Station Wagon; Pickup; Van; Sport Utility Vehicle; Truck (Single Unit 2 axle, 6 tires); Truck (Single Unit 3 or more axles); Truck/Trailer (not semi); Tractor/One Semi Trailer; Tractor/Double Trailers; Tractor/Triple Trailers; Tractor (Cab Only-No Trailer); Motor Home/Recreational Vehicle; Motorcycle; Bus/Seats 0-15 Persons including the driver; Bus/Seats 16+ Persons including the driver; School Bus; Farm Vehicle; Combination Vehicle; Unknown Type (not classified); Moped

Pre-Crash Vehicle Action: Going Straight; Backing; Changing Lanes; Overtaking/Passing; Turning Right; Turning Left; Making U Turn; Merging; Starting in Traffic; Driving Left of Center; Crossing the Median; Slowing or Stopped in Traffic; Unattended Moving Vehicle; Avoiding Object in Road; Entering Traffic Lane; Leaving Traffic Lane; Parked

Direction of Travel: North; East; Northeast; Southeast; South; West; Northwest; Southwest

Type of Primary/Secondary Roadway

One Way Traffic: One Lane; Two Lanes; Multi-Lanes (3 or more)

Two Way Traffic: Two Lanes; Multi-Lane Divided (3 or more); Multi-Lane Undivided 2 way left turn; Multi-Lane Undivided (3 or more); Private Drive; Alley

If a **Collision** Crash | Fill in only one oval in this category

Another Motor Vehicle; Pedestrian; Bicycle; Impact Attenuator/Crash Cushion; Bridge Overhead Structure; Bridge Pier or Abutment; Bridge Parapet End; Bridge Rail; Guardrail Face; Guardrail End; Median Barrier; Highway Traffic Sign Post; Deer; Animal Other than Deer; Animal Drawn Vehicle; Overhead Sign Post; Light Support; Utility Pole; Culvert; Embankment; Other Post/Pole/or Support; Wall/Building/Tunnel, etc; Work Zone Maintenance Equip; Other (explain in narrative); Railway Vehicle; Fence; Mailbox; Tree; Curb; Ditch

Or If a **Non-Collision** Crash | Fill in only one oval in this category

Overturn/Rollover; Fire/Explosion; Immersion; Jackknife; Cargo/Equipment Shift or Loss; Off Roadway; Fell from vehicle

Local ID

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red Pre-crash Location: Veh# ____ ○ Pedalcyclist ○ Pedestrian ○ Other (Explain in Narrative)

Name (Last, First, MI) Address, etc.

Safety Equipment Used: ○ No restraint ○ Lap Belt Only ○ Harness ○ Child Restraint ○ Helmet ○ Airbag (No Restraint) ○ Airbag + Harness ○ Unknown

Safety Equipment Effective?: ○ Yes ○ No ○ N/A

Ejection/Trapped: ○ Not Ejected or Trapped ○ Partially Ejected ○ Ejected ○ Trapped In ○ Pinned Under ○ Unknown

Date of Birth: Month Day Year Age

Gender ○ Male ○ Female ○ Unknown

Position in or on Vehicle (Front / Rear)

Victim Injury Status: ○ Fatal Injury; Non Fatal Injury: ○ Incapacitating ○ Non-Incapacitating ○ Unknown ○ Refused

EMS No.

Nature of Most Severe Injury: ○ Severed ○ Minor Burn ○ Internal ○ Severe Burn ○ Abrasion ○ Minor Bleeding ○ Severe Bleeding (Arterial) ○ Fracture/Dislocation ○ Contusion/Bruise ○ Complaint of Pain ○ None Visible ○ Other (Explain in Narrative)

Location of Most Severe Injury: ○ Head ○ Face ○ Eye ○ Neck ○ Chest ○ Back ○ Shoulder/Upper Arm ○ Elbow/Lower Arm ○ Abdomen/Pelvis ○ Hip/Upper Leg ○ Knee/Lower Leg/Foot ○ Entire Body

Test Given: ○ None ○ Alcohol ○ Drug ○ Alcohol+Drug ○ Refused

Type Given: ○ Blood ○ Urine ○ Breath ○ SFST ○ PBT

Results: Alcohol; Drug; Pending ○

Injured Pre-crash Location: Veh# ____ ○ Pedalcyclist ○ Pedestrian ○ Other (Explain in Narrative)

Name (Last, First, MI) Address, etc.

Safety Equipment Used: ○ No restraint ○ Lap Belt Only ○ Harness ○ Child Restraint ○ Helmet ○ Airbag (No Restraint) ○ Airbag + Harness ○ Unknown

Safety Equipment Effective?: ○ Yes ○ No ○ N/A

Ejection/Trapped: ○ Not Ejected or Trapped ○ Partially Ejected ○ Ejected ○ Trapped In ○ Pinned Under ○ Unknown

Date of Birth: Month Day Year Age

Gender ○ Male ○ Female ○ Unknown

Position in or on Vehicle (Front / Rear)

Victim Injury Status: ○ Fatal Injury; Non Fatal Injury: ○ Incapacitating ○ Non-Incapacitating ○ Unknown ○ Refused

EMS No.

Nature of Most Severe Injury: ○ Severed ○ Minor Burn ○ Internal ○ Severe Burn ○ Abrasion ○ Minor Bleeding ○ Severe Bleeding (Arterial) ○ Fracture/Dislocation ○ Contusion/Bruise ○ Complaint of Pain ○ None Visible ○ Other (Explain in Narrative)

Location of Most Severe Injury: ○ Head ○ Face ○ Eye ○ Neck ○ Chest ○ Back ○ Shoulder/Upper Arm ○ Elbow/Lower Arm ○ Abdomen/Pelvis ○ Hip/Upper Leg ○ Knee/Lower Leg/Foot ○ Entire Body

Test Given: ○ None ○ Alcohol ○ Drug ○ Alcohol+Drug ○ Refused

Type Given: ○ Blood ○ Urine ○ Breath ○ SFST ○ PBT

Results: Alcohol; Drug; Pending ○

Injured Pre-crash Location: Veh# ____ ○ Pedalcyclist ○ Pedestrian ○ Other (Explain in Narrative)

Name (Last, First, MI) Address, etc.

Safety Equipment Used: ○ No restraint ○ Lap Belt Only ○ Harness ○ Child Restraint ○ Helmet ○ Airbag (No Restraint) ○ Airbag + Harness ○ Unknown

Safety Equipment Effective?: ○ Yes ○ No ○ N/A

Ejection/Trapped: ○ Not Ejected or Trapped ○ Partially Ejected ○ Ejected ○ Trapped In ○ Pinned Under ○ Unknown

Date of Birth: Month Day Year Age

Gender ○ Male ○ Female ○ Unknown

Position in or on Vehicle (Front / Rear)

Victim Injury Status: ○ Fatal Injury; Non Fatal Injury: ○ Incapacitating ○ Non-Incapacitating ○ Unknown ○ Refused

EMS No.

Nature of Most Severe Injury: ○ Severed ○ Minor Burn ○ Internal ○ Severe Burn ○ Abrasion ○ Minor Bleeding ○ Severe Bleeding (Arterial) ○ Fracture/Dislocation ○ Contusion/Bruise ○ Complaint of Pain ○ None Visible ○ Other (Explain in Narrative)

Location of Most Severe Injury: ○ Head ○ Face ○ Eye ○ Neck ○ Chest ○ Back ○ Shoulder/Upper Arm ○ Elbow/Lower Arm ○ Abdomen/Pelvis ○ Hip/Upper Leg ○ Knee/Lower Leg/Foot ○ Entire Body

Test Given: ○ None ○ Alcohol ○ Drug ○ Alcohol+Drug ○ Refused

Type Given: ○ Blood ○ Urine ○ Breath ○ SFST ○ PBT

Results: Alcohol; Drug; Pending ○

Injured Pre-crash Location: Veh# ____ ○ Pedalcyclist ○ Pedestrian ○ Other (Explain in Narrative)

Name (Last, First, MI) Address, etc.

Safety Equipment Used: ○ No restraint ○ Lap Belt Only ○ Harness ○ Child Restraint ○ Helmet ○ Airbag (No Restraint) ○ Airbag + Harness ○ Unknown

Safety Equipment Effective?: ○ Yes ○ No ○ N/A

Ejection/Trapped: ○ Not Ejected or Trapped ○ Partially Ejected ○ Ejected ○ Trapped In ○ Pinned Under ○ Unknown

Date of Birth: Month Day Year Age

Gender ○ Male ○ Female ○ Unknown

Position in or on Vehicle (Front / Rear)

Victim Injury Status: ○ Fatal Injury; Non Fatal Injury: ○ Incapacitating ○ Non-Incapacitating ○ Unknown ○ Refused

EMS No.

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Results: Alcohol; Drug; Pending ○