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EVALUATION OF 2008 FLORIDA CRASH DATA REPORTED TO MCMIS CRASH FILE

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16. Abstract

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

MCMIS Crash File records were matched to the Florida Crash file to determine the nature and extent of underreporting. Overall, it appears that Florida is reporting 28.0 percent of crash involvements that should be reported to the MCMIS Crash file. There is some disagreement in vehicle type as determined by VIN decoding and the entry recorded on the police accident report. The reporting rate for truck tractors is 46.7 percent, while the reporting rates for single unit trucks are 6.0, 16.2, and 24.2 percent for trucks with gross vehicle weight ratings in pounds of 10,000-19,5000; 19,501-26,000; and greater than 26,000, respectively. The reporting rate for buses is 5.3 percent.

Fatal crashes are reported at about 86.0 percent, but injured/transported and towed/disabled crashes are reported at about 30.9 and 22.7 percent, respectively. The Highway Patrol has a reporting rate of 85.2 percent, while the reporting rate for police departments is 57.6 percent and for sheriff's offices is 60.6 percent.

Missing data rates are low for most variables. There are some inconsistencies between vehicle configuration as coded in the Florida Crash file and the MCMIS file.

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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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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 crash severity threshold. FMCSA maintains the MCMIS file to support its mission to reduce crashes, injuries, and fatalities involving large trucks and buses. Accurate and complete crash data are essential to assess the magnitude and characteristics of motor carrier crashes and 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 the crash file severity threshold.

The present report is part of a series of reports that evaluate the completeness and accuracy of the data in the MCMIS Crash file. Previous reports showed underreporting due in large part to problems in interpreting and applying the reporting criteria within the states' respective crash reporting systems. The problems often were more severe in large jurisdictions and police departments. Each state also had issues specific to the nature of its own system. [See references 1 to 38.] The states are responsible for identifying and reporting qualifying crash involvements. Accordingly, improved completeness and accuracy ultimately depends upon the efficiency and effectiveness of individual state systems.

This is the second evaluation of Florida Crash data reported to the MCMIS Crash file. The first report was an evaluation of 2003 data.[5] In that report, the estimated reporting rate was 24.0 percent. In this report, we focus on MCMIS Crash file reporting by Florida in 2008. Between 2003 and 2007, Florida has reported from 4,100 to 6,280 involvements annually to the MCMIS Crash file. Florida is the 4th largest state by population and in most years ranks about 3rd among the states in terms of the number of annual truck and bus fatal involvements. In recent years the number of fatal truck and bus involvements in Florida has ranged from 401 in 2003, 425 in 2004, 462 in 2005, 401 in 2006, to 345 in 2007.[39,40]

Police accident report (PAR) data recorded in Florida's statewide files as of January, 2010 were used in this analysis. The 2008 PAR file contains the crash records for 693,832 vehicles.

The usual method for state evaluations consists of the following steps, which we attempted to pursue here:

1. The complete police accident report file (PAR file hereafter) from Florida was obtained for the most recent year for which we had MCMIS Crash file data, which was 2008. An algorithm was developed, using the data coded in the Florida file, to identify all cases that qualified for reporting to the MCMIS Crash file.

2. All cases in the Florida 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 Florida.

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.

2. Data Preparation

The Florida PAR file and MCMIS Crash file each required processing before the Florida records in the MCMIS Crash file could be matched to the Florida PAR file. In the case of the MCMIS Crash file, the major tasks were to extract records reported from Florida and to eliminate duplicate records. The Florida PAR file was reformatted to create a comprehensive vehicle-level file from accident, vehicle, and person data.

The following sections describe the methods used to prepare each file and some of the problems uncovered.

2.1 MCMIS Crash Data File

The 2008 MCMIS Crash file as of June 9, 2009, was used to identify records submitted from Florida. For calendar year 2008 there were 3,860 cases reported to the file from Florida. An analysis file was constructed using all variables in the MCMIS file. This analysis file was examined for duplicate records (more than one record submitted for the same vehicle in the same crash; i.e., the report number and sequence number were identical). One such duplicate pair was found. Further examination revealed that vehicle configuration, license plate number and VIN were different among the two records. It appears that these are two different vehicles in the same crash that were mistakenly assigned the same sequence number. Therefore, these were not considered duplicate cases.

In addition, records were reviewed to find cases with identical values on accident number, accident date/time, county, city, street, VIN, and driver license number, even though their vehicle sequence numbers were different. The purpose is to find and eliminate cases where more than one record was submitted for the same vehicle and driver within a given accident. This can happen as records are corrected. No such duplicates were found. The resulting MCMIS file contains 3,860 unique records.

2.2 Florida Police Accident Report File

The Florida PAR data for 2008 obtained from the state was dated January, 2010. The data were stored as nine text files, representing Crash, Vehicle, and Person records. The combined files contained records for 363,205 traffic crashes involving 693,832 vehicles. Data for the PAR file are coded from the Florida Traffic Crash Report, Long form (revision 1/02) completed by police officers and shown in Appendix A.

The PAR file was first examined for duplicate records (involvements where more than one record was submitted for the same vehicle in the same crash). 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, number formats (such as 77037139 and 77-

37139, for example). A search for records with identical case numbers and vehicle numbers found five instances of duplicates. In two of the pairs, VIN, vehicle model year, and make were different, so these cases were not considered duplicates. The other three pairs were designated duplicates, as the vehicle-specific variables were identical.

Just as in the preparation of the MCMIS Crash file, cases also were examined to determine if there were any records that contained identical case number, time, place, and vehicle/driver variables, regardless of vehicle number. Two crash records would not be expected to be identical on all variables. Records were examined for duplicate occurrences based on the fields for case number, accident date/time, crash county, city, road, vehicle identification number, and driver date of birth. Based on the above algorithm, 74 duplicate records were found. Upon closer examination, one pair differed on vehicle make, model year, and license plate number. Thus, these two cases were not considered duplicates. In the other pairs, these variables were identical, as well as driver birth date. There were some differences in other variables. However, since the major vehicle and driver variables indicated the same vehicle, we considered these as duplicate records. A total of 37 duplicate cases were removed from the file. The resulting PAR file has 693,795 cases.

3. Matching Process

The next step involved matching records from the Florida PAR file to corresponding records from the MCMIS file. There were 3,860 Florida records from the MCMIS file available for matching, and 693,795 records from the Florida PAR file. All records from the Florida PAR data file were used in the match, even those that did not meet the requirements for reporting to the MCMIS Crash file. This allowed the identification of cases reported to the MCMIS Crash file that did not meet the reporting criteria.

Matching records in the two files is accomplished by using combinations of variables common to the two files that have a high probability of uniquely identifying accidents and specific vehicles within the accidents.

In the Florida data Report Number uniquely identified a crash, and was stored as an 8-digit character field. In the MCMIS Crash file Report Number is stored as a 12-character alphanumeric value. The report number in the MCMIS Crash file is constructed as follows: The first two columns contain the state abbreviation (FL, in this case), followed by ten digits, where the last two digits represent the crash year (08). Since the PAR Report Number corresponded to the first 8 numeric digits of the MCMIS Report Number, these variables could be used in the match.

Other data items that are useful in matching at the crash level include Crash Date, Crash Time (stored in military time as hour/minute), Crash County, Crash City, Crash Street, and Reporting Officer’s Identification number. The PAR file contained all of these variables, except for Officer Badge Number. Crash Road in the PAR file frequently matched the format of Crash Street in the MCMIS file, so these variables could be used in the match. City Name was unrecorded in only 2.0% of PAR cases and in less than 0.1% of MCMIS cases. The other variables also had low missing data rates in both files.

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), driver date of birth, and driver name. Only vehicle license number, VIN, and driver date of birth were present in the PAR file. Vehicle license number was unrecorded in 9.2% of PAR cases, and in 0.7% of MCMIS cases. VIN was unrecorded 8.7% of the time in the PAR file, but in only 0.2% of MCMIS cases. Driver date of birth was unrecorded in 15.4% of PAR cases and in 2.4% of MCMIS cases.

The match was performed in five steps, using the available variables. At each step, records in either file with duplicate values on all the match variables for the particular step were excluded, along with records with missing values for the match variables. The first match included the variables crash number, crash date (month, day), crash time (hour, minute), county, road, vehicle identification number (VIN), and driver date of birth. The second match step dropped hour, since it frequently did not match MCMIS hour, even after conversion to military time. Variables used in the second match included crash number, crash date, crash minute, county, city, license plate number, and driver age. After some experimentation, Match 3 consisted of crash number, crash date, county and the last six digits of the VIN. The variables used in the final attempt at a computer-based match were crash number, driver age, and a computed variable specifying if the vehicle was a truck, bus, or other vehicle type. The latter variable was created for matching purposes in the PAR and MCMIS datasets with code levels of Truck, Bus, and Other. Matches in the fourth step were also verified by checking that PAR license plate and VIN matched MCMIS license plate and VIN for each pair. If not, then carrier name had to match. For the twelve cases that did not match on these variables, all vehicles in each crash were examined, and a decision was made if the vehicles matched. All were determined to be valid matches. At this point there were still 46 unmatched cases.

The fifth match was a result of two hand matches. The first consisted of crash date, and county. Of all records found, cases were narrowed to those occurring on the same road and in the same city. Then vehicles were examined for like characteristics. Using this method, ten additional records were matched. The second attempt searched for each MCMIS crash number in the PAR file, and vehicles were inspected for a matching case. An additional 23 cases were matched in this manner. In total, these hand-match attempts yielded an additional 33 matches.

In total, this process resulted in matching 99.7% percent of the 3,860 MCMIS records to the PAR file. Thirteen cases could not be matched. Some records could not be matched due to unrecorded values or different values in the critical match variables (county, crash date, vehicle license plate number, and VIN). Perhaps some of these records were added to the MCMIS file as a result of attempting to apply corrections to the original records. Table 1 shows the variables used in each match step and the number of records matched at each step.

Table 1 Steps in MCMIS/Florida PAR File Match, 2008

Step	Matching variables	Cases matched
Match 1	Crash number, crash date (month, day), crash time (hour, minute), county, road, VIN, and driver date of birth	1,117
Match 2	Crash number, crash date (month, day), crash minute, county, city, license plate number, and driver age	2,274
Match 3	Crash number, crash date, county, and VIN (last 6 digits)	188
Match 4	Crash number, truck/bus type, and driver age	235
Match 5	Hand-matched using all available variables	33
Total cases matched		3,847

The matches made were verified using other variables common to the MCMIS and PAR file as a final check to ensure each match was valid. The above procedure resulted in 3,847 matches, representing 99.7 percent of the 3,860 records reported to MCMIS.

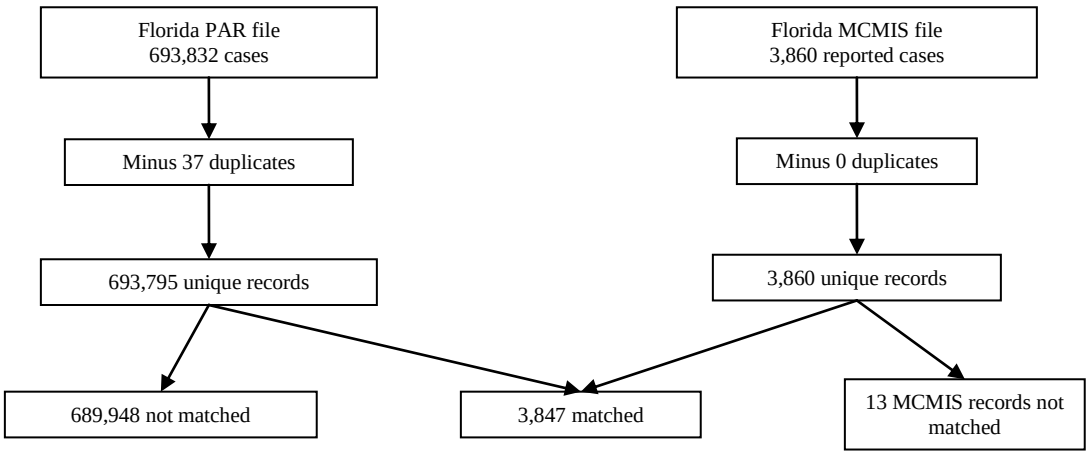

Figure 1 Case Flow in MCMIS/Florida Crash File Match

Of the 3,847 matched cases, 3,209 apparently met the MCMIS reporting criteria (reportable), as well as that could be determined using the data supplied, and 638 did not meet the MCMIS reporting criteria (not reportable). The method of identifying cases reportable to the MCMIS Crash file is discussed in the next section.

4. Identifying Reportable Cases

The next step in the evaluation of crash reporting is to identify records in the Florida data that qualify for reporting to the MCMIS Crash file. Records are selected as reportable using the information available in the computerized crash files supplied by the State of Florida. Records that are reportable to the MCMIS Crash file meet criteria specified by the FMCSA. The reporting criteria cover the type of vehicle and the severity of the crash. These criteria are discussed in more detail below, but the point here is that records transmitted to the MCMIS Crash file must be selected from among all the records in the state's crash data.

The method developed to identify reportable records is intended to be separate from any prior selection by the state being evaluated. This approach provides an independent method of evaluating the completeness of reporting. Accordingly, we use the information recorded by the officers on the crash report for all crashes.

Some states place some of the data elements intended for the MCMIS Crash file in a special section, with instructions to the reporting officer to complete that information only for vehicles and crashes that meet the MCMIS selection criteria. However, Florida includes these variables on the main crash form. Instructions for completing the Name of Motor Carrier variable, for example, are:

> This space must be completed for any self-propelled vehicle – with or without a trailer – being used in commerce to transport cargo, passengers, or any vehicle displaying a hazardous material placard including a van (vehicle type code 02), a light truck with six tires on the ground (vehicle type code 03), a medium truck (vehicle type code 04), a heavy truck (vehicle type code 05), a truck-tractor (vehicle type code 06), a bus designed to transport 9 to 15 passengers (vehicle type code 08), and a bus designed to transport over 15 passengers (vehicle type code 09). [41]

This essentially captures the vehicle criteria for the MCMIS file.

Note: In the Glossary (Appendix A) of the Florida 2008 instruction manual, Commercial Motor Vehicle is defined as: Any self-propelled or towed vehicle used on the public highways in commerce to transport passengers or cargo, if such vehicle:

(a) Has a gross vehicle weight rating of 10,000 pounds or more;
(b) Is designed to transport more than 15 passengers, including the driver; or
(c) Is used in the transportation of materials found to be hazardous for the purposes of the Hazardous Materials Transportation Act, as amended (49 U.S.C. ss. 1801 et seq.).

If the present evaluation of state reporting were limited only to records where those CMV-related data elements had been filled out, it would obviously miss cases that had been missed by the state selection process. Accordingly, the method of identifying reportable cases used in this report attempts to be independent, and relies on variables that describe vehicles and crash severity to determine if they meet the MCMIS Crash file reporting criteria. This approach should provide the best opportunity to identify any cases that might have been overlooked.

The MCMIS criteria for a reportable crash involving a qualifying vehicle are shown in Table 2. Reportable records must meet both the vehicle type and crash severity criteria. The method used for vehicle criteria and crash severity are each discussed in turn. Identifying qualifying vehicles using the Florida PAR data was accomplished using several variables in combination as described below. Identifying vehicles involved in crashes with injuries transported for immediate medical attention or those in crashes in which at least one vehicle was towed due to disabling damage was more straightforward. This is because variables are recorded in the Florida Par file for capturing information related to injury, transportation to a medical facility, and disabling damage to the vehicle. The method used is intended to be conservative, in the sense that vehicles are only selected if variables in the Florida Par file indicate that the criteria described in Table 2 below are satisfied.

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.

4.1 Qualifying Vehicles

The first step is to identify vehicles in the Florida Crash file that meet the MCMIS vehicle criteria shown in the upper portion of Table 2. Seven variables were used in combination to identify qualifying vehicles. All variables are recorded on Page 1 of the Florida Traffic Crash Report Form shown in Appendix A. A hierarchy of variables was defined since some are more useful than others when identifying certain medium/heavy trucks and buses. The seven variables and their level of importance in order are shown in the list below.

1. Vehicle Identification Number (VIN)
2. Vehicle Type
3. Vehicle Use
4. Trailer Type
5. Carrier Name
6. DOT/ICC MCC Identification Number
7. Hazmat Placard

The VIN is the primary variable used to identify whether a vehicle is a qualifying truck or bus because it is the most objective source of vehicle type information. David Hetzel of the National Institute for Safety Research (NISR) kindly decoded the VINs for all vehicles in the Florida Crash file. VIN information is recorded except for approximately 9 percent of the 693,795 vehicles in the data file. In addition to the VIN, the Florida PAR data includes vehicle type and vehicle use variables that are coded from the Florida Traffic Crash Report Form.[See the bottom of Page 1 of the Florida Traffic Crash Report in Appendix A for the codes] To a lesser extent, trailer type, carrier name, and DOT/ICC MCC number were used to aid in the identification of vehicles used for commercial use. The hazmat placard variable was used to identify vehicles displaying a hazardous materials placard that were not already identified as qualifying trucks or buses.

The relevant body type codes and their frequencies are shown in Table 3. Since VIN is used as the primary variable for identifying vehicles, the vehicle types follow those derived by the VIN decoding program with minor exceptions. For a full description of the algorithm used to select

MCMIS qualifying vehicles, the interested reader can see Appendix B. In total, 32,789 vehicles were identified as qualifying trucks, buses, or vehicles displaying a hazardous materials placard.

Table 3 Relevant Body Type Codes
Derived from Florida PAR file, 2008

Vehicle Type	Count	Percent
Single Unit Truck 10,000-19,500 lbs	4,091	12.5
Single Unit Truck 19,501-26,000 lbs	2,721	8.3
Single Unit Truck > 26,000 lbs	5,636	17.2
Medium/Heavy Pickup > 10,000 lbs	143	0.4
Step Van	165	0.5
Walk-In Van	17	0.1
Tractor with or without Trailers	13,358	40.7
Cross Country/ Intercity Bus	244	0.7
Other Bus	1,324	4.0
School Bus	2,692	8.2
Transit/Commuter Bus	1,793	5.5
Large Van	271	0.8
Light Pickup with Trailer/ Commercial Use	227	0.7
Non-Truck or Bus with Hazmat Placard	107	0.3
Total	32,789	100.0

Table 4 shows the distribution of qualifying vehicles by trucks, buses, and other vehicles displaying a hazardous materials placard. Medium or heavy trucks accounted for 81.2 percent of the vehicles, while 18.5 percent were buses. Another 0.3 percent were light vehicles with hazmat placards. Qualifying vehicles account for 32,789/693,795 = 4.7 percent of the vehicles in the 2008 Florida PAR file.

Table 4 Vehicles Meeting MCMIS Vehicle Criteria
Florida PAR File, 2008

Vehicle Type	Count	Percent
Trucks	26,629	81.2
Buses	6,053	18.5
Non-trucks with Hazmat Placard	107	0.3
Total	32,789	100.0

Since identifying qualifying vehicles was accomplished using the algorithm described above, the procedure was repeated two separate ways to check sensitivity of the algorithm. The first method uses only the VIN-decoded variable. The second method uses only the vehicle type variable as recorded on the Florida PAR form. Results are presented in Appendix C for the interested reader. The conclusion is that the two methods identify approximately the same number of qualifying vehicles, even though there are some differences in the vehicle types identified. Furthermore, the

different methods have almost no effect on the resulting reporting rate of reportable involvements by Florida to the MCMIS Crash file, as shown in Appendix C.

4.2 Crash Severity

Having identified vehicles that qualify for reporting to the MCMIS Crash file, the next step is to identify crashes that meet the MCMIS criteria. With respect to crash severity, qualifying crashes include those involving a fatality, an injured person transported for immediate medical attention, or a vehicle towed from the scene due to disabling damage. Florida classifies injury using the common KABCN scale, where injuries are classified as Fatal (K), Incapacitating (A), Non-incapacitating, but evident (B), Possible (C), and No injury. The Florida Crash file includes information about the most severe injury in the crash. A maximum injury in the crash variable was created from the Florida PAR Person file and this variable coincides exactly with the variable already recorded in the Florida data file.

Determining whether an injured person was transported for immediate medical attention is also recorded in the Florida Crash file. There is an Injured Taken To variable in the Crash file indicating whether an injured person was transported to a care facility. It appears this variable is derived according to whether an entry is made in the "Injured Taken To" (facility name) variable on the Florida Crash Report form (Appendix A). A crash was thus determined to meet the MCMIS injury severity criteria if crash severity was Fatal, or if crash severity was A, B, or C injury, and Injured Taken To was 'yes'.

Table 5 shows a cross-tabulation of maximum injury in the crash by whether an injured person was transported to a care facility. In order to qualify as a MCMIS reportable crash, the crash had to meet the strict MCMIS criteria. That is, the crash had to involve a fatality, or an injury transported for medical attention. The right column in Table 5 shows the number of vehicles involved in crashes that are reportable to MCMIS according to the injured and transported criteria. In total, 329 fatal involvements, plus 4,839 injured and transported involvements, gives 5,168 vehicles meeting the injured and transported criteria. This is likely a conservative estimate in the sense that there were 2,524 vehicles involved in crashes with no injury, yet at least one person was transported for medical care. None of these vehicles are designated as MCMIS qualifying. Similarly, for the 37 vehicles involved in crashes in which maximum injury severity is unknown and at least one person was transported for care, no vehicles are identified as MCMIS qualifying.

Table 5 Crashes Qualifying for Submission to MCMIS According to the Injured and Transported Criteria, Florida PAR file, 2008

	Transported			
Maximum Injury in Crash	No	Yes	Total	MCMIS Qualifying
Fatal	93	236	329	329
Incapacitating	73	1,103	1,176	1,103
Non-incapacitating	691	1,977	2,668	1,977
Possible injury	2,040	1,759	3,799	1,759
No injury	21,273	2,524	23,797	0
Unknown	983	37	1,020	0
Total	25,153	7,636	32,789	5,168

The last MCMIS criterion specifies "vehicles towed due to disabling damage." On the Florida Traffic Crash Report form (Appendix A), there is space for the investigating officer to record the extent of damage of each vehicle in the accident. According to the manual describing the instructions for completing the form, there are three categories for assessing damage severity to a vehicle: [41]

1. Disabling damage – vehicle must be towed from the scene of the traffic crash because it is inoperable or is drivable but must be towed from the scene of the traffic crash to prevent additional damage. This does not include a drivable vehicle that is towed from the scene of the traffic crash for any reason.
2. Functional damage – vehicle is operable and is driven away from the scene of the traffic crash in its usual operating manner.
3. No damage – no visible signs of damage.

The disabling damage definition matches closely with the MCMIS criterion. Table 6 shows the distribution of damage severity as it is recorded at the vehicle level in the Florida PAR file for all 693,795 vehicles. Approximately 28 percent of all vehicles in the crash file are coded with disabling damage. Other MCMIS evaluations tend to support an estimate of 30 percent for states that record information on the towed and disabled variables.[20,22,27,28] An analysis of the towed variable in the 2009 General Estimates System (GES) database shows that approximately 26 percent of vehicles are towed due to damage.[42]

Table 6 Distribution of Damage Severity, Florida PAR 2008

Damage severity	Count	Percent
Disabling	196,178	28.3
Functional	427,225	61.6
None	65,559	9.4
Unknown	4,833	0.7
Total	693,795	100.0

Using the definition of disabling damage, a towed and disabled flag variable was created at the crash level to be used for estimating the number of qualifying vehicles satisfying this criterion. As a note, the Florida PAR file contains a crash_damage_severity variable that is coded at the crash level with the same three categories as the damage severity variable. In the 2003 MCMIS evaluation of Florida, however, it was discovered that this variable records the *least* damaged vehicle in the crash, rather than the most damaged vehicle.[5] Inspection of the 2008 data suggests that the crash_damage_severity variable still records the least damaged vehicle in the crash.

Table 7 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 11,456 vehicles were reportable to the MCMIS Crash file. Of these, 329 were involved in fatal crashes and 4,839, or about 42.2 percent, were involved in crashes where at least one person was injured and transported for medical treatment. Based on the damage severity variable described above, it is estimated that 6,288 or about 54.9 percent of reportable vehicles were involved in crashes where at least one vehicle was towed due to disabling damage.

Table 7 Reportable Records in the Florida Crash File, 2008

Crash type	Count	Percent
Fatal	329	2.9
Injury transported for treatment	4,839	42.2
Vehicle towed due to damage	6,288	54.9
Total	11,456	100.0

5. Factors Associated with Reporting

The procedure described in the previous section identified 11,456 vehicles involved in crashes as reportable to the MCMIS Crash file. The match process described in Section 3 determined that 3,860 unique cases were reported to the MCMIS Crash file, of which 3,847 could be matched to the Florida PAR data (Figure 1). Of the 3,847 cases that could be matched, 3,209 were determined to meet the MCMIS Crash file reporting criteria. Therefore, of the 11,456 reportable vehicles in 2008, Florida reported 3,209, for an overall reporting rate of 28.0 percent. In this section, some of the factors that affect the chance that a vehicle in 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 related to 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 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 3,847 MCMIS cases could be matched to the Florida PAR data, and 3,209 were determined to meet the reporting criteria, the difference, or 638 cases, were not reportable, and should not have been reported.

Table 8 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. The majority of vehicles, 411, were qualifying vehicles, but were not involved in a crash serious enough to meet the crash severity threshold. There were also 188 vehicles in crashes in which the crash met the severity test, but the vehicle was not a qualifying truck, bus, or displaying a hazardous material placard. Finally, 39 vehicles were reported that meet neither the crash severity criteria nor the vehicle criteria since they are not trucks, buses, or hazmat placarded vehicles.

Table 8 Distribution of Non-reportable Vehicles in MCMIS Crash File, 2008

	Crash severity				
Vehicle type	Fatal	Transported injury	Towed/disabled	Other crash severity	Total
Truck	0	0	0	387	387
Bus	0	0	0	23	23
Non-truck with hazmat placard	0	0	0	1	1
Other vehicle not transporting hazmat	20	86	82	39	227
Total	20	86	82	450	638

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 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 2008 MCMIS Crash file as of June 9, 2009 was used to identify records submitted from Florida, so all 2008 cases should have been reported by that date.

Table 9 shows reporting rates according to month of the crash. Although there does not appear to be great variation in reporting rates, June and July had the lowest rates. In June the rate is 19.1 percent, and in July, only 100 of 921 reportable cases were reported, resulting in a 10.9 percent reporting rate. July also accounts for 10 percent of the total unreported cases. Rates tended to be slightly higher than the average between January and March, with more than 30 percent of reportable cases reported.

Table 9 Reporting Rate by Accident Month in Florida Crash File, 2008

Crash month	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
January	1,038	33.2	693	8.4
February	1,101	38.6	676	8.2
March	1,158	35.1	752	9.1
April	1,060	29.9	743	9.0
May	1,007	26.8	737	8.9
June	870	19.1	704	8.5
July	921	10.9	821	10.0
August	863	26.5	634	7.7
September	835	25.0	626	7.6
October	903	32.8	607	7.4
November	834	29.0	592	7.2
December	866	23.6	662	8.0
Total	11,456	28.0	8,247	100.0

Figure 2 shows the median 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 median number of days cases were submitted after the 90-day grace period. Negative numbers give the median number of days that cases were submitted within the 90-day grace period for a month. Figure 2 shows that among the 3,209 cases reported, Florida tended to report well within the grace period. As shown by the horizontal line, over the entire twelve months, cases were submitted approximately 48 days prior to the end of the grace period. Even in January, which represents the worst month, cases were submitted about 19 days prior to the end of the grace period.

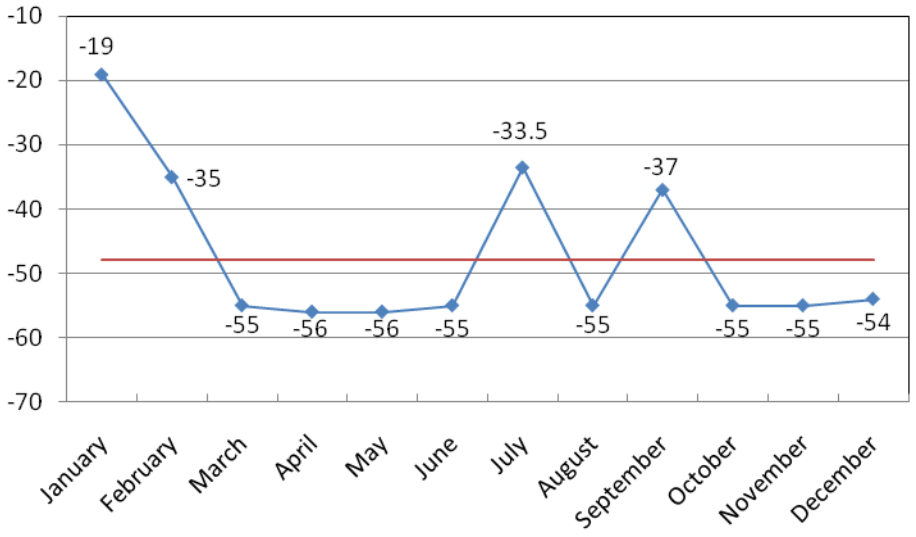

Figure 2 Median Latency (in Days, Minus 90) in Reporting to the MCMIS Crash File, Florida Reported Cases, 2008

Figure 3 is an empirical cumulative distribution plot that shows the percentage of cases submitted to the MCMIS Crash file by the number of days after the crash. A vertical line at 90

days shows that more than 90 percent of the cases were uploaded to the MCMIS Crash file within the 90-day grace period. The median time between crash occurrence and record upload was 42 days. Two-thirds were submitted within 53 days, and 99 percent were submitted within 240 days.

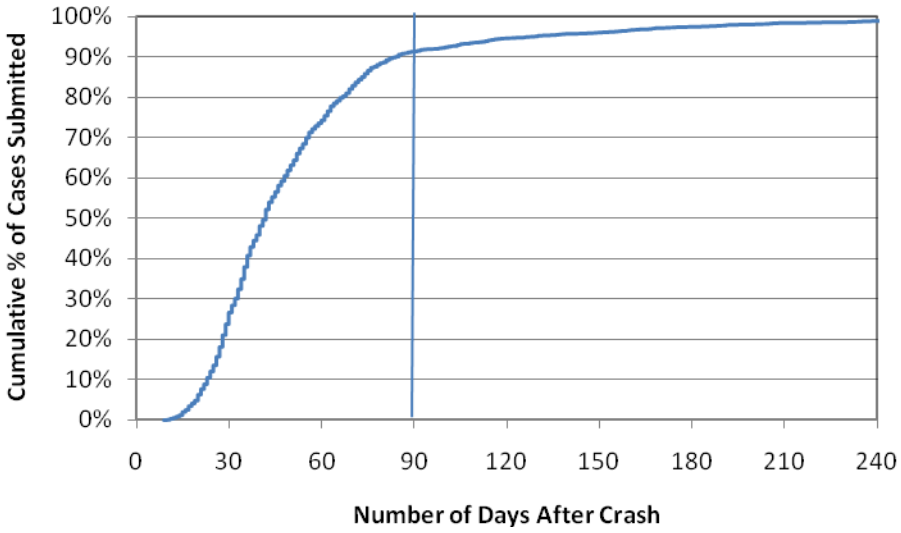

Figure 3 Cumulative Percentage of Cases Submitted to MCMIS Crash file by Number of Days After the Crash

5.1 Reporting Criteria

In this subsection, reporting is investigated according to variables in the Florida 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 10 shows reporting rates by vehicle type. The reporting rate for trucks is close to the overall rate since trucks represent the majority of reportable cases. In total, there were 1,616 buses that were reportable to MCMIS, but only 5.3 percent of these buses were reported. Less than 100 buses were reported to the MCMIS Crash file. Finally, only 6 of the 62 reportable non-trucks with a hazmat placard were reported resulting in a reporting rate of less than 10 percent.

Table 10 Reporting Rate by Vehicle Type, Florida 2008

Vehicle type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck	9,778	31.9	6,660	80.8
Bus	1,616	5.3	1,531	18.6
Non-truck with hazmat placard	62	9.7	56	0.7
Total	11,456	28.0	8,247	100.0

Results from previous MCMIS evaluations suggest that certain trucks such as tractor semitrailers are more likely to be reported than single unit trucks. Table 11 shows reporting rates according to detailed vehicle body type. The body types were derived largely from VIN decoding as described in Section 4.1. The largest reporting rate is 46.7 for tractors with or without trailers and this vehicle type also accounts for 32.3 percent of the unreported cases. For single unit trucks, the reporting rate increases with GVWR, but the reporting rate for those with GVWR between 10,000 lbs and 19,500 lbs is 6.0 percent, while the reporting rate for those with GVWR greater than 26,000 lbs is 24.2 percent. The total percentage of unreported cases for single unit trucks is 45.5 percent. In general, buses have low reporting rates. The rate for school buses is 4.5 percent, the rate for transit/commuter buses is 6.2 percent, and the rate for other buses is 1.4 percent. The cross country/intercity bus has a rate of 22.4 percent, which is substantially higher than the other three bus types. Overall, buses account for 18.6 percent of the total unreported cases. The remaining body types, such as the light pickup with a trailer that includes supporting data that the truck was used for commercial use, account for a small fraction of the unreported cases.

Table 11 Reporting Rate by Detailed Vehicle Body Style, Florida 2008

Vehicle body type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Single Unit Truck 10,000-19,500 lbs	1,472	6.0	1,383	16.8
Single Unit Truck 19,501-26,000 lbs	921	16.2	772	9.4
Single Unit Truck > 26,000 lbs	2,096	24.2	1,589	19.3
Medium/Heavy Pickup > 10,000 lbs	54	18.5	44	0.5
Step Van	58	13.8	50	0.6
Walk-In Van	6	0.0	6	0.1
Tractor with or without Trailers	4,988	46.7	2,660	32.3
Cross Country/ Intercity Bus	76	22.4	59	0.7
Other Bus	348	1.4	343	4.2
School Bus	663	4.5	633	7.7
Transit/Commuter Bus	529	6.2	496	6.0
Large Van	82	7.3	76	0.9
Light Pickup with Trailer/ Commercial Use	101	20.8	80	1.0
Non-Truck or Bus with Hazmat Placard	62	9.7	56	0.7
Total	11,456	28.0	8,247	100.0

Table 12 shows reporting rates by crash severity. Reporting rates tend to decrease as the severity of the crash decreases and this is the case in Florida. The reporting rate is 86.0 percent for vehicles involved in fatal crashes, but drops to 30.9 percent for vehicles meeting the injured and transported threshold, and drops further to 22.7 percent for vehicles meeting the towed and disabled threshold. Almost 59 percent of the unreported cases are those in the towed/disabled category. In addition, 40.5 percent of the unreported cases fall into the injured/transported category.

Table 12 Reporting Rate by Crash Severity, Florida 2008

Crash severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal	329	86.0	46	0.6
Injured/Transported	4,839	30.9	3,342	40.5
Towed/Disabled	6,288	22.7	4,859	58.9
Total	11,456	28.0	8,247	100.0

Table 13 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 12. Note the declining trend in reporting rates as injury severity decreases; however, there is a large drop from the fatal category to the other categories. In addition, the percentage of total unreported cases increases as injury severity decreases. Crashes involving no injury account for 44.1 percent of the unreported cases.

Table 13 Reporting Rate by Detailed Injury Severity, Florida 2008

Crash severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal	329	86.0	46	0.6
Incapacitating	1,154	34.5	756	9.2
Non-incapacitating	2,416	31.3	1,659	20.1
Possible	2,722	26.9	1,989	24.1
None evident	4,673	22.1	3,641	44.1
Unknown	162	3.7	156	1.9
Total	11,456	28.0	8,247	100.0

5.2 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 67 counties of Florida, the number of reportable cases ranges from 3 to 1,539. Therefore, numbers of reportable cases vary considerably based on population density, traffic density, and other geographic characteristics. Table 14 shows the top twenty counties in Florida, ordered in descending order by the number of reportable cases. The combined reporting rates for the top twenty counties and the remaining forty-seven counties are also shown. The top twenty counties have a combined reporting rate of 25.3 percent, smaller than the combined reporting rate of 39.2 percent for the remaining counties. The top twenty counties account for 83.6 percent of unreported cases. The largest jurisdiction, Miami-Dade County, has a reporting rate of 12.2

percent and accounts for 16.4 percent of unreported cases. Broward County has a reporting rate of 19.8 percent and accounts for 10.8 percent of unreported cases.

Table 14 Reporting Rate by County, Florida 2008

County	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Miami-Dade	1,539	12.2	1,352	16.4
Broward	1,108	19.8	889	10.8
Hillsborough	912	28.6	651	7.9
Orange	803	23.4	615	7.5
Duval	774	36.4	492	6.0
Palm Beach	721	26.2	532	6.5
Polk	505	44.8	279	3.4
Pinellas	396	10.1	356	4.3
Pasco	264	27.3	192	2.3
Lee	259	30.9	179	2.2
Volusia	256	30.5	178	2.2
Brevard	242	33.9	160	1.9
Marion	236	30.5	164	2.0
Alachua	211	36.0	135	1.6
Lake	189	38.6	116	1.4
Osceola	182	21.4	143	1.7
Sarasota	170	21.2	134	1.6
Manatee	162	25.9	120	1.5
Escambia	154	24.0	117	1.4
Leon	150	38.7	92	1.1
Top 20 counties	9,233	25.3	6,896	83.6
Other counties	2,223	39.2	1,351	16.4
Total	11,456	28.0	8,247	100.0

It is also possible that reporting rates are 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 15 shows reporting rates by the various agencies in Florida. Most cases are handled by the Highway Patrol and the reporting rate is 33.7 percent. Reporting rates by the remaining agencies, namely county sheriff offices and city police departments are lower at 24.7 percent and 18.0 percent, respectively.

Table 15 Reporting Rate by Reporting Agency, Florida 2008

Reporting agency	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Highway patrol	6,417	33.7	4,255	51.6
County sheriff	2,103	24.7	1,584	19.2
City police	2,916	18.0	2,392	29.0
Other	20	20.0	16	0.2
Total	11,456	28.0	8,247	100.0

5.3 Fire Occurrence

In the Florida PAR data there are four harmful event variables recorded at the vehicle level and coded in order as first/subsequent events. If fire occurs it can be recorded as one of the harmful events. With respect to the occurrence of fire in reportable crash involvements, there were 46 vehicles in which fire was coded for at least one of the harmful events. Of these, 43 were in trucks and 3 were in buses. About half of the trucks were reported and none of the buses were reported.

Table 16 Reporting of Crash Involvements with Fire Occurrence, Florida 2008

Vehicle type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck	43	51.2	21	87.5
Bus	3	0.0	3	12.5
Total	46	100.0	24	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 affect 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 Florida Crash file and in the MCMIS Crash file. Inconsistencies may indicate problems in translating information recorded on the crash report to the values in the MCMIS Crash file. All 3,847 matched cases reported to the MCMIS crash file from Florida for 2008 are used, since the purpose of the analysis is to examine the quality of the data as reported.

Table 17 shows missing data rates for selected, important variables in the MCMIS Crash file. Missing data rates are generally 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 either zero or extremely low. Body type is missing for 16.4 percent of the cases. Three of the four event variables are missing large percentages of data, though this is not necessarily an indication of a problem, since most crashes consist of a single impact.

Table 17 Missing Data Rates for Selected MCMIS Crash File Variables, Florida 2008

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	0.3	Event one	1.1
Accident minute	0.3	Event two	88.1
County	0.0	Event three	96.9
Body type	16.4	Event four	99.2
Configuration	0.1	Number of vehicles	0.0
GVWR class	2.3	Road access	2.6
DOT number *	1.0	Road surface	0.0

Variable	Percent unrecorded	Variable	Percent unrecorded
Carrier state	0.0	Road trafficway	2.7
Citation issued	1.3	Towaway	0.0
Driver date of birth	2.0	Truck or bus	0.0
Driver license number	2.8	Vehicle license number	1.9
Driver license state	1.9	Vehicle license state	0.7
Driver license class	3.7	VIN	0.2
Driver license valid	1.3	Weather	0.0

* Based on cases where the carrier is coded interstate.

Hazardous materials variable	Percent unrecorded
Hazardous materials placard	0.9
Percentages of hazmat placarded vehicles only:	
Hazardous cargo release	1.4
Hazardous materials class (1-digit)	7.1
Hazardous materials class (4-digit)	8.6
Hazardous materials name	91.4

The second section of the table shows missing data rates for the hazardous materials (hazmat) variables. Hazmat Placard was unrecorded in only 0.9 % of cases. However, rates for the variables describing the hazardous material (where present) were higher. The percentages only pertain to the 70 cases in which it was coded that the vehicle displayed a hazmat placard. The hazardous materials name variable is missing for 91.4 percent of the 70 cases.

We also compared the values of variables in the MCMIS Crash file with the values of comparable variables in the Florida 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. Florida has adopted in many instances the same code levels for certain variables as are used in the MCMIS Crash file.

Table 18 shows the coding of vehicle configuration in the MCMIS Crash file and the variable in the Florida PAR file used to identify qualifying trucks and buses. The variable in the PAR file is largely based on results from a VIN decoding program as described in Section 4.1. Obvious inconsistencies in Table 18 are shaded. The largest inconsistency is for 372 vehicles which are coded as SUTs with 3+ axles in the MCMIS file, but are coded as truck tractors in the PAR file. An additional 36 vehicles are coded as SUTs with 2 axles and 6 tires in the MCMIS file, but are coded as truck tractors in the PAR file. In the opposite direction, a total of 81 vehicles are coded as tractors with or without trailers in the MCMIS file, but are coded as SUTs in the PAR file.

Table 18 Comparison of Vehicle Configuration in MCMIS File with VIN Derived Vehicle Type in Florida Crash File

Vehicle configuration			
MCMIS Crash file	Florida Crash File	Cases	%
Light trk (only if HM placard)	Tractor with or without trailers	1	0.0
	GVWR<10,000 lbs or Unknown	2	0.1
Bus (seats 9-15, incl dr)	Tractor with or without trailers	3	0.1

	Other bus	4	0.1
	School bus	2	0.1
	Transit/commuter bus	3	0.1
Bus (seats>15, incl dr)	Med/hvy pickup >10K lbs	1	0.0
	Cross country/intercity bus	21	0.5
	Other bus	4	0.1
	School bus	34	0.9
	Transit/commuter bus	38	1.0
SUT, 2-axle, 6-tire	SUT 10,000-19,500 lbs	96	2.5
	SUT 19,500-26,000 lbs	111	2.9
	SUT >26,000 lbs	124	3.2
	Med/hvy pickup >10K lbs	9	0.2
	Step van	10	0.3
	Tractor with or without trailers	36	0.9
	School bus	1	0.0
	Large van	7	0.2
	Light pickup/trailer/commercial	26	0.7
	GVWR<10,000 lbs or Unknown	110	2.9
SUT, 3+ axles	SUT 10,000-19,500 lbs	9	0.2
	SUT 19,500-26,000 lbs	46	1.2
	SUT >26,000 lbs	355	9.2
	Med/hvy pickup >10K lbs	3	0.1
	Walkin van	1	0.0
	Tractor with or without trailers	372	9.7
	Large van	1	0.0
	GVWR<10,000 lbs or Unknown	42	1.1
Truck trailer	SUT >26,000 lbs	1	0.0
Truck tractor (bobtail)	SUT 19,500-26,000 lbs	3	0.1
	SUT >26,000 lbs	41	1.1
	Tractor with or without trailers	527	13.7
	GVWR<10,000 lbs or Unknown	21	0.5
Tractor/semitrailer	SUT 10,000-19,500 lbs	1	0.0
	SUT >26,000 lbs	28	0.7
	Tractor with or without trailers	1,419	36.9
	Cross country/intercity bus	1	0.0
	GVWR<10,000 lbs or Unknown	38	1.0
Tractor/double	SUT 19,500-26,000 lbs	1	0.0
	SUT >26,000 lbs	7	0.2
	Tractor with or without trailers	236	6.1
	GVWR<10,000 lbs or Unknown	6	0.2
Unk heavy truck>10,000	SUT 10,000-19,500 lbs	1	0.0
	SUT 19,500-26,000 lbs	2	0.1
	SUT >26,000 lbs	16	0.4
	Tractor with or without trailers	11	0.3
	GVWR<10,000 lbs or Unknown	14	0.4
Unknown	GVWR<10,000 lbs or Unknown	1	0.0
Total		3,847	100.0

Number of fatalities in the crash is recorded in both the MCMIS file and the Florida PAR file. Table 19 shows a comparison between the two files. In relation to the total 3,847 matched vehicles, there were few inconsistencies in the number of fatalities variables. Less than 1 percent of the data disagree.

Table 19 Comparison of Number of Fatalities in the Crash in MCMIS and Florida Crash Files, 2008

Number of fatals in crash			
MCMIS Crash file	Florida Crash file	Cases	%
0	0	3,535	91.9
0	1	23	0.6
1	0	9	0.2
1	1	244	6.3
1	2	1	0.0
2	1	1	0.0
2	2	21	0.5
3	3	1	0.0
4	4	11	0.3
6	6	1	0.0
Total		3,847	100.0

7. Summary and Discussion

This report is an evaluation of reporting to the MCMIS Crash file by the state of Florida in 2008. Records were matched between the Florida PAR file and the MCMIS Crash file using variables common to both files with low percentages of missing data. After 37 duplicate records were removed from the PAR file, 693,795 unique records were available for matching with 3,860 unique records in the MCMIS Crash file. No duplicate records were found in the MCMIS Crash file. In total, 3,847, or 99.7 percent of the MCMIS records were matched (Figure 1).

The next step in the evaluation process focused on identifying reportable cases using the Florida PAR file based on the MCMIS vehicle and crash severity criteria. Overall, 32,789 vehicles were identified as qualifying trucks, buses, or vehicles displaying a hazardous materials placard (Table 4). The method used to identify qualifying vehicles was based on a combination of seven variables. The VIN was used as the primary variable to identify whether a vehicle was a qualifying truck or bus because it is the most objective source of vehicle type information. The vehicle type variable as recorded on the Florida PAR form was used to supplement the VIN, particularly in cases where the VIN was missing. For a comparison of these two variables, see the two-way table and discussion in Appendix C. Other variables, such as vehicle use, trailer type, carrier name, and DOT/ICC MCC number helped to identify certain vehicles used for commercial purposes. These latter variables were mostly used to identify smaller trucks such as pickups with trailers. The idea was to use the seven variables in a way that takes advantage of the strengths of each variable. A full discussion of the method used to identify qualifying vehicles is given in Section 4.1 and Appendix B. Results in Appendix C show that approximately 32 to 33 thousand vehicles are qualifying vehicles, regardless whether the VIN is used alone, the vehicle

type as recorded on the PAR is used alone, or the method based on seven variables described in this study is used.

After identifying qualifying vehicles, it is necessary to determine which of these vehicles meet the crash severity criteria for reporting to MCMIS. Florida classifies injury using the common KABCN scale, where injuries are classified as Fatal (K), Incapacitating (A), Non-incapacitating, but evident (B), Possible (C), and No injury. The Florida Crash file includes information about the most severe injury in the crash. A maximum injury in the crash variable was created from the Florida PAR Person file and this variable coincides exactly with the variable already recorded in the Florida data file. Determining whether an injured person was transported for immediate medical attention is also recorded in the Florida Crash file. There is an Injured Taken To variable in the Crash file indicating whether an injured person was transported to a care facility. A crash was thus determined to meet the MCMIS injury severity criteria if crash severity was Fatal, or if crash severity was A, B, or C injury, and Injured Taken To was 'yes'. This is likely a conservative estimate in the sense that the recorded data must explicitly indicate that a vehicle satisfies the crash severity criterion.

The last MCMIS criterion specifies "vehicles towed due to disabling damage." The definition of the disabling damage variable coded in the Florida PAR data matches the MCMIS criterion very closely and is stated below.

- Disabling damage – vehicle must be towed from the scene of the traffic crash because it is inoperable or is drivable but must be towed from the scene of the traffic crash to prevent additional damage. This does not include a drivable vehicle that is towed from the scene of the traffic crash for any reason.

Any qualifying vehicle involved in a crash satisfying the above definition was considered towed and disabled. The frequency distribution of this variable is consistent with the towed variable in the 2009 General Estimates System, [42] and with towed and disabled variables derived in other MCMIS evaluations. [20,22,27,28] In the Florida Crash file, this variable is coded at the vehicle level so a variable was created at the crash level and used for analysis. The Florida data also has a crash_damage_severity variable recorded at the crash level, but it appears to represent the *least* damaged vehicle in the crash instead of the most damaged vehicle. The 2004 MCMIS evaluation of 2003 Florida data also references this variable and describes it as representing the least damaged variable in the crash. [5]

In total, it is estimated that 11,456 vehicles were reportable to the MCMIS Crash file. Of these, 329 were involved in fatal crashes and 4,839, or about 42.2 percent, were involved in crashes where at least one person was injured and transported for medical treatment. Based on the damage severity variable, it is estimated that 6,288 or about 54.9 percent of reportable vehicles were involved in crashes where at least one vehicle was towed due to disabling damage.

Of the 11,456 reportable vehicles in 2008, Florida reported 3,209, for an overall reporting rate of 28.0 percent. An additional 638 vehicles were reported, but did not meet the vehicle and crash severity criteria for reporting, and should not have been reported. These overreported vehicles are largely trucks that did not meet the crash severity, or non-qualifying vehicles that did meet the crash severity (Table 8).

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.

With respect to timing issues related to reporting, reporting rates were fairly consistent over the twelve months, with the exception of June and July in which rates were 19.1 and 10.9 percent, respectively. On a monthly basis, Florida appears to upload cases well within the 90-day grace period. Overall, approximately 91 percent of cases are uploaded within the 90-day grace period (Figure 3).

Overall, the reporting rate for trucks is 31.9 percent which is close to the overall rate since trucks represent the majority of reportable vehicles. A closer inspection of trucks by vehicle body style shows that the rate for tractors with or without trailers is 46.7 percent. Tractors with or without trailers account for 32.3 percent of unreported cases. For single unit trucks (SUTs) the rates increase with GVWR. For SUTs the rates are 6.0 percent, 16.2 percent, and 24.2 percent for GVWR categories 10,000-19,500; 19,501-26,000; and greater than 26,000, respectively. SUTs account for 45.5 percent of the unreported cases. Overall, the reporting rate for buses is 5.3 percent. By bus type, the rates are 6.2 percent for transit/commuter bus, 4.5 percent for school bus, and 1.4 percent for other buses. Cross country / Intercity buses have a rate of 22.4 percent, but account for only 0.7 percent of unreported cases. The reporting rate for light pickups with trailers that are used for commercial use is 20.8, but this vehicle type only accounts for 1 percent of the total of unreported cases.

With respect to crash severity, the reporting rate for fatal crashes is 86.0 percent. The rate declines to 30.9 percent for injured and transported crashes, and 22.7 percent for towed and disabled crashes. Based on the KABCN scale, rates also decline as severity declines. For A-injuries and B-injuries the reporting rates are 34.5 percent and 31.3 percent, respectively, while the rate for C-injuries is 26.9 percent.

Previous MCMIS evaluations suggest that reporting rates in larger jurisdictions tend to be lower than those in smaller ones and this is the case in Florida. In terms of the number of reportable cases, the reporting rate for the top twenty counties is 25.3 percent, compared to the higher rate of 39.2 percent for the remaining forty-seven counties. The top twenty counties account for 83.6 percent of the unreported cases. Miami Dade has the largest number of reportable cases, but has a reporting rate of 12.2 percent and accounts for 16.4 percent of all unreported cases. Broward County has the second largest number of reportable cases and has a reporting rate of 19.8 percent.

Based on reporting agency, the Florida PAR file identifies the highway patrol, sheriff's offices, and police departments. The highway patrol has the highest rate at 33.7 percent, and accounts for 51.6 percent of total unreported cases. The reporting rate for sheriff's offices is 24.7 percent, while the rate for police departments is 18.0 percent.

Missing data rates in the MCMIS Crash file were also examined for key variables. Except for the body type variable, percentages of missing data are less than 5 percent. Three of the subsequent

event variables are missing high percentages of data, but this is most likely not a problem. There are some differences between vehicle configuration as recorded in the MCMIS file and the Florida Crash file. Of the 3,847 vehicles that could be matched in the two files, 372 recorded as SUTs with 3 or more axles in the MCMIS file are recorded as tractors with or without trailers in the Florida PAR file.

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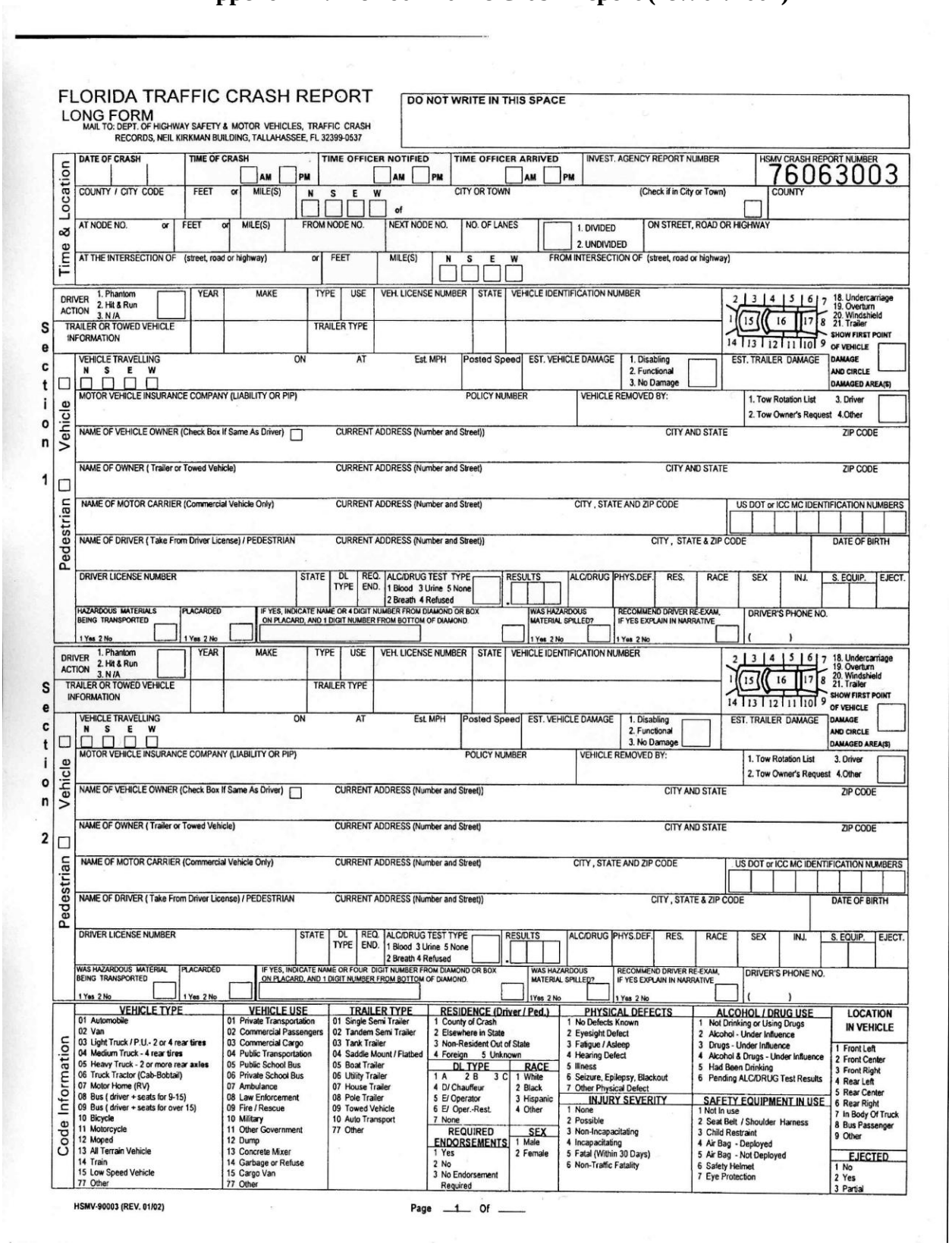
Appendix A: Florida Traffic Crash Report (rev. 01/2002)



FLORIDA TRAFFIC CRASH REPORT
LONG FORM
MAIL TO: DEPT. OF HIGHWAY SAFETY & MOTOR VEHICLES, TRAFFIC CRASH RECORDS, NEIL KIRKMAN BUILDING, TALLAHASSEE, FL 32399-0537

DO NOT WRITE IN THIS SPACE

HSMV CRASH REPORT NUMBER 76063003

Time & Location

DATE OF CRASH | TIME OF CRASH AM PM | TIME OFFICER NOTIFIED AM PM | TIME OFFICER ARRIVED AM PM | INVEST. AGENCY REPORT NUMBER

COUNTY / CITY CODE | FEET or MILE(S) | N S E W of | CITY OR TOWN (Check if in City or Town) | COUNTY

AT NODE NO. or | FEET or MILE(S) | FROM NODE NO. | NEXT NODE NO. | NO. OF LANES | 1. DIVIDED 2. UNDIVIDED | ON STREET, ROAD OR HIGHWAY

AT THE INTERSECTION OF (street, road or highway) | or FEET MILE(S) N S E W | FROM INTERSECTION OF (street, road or highway)

Section 1

Pedestrian ☐ Vehicle ☐

DRIVER ACTION 1. Phantom 2. Hit & Run 3. N/A | YEAR | MAKE | TYPE | USE | VEH. LICENSE NUMBER | STATE | VEHICLE IDENTIFICATION NUMBER

TRAILER OR TOWED VEHICLE INFORMATION | TRAILER TYPE

18. Undercarriage 19. Overturn 20. Windshield 21. Trailer SHOW FIRST POINT OF VEHICLE

VEHICLE TRAVELLING N S E W | ON | AT | Est MPH | Posted Speed | EST. VEHICLE DAMAGE | 1. Disabling 2. Functional 3. No Damage | EST. TRAILER DAMAGE | DAMAGE AND CIRCLE DAMAGED AREA(S)

MOTOR VEHICLE INSURANCE COMPANY (LIABILITY OR PIP) | POLICY NUMBER | VEHICLE REMOVED BY: | 1. Tow Rotation List 2. Tow Owner's Request 3. Driver 4. Other

NAME OF VEHICLE OWNER (Check Box If Same As Driver) ☐ | CURRENT ADDRESS (Number and Street)) | CITY AND STATE | ZIP CODE

NAME OF OWNER (Trailer or Towed Vehicle) | CURRENT ADDRESS (Number and Street) | CITY AND STATE | ZIP CODE

NAME OF MOTOR CARRIER (Commercial Vehicle Only) | CURRENT ADDRESS (Number and Street) | CITY , STATE AND ZIP CODE | US DOT or ICC MC IDENTIFICATION NUMBERS

NAME OF DRIVER (Take From Driver License) / PEDESTRIAN | CURRENT ADDRESS (Number and Street)) | CITY , STATE & ZIP CODE | DATE OF BIRTH

DRIVER LICENSE NUMBER | STATE | DL TYPE | REQ. END. | ALC/DRUG TEST TYPE 1 Blood 3 Urine 5 None 2 Breath 4 Refused | RESULTS | ALC/DRUG | PHYS.DEF. | RES. | RACE | SEX | INJ. | S. EQUIP. | EJECT.

HAZARDOUS MATERIALS BEING TRANSPORTED 1 Yes 2 No | PLACARDED 1 Yes 2 No | IF YES, INDICATE NAME OR 4 DIGIT NUMBER FROM DIAMOND OR BOX ON PLACARD, AND 1 DIGIT NUMBER FROM BOTTOM OF DIAMOND. | WAS HAZARDOUS MATERIAL SPILLED? 1 Yes 2 No | RECOMMEND DRIVER RE-EXAM. IF YES EXPLAIN IN NARRATIVE 1 Yes 2 No | DRIVER'S PHONE NO. ( )

Section 2

Pedestrian ☐ Vehicle ☐

DRIVER ACTION 1. Phantom 2. Hit & Run 3. N/A | YEAR | MAKE | TYPE | USE | VEH. LICENSE NUMBER | STATE | VEHICLE IDENTIFICATION NUMBER

TRAILER OR TOWED VEHICLE INFORMATION | TRAILER TYPE

18. Undercarriage 19. Overturn 20. Windshield 21. Trailer SHOW FIRST POINT OF VEHICLE

VEHICLE TRAVELLING N S E W | ON | AT | Est MPH | Posted Speed | EST. VEHICLE DAMAGE | 1. Disabling 2. Functional 3. No Damage | EST. TRAILER DAMAGE | DAMAGE AND CIRCLE DAMAGED AREA(S)

MOTOR VEHICLE INSURANCE COMPANY (LIABILITY OR PIP) | POLICY NUMBER | VEHICLE REMOVED BY: | 1. Tow Rotation List 2. Tow Owner's Request 3. Driver 4. Other

NAME OF VEHICLE OWNER (Check Box If Same As Driver) ☐ | CURRENT ADDRESS (Number and Street)) | CITY AND STATE | ZIP CODE

NAME OF OWNER (Trailer or Towed Vehicle) | CURRENT ADDRESS (Number and Street) | CITY AND STATE | ZIP CODE

NAME OF MOTOR CARRIER (Commercial Vehicle Only) | CURRENT ADDRESS (Number and Street) | CITY , STATE AND ZIP CODE | US DOT or ICC MC IDENTIFICATION NUMBERS

NAME OF DRIVER (Take From Driver License) / PEDESTRIAN | CURRENT ADDRESS (Number and Street)) | CITY , STATE & ZIP CODE | DATE OF BIRTH

DRIVER LICENSE NUMBER | STATE | DL TYPE | REQ. END. | ALC/DRUG TEST TYPE 1 Blood 3 Urine 5 None 2 Breath 4 Refused | RESULTS | ALC/DRUG | PHYS.DEF. | RES. | RACE | SEX | INJ. | S. EQUIP. | EJECT.

WAS HAZARDOUS MATERIAL BEING TRANSPORTED 1 Yes 2 No | PLACARDED 1 Yes 2 No | IF YES, INDICATE NAME OR FOUR DIGIT NUMBER FROM DIAMOND OR BOX ON PLACARD, AND 1 DIGIT NUMBER FROM BOTTOM OF DIAMOND. | WAS HAZARDOUS MATERIAL SPILLED? 1 Yes 2 No | RECOMMEND DRIVER RE-EXAM. IF YES EXPLAIN IN NARRATIVE 1 Yes 2 No | DRIVER'S PHONE NO. ( )

Code Information

VEHICLE TYPE
01 Automobile
02 Van
03 Light Truck / P.U.- 2 or 4 rear tires
04 Medium Truck - 4 rear tires
05 Heavy Truck - 2 or more rear axles
06 Truck Tractor (Cab-Bobtail)
07 Motor Home (RV)
08 Bus (driver + seats for 9-15)
09 Bus (driver + seats for over 15)
10 Bicycle
11 Motorcycle
12 Moped
13 All Terrain Vehicle
14 Train
15 Low Speed Vehicle
77 Other

VEHICLE USE
01 Private Transportation
02 Commercial Passengers
03 Commercial Cargo
04 Public Transportation
05 Public School Bus
06 Private School Bus
07 Ambulance
08 Law Enforcement
09 Fire / Rescue
10 Military
11 Other Government
12 Dump
13 Concrete Mixer
14 Garbage or Refuse
15 Cargo Van
77 Other

TRAILER TYPE
01 Single Semi Trailer
02 Tandem Semi Trailer
03 Tank Trailer
04 Saddle Mount / Flatbed
05 Boat Trailer
06 Utility Trailer
07 House Trailer
08 Pole Trailer
09 Towed Vehicle
10 Auto Transport
77 Other

RESIDENCE (Driver / Ped.)
1 County of Crash
2 Elsewhere in State
3 Non-Resident Out of State
4 Foreign 5 Unknown

DL TYPE
1 A 2 B 3 C
4 D/ Chauffeur
5 E/ Operator
6 E/ Oper.-Rest.
7 None

REQUIRED ENDORSEMENTS
1 Yes
2 No
3 No Endorsement Required

RACE
1 White
2 Black
3 Hispanic
4 Other

SEX
1 Male
2 Female

PHYSICAL DEFECTS
1 No Defects Known
2 Eyesight Defect
3 Fatigue / Asleep
4 Hearing Defect
5 Illness
6 Seizure, Epilepsy, Blackout
7 Other Physical Defect

INJURY SEVERITY
1 None
2 Possible
3 Non-Incapacitating
4 Incapacitating
5 Fatal (Within 30 Days)
6 Non-Traffic Fatality

ALCOHOL / DRUG USE
1 Not Drinking or Using Drugs
2 Alcohol - Under Influence
3 Drugs - Under Influence
4 Alcohol & Drugs - Under Influence
5 Had Been Drinking
6 Pending ALC/DRUG Test Results

SAFETY EQUIPMENT IN USE
1 Not In use
2 Seat Belt / Shoulder Harness
3 Child Restraint
4 Air Bag - Deployed
5 Air Bag - Not Deployed
6 Safety Helmet
7 Eye Protection

LOCATION IN VEHICLE
1 Front Left
2 Front Center
3 Front Right
4 Rear Left
5 Rear Center
6 Rear Right
7 In Body Of Truck
8 Bus Passenger
9 Other

EJECTED
1 No
2 Yes
3 Partial

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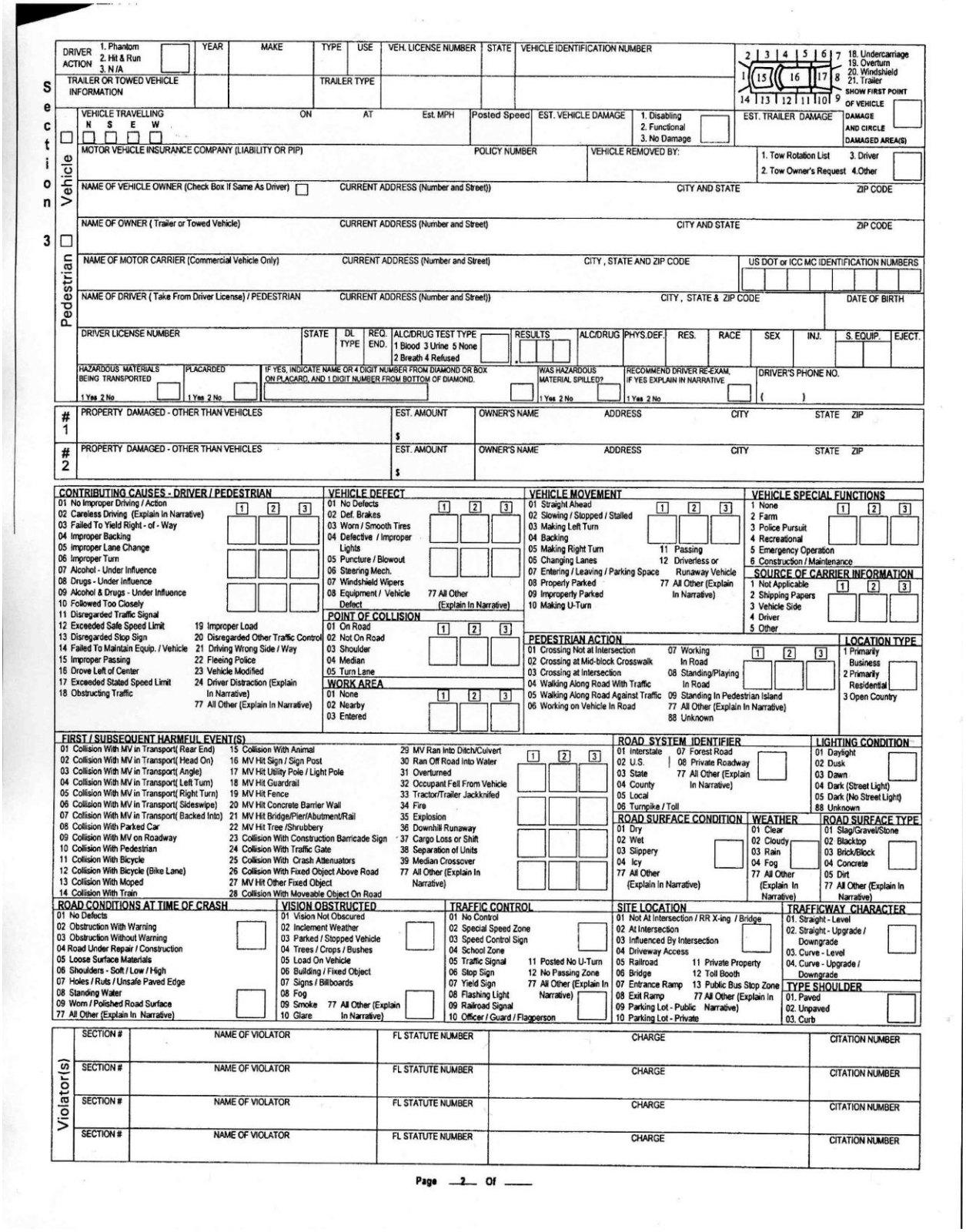

Section 3 Vehicle

DRIVER ACTION 1. Phantom 2. Hit & Run 3. N/A | YEAR | MAKE | TYPE | USE | VEH. LICENSE NUMBER | STATE | VEHICLE IDENTIFICATION NUMBER

TRAILER OR TOWED VEHICLE INFORMATION | TRAILER TYPE

18. Undercarriage 19. Overturn 20. Windshield 21. Trailer — SHOW FIRST POINT OF VEHICLE DAMAGE AND CIRCLE DAMAGED AREA(S)

VEHICLE TRAVELLING N S E W | ON | AT | Est. MPH | Posted Speed | EST. VEHICLE DAMAGE | 1. Disabling 2. Functional 3. No Damage | EST. TRAILER DAMAGE

MOTOR VEHICLE INSURANCE COMPANY (LIABILITY OR PIP) | POLICY NUMBER | VEHICLE REMOVED BY: | 1. Tow Rotation List 2. Tow Owner's Request 3. Driver 4. Other

NAME OF VEHICLE OWNER (Check Box If Same As Driver) | CURRENT ADDRESS (Number and Street)) | CITY AND STATE | ZIP CODE

Pedestrian

NAME OF OWNER (Trailer or Towed Vehicle) | CURRENT ADDRESS (Number and Street) | CITY AND STATE | ZIP CODE

NAME OF MOTOR CARRIER (Commercial Vehicle Only) | CURRENT ADDRESS (Number and Street) | CITY , STATE AND ZIP CODE | US DOT or ICC MC IDENTIFICATION NUMBERS

NAME OF DRIVER (Take From Driver License) / PEDESTRIAN | CURRENT ADDRESS (Number and Street)) | CITY , STATE & ZIP CODE | DATE OF BIRTH

DRIVER LICENSE NUMBER | STATE | DL TYPE | REQ. END. | ALC/DRUG TEST TYPE 1 Blood 2 Breath 3 Urine 4 Refused 5 None | RESULTS | ALC/DRUG | PHYS.DEF. | RES. | RACE | SEX | INJ. | S. EQUIP. | EJECT.

HAZARDOUS MATERIALS BEING TRANSPORTED 1 Yes 2 No | PLACARDED 1 Yes 2 No | IF YES, INDICATE NAME OR 4 DIGIT NUMBER FROM DIAMOND OR BOX ON PLACARD, AND 1 DIGIT NUMBER FROM BOTTOM OF DIAMOND. | WAS HAZARDOUS MATERIAL SPILLED? 1 Yes 2 No | RECOMMEND DRIVER RE-EXAM. IF YES EXPLAIN IN NARRATIVE 1 Yes 2 No | DRIVER'S PHONE NO. ( )

	PROPERTY DAMAGED - OTHER THAN VEHICLES	EST. AMOUNT	OWNER'S NAME	ADDRESS	CITY	STATE	ZIP
#1		$					
#2		$					

CONTRIBUTING CAUSES - DRIVER / PEDESTRIAN

01 No Improper Driving / Action
02 Careless Driving (Explain In Narrative)
03 Failed To Yield Right - of - Way
04 Improper Backing
05 Improper Lane Change
06 Improper Turn
07 Alcohol - Under Influence
08 Drugs - Under Influence
09 Alcohol & Drugs - Under Influence
10 Followed Too Closely
11 Disregarded Traffic Signal
12 Exceeded Safe Speed Limit
13 Disregarded Stop Sign
14 Failed To Maintain Equip. / Vehicle
15 Improper Passing
16 Drove Left of Center
17 Exceeded Stated Speed Limit
18 Obstructing Traffic
19 Improper Load
20 Disregarded Other Traffic Control
21 Driving Wrong Side / Way
22 Fleeing Police
23 Vehicle Modified
24 Driver Distraction (Explain In Narrative)
77 All Other (Explain In Narrative)

VEHICLE DEFECT

01 No Defects
02 Def. Brakes
03 Worn / Smooth Tires
04 Defective / Improper Lights
05 Puncture / Blowout
06 Steering Mech.
07 Windshield Wipers
08 Equipment / Vehicle Defect
77 All Other (Explain In Narrative)

POINT OF COLLISION

01 On Road
02 Not On Road
03 Shoulder
04 Median
05 Turn Lane

WORK AREA

01 None
02 Nearby
03 Entered

VEHICLE MOVEMENT

01 Straight Ahead
02 Slowing / Stopped / Stalled
03 Making Left Turn
04 Backing
05 Making Right Turn
05 Changing Lanes
07 Entering / Leaving / Parking Space
08 Properly Parked
09 Improperly Parked
10 Making U-Turn
11 Passing
12 Driverless or Runaway Vehicle
77 All Other (Explain In Narrative)

VEHICLE SPECIAL FUNCTIONS

1 None
2 Farm
3 Police Pursuit
4 Recreational
5 Emergency Operation
6 Construction / Maintenance

SOURCE OF CARRIER INFORMATION

1 Not Applicable
2 Shipping Papers
3 Vehicle Side
4 Driver
5 Other

PEDESTRIAN ACTION

01 Crossing Not at Intersection
02 Crossing at Mid-block Crosswalk
03 Crossing at Intersection
04 Walking Along Road With Traffic
05 Walking Along Road Against Traffic
06 Working on Vehicle In Road
07 Working In Road
08 Standing/Playing In Road
09 Standing In Pedestrian Island
77 All Other (Explain In Narrative)
88 Unknown

LOCATION TYPE

1 Primarily Business
2 Primarily Residential
3 Open Country

FIRST / SUBSEQUENT HARMFUL EVENT(S)

01 Collision With MV in Transport(Rear End)
02 Collision With MV in Transport(Head On)
03 Collision With MV in Transport(Angle)
04 Collision With MV in Transport(Left Turn)
05 Collision With MV in Transport(Right Turn)
06 Collision With MV in Transport(Sideswipe)
07 Collision With MV in Transport(Backed Into)
08 Collision With Parked Car
09 Collision With MV on Roadway
10 Collision With Pedestrian
11 Collision With Bicycle
12 Collision With Bicycle (Bike Lane)
13 Collision With Moped
14 Collision With Train
15 Collision With Animal
16 MV Hit Sign / Sign Post
17 MV Hit Utility Pole / Light Pole
18 MV Hit Guardrail
19 MV Hit Fence
20 MV Hit Concrete Barrier Wall
21 MV Hit Bridge/Pier/Abutment/Rail
22 MV Hit Tree /Shrubbery
23 Collision With Construction Barricade Sign
24 Collision With Traffic Gate
25 Collision With Crash Attenuators
26 Collision With Fixed Object Above Road
27 MV Hit Other Fixed Object
28 Collision With Moveable Object On Road
29 MV Ran Into Ditch/Culvert
30 Ran Off Road Into Water
31 Overturned
32 Occupant Fell From Vehicle
33 Tractor/Trailer Jackknifed
34 Fire
35 Explosion
36 Downhill Runaway
37 Cargo Loss or Shift
38 Separation of Units
39 Median Crossover
77 All Other (Explain In Narrative)

ROAD SYSTEM IDENTIFIER

01 Interstate
02 U.S.
03 State
04 County
05 Local
06 Turnpike / Toll
07 Forest Road
08 Private Roadway
77 All Other (Explain In Narrative)

LIGHTING CONDITION

01 Daylight
02 Dusk
03 Dawn
04 Dark (Street Light)
05 Dark (No Street Light)
88 Unknown

ROAD SURFACE CONDITION

01 Dry
02 Wet
03 Slippery
04 Icy
77 All Other (Explain In Narrative)

WEATHER

01 Clear
02 Cloudy
03 Rain
04 Fog
77 All Other (Explain In Narrative)

ROAD SURFACE TYPE

01 Slag/Gravel/Stone
02 Blacktop
03 Brick/Block
04 Concrete
05 Dirt
77 All Other (Explain In Narrative)

ROAD CONDITIONS AT TIME OF CRASH

01 No Defects
02 Obstruction With Warning
03 Obstruction Without Warning
04 Road Under Repair / Construction
05 Loose Surface Materials
06 Shoulders - Soft / Low / High
07 Holes / Ruts / Unsafe Paved Edge
08 Standing Water
09 Worn / Polished Road Surface
77 All Other (Explain In Narrative)

VISION OBSTRUCTED

01 Vision Not Obscured
02 Inclement Weather
03 Parked / Stopped Vehicle
04 Trees / Crops / Bushes
05 Load On Vehicle
06 Building / Fixed Object
07 Signs / Billboards
08 Fog
09 Smoke
10 Glare
77 All Other (Explain In Narrative)

TRAFFIC CONTROL

01 No Control
02 Special Speed Zone
03 Speed Control Sign
04 School Zone
05 Traffic Signal
06 Stop Sign
07 Yield Sign
08 Flashing Light
09 Railroad Signal
10 Officer / Guard / Flagperson
11 Posted No U-Turn
12 No Passing Zone
77 All Other (Explain In Narrative)

SITE LOCATION

01 Not At Intersection / RR X-ing / Bridge
02 At Intersection
03 Influenced By Intersection
04 Driveway Access
05 Railroad
06 Bridge
07 Entrance Ramp
08 Exit Ramp
09 Parking Lot - Public
10 Parking Lot - Private
11 Private Property
12 Toll Booth
13 Public Bus Stop Zone
77 All Other (Explain In Narrative)

TRAFFICWAY CHARACTER

01. Straight - Level
02. Straight - Upgrade / Downgrade
03. Curve - Level
04. Curve - Upgrade / Downgrade

TYPE SHOULDER

01. Paved
02. Unpaved
03. Curb

Violator(s)

SECTION #	NAME OF VIOLATOR	FL STATUTE NUMBER	CHARGE	CITATION NUMBER

Page 2 Of ____

FLORIDA TRAFFIC CRASH REPORT
NARRATIVE/DIAGRAM

MAIL TO: DEPARTMENT OF HIGHWAY SAFETY & MOTOR VEHICLES, TRAFFIC CRASH RECORDS SECTION, NEIL KIRKMAN BUILDING, TALLAHASSEE, FL 32399-0500

DO NOT WRITE IN THIS SPACE

TIME EMS NOTIFIED (FATALITIES ONLY) ☐ AM ☐ PM	TIME EMS ARRIVED (FATALITIES ONLY) ☐ AM ☐ PM	DATE OF CRASH	COUNTY / CITY CODE	INVEST. AGENCY REPORT NUMBER	HSMV CRASH REPORT NUMBER

(NARRATIVE)

SEC#	PASS#	PASSENGER 'S NAME	CURRENT ADDRESS	CITY & STATE	ZIP CODE	DATE OF BIRTH	RACE	SEX	LOC	INJ	S. EQUIP.	EJECT.

Violator(s)	SECTION #	NAME OF VIOLATOR	FL STATUTE NUMBER	CHARGE	CITATION NUMBER
	SECTION #	NAME OF VIOLATOR	FL STATUTE NUMBER	CHARGE	CITATION NUMBER

WITNESS NAME (1)	CURRENT ADDRESS	CITY & STATE	ZIP CODE	WITNESS NAME (2)	CURRENT ADDRESS	CITY & STATE	ZIP CODE

FIRST AID GIVEN BY - NAME	1. Physician or Nurse 2. Paramedic or EMT 3. Police Officer 4. Certified 1st Aider 5. Other ☐	INJURED TAKEN TO:	BY - NAME

WAS INVESTIGATION MADE AT SCENE? 1. YES 2. NO ☐	IF NO, THEN WHERE?	IS INVESTIGATION COMPLETE? 1. YES 2. NO ☐	IF NO, THEN WHY?	DATE OF REPORT	PHOTOS TAKEN 1. YES 2. NO ☐	IF YES, BY WHOM? 1. INVESTIGATING AGENCY 2. OTHER ☐

INVESTIGATOR - RANK & SIGNATURE	ID/BADGE NUMBER	DEPARTMENT	FHP ☐	SO ☐	PD ☐	OTHER ☐

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DIAGRAM

INDICATE NORTH
WITH ARROW

Page _____ Of _____

Appendix B: Algorithm for Selecting Qualifying Vehicles Using the Florida 2008 PAR Data

The following table shows the method used for identifying trucks and buses that satisfy the vehicle criteria outlined in Table 2. For example, if the VIN indicates that a vehicle is a single unit truck (SUT) and the vehicle type is not a bus, the vehicle is classified as a qualifying truck. Any vehicle coded as a motor home by either the VIN or the vehicle type variable was excluded from consideration as a qualifying vehicle. A vehicle was determined to be used for commercial use if the vehicle use variable was coded as commercial cargo, dump, concrete mixer, garbage/refuse, cargo van (see the bottom of the Florida Crash Report Form in Appendix A for the Vehicle Use codes), or if a carrier name or a DOT/ICC MC number was recorded for those vehicles in the Florida PAR data.

Vehicles designated as light pickups by the vehicle type variable were classified as trucks if it could be determined that they were pulling a trailer other than a boat or a house trailer, and they were used for commercial use as described above.

VIN	Vehicle Type	Commercial Use	Trailer	Classification
SUT	not bus			Truck
Step, Walk-in Van	not bus			Truck
Medium/ Heavy Pickup >10,000 lbs		Yes		Truck
Large Van		Yes		Truck
	Light Pickup	Yes	Yes	Truck
Truck Tractor with / without Trailers				Truck
Unknown or Trailer	Heavy Truck / Truck Tractor			Truck
Bus				Bus
SUT, Large Van, Unknown	Bus			Bus

Appendix C: Comparison of VIN-Decoded and PAR Vehicle Type Identification of MCMIS Qualifying Vehicles

To identify qualifying vehicles, this report uses seven variables in combination as described in Section 4.1. Two of the primary variables are the VIN-decoded vehicle type and the vehicle type as recorded on the Florida Crash Report Form. A cross-classification of these two variables appears below. As shown by entries on the main diagonal, the variables generally agree; however, there are differences, as shown by the shaded cells in the table.

While the total number of qualifying trucks agree at about 27,000, there are 6,677 vehicles classified as "Other" based on VIN decoding that are classified as trucks by the PAR vehicle type. Similarly, there are 6,651 classified as "Other" based on the PAR vehicle type that are classified as trucks based on VIN decoding. In addition, there are 1,270 vehicles classified as "Other" by VIN decoding, but are classified as buses based on the PAR vehicle type.

VIN Decoded Vehicle Type	Vehicle Type Recorded on PAR				
	Truck	Bus	Hazmat	Other	Total
Truck	20,220	124	14	6,651	27,009
Bus	44	4,359	0	374	4,777
Hazmat	23	0	87	0	110
Other	6,677	1,270	0	653,952	661,899
Total	26,964	5,753	101	660,977	693,795

The table below shows total qualifying vehicles using the VIN-decoded vehicle type variable, the vehicle type variable as recorded on the Florida Traffic Crash Report Form, and the methodology used in this report based on a combination of seven variables.

	VIN	PAR	Study
Truck	27,009	26,964	26,629
Bus	4,777	5,753	6,053
Hazmat	110	101	107
Total	31,896	32,818	32,789

As a further check on any differences due to the definition of qualifying vehicles, the injured/transported and towed/disabled criteria were applied in order to arrive at reporting rates based on the three methods. The following table shows number of vehicles reportable to the MCMIS Crash file.

Crash type	VIN	PAR	Study
Fatal	344	346	329
Injury transported for treatment	4,842	5,305	4,839
Vehicle towed due to damage	6,269	6,335	6,288
Total	11,455	11,986	11,456

Finally, the following table shows consistency of reporting rates, regardless of the method.

Reporting	VIN	PAR	Study
Reported	3,161	3,213	3,209
Reportable	11,455	11,986	11,456
Rate	27.6	26.8	28.0