EVALUATION OF 2006 MAINE CRASH DATA REPORTED TO MCMIS CRASH FILE

ANNE MATTESON
DANIEL BLOWER

Evaluation of 2006 Maine Crash Data Reported to the MCMIS Crash File

Anne Matteson
Daniel Blower

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

June 2008

1. Report No. UMTRI-2008-36	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Evaluation of 2006 Maine Crash Data Reported to the MCMIS Crash File		5. Report Date June 2008
		6. Performing Organization Code
7. Author(s) Matteson, Anne and Blower, Daniel		8. Performing Organization Report No. UMTRI-2008-36
9. Performing Organization Name and Address The University of Michigan Transportation Research Institute 2901 Baxter Road Ann Arbor, Michigan 48109-2150 U.S.A.		10. Work Unit no. (TRAIS) 052702
		11. Contract or Grant No. DTMC75-06-H-00003
12. Sponsoring Agency Name and Address U.S. Department of Transportation Federal Motor Carrier Safety Administration 400 Seventh Street, SW Washington, D.C. 20590		13. Type of Report and Period Covered 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. The earlier studies showed that reporting to the MCMIS Crash File was incomplete. This report examines the factors that are associated with reporting rates for the state of Maine.

MCMIS Crash File records were matched to the Maine Crash file to determine the nature and extent of underreporting. Overall, it appears that Maine is reporting 72.0 percent of crash involvements that should be reported to the MCMIS Crash file. However, since Maine does not capture whether injuries are transported for treatment or whether vehicles were towed due to damage, proxies for these criteria were developed and the true reporting rate may be somewhat higher or lower. The rate is unlikely to be higher than the rate for fatal involvements, 83.3 percent.

Reporting rates were related to crash severity, vehicle type and size, and reporting agency. Tractor-semitrailers were more likely to be reported than smaller trucks, and only 12.9 percent of buses were reported.

Missing data rates are low for almost all variables. The data reported to MCMIS was quite consistent with that in the Maine Crash file, although there were some discrepancies with respect to truck configuration, likely because the method of categorization differs between the two files.

17. Key Words MCMIS, Maine Crash File, accident statistics, underreporting		18. Distribution Statement Unlimited	
19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. No. of Pages 36	22. Price

iii

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)				
^{o}F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	^{o}C
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)				
^{o}C	Celsius	1.8C+32	Fahrenheit	^{o}F
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)

iv

Table of Contents

List of Tables

List of Figures

Evaluation of 2006 Maine Crash Data Reported to the MCMIS Crash File

1   Introduction

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

The present report is part of a series evaluating the completeness and accuracy of the data in the MCMIS Crash file. Previous reports on a number of states showed underreporting due in large part to problems in interpreting and applying the reporting criteria. The problems were more severe in large jurisdictions and police departments. Each state also had problems specific to the nature of its system. Some states also had overreporting of cases, often due to technical problems with duplicate records. [See references 3 to 29.] The states are responsible for identifying and reporting qualifying crash involvements. Accordingly, improved completeness and accuracy must ultimately reside with the individual states.

In this report, we focus on MCMIS Crash file reporting by Maine. In recent years, Maine has reported from 307 to 1727 involvements annually to the MCMIS Crash file. According to the 2002 Vehicle Inventory and Use Survey (the last available), in 2002, Maine had over 24,000 trucks registered, ranking 43rd among the states and accounting for 0.4 percent of all truck registrations.[1] Maine is the 40th largest state by population and generally ranks 42nd in terms of the number of annual truck and bus fatal involvements.

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

1. The complete police accident report file (PAR file hereafter) from Maine was obtained for the most recent year available, 2006.

2. An algorithm was developed in the Maine PAR file to identify the cases that qualified for reporting, based on the vehicle type and severity of the crash as coded in the Maine PAR file.

3. Cases in the Maine PAR file were joined to matching cases in the MCMIS Crash file, using a multi-stage matching algorithm. All cases in the Maine PAR file were eligible in the match, in order to identify both cases that should have been reported as well as cases that did not qualify for reporting.

4. Cases that should have been reported, but were not, were compared with those that were reported to identify the sources of underreporting.

5. Cases that did not qualify but which were reported anyway were examined to identify the extent and nature of overreporting.

Police accident report (PAR) data recorded in Maine's statewide files as of March 19, 2008 were used in this analysis. The 2006 PAR file contains the computerized records of 65,742 units involved in 36,877 crashes that occurred in Maine.

2 Data Preparation

The Maine PAR file and MCMIS Crash file each required some preparation before the Maine records in the MCMIS Crash file could be matched to the Maine PAR file. In the case of the MCMIS Crash file, the only processing necessary was to extract records reported from Maine and to eliminate duplicate records. The Maine PAR file required more extensive work to create a comprehensive vehicle-level file from accident, vehicle, and occupant 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 2006 MCMIS Crash file as of June 4, 2007 was used to identify records submitted from Maine. For calendar year 2006 there were 732 cases. An analysis file was constructed using all variables in the file. The file was then examined for duplicate records (those involvements where more than one record was submitted for the same vehicle in the same crash; i.e., the report number and sequence number were identical). One such duplicate pair was found. In examining the two records, the driver and vehicle information was the same, but Accident Time varied by two minutes, and the First Crash Event was also different. It is likely that this vehicle was involved in a second accident, just a couple of minutes after the first. Since it did not appear the records were duplicates, both were left in the file. There were no other instances of duplicate records. It should be noted, though, that all report numbers were not recorded in the same format, so it was difficult to be certain. (E.g. numbers are recorded in forms such as ME60006-4344, ME000-044-AC, ME600P003644, MEG00-000844).

Records also were examined for identical values on accident number, accident date/time, county, city, vehicle license number, and driver license number, even though their vehicle sequence numbers were different. One would not expect two records for the same vehicle and driver within a given accident. No such duplicates were found.

2.2 Maine Police Accident Report File

The Maine PAR data for 2006 (as of March 19, 2008) was obtained from the data contractor for the state of Maine. The data were stored in Microsoft Access tables, representing Accident, Vehicle, and Person information. The combined files contain records for 36,877 crashes involving 65,742 vehicles. Data for the PAR file are coded from the Maine Traffic Crash Report (forms 13:20A, 13:91, and 13:93) completed by police officers.

The PAR file was first examined for duplicate records. Inspection of Incident numbers in the accident-level file determined they were not recorded consistently, and that some numbers appeared more than once. In fact, consultation with Maine's data processor revealed that two different reporting agencies could use the identical Incident number when submitting a case.

However, a crash is uniquely identified by using both the Incident number and the Originating Agency Identification (ORI) number. In fact, a search for records in the PAR file with identical Incident, ORI, and Unit numbers found no such instances. Although Incident numbers were not recorded in the same format (06-000406, 006-00406, 00528), ORI numbers appeared to be coded in a consistent fashion (e.g., no instances of ME0100500 and ME-100500).

Cases were also examined to determine if there were any records that contained identical case number, time, place, investigating officer, and vehicle/driver variables, even though their vehicle numbers were different. Two cases should not be identical on all variables. To investigate this possibility, records were examined for duplicate occurrences based on the variables incident number, originating agency identification, accident date/time, city, officer ID, vehicle identification number (VIN), and driver license number. Based on the above algorithm, no duplicate records were identified. The resulting PAR file has 65,742 unique records.

3   Matching Process

The next step involved matching records from the Maine PAR file to corresponding records from the MCMIS file. Since no duplicate cases were found, there were 732 Maine records from the MCMIS file available for matching, and 65,742 records from the Maine PAR file. All records from the Maine PAR data file were used in the match, even those that were not reportable to the MCMIS Crash file. This allowed the identification of cases in the MCMIS Crash file that did not meet the MCMIS Crash file reporting criteria.

Matching records in the two files requires finding combinations of variables common to the two files that have a high probability of uniquely identifying accidents and specific vehicles within the accidents. Incident Number and Originating Agency ID, used to uniquely identify a crash in the Maine PAR data, and Report Number in the MCMIS Crash file are obvious first choices. However, a direct correspondence could not be found between these numbers. Incident Number in the Maine PAR file is a three to twenty-digit combination of alphabetic characters and numbers, while in the MCMIS Crash file Report Number is stored as a 12-character alphanumeric value. It appears that the report number in the MCMIS Crash file is constructed as follows: The first two columns contain the state abbreviation (ME, in this case), followed by ten digits. In some cases the leftmost eighth through twelfth digits correspond to the same digits of the Incident Number. These digits were then used in the match.

Other variables that are usually useful for 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 Maine PAR file did not include a County variable, and Crash City code on the PAR file did not match City Code on the MCMIS file. Thus, these two variables could not be used in the matching process.

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 last name. All of these variables were present in the PAR file. VIN and License Plate Number were unrecorded approximately 10 percent of the time in the PAR data and were unknown in less than three percent of MCMIS cases. In the PAR file, Driver Date of Birth, Driver Age, Driver License Number, and Driver Last Name were each unrecorded in about 16 percent of cases, compared to less than one percent of MCMIS cases.

Four separate matches were performed using the available variables. At each step, records in either file with duplicate values on all the match variables were excluded, along with records that were missing values on the match variables. The first match included the variables case number (5 digits), crash date (month, day), crash time (hour, minute), officer ID, street, VIN, and driver license number. The second match step matched on crash date, crash time, officer ID, license plate number, age, and driver last name. The third match step dropped crash minute, officer ID, and driver last name. After some experimentation, the fourth match included variables crash date, hour, and VIN. All of the matched cases in the third and fourth match steps were hand-verified. This process resulted in matching 98.8 percent of the MCMIS records to the PAR file. See Table 1 for the variables used in each match step along with the number of records matched at each step.

Table 1 Steps in MCMIS/Maine PAR File Match, 2006

Step	Matching variables	Cases matched
Match 1	Case number, crash date, crash time, officer ID, street, VIN, and driver license number	151
Match 2	Crash date, crash time, officer ID, license plate number, driver age, and driver last name	520
Match 3	Crash date, crash hour, license plate number, and driver age	32
Match 4	Crash date, crash hour, and VIN	20
Total cases matched		723

Matched records were verified using other variables common to the MCMIS and PAR file as a final check to ensure the match was valid. The above procedure resulted in 723 matches, representing 98.8 percent of the 732 non-duplicate records reported to MCMIS.
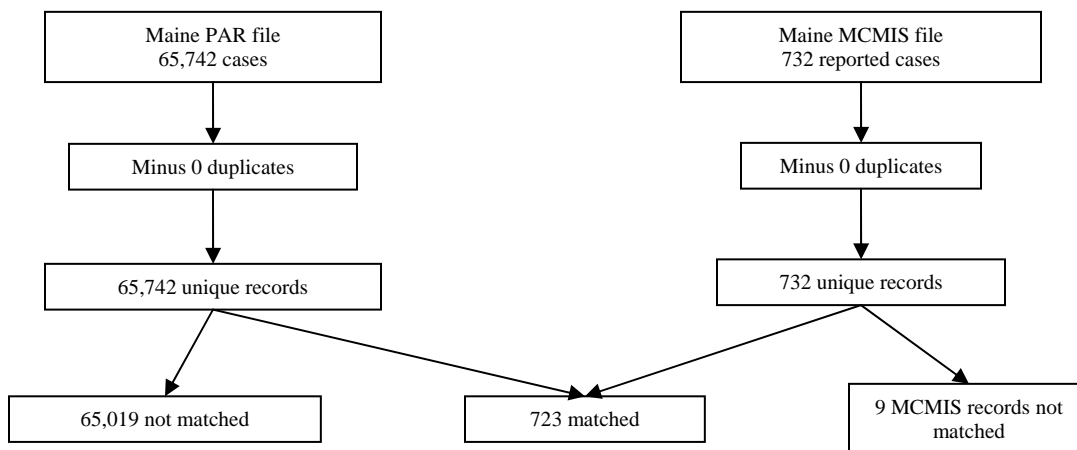

Figure 1 Case Flow in MCMIS/Maine Crash File Match

Of the 723 matched cases, 49 are not reportable and 674 are reportable. The 49 cases did not qualify because they did not meet the crash severity criteria.

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 data preparation is to identify records in the Maine data that qualified for reporting to the MCMIS Crash file. Records are identified using the information available in the computerized crash files that were sent by Maine. To identify reportable records, we use the information that is completed by the officers for all vehicles. That is, some police reports place certain data elements that are to be collected for the MCMIS file in a special section or supplemental form, with the instruction to the officer to complete that section if the vehicle and crash meets the MCMIS reporting criteria. This is the case in Maine.

Officers are instructed to use the Maine Crash Reporting System (MCRS) which computer-generates a Traffic Crash Report. Like many other states, Maine has a separate form (Appendix A) which is used to record the additional information required for the MCMIS Crash file. The instruction manual (current draft) states that officers complete the form when a commercial type configuration is selected for Unit Type. That is, the form is completed for all qualifying <u>vehicles</u>, without regard to whether the vehicle was in a qualifying <u>crash</u>. Commercial Motor Vehicle is defined as:

> "Any self-propelled or towed vehicle used on public highways for interstate or intrastate commerce to transport passengers or property when:
>
> 1.   The vehicle has a gross vehicle weight rating or gross combination weight rating or gross weight of 10,001 or more pounds;
>
> 2.   The vehicle is for commercial transport of more than 8 passengers, including the driver; or
>
> 3.   Is used for non-commercial transportation of more than 15 passengers, including the driver; or
>
> 4.   The vehicle is used in transporting material found by the Secretary of Transportation to be hazardous under 49 U.S.C.5103 and transporting in a quantity requiring placarding under regulations prescribed by the Secretary under 49 CFR. Subtitle B, chapter 1, subchapter C.
>
> 5.   Note: This applies to trucks, truck tractors, semi-trailers, buses, tow dollies, and converter dollies that meet this description. "

Since our goal is to evaluate the completeness of reporting, we attempt to identify all reportable cases, even those an officer may have overlooked. For this purpose, we use the data that is completed for all crashes, and all vehicles, not just the ones for which the officer completes the supplemental MCMIS data. The goal of the selection process is to approximate independently as closely as possible the reporting threshold of the MCMIS file. The MCMIS criteria for a reportable crash involving a qualifying vehicle are shown in Table 2.

Table 2 Vehicle and Crash Severity Threshold for MCMIS Crash File

Vehicle	Truck with GVWR over 10,000 or GCWR over 10,000, or Bus with seating for at least nine, including the driver, or Vehicle displaying a hazardous materials placard.
Accident	Fatality, or Injury transported to a medical facility for immediate medical attention, or Vehicle towed due to disabling damage.

Note that Maine's definition of a Commercial Motor Vehicle cited above is entirely consistent with the vehicles described as reportable in Table 2. The process of identifying reportable vehicles is fairly straightforward in the Maine PAR file. A thirty-nine level Unit Type variable was used to identify qualifying trucks and buses. Table 3 shows the relevant code levels of the Unit Type variable that meet the vehicle criteria.

Table 3 Relevant Vehicle Unit Type Codes
in Maine PAR file

Trucks:
Truck tractor only (bobtail)
2 axle single unit with dual tires
2 axle tractor with single axle semi
2 axle tractor with tandem axle semi
2 axle tractor w/single axle semi & 2 axle trailer
3 axle single unit
3 axle tractor with single axle semi
3 axle tractor with tandem axle semi
3 axle tractor with tridem axle semi
3 axle tractor with single axle semi & 2 axle trailer
3 axle tractor w/tandem axle semi & 2 axle trailer
5 axle semi; split trailer tandem
6 axle semi; split trailer tandem w/center axle
6 axle; standard trailer tandem w/center axle
4 axle single unit
4 axle tractor with tandem axle semi
Any other axle configuration
Buses:
School bus
2 axle bus
3 axle bus

In addition to these vehicle types, any vehicle, regardless of size, displaying a hazardous materials placard, also meets the MCMIS vehicle type definition. Maine's commercial vehicle form includes variables that indicate if a vehicle was placarded and record other information pertaining to hazardous materials transported. In addition, on the main form, there is a variable where the reporting officer records, for a particular vehicle, if any hazardous materials were involved. The variable on the main form is preferred in identifying hazmat vehicles because it covers all vehicles, not just the ones for which the reporting officer completed the CMV supplement. This variable was used to identify non-trucks transporting hazardous materials.

In total, there were 2,304 vehicles identified as eligible trucks, buses, or vehicles transporting hazmat in the Maine PAR data. Table 4 shows the distribution by vehicle type. The great majority of qualifying vehicles are trucks, while about 8.1 percent are buses. Only seven non-trucks transporting hazardous materials were identified. The 2,304 eligible vehicles represent 3.5 percent of all 65,742 vehicles in the PAR file. This result is consistent with other MCMIS evaluations in which the percentage of eligible vehicles has ranged from 2.6 to 6.1 percent.

Table 4 Vehicles Meeting MCMIS Vehicle Criteria, Maine PAR File, 2006

Vehicle type	N	%
Trucks	2,111	91.6
Buses	186	8.1
Transporting hazardous materials	7	0.3
Total	2,304	100.0

Having identified qualifying vehicles, the next step is to identify crashes of sufficient severity to qualify for reporting to the MCMIS Crash file. Qualifying crashes include those involving a fatality, an injured person transported for immediate medical attention, or a vehicle towed from the scene due to disabling damage. Limitations in the Maine data hindered the effort to identify qualifying accidents. Because certain information, mainly whether a vehicle was towed *due to disabling damage*, and whether an injured person was *transported for medical attention*, is not available, it is not possible to identify reportable cases cleanly. We developed a method to approximate reportable cases as closely as possible.

The Maine Person file contains the information needed to identify crashes involving an injury. The officer records the severity of the injury (using the usual KABCN scale). However there is no indication if the person was transported for treatment. Since it is not known if an accident involved a transported injury, the decision was made to use A and B injuries as a surrogate for injured/transported. While unsatisfactory, this is the best available surrogate, based on comparison with national crash files that include both the KABCN (sometimes called KABC0) as well as information about whether the injured person was transported for medical attention.

We examined six years of crash data reported in the National Automotive Sample Survey General Estimates System (NASS GES or just GES) files to determine the proportion of crashes in which either a person is transported for treatment or a vehicle towed due to disabling damage for each level of maximum injury severity in a crash. Table 5 shows the percentage of crash involvements of trucks and buses with respect to the MCMIS crash severity thresholds by the

most severe injury in the crash. All fatal involvements are reportable, of course, and the table shows that 100 percent of the cases where the most severe injury was a fatality meet the MCMIS fatal reporting threshold. More interesting are the proportions for the non-fatal injuries. Note that 95.5 percent of the cases in which the maximum injury severity was an incapacitating injury (A-injury) were in the injury/transported group and an additional 3.3 percent met the tow/disabled criteria. So, overall, 98.8 percent of truck and bus involvements in which the most severe injury was an A injury met at least one of the MCMIS crash severity reporting criteria. For non-incapacitating (B) injuries, 89.9 percent (67.3 + 22.6) are reportable. A majority of involvements are reportable even where the most severe injury is a possible (C) injury, with 69.6 percent meeting either the injury/transported or tow/disabled criteria. (Note, however, that less than half of C-injured persons were transported for treatment.) Where no injury occurred, only 18.5 percent were reportable, almost all because of the tow/disabled requirement.

Table 5 Distribution of MCMIS Reporting Threshold by Most Severe Injury in Crash, GES 2000-2005

Maximum injury severity in crash	MCMIS Reporting Threshold				Total
	Fatal	Injury/ transported	Tow/ disabled	Non-reportable	
Fatal (K)	100.0	0.0	0.0	0.0	100.0
Incapacitating (A)	0.0	95.5	3.3	1.2	100.0
Nonincapacitating (B)	0.0	67.3	22.6	10.1	100.0
Possible (C)	0.0	45.5	24.1	30.4	100.0
None	0.0	0.1	18.4	81.5	100.0

Based on Table 5, it was determined that crashes in which the most severe injury was either a fatality, an incapacitating injury, or a non-incapacitating but evident injury—K, A, or B injuries—identify a subset of crashes that have a high probability of meeting the MCMIS Crash severity criteria. Thus, the K, A, or B involvements can be reasonably identified as reportable, even though we do not have information on whether an injured person was transported for treatment.

The Maine PAR data includes information to identify crashes in which a vehicle was towed. The officer records the name of a towing company in the Towed_By field, but there is no indication if the tow was due to disabling damage. Independently, the officer records Vehicle Damage Codes, specifying *areas* of the vehicle that were damaged, and the relative severity order of these areas. Codes 0 (no damage), 11 (entire vehicle damaged), and 99 (unknown) take precedence over any other codes. Severity order itself could not be used to determine "disabling damage," as the code levels only indicated relative order of severity of the damaged areas. Therefore, a value of 0 could mean Entire Vehicle Damaged or No damage, depending on the vehicle. Since there could be more than one damage record per vehicle, the most severe area of damage was selected, based on the severity order variable.

These variables were used as a proxy to determine cases that met the "towed due to disabling damage" accident severity criteria. Thus, a vehicle was identified as "towed" if there was a valid entry in the tow-by variable, except for cases where No Damage was specified. (Tow-by entries such as Not Applicable, Unknown, and Driven were not considered valid entries.) In addition,

cases were considered "towed" if Entire Vehicle Damaged was specified, as such damage would undoubtedly require a tow, even if the tow-by variable did not contain the name of a valid tow company.

Implementing the eligible vehicle and crash severity filters selected a total of 936 reportable cases in the Maine crash data in 2006. There were 936 vehicles—either a truck, bus, or vehicle transporting hazmat—involved in a crash that included either a fatality, at least one person transported for immediate medical attention, or at least one vehicle towed due to disabling damage, based on the surrogate definitions explained above.

Table 6 Reportable Records in Maine Crash File, 2006

Crash type	Total	%
Fatal	24	2.6
A/B injury crash	245	26.2
Towaway crash	667	71.3
Total	936	100.0

As Figure 1 above shows, there were 732 records reported to the MCMIS Crash file by Maine in 2006. Of these, 723 were matched to the Maine file, but 49 did not qualify for reporting, under the method developed to identify reportable cases.

At this point, it is possible to calculate an overall reporting rate from Maine to the MCMIS file. Table 6 shows that 936 reportable cases were identified in the Maine PAR file. Of these, 674 (723 – 49 = 674) were reported to the MCMIS Crash file, for a rate of 72.0 percent. The estimate has some level of uncertainty in that it is not possible to identify precisely whether cases in the Maine PAR file qualified for reporting, since two key elements of the criteria are not directly available. (Whether an injury was transported and whether a vehicle was towed due damage or for some other reason.) However, the estimate is the best that can be made with available data.

5   Factors Associated with Reporting

5.1   Overreporting

MCMIS evaluations tend to focus on underreporting because underreporting is typically 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 723 MCMIS cases could be matched to the Maine PAR data, and 674 were determined to meet the reporting criteria, the difference, 49 cases, were not reportable, based on the definitions discussed in Section 4.

In this case, all 49 cases were eligible trucks, but they did not qualify for reporting because they did not meet the crash severity criteria. Table 7 shows a two-way classification of crash injury severity by towed status. Eleven cases most certainly should not have been reported, as the accident involved neither an injury nor a towed vehicle. However, it is possible that a portion of the 38 remaining cases involved a transported injury, even though there was no towed vehicle. In that case, they should have been reported, though there is no way to verify this, and the

probability, based on overall trends, is that they did not qualify for reporting. Recall, that since there is no way to determine if injuries are transported for treatment, only fatal, A, and B injuries were considered as meeting the injury severity criteria.

Table 7 Distribution of Crash Injury Severity by Towed Vehicle in Crash
for Non-reportable Vehicles from Maine
in MCMIS Crash File, 2006

Crash injury severity	Crash involved a towed vehicle?	
	Yes	No
Possible injury	0	38
No injury	0	11
Total	0	49

5.2 Underreporting

In this section, we present a discussion of factors that may be contributing to the level of crash reporting to the MCMIS Crash file from Maine. The factors include the timing of uploading cases, the criteria used in identifying cases, and the agencies that complete the police accident reports.

5.2.1 Case Processing

Delays in transmitting cases may partially account for the incompleteness of the MCMIS Crash file. The time lag in extracting and submitting reports to the MCMIS Crash file might explain some portion of the unreported cases. All reportable crash involvements for a calendar year are required to be transmitted to the MCMIS Crash file within 90 days of the date of the crash. The 2006 MCMIS Crash file as of June 4, 2007 was used to identify records submitted from Maine, so all 2006 cases should have been reported by that date.

Table 8 shows reporting rates according to month of the crash. Monthly reporting rates range from 60.3 to 88.9 percent of reportable cases, with May and December having the lowest reporting rates. Although December represents the largest proportion of unreported cases, there is no consistent pattern of underreporting across the months.

Table 8 Reporting Rate by Accident Month in Maine Crash File, 2006

Crash month	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
January	144	78.5	31	11.8
February	67	67.2	22	8.4
March	72	66.7	24	9.2
April	63	88.9	7	2.7
May	73	60.3	29	11.1
June	82	68.3	26	9.9

Crash month	Reportable cases	Reporting rate	Unreported cases	% of total unreported cases
July	61	77.0	14	5.3
August	75	76.0	18	6.9
September	75	66.7	25	9.5
October	70	77.1	16	6.1
November	55	72.7	15	5.7
December	99	64.6	35	13.4
Total	936	72.0	262	100.0

Figure 2 shows the cumulative percent of cases submitted by latency in days, i.e. the number of days between the crash date and the date the case was uploaded to the MCMIS Crash file. Over half of the cases (56.8 percent) were submitted within 20 days after the crash, while 88.0 percent were reported within 60 days. Before the 90-day cut-off period, approximately 95 percent of Maine's cases have been reported. There does not appear to be any major problems related to timing with submitting cases to the MCMIS Crash file.
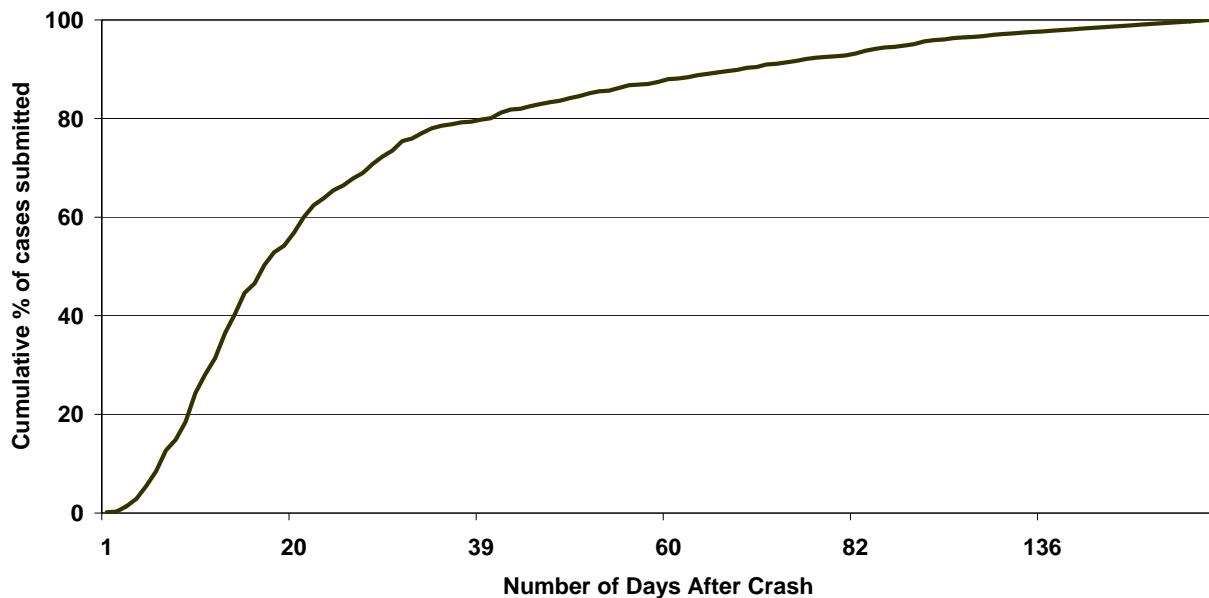
Figure 2 Percent of Cases Submitted to MCMIS Crash File by Number of Days After Crash, Maine 2006

5.2.2   Reporting Criteria

In this section we discuss factors that are associated with the observed reporting rate. Recall that Maine, like many other states, uses a separate form that officers must complete if any of the involved vehicles meet the commercial vehicle criteria. The separate form for Commercial Motor Vehicles (CMVs) includes variables that are required to be reported to the MCMIS Crash file, such as carrier identification, gross vehicle weight rating (GVWR), and hazardous materials

information. Thus, the officer is responsible for recognizing and submitting this form for all commercial vehicles.

It is clear that completing the CMV form appears to be a necessary, but not sufficient condition for reporting to the MCMIS Crash file. Table 9 shows that essentially all of the cases that were reported to the MCMIS file had CMV variables recorded. However, of 262 reportable, but not reported cases, 101 had the CMV form filled-out, while 161 did not.

Table 9 MCMIS Crash file reporting and completing the form for CMVs, Maine 2006

CMV variables recorded?	Reported		
	Yes	No, but reportable	No, not reportable
Yes	674	101	49
No	9*	161	0

* These 9 cases could not be matched in the Maine PAR file, so they may in fact have CMV variables recorded.

It appears that cases uploaded through SafetyNet to the MCMIS Crash file are selected almost exclusively from among those for which the reporting officer completed the CMV form. If this is the case, it is not known why the 101 cases were not reported, since they met the crash-severity threshold. It appears that the *crash-level* criteria are applied at the State level, so these cases somehow eluded the State's method of identifying MCMIS-reportable crashes.

Table 10 shows reporting rates, the number of unreported cases, and the proportion of unreported cases for each level of the MCMIS crash severity criteria. Traffic crashes that resulted in a fatality were reported at the highest rate, with 83.3 percent of such crash involvements reported. However, the two less-severe levels of crash severity were reported at lower rates. Injury/transported involvements were reported at a 67.8 percent rate, while 73.2 percent of the towed involvements were reported. Although towed crashes are reported at a somewhat higher rate than injury crashes, almost two-thirds of the unreported cases are accounted for by towaway crashes. A significant improvement in the reporting rate of towaway crashes would greatly reduce the total number of unreported cases.

Table 10 Reporting Rate by MCMIS Crash Severity, Maine 2006

MCMIS Crash Type	Reportable	Reporting rate	Unreported	% of total unreported
Fatal accident	24	83.3	4	1.5
A/B injury accident	245	67.8	79	30.2
Towed accident	667	73.2	179	68.3
Total	936	72.0	262	100.0

In Table 11 crash severity is measured by the most severe injury in the crash, using the KABCN scale. In this scale, incapacitating injuries are deemed severe, injuries that are evident but not

incapacitating are called moderate, and complaint of pain is the least severe injury. In most states, the reporting rates increase as injury severity increases. It appears that there are basically two levels of reporting rates, one for fatal crash involvements and the other for all other crash severities. Fatal crashes likely are more closely investigated, resulting in a higher rate of reporting to the MCMIS Crash file. Reporting rates for non-fatal crashes are similar to one another. It appears that crash severity is related to reporting rates only for fatal involvements. All less severe crashes are reported at about the same rate, suggesting they all are subject to the same system.

Table 11 Reporting Rate by PAR Calculated Crash Severity, Maine 2006

Police-reported Crash Severity	Reportable	Reporting rate	Unreported	% of total unreported
Fatal injury	24	83.3	4	1.5
Severe injury	49	69.4	15	5.7
Moderate injury	196	67.4	64	24.4
Complaint of pain	167	72.5	46	17.6
No injury	500	73.4	133	50.8
Total	936	72.0	262	100.0

Reporting also varied by the type of vehicle. Table 12 provides detail about vehicle type from the PAR Unit Type variable. Since the reporting officer's recognition of a reportable vehicle triggers completing the CMV supplement, and since the CMV supplement is virtually essential to reporting a case, variations in reporting rates by vehicle type reflect how accurately the officer's recognized a reportable vehicle and completed the CMV supplement. Typically, officer's more readily recognize large trucks as reportable, over smaller trucks or buses. Table 12 is consistent with this pattern. Both tractor-semitrailer and tractor-double combinations are reported at rates significantly higher than the overall rate, 88.3 percent and 93.8 percent respectively. In contrast, 2-axle SUTs (single-unit truck) are reported at a 59.9 percent rate, and accounted for 45.4 percent of the total unreported cases. As SUTs increase in size, the reporting rate does likewise. It is interesting to note that none of the 46 reportable school buses were reported, and only half of "other buses" were reported. In total, buses account for over 20 percent of the unreported cases. Only eight of 62 bus involvements were reported.[1]

---

[1] In completing this study we noticed an apparent omission in the REFUNITTYPE ACCESS table containing formats for the Unit Type variable. This table is part of the MCRS_DPS PAR database sent to us. All but one of the codes that meet the MCMIS definition of a reportable vehicle have a number indicated in the Safetynet column of the table. However, code 12, School buses does not have such a number in the Safetynet column. This omission may explain why none of the school buses were reported.

Table 12 Reporting Rate by Police-Reported Vehicle Configuration, Maine 2006

Vehicle configuration	Reportable	Reporting rate	Unreported	% of total unreported
SUT, 2-axle	297	59.9	119	45.4
SUT, 3-axle	114	71.1	33	12.6
SUT, 4-axle	33	87.9	4	1.5
Truck/tractor (bobtail)	14	78.6	3	1.2
Tractor semitrailer	359	88.3	42	16.0
Doubles combination	48	93.8	3	1.2
Other configuration	9	55.6	4	1.5
School bus	46	0.0	46	17.6
Other bus	16	50.0	8	3.1
Total	936	72.0	262	100.0

Reporting rates are also associated with the license state of the vehicle. This could indicate that officers believe the MCMIS Crash file pertains primarily to vehicles in interstate commerce. However, Maine's definition of a CMV states that both interstate and intrastate vehicles qualify (Section 4 above). A variable on the CMV crash form indicates whether a vehicle is involved in interstate commerce; however, since we do not want to potentially exclude any vehicles, vehicle license state, recorded for all vehicles, was used as an indirect measure of interstate/intrastate. Vehicles with out-of-state licenses are clearly involved in interstate commerce, while vehicles registered in Maine may or may not be. Table 13 shows that 83.2 percent of vehicles registered out-of-state were actually reported, compared with about 70 percent of in-state vehicles. This difference is statistically significant. The involvements of vehicles with Maine plates make up 83.6 percent of unreported cases, so reporting the involvements of Maine-registered at the same rate as out-of-state vehicles would result in about 95 more reports, reducing the number of unreported cases by over one-third.

Table 13 Reporting Rate by Vehicle License State, Maine 2006

Vehicle license state	Reportable	Reporting rate	Unreported	% of total unreported
Maine	736	70.2	219	83.6
Other	167	83.2	28	10.7
Not coded	33	54.6	15	5.7
Total	936	72.0	262	100.0

5.2.3 Reporting Agency and Area

In addition to the reporting criteria, there can be differences in reporting related to where the crash occurs or the type of agency that investigated 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. Such differences can serve as a guide for focusing resources in areas that would produce the greatest improvement. This section examines reporting rates by location and agency.

The PAR data provided for this study did not include a County variable, so reporting rates were examined by Crash City. Table 14 shows the top six cities displayed in descending order by the number of reportable cases. As a group their overall reporting rate is only slightly below the statewide average, but the six cities account for 19.1 percent of unreported cases. Portland has the lowest reporting rate at 58.3 percent, and accounts for 7.6 percent of the unreported cases.

Table 14 Reporting Rate by Crash City, Maine 2006

Crash city	Reportable	Reporting rate	Unreported	% of total unreported
Portland	48	58.3	20	7.6
Scarborough	29	72.4	8	3.1
Auburn	23	78.3	5	1.9
S. Portland	23	87.0	3	1.1
Saco	22	68.2	7	2.7
Bangor	21	66.7	7	2.7
Total 6 Cities	166	69.9	50	19.1
Total All Cities	936	72.0	262	100.0

Reporting rates vary to some extent by the type of investigating agency (Table 15). There are three primary levels of investigating agencies identified in the Maine crash file: state police, county sheriff, and city police. If reporting rates depended critically on the training and responsibilities of the reporting officer, one would expect that reporting rates would vary by the type of investigating agency. Differences by agency type are limited in Maine, as city police have a reporting rate of 67.0 percent, compared with rates of 75.7 and 76.9 for the other two agencies. The local police are responsible for the most reportable cases, and account for over half of the unreported cases.

Table 15 Reporting Rate by Investigating Agency, Maine 2006

Investigating agency	Reportable	Reporting rate	Unreported	% of total unreported
State Police	346	75.7	84	32.1
County Sheriff	169	76.9	39	14.9
City Police	421	67.0	139	53.1
Total	936	72.0	262	100.0

5.2.4   Fire Occurrence

There is an Accident Type variable in the crash file that indicates if the crash involved a fire.
Based on 2006 Maine data there were eleven trucks and no buses involved in crashes where a
fire occurred (Table 16). Over 81 percent of these trucks were reported.

Table 16 Reporting Rates for Vehicles In Crashes Involving Fire, Maine 2006

Vehicle type	Reportable	Reporting rate	Unreported	% of total unreported
Truck	9	81.8	2	100.0
Bus	0	-	-	-
Other	0	-	-	-
Total	9	81.8	2	100.0

6   Data Quality of Reported Cases

In this section, we consider the quality of data reported to the MCMIS crash file. Two aspects of
data quality are examined. The first is the amount of missing data. Missing data rates are
important to the usefulness of a data file because records with missing data cannot contribute to
an analysis. The second aspect of data quality considered here is the consistency of coding
between records as they appear in the Maine Crash file and as they appear in the MCMIS Crash
file. Inconsistencies can indicate errors in translating information recorded on the crash report to
the values in the MCMIS Crash file.

Table 17 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 either zero or extremely low. DOT number is not recorded for 4.8 percent of interstate
cases. Three of the four event variables are missing for 75.4 to 98.0 percent of cases, 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, Maine 2006

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	0.1
Accident minute	0.0	Event two	75.4
County	0.0	Event three	92.4
Body type	0.3	Event four	98.0

Variable	Percent unrecorded	Variable	Percent unrecorded
Configuration	0.8	Number of vehicles	0.0
GVWR class	0.0	Road access	0.1
DOT number *	4.8	Road surface	0.0
Carrier state	0.0	Road trafficway	0.0
Citation issued	0.0	Towaway	0.0
Driver date of birth	0.0	Truck or bus	0.0
Driver license number	0.1	Vehicle license number	0.0
Driver license state	0.1	Vehicle license state	0.0
Driver license class	1.5	VIN	2.6
Driver license valid	0.0	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)	0.0
Hazardous materials class (4-digit)	0.0
Hazardous materials name	0.0

There were 45 vehicles for which it was recorded that they displayed a hazmat placard. The table above shows information about the recording of hazmat variables only for those vehicles coded with a hazmat placard. All four of the hazardous materials variables are recorded for all of the placarded vehicles.

We also compared the values of variables in the MCMIS Crash file with the values of comparable variables in the Maine 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. Maine 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 record as it appears in the Maine Crash file. The consistency between coding in the two files is excellent for buses and single unit trucks. However, there were 33 double combinations in the Maine PAR data that were not coded as Tractor/double in the MCMIS file. In addition, two tractor semitrailers in the PAR file were coded as Tractor/triple in the MCMIS file.

Table 18 Vehicle Configuration in Maine and MCMIS Crash Files, 2006

Vehicle configuration		Cases	%
MCMIS Crash File	Maine Crash File	Cases	%
Missing data	Any other axle configuration	6	0.8
Bus(seats >15,incl dr)	2 axle bus	1	0.1
	3 axle bus	7	1.0
SUT, 2-axle, 6-tire	2 axle single unit with dual tires	193	26.7
SUT, 3+ axles	2 axle single unit with dual tires	1	0.1
	3 axle single unit	84	11.6
	3 axle tractor w/single axle semi & 2 axle trailer	1	0.1
	4 axle single unit	31	4.3
Truck tractor (bobtail)	Truck tractor only (bobtail)	12	1.7
	3 axle tractor w/single axle semi & 2 axle trailer	1	0.1
Tractor/semitrailer	2 axle tractor with single axle semi	17	2.4
	2 axle tractor with tandem axle semi	49	6.8
	2 axle tractor w/single axle semi & 2 axle trailer	3	0.4
	3 axle tractor with single axle semi	8	1.1
	3 axle tractor with tandem axle semi	151	20.9
	3 axle tractor with tridem axle semi	104	14.4
	3 axle tractor w/single axle semi & 2 axle trailer	25	3.5
	3 axle tractor w/tandem axle semi & 2 axle trailer	3	0.4
	5 axle semi; split trailer tandem	3	0.4
	4 axle tractor with tandem axle semi	3	0.4
Tractor/double	2 axle tractor w/single axle semi & 2 axle trailer	5	0.7
	3 axle tractor w/single axle semi & 2 axle trailer	11	1.5
	3 axle tractor w/tandem axle semi & 2 axle trailer	2	0.3
Tractor/triple	5 axle semi; split trailer tandem	1	0.1
	6 axle semi; split trailer tandem w/center axle	1	0.1
Total		723	100.0

There were minor inconsistencies among some of the other variables examined. Code values for the Number of Vehicles variable differed for three cases, and there were two cases in which the Hazardous Placard variable was coded "yes" in the MCMIS file, and "no" in the PAR file. Although the Event 1 variable agreed entirely among the two files, there were some minor discrepancies in variables Event 2, Event 3, and Event 4. The variables Light Condition, Road Surface Condition, Weather, License Plate State, and Hazardous Materials Release were coded identically between the two files.

7   Summary and Discussion

This study is an evaluation of reporting to the MCMIS Crash file by the state of Maine for crashes occurring during 2006. The complete Police Accident Report (PAR) file was obtained from the state of Maine, containing 65,742 unit-level records. These records were matched against Maine's 732 records submitted to the 2006 MCMIS Crash file. A total of 723 records were successfully matched.

Some aspects of Maine's crash data are well-designed to identify crashes reportable to the MCMIS Crash file, while others could be improved. Reportable vehicles could be readily identified using Maine's Unit Type and Hazardous Materials Involved variables recorded for all vehicles. Based on the MCMIS criteria, 2,304 trucks, buses, and non-trucks transporting hazardous materials were identified.

However, the Maine data are less well-adapted to identifying crashes that meet the MCMIS crash severity criteria. A qualifying crash is one including a fatality, an injured person transported for immediate medical attention, or a vehicle towed from the scene due to disabling damage. Because Maine does not collect information on whether an injured person was *transported for medical attentio*n, or if a vehicle was towed *due to disabling damage*, it was necessary to develop alternative methods. As a proxy for injured/transported crashes, we decided to include all crashes involving an A or B-injured person. It is likely that these types of injuries would be transported to a hospital for immediate care. Using Injury Severity (KABCN scale) from the Person file, the most severe injury in the crash could be determined.

The Maine PAR data includes information to identify crashes involving a towed vehicle, since the reporting officer is instructed to record the name of the towing company. In addition, the officer indicates areas of the vehicle that were damaged, and assigns a relative order of severity to the damaged areas. However, there is no specific indication if the vehicle sustained *disabling damage*. So crashes with vehicles towed due to disabling damage could not be definitively identified. Again, it was necessary to develop a proxy for the criteria. A vehicle was considered tow/disabled if it had a valid entry in the Tow-By variable, except for cases where No Damage was specified. In addition, all cases were taken where Entire Vehicle Damaged was indicated. A crash involving such a tow/disabled vehicle was considered to meet the MCMIS criteria.

Implementing the vehicle and crash severity filters identified a total of 936 cases in the 2006 Maine PAR file that qualified as reportable to the MCMIS Crash file. There were 732 records reported to the MCMIS Crash file by Maine in 2006. Of these, nine could not be matched to the PAR file, 674 were estimated to be reportable, and 49 were not reportable. Since 38 of the 49 vehicles were involved in crashes with a "possible injury," it is conceivable that some or all of the "possible injury" individuals may have been transported for treatment, and thus would have resulted in these crashes qualifying as reportable. If this is the case, then the number of reportable cases would be underestimated. Similarly, if some of the cases we identified as tow/disabled were not actually disabled, then we could be overestimating those types of cases. Dividing the 674 reported cases deemed to be reportable by the 936 estimated reportable cases, gives an overall reporting rate of 72.0 percent. It is noted, however, that, because of the uncertainties just described, the true reporting rate could be somewhat higher or somewhat lower. However, it is very unlikely that the reporting rate is higher than that for fatal crashes, 83.3 percent, which are the most likely to be correctly reported.

In Maine, officers fill out a separate form for all commercial vehicles involved in any crash. All of the reported cases had this form completed, so clearly, an officer filling out the supplement is the critical first step in reporting cases. Our examination of the Maine crash data found at least 161 CMVs for which no supplemental report was completed. Thus, one question that arises is, why were these vehicles missed?

Reporting rates did vary by vehicle type, specifically the size of the vehicle. As with other states, larger trucks are reported more often than smaller ones. Tractor semitrailers and double combinations are reported at rates of 88.3 percent and 93.8 percent, respectively, while two-axle SUTs are only reported 59.9 percent of the time. Perhaps officers are more likely to overlook the requirement for the CMV supplement for smaller trucks. In addition, Maine did not report any of the 46 school buses in reportable crashes, and only half of other bus types.

Reporting rates also varied by the license state of the vehicle. Reporting rates were compared for vehicles registered in Maine versus vehicles registered out-of-state. Out-of-state vehicles were reported 83.2 percent of the time, while in-state vehicles had a reporting rate of 70.2 percent. In combination with the finding on vehicle size, this finding suggests that at least some reporting officers focus on the big trucks operated by interstate carriers and miss the smaller, local vehicles—and buses—that also should be reported.

Maine has three types of investigating agencies: state police, sheriff departments, and local police. Reporting rates for the city police averaged 67.0 percent, while the state police and sheriffs each report over 75 percent of their cases. This discrepancy may be due to heavier work loads for the local police, or on differences in training and responsibilities.

Finally, reporting rates also varied by crash severity, and in a bimodal way. Crashes involving a fatality were reported at a 83.3 percent rate, while crashes of lower severity were all reported within a narrow range of rates, regardless of severity. The crash severity criteria must be applied at a more centralized level, since the officers who fill out the crash reports are supposed to fill them out for CMVs in all, not just those that meet the MCMIS criteria. The two-level reporting rate suggests that fatal crash involvements receive more scrutiny and thus are reported at a higher rate, while those of lesser severity receive less scrutiny, and thus are reported at lower rates.

Overall, it appears that some aspects of the Maine crash system are well-configured to support more comprehensive reporting of the appropriate crashes, while there is room for improvement in others. The requirement that the CMV supplement be completed for all CMVs is a good one, since it relieves the officer in the field from having to apply the MCMIS Crash severity rules, in addition to all his other duties. However, there appears to be some problems at the state level in identifying the right crashes, as shown by the different reporting rates by crash severity. If Maine collected just two additional data items—injury transported for medical attention and vehicle towed due to damage—that problem could be solved. Better training of the reporting officers, or a different approach to identifying reportable vehicles and collecting the needed data, could resolve the problem of completing the CMV supplement for all reportable vehicles.

8   References

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

2   State of Kentucky Investigator's Motor Vehicle Accident Report, [January 2002], Highway Safety Section, Kentucky Department of Roads

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.

9   Appendix A Maine Traffic Accident Reports

FORM 13:20A
Rev. 4/97

A N C U C M I B D E E R N T	City or Town		Month	Date	Year
	IN				
	Number of Highway	Or - Name of Street or Highway			
	ON and				
	Driver - Name				
DO NOT WRITE IN THIS SPACE	Driver - Name				

State of Maine

Supplement to

**POLICE
TRAFFIC ACCIDENT REPORT**

for

ADDITIONAL DIAGRAMS, DATA OR ANY

NECESSARY STATEMENTS TAKEN

Confidential if so Marked

FORM 13.91

IN City or Town	Month	Day	Year	Unit Number

Number of Highway and   Or - Name of Street or Highway

FOR D.P.S. USE ONLY

STATE OF MAINE
COLLISION SUPPLEMENT FORM 1393 REV. (11/2001)
POLICE TRAFFIC COLLISION REPORT

Driver Name   DOB

CONFIDENTIAL IF SO MARKED

Driver License Number   State   Class

Vehicle ID Number

Vehicle License State   Vehicle Plate Number

☐ FATAL   ☐ INJURY   ☐ DISABLING DAMAGE

U.S.DOT# _____

* Carrier Name: _____   Interstate Carrier: (Y/N): _____

* Address: _____

* City, State, Zip Code: _____

Traffic Way: _____
1. Not Physically Divided - Two Way Traffic   3. Divided Highway, Median Strip, w/ Traffic Barrier
2. Divided Highway, Median Strip, w/o Traffic Barrier   4. One Way Traffic

Traffic Access: _____
1. No Control - unlimited Access   2. Full Control - only ramp entry and exit   3. Other

Cargo Body Type: _____
1. Bus (seats 15 plus incl. driver)   4. Flatbed   7. Auto transporter   **Vehicle Code** _____
2. Van/closed box   5. Dump   8. Garbage/refuse
3. Cargo tank   6. Concrete mixer   9. Mobile/modular home   10. Other

Gross Vehicle Weight of Power Unit: _____ <= 10,000 lb.   _____ 10,001 - 26,000   _____ > 26,000

Hazardous Material Involvement: Placarded (Y/N) _____   *(If yes, complete 1, 2 and 3)*

    1. Was HAZMAT Cargo Released? (Y/N) _____   (not including the engine fuel tank)   How Transported: _____   T = Tank/Bulk; P = Package

    2. Four digit number from placard _____   and name: _____

    3. HAZMAT CLASS: _____   *(From bottom of placard)*   IF ONE DIGIT ONLY, ENTER IN FIRST SPACE

Sequence of events: First event _____   *Second event _____   *Third event _____   *Fourth event _____

    (Enter in spaces in order of occurrence)   /- * - When necessary - * -/

01 Ran off road   05 Cargo loss/shift   09 Collision w/ MV in transport   13 Collision w/ animal
02 Jackknife   06 Explosion or fire   10 Collision w/ parked MV   14 Collision w/ fixed object
03 Overturned (rollover)   07 Separation of units   11 Collision w/ train   15 Collision w/ other object
04 Downhill runaway   08 Collision w/ pedestrian   12 Collision w/ pedalcycle   16 Collision w/ other

Cargo Code: 1 = Unloaded   2 = Partially loaded   3 = Loaded _____   *(Enter one code only)*

Commodity Code: _____   *(cargo carried)*   and name: _____

Length *(to nearest foot):*   Overall _____   Trailer length _____

Summons Issued _____ Yes   _____ No   Charge: _____

Oversize permit *(Enter "Y" in all appropriate boxes):*   Weight _____   Length _____   Height _____   Width _____

IN City or Town | Month | Day | Year | Unit Number

FOR D.P.S. USE ONLY

Number of Highway | Or - Name of Street or Highway

STATE OF MAINE
ACCIDENT SUPPLEMENT FORM 1393 REV.(4-96)
POLICE TRAFFIC ACCIDENT REPORT

Driver Name

* Driver License Number

* Vehicle ID Number

CONFIDENTIAL IF SO MARKED

Vehicle License State | Vehicle Plate Number

*

U.S.DOT# ☐☐☐☐☐   ICC# ☐☐☐☐☐☐☐☐

Interstate Carrier: (Y/N) ☐

* Carrier Name: _____

* Address: _____

* City, State, Zip Code: _____

Source of Carrier Name
1. Side of Vehicle
2. Shipping papers
3. Driver
4. Log book

Traffic Way: ☐   1. Not Physically Divided - Two Way Traffic   3. Divided Highway, Median Strip, w/ Traffic Barrier
2. Divided Highway, Median Strip, w/o Traffic Barrier   4. One Way Traffic

Traffic Access: ☐   1. No Control - unlimited Access   2. Full Control - only ramp entry and exit   3. Other

Cargo Body Type: ☐   1. Bus (seats 15 plus incl. driver)   4. Flatbed   7. Auto transporter   10. Other   Vehicle Code ☐
2. Van/closed box   5. Dump   8. Garbage/refuse
3. Cargo tank   6. Concrete mixer   9. Mobile/modular home

COMBINED Gross Vehicle Weight Rating/From Mfg. Specs: ☐☐   Register GVW: ☐☐   Boosted registration GVW: ☐☐
(to nearest thousand)   (to nearest thousand)   (to nearest thousand)

Hazardous Material Involvement Placarded (Y/N) ☐   *(If yes, complete 1, 2 and 3)*

1. Was HAZMAT Cargo Released (Y/N) ☐   *(not including the engine fuel tank)*   How Transported: ☐   T = Tank/Bulk
P = Package

2. Four digit number from placard ☐☐☐   and name: _____

3. HAZMAT CLASS: ☐☐   *(From bottom of placard)*   IF ONE DIGIT ONLY, ENTER IN FIRST BOX

Sequence of events: First event ☐☐   *Second event ☐☐   *Third event ☐☐   *Fourth event ☐☐

(Enter in boxes in order of occurrence)   /- * - When necessary - * -/

01 Ran off road   05 Cargo loss/shift   09 Collision w/ MV in transport   13 Collision w/ animal
02 Jackknife   06 Explosion or fire   10 Collision w/ parked MV   14 Collision w/ fixed object
03 Overturned (rollover)   07 Separation of units   11 Collision w/ train   15 Collision w/ other object
04 Downhill runaway   08 Collision w/ pedestrian   12 Collision w/ pedalcycle   16 Collision w/ other

Cargo Code: 1 = Unloaded   2 - Partially loaded   3 - = Loaded ☐   *(Enter one code only)*

Commodity Code: ☐   *(Cargo carried)*   and name: _____

Length   *(to nearest foot):*   Overall ☐☐   Trailer length ☐☐

Distance   *(to nearest foot):*   Center of front axle to center of rearmost axle: ☐☐☐

Distance   *(to nearest foot):*   Center of rear drive axle to center of rearmost axle: ☐☐☐

Oversize permit   *(Enter "Y" in all appropriate boxes):*   Weight ☐   Length ☐   Height ☐   Width ☐