UMTRI-2009-45 NOVEMBER 2009

EVALUATION OF 2007 TEXAS CRASH DATA REPORTED TO MCMIS CRASH FILE

DANIEL BLOWER
ANNE MATTESON

UMTRI-2009-45

Evaluation of 2007 Texas Crash Data Reported to the MCMIS Crash File

Daniel Blower
Anne Matteson

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

November 2009

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
UMTRI-2009-45		

4. Title and Subtitle	5. Report Date
Evaluation of 2007 Texas Crash Data Reported to the MCMIS Crash File	November 2009
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
Blower, Daniel and Matteson, Anne	UMTRI-2009-45

9. Performing Organization Name and Address	10. Work Unit no. (TRAIS)
The University of Michigan Transportation Research Institute 2901 Baxter Road Ann Arbor, Michigan 48109-2150 U.S.A.	059778
	11. Contract or Grant No. DTMC75-06-H-00003

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
U.S. Department of Transportation Federal Motor Carrier Safety Administration 400 Seventh Street, SW Washington, D.C. 20590	Special report
	14. Sponsoring Agency Code

15. Supplementary Notes

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. This report examines the factors that are associated with reporting rates for the state of Texas.

Evaluating Texas data in the MCMIS Crash file presented unique problems. Gaps in the PAR data made difficult to identify vehicles that meet the MCMIS vehicle type criteria with confidence or to cleanly identify crashes meeting the severity threshold.

Alternative methods were developed to evaluate reporting indirectly. The result of each method was consistent with the conclusion that Texas reporting is substantially complete. No evidence was found that would tend to show underreporting or overreporting. Missing data rates are low for most variables, and that data reported are consistent.

However, it is emphasized that gaps in the Texas data make it impossible to directly measure crash reporting rates.

17. Key Words	18. Distribution Statement
MCMIS, Texas Crash File, accident statistics, underreporting	Unlimited

19. Security Classification (of this report)	20. Security Classification (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	35	

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)

Table of Contents

List of Tables

List of Figures

Evaluation of 2007 Texas 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 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 that evaluates the completeness and accuracy of the data in the MCMIS Crash file. Previous reports showed significant underreporting which was due in large part to problems in interpreting and applying the reporting criteria within the states. The problems tended to be more severe in large jurisdictions and police departments. Each state also had issues specific to the nature of its own system. Some states also were overreporting some cases, often due to technical problems with duplicate records. [See references 3 to 35.] 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.

In this report, we focus on MCMIS Crash file reporting by Texas. In recent years, Texas has reported from 12,000 to 18,000 involvements annually to the MCMIS Crash file. The trend has been toward increasing numbers of cases reported with 11,868 reported in 2002, up to 14,824 in 2004, and 18,269 in 2006. Texas is the second largest state by population and generally ranks first in terms of the number of annual truck and bus fatal involvements. The number of fatal truck and bus involvements in Texas has ranged from 524 in 2003, 500 in 2004, 527 in 2005, 524 in 2006, and 540 in 2007.

Police accident report (PAR) data recorded in Texas's statewide files as of March 26, 2009 were used in this analysis. The 2007 PAR file contains the crash records for 1,119,074 units (primarily vehicles).

The evaluation of reporting by Texas to the MCMIS Crash file presented unique problems which required a methodology that was significantly different from the approach used for other states. Typically, the process of evaluation proceeds by identifying all crashes that meet the MCMIS reporting criteria in the state's computerized crash file, matching the entire state crash file to the MCMIS crash file to see which records were actually reported, and then calculating reporting rates and determining the factors that affect reporting. The method fundamentally depends on the ability to match records in the state file with records in the MCMIS Crash file.

However, it was not possible to match Texas crash records with the MCMIS file because the Texas data do not include the variables needed to make a match. Because of this limitation it was necessary to develop alternative approaches. In the first, we attempt to identify reportable crash

involvements in the Texas crash data, to determine what crashes should have been reported. This produces an estimate of the total number of cases that meet the reporting requirements, which can be compared with the total actually reported. In the second, we match the Texas commercial motor vehicle file—which is the set of crashes identified by the state and prepared for the MCMIS file—to the records actually reported to the MCMIS Crash file. This provides insight into the cases Texas identifies as reportable and also permits a comparison of data in the Texas CMV file with the same cases in MCMIS. And in the third approach, we estimate the number of records that should have been reported to the MCMIS Crash file, using a predictive model developed by UMTRI, and compare that number with the count of records actually reported. In addition, the data reported to MCMIS are evaluated for missing data.

2. Data Preparation

This section describes the processing of the Texas PAR file and the MCMIS Crash file to prepare them for the evaluation and analysis. In the case of the MCMIS Crash file, the only processing necessary was to extract records reported from Texas and to eliminate duplicate records. The Texas PAR file required more extensive work to create a comprehensive vehicle-level file from accident, vehicle, and person data. The following subsections describe the steps taken to prepare each file and some of the problems uncovered.

2.1 MCMIS Crash Data File

The 2007 MCMIS Crash file as of August 27, 2008, was used to identify records submitted from Texas. For calendar year 2007, 19,154 records were reported to the file from Texas. An analysis file was constructed using all variables in the MCMIS file. The analysis file was then examined for duplicate case numbers (more than one record submitted with the same report number and the same sequence number). Four such duplicate pairs were found. In each pair, the driver and vehicle information was identical, so they were considered duplicate records.

In addition, records were examined for identical values on accident number, accident date/time, county, street, vehicle license number, and driver license number, even though their vehicle sequence numbers were different. The purpose is to identify cases with multiple records for the same vehicle and driver within a given accident. Fourteen such duplicate pairs were found. In each pair, certain vehicle and driver-specific variables were identical, as were almost all of the crash-related variables. One member of the pair may have been mistakenly entered while updating the original record. Including the records identified above, a total of eighteen duplicate cases were identified. The member of the pair with the earliest upload date was deleted, resulting in 19,136 cases in the MCMIS file.

2.2 Texas Police Accident Report File

The Texas PAR data for 2007 (as of March 26, 2009) were obtained from the state. The data were stored as multiple text files, representing Crash, Vehicle, and Person information. The file contained records for 578,389 traffic crashes involving 1,119,074 units. Data for the PAR file are coded from the Texas Peace Officer's Crash Report (CRB-3 (Rev. 01/06) completed by police officers.

The Texas police officer completes the CRB-3 crash report for all vehicles and, in addition, the CMV Supplement (CRB-3C) for vehicles meeting specific truck, bus, and hazmat criteria. Both of these forms are submitted to the Texas Department of Transportation (TXDOT) Crash Records. Using the Crash Records Information System (CRIS), TXDOT creates Accident, Vehicle and Person files for all vehicles. Although these files include trucks and buses, they do not specifically identify CMV vehicles.

Both the main crash report and the CMV supplement are subsequently forwarded to the Department of Public Safety (DPS) Motor Carrier Bureau. The DPS extracts the CMV Supplement data along with other variables from the CRB-3 form and creates Accident and Vehicle files for CMVs. The CMV data are then uploaded through the SafetyNet system to the MCMIS Crash file.

The CMV file from the DPS cannot be merged with the TXDOT vehicle file. The case identifiers in each do not match, nor do the files contain the data necessary to develop a probabilistic matching algorithm. Each file was primarily developed to serve different purposes. The information on the crashes, once separated, cannot be joined back together.

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). An 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 2007076537 and 2007-76537, for example). In addition, the file was examined for duplicate records based on identical case number and vehicle number. No such instances were found.

Just as in the preparation of the MCMIS Crash file, cases 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 should not be identical on all variables. To investigate this possibility, records were examined for duplicate occurrences based on the fields for case number, accident date/time, crash county, city, street, driver age, vehicle make, model, and vehicle model year. Based on the above algorithm, 132 duplicate records (pairs, triplicates, etc.) were found. Examination of the candidate duplicates showed that most variables were identical. Since driver age, vehicle make, model, and model year were identical, these records were considered duplicates. It is possible these duplicates are generated during the process of updating the case, if the original record was not deleted after the update. All but one member of the duplicate group were excluded, resulting in dropping 71 records. After deleting duplicate records, the resulting PAR file has 1,119,003 unique records.

Texas Commercial Vehicle File

The Texas Commercial Vehicle file for 2003-2007 (as of October 20, 2008) was obtained from the state. The data were stored in a Microsoft Access™ database, representing Crash, Vehicle, and Driver information. The file contained records for 22,332 traffic crashes in 2007 involving 24,241 units. As with the PAR file, the CMV file was searched for duplicate records. A search for records with identical case number and vehicle number found four instances. In two of the pairs, vehicle and driver variables were different, so they were not considered duplicates. In the other two pairs, vehicle and driver information was identical, so one member of each pair was excluded.

Cases were also examined to identify records containing identical case number, time, place, and vehicle/driver variables, even though vehicle numbers differed. Records were examined for duplicate occurrences based on the variables for crash number, accident date/time, county, VIN, and driver license number. Three potential duplicates cases were found. In each of the pairs, almost all variables were identical. After excluding duplicate records, the resulting CMV file contained 24,236 cases.

3. The Problem of Linking Files

3.1 Matching Texas PAR file with MCMIS file

The next step in the evaluation process typically is to match records in the Texas PAR file to corresponding records from the MCMIS file. However, because of the nature of the data captured in the Texas PAR file, computer matching of the Texas crash file records to the MCMIS Crash file is not possible.

Matching records in the two files requires finding combinations of variables common to the two files that have a high probability of uniquely identifying both accidents and also specific vehicles within the accidents. A "hard" link, using case identifier variables, is the most desirable. This is the equivalent of joining information together from multiple sources using a person's Social Security number. A field called Crash Number is used to uniquely identify a crash in the Texas PAR data, and Report Number field is the case identifier variable in the MCMIS Crash file. Crash Number in the Texas PAR file is a ten-digit numeric field, while in the MCMIS Crash file Report Number is stored as a 12-character alphanumeric value. There is no correspondence between the PAR Crash Number and the MCMIS Report Number, so these variables could not be used in the match. Report number in the MCMIS Crash file is constructed with the state abbreviation (TX, in this case) followed by ten digits. However, even after stripping off the letters, there was no correspondence between the string of numbers used in the PAR Crash Number and the MCMIS Report Number fields.

The lack of correspondence between case identifiers in State files and in the MCMIS Crash file is not unusual; states often generate a unique number for records reported to the MCMIS Crash file, which is not related to the state's internal identification method. Fortunately, even without the hard link of case identifiers, it is usually possible to develop a probabilistic link, using combinations of variables that identify specific vehicles in crashes in specific times and locations. However, this was not the case with the Texas data that was supplied.

Data items useful for making a match at the crash level typically include Crash Date, Crash Time, Crash County, Crash City, Crash Street and Reporting Officer's Identification number. However, the data as stored in the MCMIS Crash file and the Texas PAR could not be used for this purpose. Reporting Officer's Badge Number was not available in the PAR data. Crash Street Name is a 30-character field in the PAR file, and a 50-character field in the MCMIS file. Some of the street names recorded in the two files apparently refer to the same road—for example, IH0010 in PAR file likely matches 0010 in MCMIS Crash file. But such matches could only be made by a manual review of records, and with roughly 19,000 records in the MCMIS file, this is clearly not feasible. Moreover, while the PAR file also had a Street Number and Highway Number field, they were unrecorded in 59 percent and 51 percent of the records, respectively.

Crash City Name and Crash City Code in the MCMIS file were both unrecorded in 100 percent of cases. Thus, no matches could be made at the crash level.

Variables that can be used to identify specific vehicles in a crash were similarly lacking. Vehicle license number, driver's license number, driver last name, VIN, and driver date of birth could all be used to identify a specific vehicle, but none of these variables were available in the Texas PAR file, at least in the computerized record. They are all on the police report itself, but apparently not captured in the computerized crash file. Driver Age can be used instead of date of birth, though it is less useful since it is more likely that two drivers will have the same age than the same date of birth. Moreover, in the PAR file Driver Age was unrecorded for 18.9 percent of records. The PAR file contains a number of CMV-specific variables such as Cargo Body and Vehicle Type, but the corresponding CMV variables useful for matching were unrecorded in more than 99 percent of cases. The PAR Vehicle Make, Model, and Body Style variables could be useful in a hand-match in some instances. However, in a number of cases examined, these variables were not specific enough to identify which potential PAR vehicle matched the MCMIS case, particularly since the MCMIS file does not contain Make or Model variables. Decoding the MCMIS VIN might provide additional information regarding vehicle make, but this was not possible given the number of cases to match.

Because of the sheer number of cases in TX, and the lack of accident-level and vehicle-level variables to use in a match, it is not possible to computer-match the Texas PAR data with the MCMIS file.

3.2 Matching Texas PAR file with Texas CMV file

There is a very limited number of variables common to the PAR file and the CMV file that allow accident/vehicle-specific matching. At the crash level, only crash date, time, and county are available. Crash Number and City do not match between the two files. There are variables that capture street and route information on each file, but the formats are inconsistent. To be used in a match would necessitate either excessive pre-processing or manual matching. At the vehicle level, only driver age and vehicle model year are available. Age is unrecorded in almost 19 percent of the PAR records and model year is missing in over 7 percent of cases. Thus, the computerized matching process would be limited to the variables for crash date, time, county , driver age, and vehicle model year.

The typical match process uses all vehicles in the state crash file, which makes it possible to identify any stray records reported to the MCMIS file that do not meet the vehicle type criteria. However, because of the imprecision of the variables available to identify vehicles, it is likely that, in a file as vast as the Texas crash file, with almost 1.2 million records, there would be crashes involving more than one driver with the same age or the same model year of vehicle.

Accordingly, it was decided to attempt the match using a somewhat different approach. Rather than including all records, the match was limited to likely truck and bus cases. This reduces the number of non-matches because of duplicate occurrences of the match variables. To limit the PAR file, we excluded cases where Vehicle Unit Description Id was something other than a motor vehicle. The PAR file was also further restricted by excluding the following Vehicle Types: passenger, passenger car and trailer, passenger car and house trailer, mobile home, motorcycle, motor scooter/bike, motor assisted bike, motorcycle (police), train, pedestrian, and

pedalcyclist (again, unless the motorized unit was transporting hazmat). Excluding these cases reduced the number of vehicles used for the match from 1,119,003 to 573,817 records.

All cases in the CMV file (24,236) were used in the match, since over 99 percent of them were motor vehicles, based on the Vehicle Unit Description ID. The variables available for use in the match were crash date (month, day), crash time (hour, minute), county, driver age, and vehicle model year.

This procedure produced 15,254 matches, which is only 63 percent of CMV records. The large number of CMV records that were not matched to the PAR file prevents a meaningful analysis of the factors influencing selection to the MCMIS Crash file.

3.3 Matching CMV file with MCMIS file

Many variables in the CMV file matched MCMIS variables. These included Case Number, Crash Date and Time, County, Vehicle License Plate, Vehicle Identification Number (VIN), Driver License Number, Driver Last Name, and Driver Date of Birth. Since Driver DOB was unrecorded in 5.2 percent of CMV cases and in 4.7 percent of MCMIS cases, it was not used in the match. This did not present an obstacle, as other vehicle and driver-specific variables were available.

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 were excluded, along with records that were missing values on the match variables. The first match included the variables case number, crash date (month, day), crash time (hour, minute), county, driver license number, and vehicle identification number (VIN). The second match step dropped minute as well as VIN, and matched on case number, crash date, crash hour, county, driver license number, and vehicle license plate number. The third match used variables case number, crash date, county, vehicle license plate number, and driver last name. After some experimentation, the fourth match step included case number, crash date, and driver last name. A fifth match matched on case number, crash date, and vehicle license plate number.

In total, 99.1 percent of the MCMIS records were matched to the CMV file. Only 174 cases could not be matched. See Table 1 for the variables used in each match step and the number of records matched at each step. Figure 1 shows the flow of cases from each file in the match process.

Table 1 Steps in MCMIS/Texas CMV File Match, 2007

Step	Matching variables	Cases matched
Match 1	Case number, date, time, county, driver license number, and VIN	17,771
Match 2	Case number, date, hour, county, driver license number, and vehicle license plate	77
Match 3	Case number, date, county, vehicle license plate, and driver last name	439
Match 4	Case number, date, and driver last name	525
Match 5	Case number, date, and vehicle license plate	150
Total cases matched		18,962

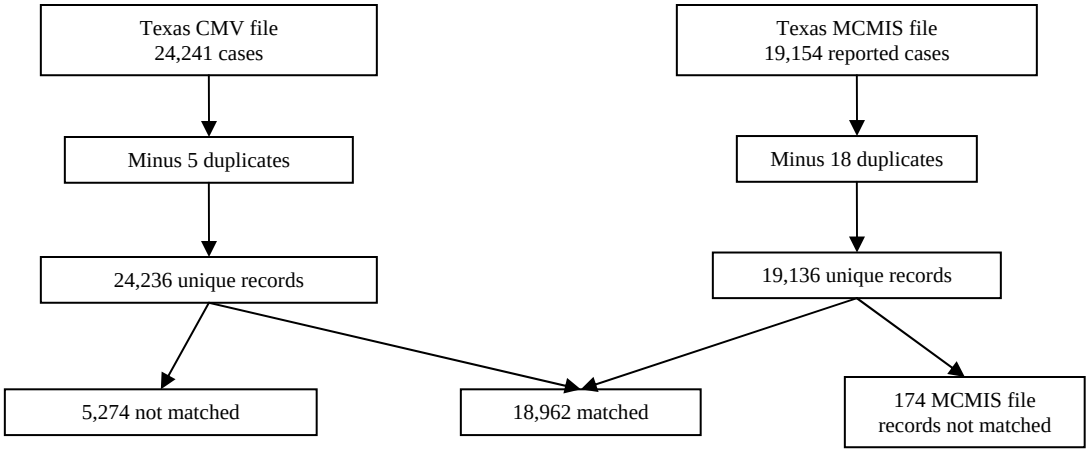


Figure 1 Case Flow in Texas CMV/MCMIS File Match

4. Identifying Reportable Cases in the Texas Crash Data

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 the vehicle and crash severity criteria are each discussed in turn.

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 Vehicle type

Identifying vehicles that meet the MCMIS reporting criteria in the Texas PAR file using the variables included in the file is very challenging and the results must be understood as expert guesses, rather than a definitive identification. The methods used to capture and record vehicle type on the Texas PAR prevent identifying vehicles that meet the MCMIS Crash file definitions with any degree of confidence that the full set of eligible vehicles has been accurately selected.

Information about vehicle type is entered on the police report as an alpha string in the “body style” blank. The instruction manual provides no guidance with reference to trucks or buses concerning what should be entered. [Reference 2, pages 10-12.] The examples given in the manual are for automobiles, pickups, and sport utility vehicles. Moreover, there is no standardized list of vehicle types, either in the instruction manual or elsewhere, to help the officer. The list of vehicles in the instruction manual for coding vehicle types on the CMV

contains significant errors.[1] In terms of the coded data about vehicles in the Texas PAR file, apparently there is a manual process through which the diversity of entries the hundreds of police officers who complete crash reports might make is reduced to 66 distinct categories. The categories, even when the unit type is restricted to motor vehicle, are a mixture of vehicle types, trailer types, cargo body types, and even cargo types. There is also a vehicle type ID variable in the computerized record, which is added to the file later as a "derived" variable, as there is no such variable on the police report itself.

Vehicle type and vehicle body style are the only variables available to identify reportable trucks and buses. VIN is not available to verify the selection. The manual does not provide definitions for the vehicle types derived from the main PAR (though it does provide definitions and examples of vehicle types for the CMV form, some of which are incorrect.) Accordingly it is necessary to rely on the wording of the code levels themselves to decide whether a vehicle meets the MCMIS rules. Appendix A shows the combination of codes used to identify trucks and buses that meet the MCMIS reporting criteria.

Using the codes shown identifies 36,037 vehicles as meeting the MCMIS vehicle type criteria. It should be noted that this is likely an underestimate of the true number, because of the ambiguities in the data available. For example, there are likely many vehicles that meet the MCMIS criteria coded as "van all types" in the body style variable. But these cases were not taken because they also likely include many light duty van and even passenger vans, and there is no way to distinguish those with a gross vehicle weight rating over 10,000 pounds from the smaller vans. VIN is captured on the police report, but not included in the computer file, so there is no way to tell with the data available.

4.2 Crash severity

Identifying crashes that meet the MCMIS severity criteria is also problematic. 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. The Texas police report includes all the information required, but not all of the needed information makes it into the computerized record. Therefore, it is not possible to develop an algorithm to identify cases that meet the MCMIS crash severity criteria directly. Data gaps necessitate the use of approximations.

With respect to injuries, Texas codes the severity of injury for each person involved in an accident using the KABCO scale, which is common among the states. The CRB-3 also includes a box for the number of persons transported for treatment. This should be enough to identify crashes in which an injured person was transported for treatment. Unfortunately, the information about transportation for medical attention is not included in the computerized PAR data. The Texas CMV file includes a variable which flags the crash as including a person transported for treatment, but that information cannot be used with the main PAR data because it is not possible

[1] The illustrations of tractor/double trailer and tractor/triple trailer shown on page 46 of reference 2 are incorrect. The drawing for the double shows a straight truck pulling an "other" (non-semitrailer) trailer. The illustration for tractor/triple shows a straight truck pulling two "other" trailers. The "triple" combination as shown is operated nowhere in the US and is likely not possible. The combination mislabeled as double is only used in a few highly specialized operations in the US.

to join the PAR data with the CMV data, as described above. The only injury severity scale that can be used with the Texas PAR file is to classify crashes by the most severe injury in the crash.

The other piece of the crash severity measure is based on damage to vehicles. Crashes in which at least one vehicle is towed due to disabling damage meet the MCMIS Crash file crash severity criteria. In this regard, the Texas PAR data includes the necessary information. For each unit in a crash, the officer checks a box to indicate if a vehicle was towed due to disabling damage. In addition, the officer records where and by whom the vehicle was removed. Using this information, it is simple to identify crashes in which at least one motor vehicle was towed due to disabling damage.

The injury and vehicle damage information was used to develop a measure that approximates the MCMIS Crash severity criteria. The set of involvements in which the maximum injury severity was fatal, A-, or B-injury plus the set of involvements in which at least one motor vehicle was towed due to disabling damage is reasonably close to the MCMIS criteria. We tested this in the 2008 General Estimates System data, which is a nationally representative sample of police-reported crashes in the US. In the GES data, K, A, or B-injury crash involvements plus the towed/disabled involvements amount to about 94.0 percent of the total reportable crashes. However, it should be noted that about just using the maximum injury severity in the crash without regard to whether an injured person was transported results in taking some additional cases that do not meet the criteria. These would be cases in which the most severe injury was an A- or B-injury and no vehicle was towed. These cases, while unusual, amount to about 1.7 percent of the cases that would be selected if whether an injured person was transported could not be used. To summarize, analysis of the 2008 GES data indicates that using maximum injury severity and towed/disabled information encompasses about 94.0 percent of reportable cases, but includes an extra 1.7 percent of cases, in which a person receives an A- or B-injury, but is not transported and no vehicle is towed due to disabling damage.

4.3 Estimate of Reportable Crashes Based on Vehicle Type and Crash Severity Surrogate

We used the vehicle type identification method described in section 4.1 and the crash severity identification method described in section 4.2 to identify reportable crash involvements in the Texas data. This resulted in the selection of 15,505 vehicles that meet the MCMIS vehicle type criteria and that were involved in a crash meeting the MCMIS severity criteria.

The analysis in section 4.2 estimated that the crash severity selection process would encompass 94.0 percent of reportable cases, but that 1.7 percent of the cases would actually not meet the crash severity criteria. Adjusting for these two factors results in a net estimate of 16,214 reportable cases. However, it was pointed out in section 4.1 that the identification of qualifying vehicles in the Texas data is problematic because some of the code levels were not clear as to whether they were vehicles that met the GVWR threshold. It is likely that some medium duty vehicles were missed and that the estimate of vehicles is therefore too low. There is not enough information to estimate the under count of qualifying vehicles. Likely there are some vehicles that were classified as “van all types” that exceed the 10,000 lb. GVWR threshold, but it is not possible to determine how many. But it is very likely that the 16,214 reportable involvements estimated in this section is conservative and that the true number is somewhat higher. If the true

number is 20% higher, that would result in an estimate of 20,200 reportable cases from Texas in 2008. That number is quite close to the 19,136 actually reported.

5. Analysis of Cases in the Texas CMV File

Texas compiles a CMV crash file, which contains information from the main Texas crash report (CRB-3) and the CMV supplement (CRB-3C). Instructions on the crash report require a supplement to be completed for any commercial motor vehicle involved in a motor vehicle crash. The instructions correctly identify the vehicles that meet the MCMIS Crash file vehicle criteria. The instructions state that the form should be completed for vehicles with a GVWR or GCWR of 10,001 lbs. or more, for any bus with a seating capacity for nine or more occupants, or for any motor vehicle transporting hazardous materials that require a placard. Note that there are no instructions with respect to crash severity.

The CMV supplement includes most of the information required for the MCMIS Crash file, and the variables use the MCMIS code levels, including those for vehicle type, cargo body, and sequence of events. The CRB-3C and the CRB-3 are both forwarded to the Department of Public Safety (DPS)/Motor Carrier Bureau. The DPS extracts the data from the CRB-3C and the main CRB-3 and creates the CMV data file.

The CMV supplement data contains enough information to match to the MCMIS file and, as reported in section 3.3, 18,962 of the 24,236 records in the CMV file matched records in the MCMIS Crash file.

Since the CMV supplement data includes all the variables needed for the MCMIS Crash file, it is an easy task to identify the records in the CMV supplement that meet the MCMIS Crash file reporting criteria. Qualifying vehicles are identified using the AV_SNET_VEHCONFIG field, along with the AV_VEH_HAZMAT field for nontrucks that were transporting hazmat. The most severe injury in the crash is identified in the AC_SEVERITY field and the CMV data includes a flag for crashes in which an injured person was transported for medical attention, AC_MED_ATTN. In addition, there is a flag for crashes with a vehicle towed due to disabling damage (AC_TOWAWAY), so all the elements necessary to identify reportable crashes are present.

Applying these filters, 19,174 vehicles are identified in the 2007 CMV supplemental data as meeting the MCMIS Crash file criteria. Of these records, 18,744 were reported to the MCMIS Crash file, for a reporting rate from the CMV file of 97.8 percent. It should be remembered that this reporting rate only applies to the CMV supplement data, not to the entire Texas PAR file.

The previous section demonstrated that it is not possible to identify <u>independently</u> vehicles in crashes that meet the MCMIS Crash file requirements. An estimate of that number was developed, but the estimate is based on a set of assumptions and is likely low. The CMV supplement data represents at least two steps removed from the PAR data. The first step is the identification by the reporting officer of vehicles that meet the MCMIS vehicle criteria. Officers must recognize that the crash involves a vehicle that fits the criteria before they complete the CMV supplement form. The second step is whatever selection, processing, and review is done at the DPS/Motor Carrier Bureau when compiling the data.

That said, it is noteworthy that the 18,744 CMV supplement records reported to the MCMIS Crash file is quite close to the estimate of roughly 16,200 records developed from the PAR data, particularly since that latter estimate is likely to be low.

Analysis of the crashes reported from the CMV file to MCMIS shows a high degree of compliance with the reporting requirements. The overall reporting rate was 97.8 percent. The reporting rate was high for every subcategory of vehicle and crash severity that was examined. The following few tables illustrate the point. Rates are high in each category. Reporting rates are almost identical for each crash severity, for trucks as well as buses, and for large vehicles as well as small ones. The only apparent deviation from this pattern is the somewhat lower rate for tractor/triple combinations, but that is misleading since there were only eight such cases. Missing only one would result is a significant decline in the percentage, even though only one was missed.

Table 3 Reporting Rate by Vehicle Type from Texas CMV File to MCMIS Crash File, Texas 2007

MCMIS Vehicle Type	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Truck	17,758	97.7	404	94.0
Bus	1,416	98.2	26	6.0
Total	19,174	97.8	430	100.0

Table 4 Reporting Rate by Vehicle Configuration from Texas CMV File to MCMIS Crash File, Texas 2007

Vehicle configuration	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Bus (9-15 seats)	213	97.7	5	1.2
Bus (> 15 seats)	1,194	98.2	21	4.9
SUT, 2axle, 6 tire	2,970	98.9	32	7.4
SUT, 3+ axle	2,003	98.8	24	5.6
Truck trailer	2,524	97.6	61	14.2
Truck tractor	966	98.0	19	4.4
Tractor/semitrailer	8,752	97.3	238	55.3
Tractor/double	195	99.0	2	0.5
Tractor/triple	7	85.7	1	0.2
Unknown heavy truck	209	92.8	15	3.5
Unrecorded	141	91.5	12	2.8
Total	19,174	97.8	430	100.0

Table 5 Reporting Rate by Vehicle Type from Texas CMV File to MCMIS Crash File, Texas 2007

MCMIS Crash Severity	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
Fatal	499	99.2	4	0.9
Injured/transported	7,309	97.8	164	38.1
Tow/disabled	11,366	97.7	262	60.9
Total	19,174	97.8	430	100.0

Thus, it appears that there is no overall pattern for the few cases that were missed, no category of vehicle or severity that was missed. Table 6 shows the distribution of reportable records not reported from the CMV file to the MCMIS file. There is some slight trend toward tractor-semitrailers not reported, but with respect to crash severity and the other vehicle configurations, there is no indication that any specific type of vehicle or crash is not being picked up.

Table 6 Reportable Cases in Texas CMV File Not Reported

	Crash severity			
Vehicle configuration	Fatal	Injured, transported	Towed, disabled	Total
Bus (9-15 seats)	0	2	3	5
Bus (> 15 seats)	0	10	11	21
SUT, 2axle, 6tire	0	13	19	32
SUT, 3+ axles	1	11	12	24
Truck Trailer	0	22	39	61
Truck Tractor	0	9	10	19
Tractor/semitrailer	3	86	149	238
Tractor/double	0	1	1	2
Tractor/triple	0	1	0	1
Unknown heavy truck	0	7	8	15
Unrecorded	0	2	10	12
Total	4	164	262	430

Overall, the correct cases are identified in the Texas CMV data and uploaded to the MCMIS Crash file.

5.1 Reporting Latency

Crashes are required to be reported to the MCMIS Crash file within 90 days of crash occurrence. Timely reporting is essential, since the data are used to find unsafe carriers for safety interventions. Delays in reporting crashes could result in delays in identifying patterns that could signal a problem.

Overall, about 90 percent of crashes were reported within 90 days of their occurrence. Within 120 days, the percentage increased to about 94 percent. Figure 2 shows the cumulative percentage by the number of days after the crash. The rate approaches 100 percent, but has a very long tail, indicating that records tricked in slowly after the bulk of records had been

submitted. Ninety-nine percent were submitted by 240 days and the greatest time interval was one record that was submitted a full 584 days after the crash, or about 1 year and 7 months.

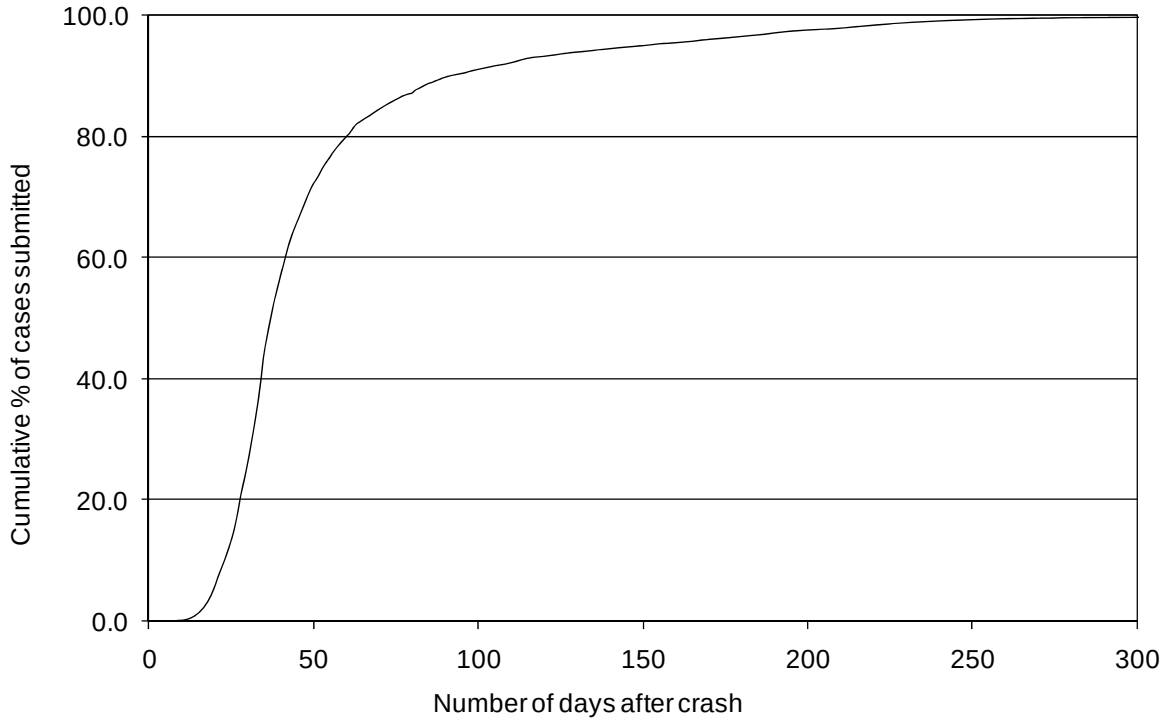


Figure 2 Cumulative Percent of Cases Submitted to MCMIS Crash File by Number of Days After Crash, Texas 2007

The first date on which crash records from 2007 were uploaded was February 5, 2007, when five records were uploaded. On average, uploads occurred every 1.6 days between then and August 27, 2008, when the last upload occurred. The uploads averaged 60.0 records were uploaded per upload, with a maximum of 1,076 in October of 2007. Many uploads consisted only of a few records, particularly after March, 2008. Over 90 percent of reported records had been uploaded by the end of January 2008.

6. Estimation of Reportable Cases

A third perspective on Texas reporting to the MCMIS Crash file can be gained by estimating the number of records that would be expected to be reported, given the size of the state and the number of fatal involvements.

UMTRI has developed a method to predict the number of reportable nonfatal cases based on the number of reportable fatal involvements.[36] The method takes advantage of one of the fact that the MCMIS reporting criteria are designed to be independent of any particular state data system. The definitions of a fatal crash, a crash with at least one person transported for medical attention, or at least one vehicle towed due to disabling damage do not depend on a state's injury scaling system or vehicle damage scaling system. Instead, they can be applied in any state and should encompass the same level of damage or injury severity everywhere. It is known that the application of the KABCO system varies from state to state. Some states have much larger proportions of A-injuries than others, for example. But the decision whether to transport an

injured person for treatment would be the same, regardless of state. The same should be true for towing disabled vehicles.

Analysis of crash data from several states whose data systems support direct identification of the MCMIS crash severities produced a model that predicts the number of reportable nonfatal crash involvements, given the number of fatal involvements. The number of fatal involvements in a state should be known with a reasonable level of precision, because they are so serious. The UMTRI work is made operational in a Microsoft Excel® spreadsheet, which calculates the predicted number of nonfatal involvements based on an input count of fatal involvements.

Three sources of counts of fatal involvements are available for Texas in 2007. The Texas PAR data and the CMV supplement data are the first two obvious ones. In the CMV supplement data, there were 499 involvements of vehicles that meet the MCMIS Crash file criteria. The problem of identifying reportable vehicles in the Texas PAR data was discussed in section 4.1, where it was noted that the number identified is likely low. However, using the Texas PAR data identified 438 MCMIS vehicles involved in a fatal crash. The final source of counts is derived from the Fatality Analysis Reporting System (FARS) data from NHTSA. Trucks and buses that meet the MCMIS criteria were identified in the FARS file using the algorithm UMTRI has developed for its Trucks Involved in Fatal Accidents and Buses Involved in Fatal Accidents surveys. A total of 540 records qualifying trucks and buses were identified from Texas in the 2007 FARS file. This number may be slightly high because the UMTRI method is to select all possible candidates and then refine the selection by its telephone survey of the operators.

Predicting the total number of reportable crash involvements from these three counts of fatal involvements produces estimates ranging from about 16,500 to 20,500. The number of unique records actually reported is 19,136. The prediction from the Texas PAR count of fatal involvements is probably too low, because of the difficulty in identifying vehicles comprehensively, as explained above. The count from FARS is likewise somewhat high, given that the TIFA and BIFA surveys almost always determine that some vehicles are misidentified in FARS. The conclusion, then, is that the number actually reported by Texas to the MCMIS Crash file is very close to the number that would be expected, based on the number of fatal involvements.

Table 7 Predicted Number of MCMIS-Reportable Records in Texas Based on Counts of Fatal Involvements from Three Sources

Source of count of fatal involvements	Fatal	Predicted Nonfatal	Predicted total
CMV supplement	499	18,373	18,872
Texas PAR	438	15,995	16,433
FARS	540	19,981	20,521
Actual reported	Fatal	Nonfatal	Total
	500	18,636	19,136

7. Data Quality of Reported Cases

In this section, we consider the quality of data reported to the MCMIS crash file. Two aspects of data quality are examined. The first is the amount of missing data. Missing data rates are critical

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 state crash file and in the MCMIS Crash file. Inconsistencies can indicate problems in translating information recorded on the crash report to the values in the MCMIS Crash file.

Table 8 shows missing data rates for selected, important variables in the MCMIS Crash file. Missing data rates are generally quite low, with a handful of exceptions. On most fundamental, structural variables, such as date, time, number of fatalities and number of injuries, missing data rates are zero. That is, all records are complete.

No variables have what would be considered high rates of missing data. Driver license class has the highest rate at 10.7 percent. Other variables have missing data rates that range from 1.3 percent to 4.9 percent, which is quite within the range that is reasonable in a crash file. Events two through four have much higher apparent rates, but most crashes consist of only one harmful event (a collision), so higher rates of "missing" data for subsequent events is not unreasonable.

Table 8 Missing Data Rates for Selected MCMIS Crash File Variables, Texas, 2007

Variable	Percent unrecorded	Variable	Percent unrecorded
Report number	0.0	Fatal injuries	0.0
Accident year	0.0	Non-fatal injuries	0.0
Accident month	0.0	Interstate	0.0
Accident day	0.0	Light	0.0
Accident hour	0.0	Event one	2.2
Accident minute	0.0	Event two	75.6
County	0.0	Event three	89.1
Body type	0.0	Event four	96.0
Configuration	1.3	Number of vehicles	0.0
GVWR class	4.5	Road access	0.0
DOT number *	1.6	Road surface	0.0
Carrier state	0.0	Road trafficway	0.0
Citation issued	0.7	Towaway	0.0
Driver date of birth	4.7	Truck or bus	0.0
Driver license number	4.9	Vehicle license number	2.7
Driver license state	4.9	Vehicle license state	2.4
Driver license class	10.2	VIN	1.7
Driver license valid	0.7	Weather	0.0

* Based on 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)	10.5
Hazardous materials class (4-digit)	0.0
Hazardous materials name	100.0

The second section of the table shows missing data rates for the hazardous materials (hazmat) variables. Hazmat Placard was recorded in every record. The other missing data rates shown are

limited to the 19 records where the vehicle displayed a hazmat placard, indicating it was carrying hazmat. There was no missing data for hazardous cargo release or hazmat 4-digit class. However, the hazmat class 1-digit code was missing in 10.5 percent of cases, and the hazmat name was missing in all cases.

It is also useful to compare records as they appear in the state crash file with the records in the MCMIS Crash file. Differences may indicate errors in processing and preparing it for upload in the SafetyNet system. The only comparisons that can be made in the Texas data is between the CMV file and the MCMIS file, because it is not possible to match the PAR data with the MCMIS data.

We compared code values in MCMIS and in the CMV data for a large number of variables, including vehicle configuration, license state, driver's license class, light condition, weather, road surface condition, sequence of events, cargo body type, hazmat class, hazmat 4-digit number, hazmat release, trafficway flow, and number of fatalities. For each pair of variables compared, the result was either no difference or differences in only a handful of cases, typically no more than five. In terms of vehicle configuration, there were two cases, out of 18,962, that differed. One vehicle was coded as a truck trailer in the CMV data, but as a bus in the MCMIS file. There was also one truck trailer (CMV) recorded as a single unit truck (no trailer) in MCMIS. There were three differences on cargo body, each of which were coded as not applicable in one file, but with a valid cargo body in the other. These differences are of only slight significance, and may have occurred when a correction was made to the CMV data, but not updated in the MCMIS file.

Overall, the quality of data reported from Texas to the MCMIS file is quite good.

8. Summary and Discussion

Evaluating Texas data in the MCMIS Crash file presented unique problems. Gaps in the PAR data makes it very difficult to identify vehicles that meet the MCMIS vehicle type criteria with confidence. Similarly, it is not possible to cleanly identify crashes meeting the severity threshold, because the information about transporting injured persons for medical attention, while present on the CRB-3 crash report, is not included in the computer file. Furthermore, the Texas PAR and CMV files do not include information needed to join the PAR data to the MCMIS data, or even the PAR data to the CMV data within the Texas system.

These data files presented major impediments to the customary procedures for evaluating the completeness and accuracy of state reporting to the MCMIS Crash file. It was not possible to identify reportable records in the Texas PAR file with confidence, and it was not possible to link the Texas PAR data with the MCMIS file to see if those specific records had been reported. Similarly, it was not possible to link the Texas PAR data with the CMV file, to determine in the correct records were included in the CMV data.

However, we did develop alternative methods to evaluate reporting from Texas. While these methods cannot directly and definitively determine if Texas is submitting all the correct reports, they do provide indirect checks. And the conclusion from each of the perspectives is that the number of cases Texas is reporting is about the number that would be expected, that the cases

they submit fit the MCMIS criteria accurately, and that the data submitted is substantially complete and consistent.

The first approach was to attempt to identify reportable cases in the Texas PAR data. Two factors in the Texas PAR data reduced the accuracy with which this could be accomplished. Vehicle configuration is ambiguously coded in the crash file. It is recorded by the officer on the CRB-3 in the body style field as an alphabetic string, which is standardized during case processing and a vehicle type field is added. However, the instruction manual for police officers does not include definitions or a standard list of types, and we were unable to obtain clear definitions of the different types that appeared in the file from DPS personnel. Moreover, the file does not include the VIN, which could be used to discriminate trucks and buses that meet the MCMIS vehicle type criteria. The result was that it was not possible to develop a selection process that would cleanly identify MCMIS vehicles and exclude vehicles that do not meet the MCMIS criteria. The problem is most acute at the lower end of the GVWR scale, at the boundary between light and medium vehicles. The set of cases taken therefore probably misses some medium duty vehicles and is likely lower than it would be if all needed information was available.

The other problem is in applying the crash severity criteria. Whether injured persons are transported is indicated on the CRB-3 crash report, but that information is not included in the crash file. A selection method that bypasses the missing information was developed, but again, at the cost of an estimate that is likely too low.

However, even given these two problems, we estimate that 16,200 cases were reportable from Texas. Given that about 19,100 records were actually reported and that there are very good grounds for believe the estimate from the PAR data is too low, this result is consistent with a conclusion of substantially complete reporting.

The second analysis focused on the Texas CMV data. Unfortunately, these data cannot be linked back to the Texas PAR file. And they represent the set of crashes that Texas itself has concluded meet the MCMIS vehicle type criteria, so they are not a true independent selection of reportable cases.

However, the result of the analysis of the CMV data was very strong. Almost 98 percent of the reportable records in the CMV data were actually reported to the MCMIS Crash file. The reporting rate was high for virtually all vehicle types and for all crash severities. This indicates that there is no systematic problem with applying the MCMIS reporting criteria accurately. There was a relative handful of reportable cases that were not report, but there was no pattern evident that would indicate a systematic problem.

Moreover, the number reported from the CMV file was quite close to the expected number. In the third perspective on reporting, we estimated the number of reportable cases based on a method developed by UMTRI for predicting the number of total reportable cases from the number of trucks and buses involved in fatal crashes. In the case of the CMV data, the UMTRI method predicted about 18,900 records reported, and about 19,100 records were actually reported. Given the uncertainties, this is remarkably good agreement.

In addition to analyzing, to the extent possible, the completeness of reporting, we also examined the timeliness of reporting and the quality of the data reported. Texas reports about 90 percent of the records ultimately reported within 90 days, which is the requirement for reporting. After that 90 day boundary, reporting slows considerably, and reports are added in small batches for a considerable period of time. Ninety-nine percent reporting was not achieved until 240 days. The greatest duration between the crash and the time the record was uploaded was 584 days.

With respect to the reported data itself, missing data rates for most fields reported to the MCMIS Crash file are quite low, with no significant problems. Driver license class was missing for 10.2 percent of records, but the rate was either zero or less than five percent for all other records. Rates were low even for the hazmat variables.

There also appear to be no systematic errors in translating the data from the Texas system to the MCMIS Crash file. Data for almost all CMV records was identical to the record in the MCMIS file. There was a tiny handful of records—no more than five—in which there were differences in a small number of fields, but overall, the data reported appears to be of good quality.

Despite the considerable and surprising obstacles to this evaluation, we found no evidence that reporting from Texas to the MCMIS Crash file is not substantially complete. This conclusion must be considered in light of the fact that our normal method of evaluation was not possible. So it must be acknowledged that we make categorical statements about whether the reporting is complete and accurate. However, the alternative methods developed turned up no evidence of either underreporting or overreporting. Each of the approaches taken produced results consistent with substantially complete reporting. And the resulting records appear to be complete and accurate.

Yet the obstacles must also be acknowledged. The Texas crash report (CRB-3) contains all the information needed, if only it were all keypunched and made available in the crash file. The method of capturing vehicle configuration is ambiguous at best and open to great inconsistency between officers and coders. It is a simple matter to develop a comprehensive standardized list of vehicle types and configurations and train the officers to use them. This would be invaluable to accurately identifying vehicle types for this and other safety analyses. Including VIN in the file would enhance the value of the crash data immensely. Finally, adding the ability to link files is critical, particularly the PAR and CMV files. The combined information would be enormously valuable for safety analysis, well beyond the present evaluation of truck and bus crash data.

9. References

1 U.S. Bureau of Census, 2002 Economic Census, Vehicle Inventory and Use Survey.

2 Instructions to Police for Reporting Crashes, 2008 Edition. State of Texas, Texas Department of Transportation. Austin, Texas. CR-100 (Rev. 03/08).

3 Blower, D., and Matteson, A., Evaluation of Missouri Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. January 2004. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

4 Blower, D., and Matteson, A., Evaluation of the Motor Carrier Management Information System Crash File, Phase One. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. March 2003. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

5 Blower, D., and Matteson, A., Patterns of MCMIS Crash File Underreporting in Ohio. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. August 2003. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

6 Blower, D., and Matteson, A., Evaluation of Michigan Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. September 2004. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

7 Blower, D., and Matteson, A., Evaluation of Florida Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. December 2004. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

8 Matteson, A., and Blower, D., Evaluation of California Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. February 2005. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

9 Green, P.E., and Blower, D., Evaluation of New Jersey Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. February 2005. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

10 Green, P.E., and Blower, D., Evaluation of New Mexico Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. July 2005. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

11 Matteson, A., and Blower, D., Evaluation of North Carolina Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. May 2005. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

12 Matteson, A., and Blower, D., Evaluation of Illinois Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. July 2005. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

13 Blower, D., and Matteson, A., Evaluation of Washington Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. June 2006. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

14 Blower, D., and Matteson, A., Evaluation of Iowa Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. August 2006. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

15 Blower, D., and Matteson, A., Evaluation of 2005 Missouri Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. September 2006. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

16 Green, P.E., and Matteson, A., Evaluation of Maryland Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. July 2006. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

17 Green, P.E., and Matteson, A., Evaluation of 2005 Ohio Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. December 2006. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

18 Blower, D., and Matteson, A., Evaluation of 2005 Louisiana Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. December 2006. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

19 Blower, D., and Matteson, A., Evaluation of 2005 Nebraska Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. February 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

20 Blower, D., and Matteson, A., Evaluation of 2005 South Dakota Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. March 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

21 Blower, D., and Matteson, A., Evaluation of 2004 Tennessee Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. May 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

22 Green, P.E., and Matteson, A., Evaluation of 2005 Arizona Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann

Arbor, Michigan. June 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

23 Blower, D., and Matteson, A., Evaluation of 2005 Pennsylvania Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. Sept 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

24 Green, P.E., and Matteson, A., Evaluation of 2005 Indiana Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. Sept 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

25 Blower, D., and Matteson, A., Evaluation of 2005 Connecticut Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. Sept 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

26 Green, P.E., and Matteson, A., Evaluation of 2005 Alabama Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. Sept 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

27 Green, P.E., and Matteson, A., Evaluation of 2006 Georgia Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. November 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

28 Green, P.E., and Matteson, A., Evaluation of 2006 Idaho Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. December 2007. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

29 Green, P.E., and Matteson, A., Evaluation of 2006 Wisconsin Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. March 2008. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

30 Matteson, A., and Blower, D., Evaluation of 2006 Maine Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. June 2008. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

31 Green, P.E., and Matteson, A., Evaluation of 2006 South Carolina Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. July 2008. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

32 Blower, D., and Matteson, A., Evaluation of 2007 Arkansas Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. December 2008. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

33 Blower, D., and Matteson, A., Evaluation of 2007 Minnesota Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. March 2009. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

34 Blower, D., and Matteson, A., Evaluation of 2007 Oklahoma Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. June 2009. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

35 Blower, D., and Matteson, A., Evaluation of 2008 North Dakota Crash Data Reported to MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. July 2009. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T.

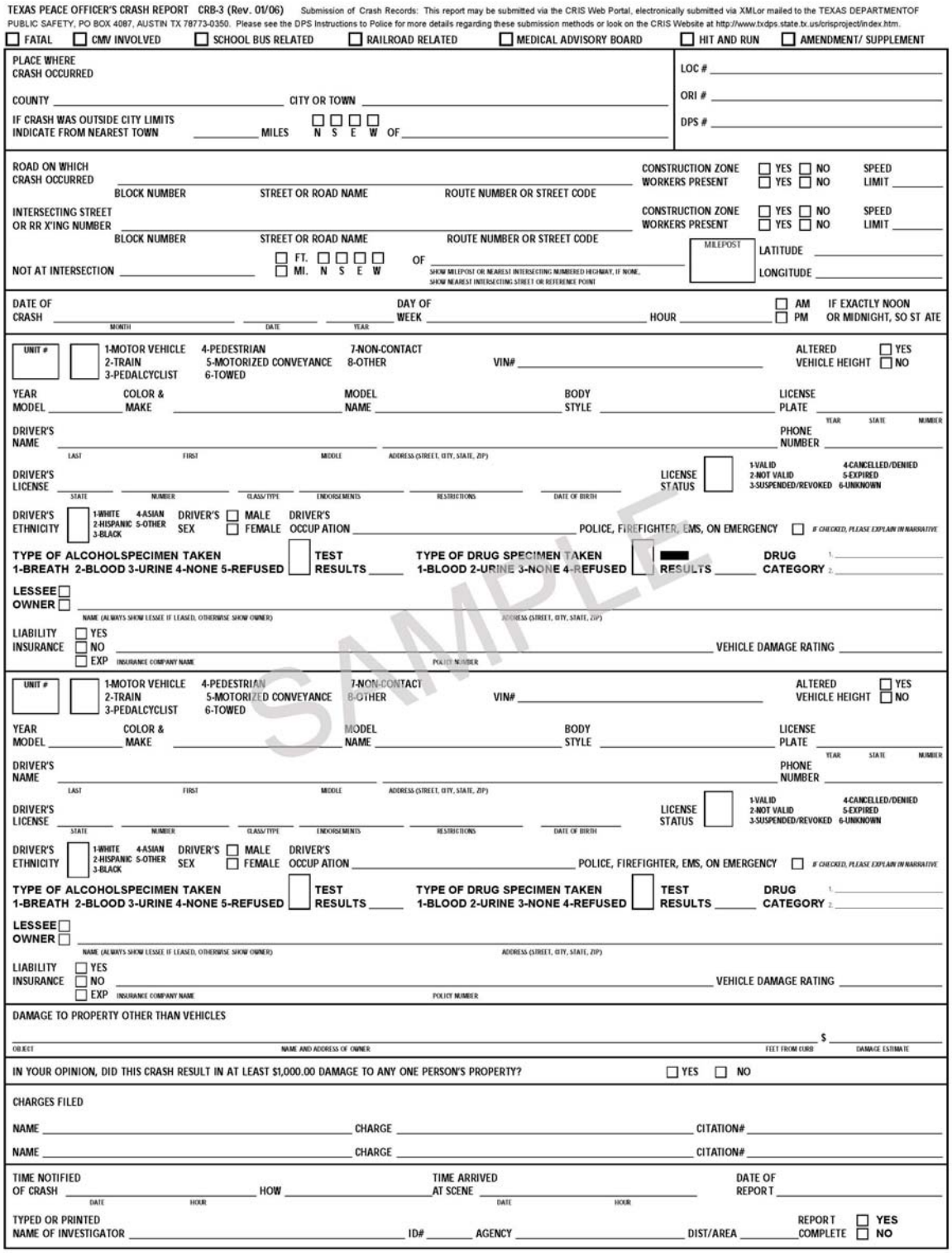
36 Green, P.E., and Blower, D. Updated Ratio of Crash Severities Reportable to the MCMIS Crash File. University of Michigan Transportation Research Institute, Ann Arbor, Michigan. October 2008. Sponsor: Federal Motor Carrier Safety Administration, U.S. D.O.T. 24 pages.

Appendix A Vehicle Codes Used to Identify Trucks/Buses in Texas PAR File

This table shows the combination of codes in the variables veh_type_id and veh_body_styl_id that were considered to identify trucks and buses that meet the MCMIS Crash file vehicle type definition.

Veh_type_id	Veh_body_styl_id
Truck & trailer	Dump
	Flatbed
	Refrigerator van
	Truck-tractor
	Semi-trailer
Oth trk combins	Dump
	Flatbed
	Garbage
	Concrete
	Truck-tractor
Truck-tractor	Unknown
	Bobtail
	Dump
	Flatbed
	Garbage
	Refrigerator van
	Tank/tube trailer
	Truck-tractor
	Stake
	Semitrailer
Other-not listed	Truck-tractor
	Dump
	Beverage
	Flatbed
	Garbage
	Concrete
	Refrigerator van
	Truck-tractor
	Street-sweeper
Truck*	Beverage
	Street sweeper
	Truck-tractor
	Dump
	Flatbed
	Garbage
	Concrete
Bus	Unknown
	Limousine
	Bus
School bus	Bus

Appendix B Texas Crash Report (CRB-3, rev 01/06)



TEXAS PEACE OFFICER'S CRASH REPORT CRB-3 (Rev. 01/06) Submission of Crash Records: This report may be submitted via the CRIS Web Portal, electronically submitted via XMLor mailed to the TEXAS DEPARTMENTOF PUBLIC SAFETY, PO BOX 4087, AUSTIN TX 78773-0350. Please see the DPS Instructions to Police for more details regarding these submission methods or look on the CRIS Website at http://www.txdps.state.tx.us/crisproject/index.htm.

☐ FATAL ☐ CMV INVOLVED ☐ SCHOOL BUS RELATED ☐ RAILROAD RELATED ☐ MEDICAL ADVISORY BOARD ☐ HIT AND RUN ☐ AMENDMENT/ SUPPLEMENT

PLACE WHERE CRASH OCCURRED — LOC # — ORI # — DPS #

COUNTY — CITY OR TOWN — IF CRASH WAS OUTSIDE CITY LIMITS INDICATE FROM NEAREST TOWN — MILES ☐N ☐S ☐E ☐W OF

ROAD ON WHICH CRASH OCCURRED — BLOCK NUMBER — STREET OR ROAD NAME — ROUTE NUMBER OR STREET CODE — CONSTRUCTION ZONE WORKERS PRESENT ☐YES ☐NO — SPEED LIMIT

INTERSECTING STREET OR RR X'ING NUMBER — BLOCK NUMBER — STREET OR ROAD NAME — ROUTE NUMBER OR STREET CODE — CONSTRUCTION ZONE WORKERS PRESENT ☐YES ☐NO — SPEED LIMIT

NOT AT INTERSECTION — ☐FT. ☐MI. ☐N ☐S ☐E ☐W OF — SHOW MILEPOST OR NEAREST INTERSECTING NUMBERED HIGHWAY, IF NONE, SHOW NEAREST INTERSECTING STREET OR REFERENCE POINT — MILEPOST — LATITUDE — LONGITUDE

DATE OF CRASH — MONTH — DATE — YEAR — DAY OF WEEK — HOUR ☐AM ☐PM — IF EXACTLY NOON OR MIDNIGHT, SO ST ATE

UNIT # — 1-MOTOR VEHICLE 2-TRAIN 3-PEDALCYCLIST 4-PEDESTRIAN 5-MOTORIZED CONVEYANCE 6-TOWED 7-NON-CONTACT 8-OTHER — VIN# — ALTERED VEHICLE HEIGHT ☐YES ☐NO

YEAR MODEL — COLOR & MAKE — MODEL NAME — BODY STYLE — LICENSE PLATE — YEAR — STATE — NUMBER

DRIVER'S NAME — LAST — FIRST — MIDDLE — ADDRESS (STREET, CITY, STATE, ZIP) — PHONE NUMBER

DRIVER'S LICENSE — STATE — NUMBER — CLASS/TYPE — ENDORSEMENTS — RESTRICTIONS — DATE OF BIRTH — LICENSE STATUS — 1-VALID 2-NOT VALID 3-SUSPENDED/REVOKED 4-CANCELLED/DENIED 5-EXPIRED 6-UNKNOWN

DRIVER'S ETHNICITY — 1-WHITE 2-HISPANIC 3-BLACK 4-ASIAN 5-OTHER — DRIVER'S SEX ☐MALE ☐FEMALE — DRIVER'S OCCUP ATION — POLICE, FIREFIGHTER, EMS, ON EMERGENCY ☐ IF CHECKED, PLEASE EXPLAIN IN NARRATIVE

TYPE OF ALCOHOLSPECIMEN TAKEN 1-BREATH 2-BLOOD 3-URINE 4-NONE 5-REFUSED — TEST RESULTS — TYPE OF DRUG SPECIMEN TAKEN 1-BLOOD 2-URINE 3-NONE 4-REFUSED — TEST RESULTS — DRUG CATEGORY 1. 2.

LESSEE ☐ OWNER ☐ — NAME (ALWAYS SHOW LESSEE IF LEASED, OTHERWISE SHOW OWNER) — ADDRESS (STREET, CITY, STATE, ZIP)

LIABILITY INSURANCE ☐YES ☐NO ☐EXP — INSURANCE COMPANY NAME — POLICY NUMBER — VEHICLE DAMAGE RATING

UNIT # — 1-MOTOR VEHICLE 2-TRAIN 3-PEDALCYCLIST 4-PEDESTRIAN 5-MOTORIZED CONVEYANCE 6-TOWED 7-NON-CONTACT 8-OTHER — VIN# — ALTERED VEHICLE HEIGHT ☐YES ☐NO

YEAR MODEL — COLOR & MAKE — MODEL NAME — BODY STYLE — LICENSE PLATE — YEAR — STATE — NUMBER

DRIVER'S NAME — LAST — FIRST — MIDDLE — ADDRESS (STREET, CITY, STATE, ZIP) — PHONE NUMBER

DRIVER'S LICENSE — STATE — NUMBER — CLASS/TYPE — ENDORSEMENTS — RESTRICTIONS — DATE OF BIRTH — LICENSE STATUS — 1-VALID 2-NOT VALID 3-SUSPENDED/REVOKED 4-CANCELLED/DENIED 5-EXPIRED 6-UNKNOWN

DRIVER'S ETHNICITY — 1-WHITE 2-HISPANIC 3-BLACK 4-ASIAN 5-OTHER — DRIVER'S SEX ☐MALE ☐FEMALE — DRIVER'S OCCUP ATION — POLICE, FIREFIGHTER, EMS, ON EMERGENCY ☐ IF CHECKED, PLEASE EXPLAIN IN NARRATIVE

TYPE OF ALCOHOLSPECIMEN TAKEN 1-BREATH 2-BLOOD 3-URINE 4-NONE 5-REFUSED — TEST RESULTS — TYPE OF DRUG SPECIMEN TAKEN 1-BLOOD 2-URINE 3-NONE 4-REFUSED — TEST RESULTS — DRUG CATEGORY 1. 2.

LESSEE ☐ OWNER ☐ — NAME (ALWAYS SHOW LESSEE IF LEASED, OTHERWISE SHOW OWNER) — ADDRESS (STREET, CITY, STATE, ZIP)

LIABILITY INSURANCE ☐YES ☐NO ☐EXP — INSURANCE COMPANY NAME — POLICY NUMBER — VEHICLE DAMAGE RATING

DAMAGE TO PROPERTY OTHER THAN VEHICLES

OBJECT — NAME AND ADDRESS OF OWNER — FEET FROM CURB — $ DAMAGE ESTIMATE

IN YOUR OPINION, DID THIS CRASH RESULT IN AT LEAST $1,000.00 DAMAGE TO ANY ONE PERSON'S PROPERTY? ☐YES ☐NO

CHARGES FILED

NAME — CHARGE — CITATION#

NAME — CHARGE — CITATION#

TIME NOTIFIED OF CRASH — DATE — HOUR — HOW — TIME ARRIVED AT SCENE — DATE — HOUR — DATE OF REPORT

TYPED OR PRINTED NAME OF INVESTIGATOR — ID# — AGENCY — DIST/AREA — REPORT COMPLETE ☐YES ☐NO

SEAT POSITION
1-FRONT LEFT
2-FRONT CENTER
3-FRONT RIGHT
4-SECOND SEAT LEFT
5-SECOND SEAT CENTER
6-SECOND SEAT RIGHT
7-THIRD SEAT LEFT
8-THIRD SEAT CENTER
9-THIRD SEAT RIGHT
10-CARGO AREA
11-OUTSIDE VEHICLE
12-UNKNOWN

SOLICITATION
INDICATES A PERSON'S DESIRE TO RECEIVE CONTACT FROM PERSONS SEEKING PROFESSIONAL EMPLOYMENT AS/FOR ATTORNEY , CHIROPRACTOR, PHYSICIAN, SURGEON, PRIV ATE INVESTIGATOR, OR ANY OTHER PERSON REGISTERED OR LICENSED BY A HEALTH CARE REGULA . TORY AGENCY (Y=SOLICIT, N=NO SOLICIT).

EJECTED
1-NO
2-YES
3-YES, PARTIAL
4-NOT APPLICABLE
5-UNKNOWN

RESTRAINT USED
1-SHOULDER & LAP BEL T
2-SHOULDER BELT ONL Y
3-LAP BELT ONLY
4-CHILD SEA T, FACING FORWARD
5-CHILD SEA T, FACING REAR
6-CHILD SEA T, UNK
7-BOOSTER SEA T
8-NONE
9-OTHER
10-UNKNOWN

AIRBAG
1-NOT APPLICABLE
2-NOT DEPLOYED
3-DEPLOYED, FRONT
4-DEPLOYED, SIDE
5-DEPLOYED, OTHER
6-UNKNOWN

HELMET USE
1-WORN, DAMAGED
2-WORN, NOT DAMAGED
3-WORN, UNK. DAMAGE
4-NOT WORN
5-UNKNOWN IF WORN

INJURY SEVERITY
K-KILLED
A-INCAPACITATING INJURY
B-NON INCAPACITATING INJURY
C-POSSIBLE INJUR Y
N-NOT INJURED
U-UNKNOWN

UNIT# ☐ TOWED DUE TO DISABLING DAMAGE ☐ YES ☐ NO VEHICLE REMOVED TO _____ BY _____

ITEM#	SEAT POSITION	COMPLETE ALL DATA ON ALL OCCUPANTS NAMES, POSITIONS, RESTRAINTS USED, ETC. HOWEVER, IT IS NOT NECESSARY TO SHOW ADDRESSES UNLESS KILLED OR INJURED NAME (LAST, FIRST, MI) ADDRESS	SOL.	EJECTED	RESTRAINT USED	AIRBAG	HELMET	AGE	SEX	INJURY CODE
1										
2										
3										
4										
5										

UNIT# ☐ TOWED DUE TO DISABLING DAMAGE ☐ YES ☐ NO VEHICLE REMOVED TO _____ BY _____

ITEM#	SEAT POSITION	COMPLETE ALL DATA ON ALL OCCUPANTS NAMES, POSITIONS, RESTRAINTS USED, ETC. HOWEVER, IT IS NOT NECESSARY TO SHOW ADDRESSES UNLESS KILLED OR INJURED NAME (LAST, FIRST, MI) ADDRESS	SOL.	EJECTED	RESTRAINT USED	AIRBAG	HELMET	AGE	SEX	INJURY CODE
6										
7										
8										
9										
10										

PED., PEDAL., MOT. CONVEY, ETC.	COMPLETE IF CASUALTIES NOT IN MOTOR VEHICLE CASUALTY NAME (LAST, FIRST, MI) ADDRESS	SOL.	ALCOHOL SPECIMEN TAKEN	RESULT	DRUG SPECIMEN TAKEN	RESULT	HELMET	AGE	SEX	INJURY CODE

DISPOSITION OF KILLED OR INJURED

ITEM#	TAKEN TO	BY

IF AMBULANCE USED, SHOW

TIME NOTIFIED	TIME ARRIVED AT SCENE	AMBULANCE UNIT #	# OF ATTENDANTS INCLUDING DRIVER	# OF PERSONS TRANSPORTED FOR TREATMENT

COMPLETE THIS SECTION IF PERSON KILLED (If a person dies within 30 days of the crash, please complete this area and mail the supplement to the Crash Records Bureau)

ITEM #	DATE OF DEATH	TIME OF DEATH	ITEM#	DATE OF DEATH	TIME OF DEATH	ITEM#	DATE OF DEATH	TIME OF DEATH	ITEM#	DATE OF DEATH	TIME OF DEATH

INVESTIGATOR'S NARRATIVE OPINION OF WHAT HAPPENED (ATTACH ADDITIONAL SHEETS IF NECESSARY)

DIAGRAM

INDICATE NORTH

☐
1-TWO-WAY, NOT DIVIDED
2-TWO-WAY, DIVIDED, UNPROTECTED MEDIAN
3-TWO-WAY, DIVIDED, PROTECTED BARRIER
4-ONE-WAY
9-UNKNOWN

FACTORS AND CONDITIONS LISTED ARE THE INVESTIGATOR'S OPINION

UNIT#	FACTORS/CONDITIONS CONTRIBUTING			OTHER FACTORS/CONDITIONS MAY OR MAY NOT HAVE CONTRIBUTED			VEHICLE DEFECTS CONTRIBUTING		VEHICLE DEFECTS MAY HAVE CONTRIBUTED	
	1	2	3	1	2	3	1	2	1	2
	1	2	3	1	2	3	1	2	1	2

1-ANIMAL ON ROAD-DOMESTIC
2-ANIMAL ON ROAD-WILD
3-BACKED WITHOUT SAFETY
4-CHANGED LANE WHEN UNSAFE
5-TO SEE VEHICLE DEFECTS
14-DISABLED IN TRAFFIC LANE
15-DISREGARD STOP AND GO SIGNAL
16-DISREGARD STOP SIGN OR LIGHT
17-DISREGARD TURN MARKS AT INTERSECTION
18-DISREGARD WARNING SIGN AT CONSTRUCTION
19-DISTRACTION IN VEHICLE
20-DRIVER INATTENTION
21-DROVE WITHOUT HEADLIGHTS
22-FAILED TO CONTROL SPEED
23-FAILED TO DRIVE IN SINGLE LANE
24-FAILED TO GIVE HALF OF ROADWAY
25-FAILED TO HEED WARNING SIGN
26-FAILED TO PASS TO LEFT SAFELY
27-FAILED TO PASS TO RIGHT SAFELY
28-FAILED TO GIVE SIGNAL OR WRONG SIGNAL
29-FAILED TO STOP AT PROPER PLACE
30-FAILED TO STOP FOR SCHOOL BUS
31-FAILED TO STOP FOR TRAIN
32-FAILED TO YIELD ROW-EMERGENCY VEHICLE
33-FAILED TO YIELD ROW-OPEN INTERSECTION
34-FAILED TO YIELD ROW-PRIVATE DRIVE
35-FAILED TO YIELD ROW-STOP SIGN
36-FAILED TO YIELD ROW TO PEDESTRIAN
37-FAILED TO YIELD ROW-TURNING LEFT
38-FAILED TO YIELD ROW-TURN ON RED
39-FAILED TO YIELD ROW-YIELD SIGN
40-FATIGUED OR ASLEEP
41-FAULTY EVASIVE ACTION
42-FIRE IN VEHICLE
43-FLEEING OR EVADING POLICE
44-FOLLOWED TOO CLOSELY
45-HAD BEEN DRINKING
46-HANDICAPPED DRIVER (EXP. IN NARRATIVE)
47-ILL (EXP. IN NARRATIVE)
48-IMPAIRED VISIBILITY (EXP. IN NARRATIVE)
49-IMPROPER START FROM PARKED POSITION
50-LOAD NOT SECURED
51-OPENED DOOR TO TRAFFIC LANE
52-OVERSIZE VEHICLE OR LOAD
53-OVERTAKE AND PASS INSUFFICIENT CLEARANCE
54-PARKED AND FAILED TO SET BRAKES
55-PARKED IN TRAFFIC LANE
56-PARKED WITHOUT LIGHTS
57-PASSED IN NO PASSING ZONE
58-PASSED ON RIGHT SHOULDER
59-PED/PEDALCYC/MOT CONV TO VEHICLE
60-SPEEDING UNSAFE (UNDER LIMIT)
61-SPEEDING OVER LIMIT
62-TAKING MEDICATION (EXP. IN NARRATIVE)
63-TURNED IMPROPERLY - CUT CORNER ON LEFT
64-TURNED IMPROPERLY - WIDE RIGHT
65-TURNED IMPROPERLY - WRONG LANE
66-TURNED WHEN UNSAFE
67-UNDER INFLUENCE - ALCOHOL
68-UNDER INFLUENCE - DRUG
69-WRONG SIDE - APPROACH OR IN INTERSECTION
70-WRONG SIDE - NOT PASSING
71-WRONG WAY-ONE WAY ROAD
72-CELL/MOBILE PHONE USE
73-ROAD RAGE
74-OTHER FACTOR (WRITE ON LINE)

VEHICLE DEFECTS
1-DEFECTIVE OR NO HEADLAMPS
6-DEFECTIVE OR NO STOP LAMPS
7-DEFECTIVE OR NO TAIL LAMPS
8-DEFECTIVE OR NO TURN SIG. LAMPS
9-DEFECTIVE OR NO TRAILER BRAKES
10-DEFECTIVE OR NO VEHICLE BRAKES
11-DEFECTIVE OR NO STEERING MECH.
12-DEFECTIVE OR SEIOK TIRES
13-DEFECTIVE TRAILER HITCH

TRAFFIC CONTROL
1-NONE
2-INOPERATIVE
3-OFFICER
4-FLAGMAN
5-SIGNAL LIGHT
6-FLASHING RED LIGHT
7-FLASHING YELLOW LIGHT
8-STOP SIGN
9-YIELD SIGN
10-WARNING SIGN
11-CENTER STRIPE/DIVIDER
12-NO PASSING ZONE
13-RR GATES/SIGNAL
14-SCHOOL ZONE
15-CROSSWALK
16-BIKE LANE
17-OTHER
☐

ROADWAY RELATION
1-ON ROADWAY
2-OFF ROADWAY
3-SHOULDER
4-MEDIAN
☐

PART OF THE ROADWAY
1-MAIN LANE
2-SERVICE ROAD
3-ENTRANCE RAMP
4-EXIT RAMP
5-CONNECTOR
6-DETOUR
7-OTHER
☐

ROADWAY ALIGNMENT
1-STRAIGHT,LEVEL
2-STRAIGHT, GRADE
3-STRAIGHT, HILLCREST
4-CURVE, LEVEL
5-CURVE, GRADE
6-CURVE, HILLCREST
7-OTHER
8-UNKNOWN
☐

LIGHT CONDITION
1-DAYLIGHT
2-DARK, NOT LIGHTED
3-DARK, LIGHTED
4-DARK, UNK LIGHTING
5-DAWN
6-DUSK
8-OTHER
9-UNKNOWN
☐

TYPE OF ROAD SURFACE
1-CONCRETE
2-BLACKTOP
3-BRICK
4-GRAVEL
5-DIRT
6-OTHER
7-UNKNOWN
☐

WEATHER
1-CLEAR/CLOUDY
2-RAIN
3-SLEET/HAIL
4-SNOW
5-FOG
6-BLOWING SAND/SNOW
7-SEVERE CROSSWINDS
8-OTHER
9-UNKNOWN
☐

SURFACE CONDITION
1-DRY
2-WET
3-STANDING WATER
4-SNOW
5-SLUSH
6-ICE
7-SAND, MUD, DIRT
8-OTHER
9-UNK
☐

CRB-3C (Rev. 01/06) COMMERCIAL MOTOR VEHICLE ENFORCEMENT SUPPLEMENT TO THE TEXAS PEACE OFFICER'S CRASH REPORT

☐ 10,001 LBS. OR MORE ☐ HAZARDOUS MATERIAL ☐ 9 OR MORE PASSENGER CAPACITY (DRIVER INCLUDED)

CRASH INFORMATION

LOC# _____

ORI# _____

DPS# _____

1. COUNTY _____ 2. CITY OR TOWN _____

3. ROAD ON WHICH CRASH OCCURRED _____
BLOCK # STREET OR ROAD NAME ROUTE#

4. DATE OF CRASH _____ _____ _____ 5. HOUR _____ ☐ AM ☐ PM
MONTH DATE YEAR

ROADWAY ACCESS
☐ 1-FULL ACCESS CONTROL
2-PARTIAL ACCESS
3-NO ACCESS

DRIVER INFORMATION

6. NAME _____ 7. DRIVER LICENSE CLASS ☐ 1-A 4-D 2-B 5-M 3-C 6-UNK

CARRIER INFORMATION

8. VEHICLE OPERATION ☐ INTERSTATE COMMERCE ☐ INTRASTATE COMMERCE ☐ NOT IN COMMERCE ☐ GOVERNMENT ☐ PERSONAL

9. CARRIER'S CORPORATE NAME _____

10. CARRIER'S PRIMARY ADDRESS _____
NUMBER STREET CITY STATE ZIP

11. CARRIER ID TYPE ☐ ICC ☐ US DOT ☐ TxDOT ☐ OTHER ☐ NONE 12. CARRIER ID NUMBER _____

MOTOR VEHICLE INFORMATION

13. UNIT NUMBER ON CRB-3 ☐ 14. LICENSE PLATE _____
YEAR STATE NUMBER

15. GROSS VEHICLE WEIGHT RATING (GVWR) ☐
REGISTERED GROSS VEHICLE WEIGHT (RGVW) ☐ _____

16. VEHICLE TYPE ☐
1-PASSENGER CAR (ONLY IF VEHICLE DISPLAYS HM PLACARDS)
2-LIGHT TRUCK (ONLY IF VEHICLE DISPLAYS HM PLACARDS)
3-BUS (SEATS FOR 9-15 PEOPLE, INCLUDING DRIVER)
4-BUS (SEATS FOR >15 PEOPLE, INCLUDING DRIVER)
5-SINGLE UNIT TRUCK (2 AXLES, 6 TIRES)
6-SINGLE UNIT TRUCK (3 OR MORE AXLES)
7-TRUCK TRAILER
8-TRUCK TRACTOR (BOBTAIL)
9-TRACTOR/SEMITRAILER
10-TRACTOR/DOUBLE TRAILER
11-TRACTOR/TRIPLE TRAILER
99-UNKNOWN HEAVY TRUCK OVER 10,000 LBS. (CANNOT CLASSIFY)

17. CARGO BODY STYLE ☐
1-BUS (SEATS FOR 9-15 PEOPLE, INCLUDING DRIVER)
2-BUS (SEATS FOR >15 PEOPLE, INCLUDING DRIVER)
3-VAN/ENCLOSED BOX
4-CARGO TANK
5-FLATBED
6-DUMP
7-CONCRETE MIXER
8-AUTO TRANSPORTER
9-GARBAGE/REFUSE
10-GRAIN, CHIPS, GRAVEL
11-POLE
12-NOT APPLICABLE
98-OTHER _____

18. HAZARDOUS MATERIAL

TRANSPORTING PLACARDABLE HAZARDOUS MATERIAL ☐ YES ☐ NO
1 DIGIT CLASS# ☐ 4 DIGIT ID# ☐☐☐☐

HAZARDOUS MATERIAL RELEASED OR SPILLED ☐ YES ☐ NO (DO NOT INCLUDE FUEL FROM THE VEHICLE FUEL TANK)
1 DIGIT CLASS# ☐ 4 DIGIT ID# ☐☐☐☐

TRAILER NUMBER 1 INFORMATION

19. LICENSE PLATE _____ 20. GROSS VEHICLE WEIGHT RATING (GVWR) ☐
REGISTERED GROSS VEHICLE WEIGHT (RGVW) ☐ _____

TRAILER TYPE ☐
1-FULL TRAILER
2-SEMI TRAILER
3-POLE TRAILER

TRAILER NUMBER 2 INFORMATION

21. LICENSE PLATE _____ 22. GROSS VEHICLE WEIGHT RATING (GVWR) ☐
REGISTERED GROSS VEHICLE WEIGHT (RGVW) ☐ _____

TRAILER TYPE ☐
1-FULL TRAILER
2-SEMI TRAILER
3-POLE TRAILER

23. SEQUENCES OF EVENTS - UNIT _____
SEQ 1 SEQ 2 SEQ 3 SEQ 4

1-NONCOLLISION: RAN OFF ROAD
2-NONCOLLISION: JACKKNIFE
3-NONCOLLISION: OVERTURN (ROLLOVER)
4-NONCOLLISION: DOWNHILL RUNAWAY
5-NONCOLLISION: CARGO LOSS OR SHIFT
6-NONCOLLISION: EXPLOSION OR FIRE
7-NONCOLLISION: SEPARATION OF UNITS
8-NONCOLLISION: CROSS MEDIAN/CENTERLINE
9-NONCOLLISION: EQUIPMENT FAILURE
10-NONCOLLISION: OTHER
11-NONCOLLISION: UNKNOWN
12-COLLISION INVOLVING PEDESTRIAN
13-COLLISION INVOLVING MOTOR VEHICLE IN TRANSPORT
14-COLLISION INVOLVING PARKED MOTOR VEHICLE
15-COLLISION INVOLVING TRAIN
16-COLLISION INVOLVING PEDALCYCLE
17-COLLISION INVOLVING AN ANIMAL
18-COLLISION INVOLVING A FIXED OBJECT
19-COLLISION WITH WORK ZONE MAINTENANCE EQUIPMENT
20-COLLISION WITH OTHER MOVABLE OBJECT
21-COLLISION WITH UNKNOWN MOVABLE OBJECT
98-OTHER _____

24. TOTAL NUMBER OF AXLES ☐

25. TOTAL NUMBER OF TIRES ☐

26. OFFICER'S PRINTED NAME _____ DEPT. _____ DATE _____

GENERAL

A separate commercial supplement is to be completed on **each** commercial motor vehicle involved in a motor vehicle crash. This supplement(s) must be attached to the basic peace officer's crash report. A commercial motor vehicle for supplemental reporting is defined as:

1. Any motor vehicle or towed vehicle with a Gross Vehicle Weight Rating (GVWR) or a Registered Gross Vehicle Weight (RGVW), whichever is greater, of 10,001 lbs. or more, or any combination of vehicles where the Gross Combined Weight Rating (GCWR) or the total RGVW of the combination is 10,001 lbs. or more.

   1.1 GVWR and RGVW are both defined as the weight of the fully equipped vehicle plus its net carrying capacity. The GCWR is the combined weight rating of a motor vehicle and a towed unit(s). On occasion, the GVWR and the RGVW will differ. In those situations, the greater weight value will be used to determine if this form must be completed.
   1.2 The GVWR of a motor vehicle normally can be found on an information plate on the driver's door or door post. The GVWR of a trailer normally can be found on an information plate near the front left portion of the trailer. If the vehicle does not have an information plate or it is illegible, use RGVW. For combination or token trailers, see 1.6 below.
   1.3 On vehicles registered in Texas, the RGVW is shown on the registration receipt under "gross weight." Commercial motor vehicles are required to carry the registration receipt.
   1.4 In the event the registration receipt is not available, RGVW can normally be obtained by a **complete** registration check. Exception: If the vehicle has exempt license plates (i.e. owned by a government entity) no RGVW will be shown. In those instances, GVWR must be used.
   1.5 If GVWR is used to determine the need to complete this supplement, GVWR for the motor vehicle and each trailer(s) must be obtained and shown in the appropriate blank(s).
   1.6 If RGVW is used to determine the need to complete this supplement, the RGVW should be obtained for each motor vehicle and trailer in the combination unless the combination is registered as a **combination/token** vehicle or as an **apportioned** vehicle. In those situations the license plates will indicate combination/token or apportioned. If the vehicle is registered as a combination/token or apportioned vehicle, the entire registered gross weight will be shown on the power unit and the trailer will not carry a RGVW. In those instances, show the RGVW of the combination in the power unit and show zero (0) on the trailer(s).
   1.7 RGVW for out-of-state vehicles and trailer(s) may be obtained from registration receipts issued by the licensing state, temporary permits, cab cards or other documents or as in 1.4 above.

2. Any bus, which shall include every motor vehicle with a seating capacity of nine (9) or more passengers **(including the driver)** and used for the transportation of persons. The seating capacity of a bus (excluding school buses) shall be determined by allowing one (1) passenger for each sixteen (16) inches of seat space. The seating capacity of a school bus shall be determined by allowing one (1) passenger for each thirteen (13) inches of seat space.

3. Any motor vehicle hauling hazardous materials which is required to be placarded under the Hazardous Materials Transportation Act.

INSTRUCTIONS FOR COMPLETION OF FORM CRB-3C

Detailed instructions for completion of this supplement are included in the Instructions to Police for Reporting Crashes.

Check Boxes (Top of Report)
Check appropriate box indicating if the vehicle was over 10,001 pounds, Hazardous Material(s), or 9 or more passenger capacity (driver included). More than one box may be checked.

Roadway Access- Code the access control characteristics which best describes the roadway which the vehicle was traveling on at the time of the crash. Full Access Control- is an expressway or freeway where the only means of entry to or exit from the roadway is by ramps connecting to other streets or highways. No Access Control- is a street or highway where driveways provide access to and egress from adjacent properties and where cross streets intersect at a grade. Partial Access Control- is a street or highway which does not clearly fit the above definitions.

CRASH INFORMATION (Items 1-5)
Complete the information in this section exactly as shown on the basic report (CRB-3).

DRIVER INFORMATION (Items 6-7)
Complete items 6 and 7 exactly as shown on the basic report (CRB-3).

CARRIER INFORMATION (Items 8-12)
Indicate whether the operation of the commercial motor vehicle at the time of this crash is defined as an interstate, intrastate, government or personal operation. An interstate operation is one where the transportation of the property originated in one state or country and passed through or terminated in another state or country. An intrastate operation is one where the transportation of the property did not cross a state or international boundary. The bill of lading origin and destination information may be one source available to make this determination. Government and Personal use will be determined through investigation. Indicate the Carrier's corporate name and primary business address in items 9 and 10. The Carrier is defined as the entity responsible for the operation of the vehicle at the time of the crash. This may be the actual owner of the vehicle or the lessee. The information should match Owner/Lessee shown on the CRB-3. Show the type of carrier identification by checking the appropriate box in item 11. Show the ID number in item 12, if applicable.

MOTOR VEHICLE INFORMATION (Items 13-18)
Enter the unit number from the CRB-3 for this motor vehicle in item 13. Show the registration year, state and number in item 14. Enter the GVWR and RGVW as applicable in item 15. Indicate which, GVWR or RGVW, by checking the appropriate box.
Indicate the appropriate number in the box for Vehicle Type in item 16.
Indicate the appropriate number in the box for Cargo Body Style in item 17.
Indicate by checking the appropriate box in item 18 whether this vehicle is hauling hazardous material(s). If yes, enter the class and ID numbers of the hazardous material(s) being transported. Indicate by checking the appropriate box whether hazardous materials were released (spilled, discharged, etc.) The class and ID numbers should be obtained from the bill of lading or shipping papers. If unavailable, the class and ID numbers may be taken from the placard. The class may be located in the lower corner of the diamond shaped placard. The ID numbers may be located on the placard or on an orange label near the placard. (REFER TO DETAILED INSTRUCTIONS).

TRAILER NUMBER 1 & 2 INFORMATION (Item 19-22)
If the commercial motor vehicle reported on this supplement is towing one trailer, complete trailer number 1 section only. If towing 2 trailers, complete both trailer number 1 and 2 sections.
Indicate the registration year, state, and number in item 19, and if applicable item 21. Show the GVWR or RGVW in item 20 and, if applicable, item 22.
Indicate which, GVWR or RGVW by checking the appropriate box.
Indicate the appropriate number in the box for Trailer Type (item 20, and if applicable, item 22).
Indicate Sequence of Events (Item 23). Indicate the order and type of crash events which occurred involving this vehicle.
Indicate the Total Number of Axles (Item 24). Indicate the total number of axles on the motor vehicle. (Do not include trailer axles)
Indicate the Total Number of Tires (Item 25). Indicate the total number of tires on the motor vehicle. (Do not include trailer tires)
The person completing this supplement should print name, show department and the date this supplement was prepared in item 26.