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VALIDITY AND RELIABILITY OF POLICE-REPORTED CRASH DATA: THE NEW MICHIGAN UD-10

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16. Abstract

The purpose of this study was to evaluate the validity of data entered on the new State of Michigan Traffic Crash Report form, or UD-10, and the reliability of data entered from this form into the Michigan State Police (MSP) data base.

In order to check the validity of crash data reported on the new UD-10, data from eighteen crashes reported on UD-10s were compared to data from a second report on the same crashes, collected by independent investigators for the University of Michigan In-depth Vehicle Occupant Report (UMIVOR).

Comparisons were made on 63 data items in 20 crashes for a total of 882 data entries, with UMIVOR used as the validity check and the UD-10 compared to it. Universal agreement between the two reports was found on 34 data items. The remaining 29 items had at least one or more crashes in which UD-10 disagreed with UMIVOR or had missing data. In these 29 data items there were 101 data entries with disagreement or missing data, or 11.4 percent of the total data entries.

In order to check the reliability of crash data entered into the Michigan State Police data base, data from the same eighteen UD-10s described earlier were compared to printouts of crash data from the Michigan State Police data base for these UD-10s.

The majority of the disagreements occurred in areas of the UD-10 where data was coded by filling in a "bubble" alone (77.6 percent) or by filling in a "bubble" and printing the data (1.6 percent) for a total of 79.2 percent of the disagreements. At this time it is not clear how the errors occurred in reading the optically scanned part of the UD-10. The remaining errors, 20.8 percent, occurred in data printed on the UD-10 and incorrectly entered into the MSP data base.

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Introduction

The purpose of this study was to evaluate the validity of data entered on the new State of Michigan Traffic Crash Report form, or UD-10, and the reliability of data entered from this form into the Michigan State Police (MSP) data base. Significant changes were implemented on the UD-10 beginning in January, 1992 that required revised police officer training on how to complete the new form. In addition, changes were made in how data from the new UD-10 are entered into the State of Michigan Crash Records System. Because these data are used by a wide variety of public, private, and university investigators for studies used to make policy decisions, a formal review was deemed necessary to determine whether or not accurate information from motor vehicle crashes is being correctly reported and recorded.

History of the UD-10

The UD-10 had not been revised since 1978, and in April, 1991, the Michigan State Police Office of Highway Safety Planning (OHSP) began to develop a new UD-10 for implementation in January, 1992. The major reason for revising the UD-10 was to reduce the extensive delay in crash data availability. Other goals included reduction of manual data entry, to make the form self-coding, with standardized input to make recording of crash data convenient for police officers, to meet nationally suggested uniform data elements, and to keep the form to a maximum of a single two-sided page. OHSP surveyed police agencies, country road commissions, and state agencies, and also sought input from thirteen Traffic Safety Committees sponsored by OHSP and from the American Automobile Association of Michigan. The resulting UD-10 minimizes manual data reporting and entry, provides for uniformity in the completion of the information, and allows 80 percent of the data to be read and entered into the data base with an optical scanner. The new UD-10 was revised in May, 1992 and again in January, 1993.

Confirming Data Reliability and Validity

All data items can be described in terms of their *validity* and *reliability*. An item's *validity* refers to the extent to which that data item reflects the "true" value for that item. An item's *reliability* refers to the extent to which repeated measures of the same items result in the same readings. An example of these issues may help make these definitions clearer. Take, for example, a thermometer that always reads the temperature for boiling water in your house to be 150 degrees F. That thermometer is said to be reliable, that is it provides the same reading on repeated occasions for boiling water. On the other hand, the thermometer is not providing valid data because it states that the water is boiling at 150 degrees, when we know from basic physics (based on tests with proven valid thermometers) that the temperature of the water should be close to 212 degrees F.

The validity of the crash data was studied by comparing UD-10 data with a second report on the same crash, the University of Michigan In-depth Vehicle Occupant Report (UMIVOR). This will be discussed further in the UD-10 and UMIVOR comparison section. The reliability of the information in the Michigan State Police data base was examined by comparing a printout of crash data from selected records to its corresponding UD-10 hard-copy reports for each crash. This will be discussed further in the UD-10 and Michigan State Police data base computer printout comparison.

Description of Report Structure

The body of this report presents a section on each of the areas of reliability and validity, with each section containing its own introduction, methods, results, discussion, and conclusion. These are followed by a general summary and discussion and references.

Validity Check: UD-10 and UMIVOR Comparison

In order to check the validity of crash data reported on the new State of Michigan Traffic Crash Report form, or UD-10, data from eighteen crashes reported on UD-10s were compared to data from a second report on the same crashes, specifically the University of Michigan In-depth Vehicle Occupant Report (UMIVOR). As part of an on-going study of vehicle crashes, trained field investigators from the Biosciences group at the University of Michigan Transportation Research Institute conduct an extensive examination of selected crashes and complete UMIVOR, a detailed report on their findings. The investigators average about one hour inspecting the crash scene, two hours inspecting the case vehicle and taking photographic slides, one hour interviewing the case vehicle driver and passengers, police, and witnesses, and sixteen hours completing the UMIVOR. Data for this report come from crash site and vehicle inspections, interviews with vehicle occupants, police, and witnesses, and from hospital records. Cars selected for examination by the UMTRI Biosciences group were determined either by the American Automobile Manufacturers Association or the project director. These were limited to General Motors and Chrysler vehicles up to four years old and Ford vehicle up to six years old. These vehicles must be involved in crashes with a passenger injury or, if no injury occurs, be equipped with an airbag and sustain significant damage.

Methods

Starting at the beginning of the Biosciences 1993 file on Chrysler vehicles, the first twenty completed UMIVOR cases were selected for reviewing. Biosciences completed 93 UMIVORs on crashes involving Chrysler vehicles in 1993. The files contain the completed UMIVOR, photographic slides of the case vehicle, and a copy of the UD-10 completed by the police. UD-10 and UMIVOR comparisons were made for crashes reported on eighteen UD-10s and twenty UMIVORs. There are two more UMIVOR cases than UD-10 cases because, in two of these crashes, two cars were involved and both were UMIVOR case vehicles. In the following analysis these will be treated as two separate crashes. Since UMIVOR reports little information on noncase vehicles involved in multiple car crashes, the comparisons of data are based on the vehicle designated as the UMIVOR case vehicle. UMIVOR was assumed to be correct when comparing the two reports.

Comparisons were not made for all data items appearing on UD-10. Some data collected on UD-10 do not appear in UMIVOR so they are not included in this comparison, such as special study, case vehicle driver, and passenger addresses and phone numbers. Other data are copied directly from UD-10 to UMIVOR, such as the occupant injury levels. Also, the two reports use two very different scales for reporting the extent of vehicle damage so this was not compared.

A review form was then created that listed the individual UD-10 items in one column and the corresponding UMIVOR items in a second column. One form was used for each UD-10/UMIVOR pair with the UD-10 being reviewed first and UMIVOR second. When checking for agreement, the UMIVOR report was the standard against which the validity of the UD-10 was assessed. Items reporting the same data were considered "Agreement," lack of agreement with UMIVOR was considered "Disagreement," and incomplete or uncoded items on the UD-10 were considered "Missing." This procedure was modified slightly for three items describing the location of the crash-- distance from cross street, direction from nearest intersection, and name of nearest cross street. UMIVOR does not normally report these items unless the crash takes place in, or very close to, an intersection. When UMIVOR did not report this information, the data were not included when considering agreement, disagreement, or missing data. After the reviews were completed, an additional review form was used to tally the responses and arrive at the Ns for each item. Finally, two tables were prepared for each item that was compared. The first table contains the possible codes and data collection method for each report and the method used for comparing the data. The second table summarizes the results of the comparison for that item giving the number and types of agreement, disagreement, and missing data.

In discussing data collection procedures with UMTRI Biosciences field investigators, it became apparent that there were sources of differences between data reported on the UD-10 and UMIVOR reports other than officer error. Case vehicle drivers are assured confidentiality by Bioscience field investigators and this may sometimes lead to differences between what these drivers report to the investigating police officer and to the

Biosciences field investigator. In one case we examined, the driver admitted to not being truthful with the police about his actions prior to the crash because he hoped the citation he received would be for a less serious offense. In another case the driver disagreed with the crash sequence of events as reported on the UD-10.

The UD-10s were completed by the following police agencies:

AGENCY	N
Livingston County Sheriff	1
Washtenaw County Sheriff	8
Ann Arbor Police	7
Farmington Hills Police	1
Pittsfield Township Police	1

Results

TABLE 1. NUMBER OF VEHICLES Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	1 - 9	Police report the number of vehicles involved in the crash.	UD-10 reports the number of vehicles involved in a crash. UMIVOR reports the number of vehicles contacted by the case vehicle, but not the case vehicle itself. In one and two vehicle crashes, adding one to the UMIVOR count will equal the UD-10 count. In crashes involving three vehicles the UMIVOR case vehicle may not contact the other two vehicles. In these cases the narratives and site drawings were compared. The comparison of the number of vehicles was based on the number reported in UD-10.
UMIVOR	0 - 7 8 or more	Investigator reports the number of vehicles contacted by the case vehicle.	

TABLE 2. NUMBER OF VEHICLES Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 6 cases agreed *1* vehicle involved in crash. • 12 cases agreed *2* vehicles involved in crash. • 2 cases agreed *3* vehicles involved in crash.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 3. CRASH TYPE
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Single Motor Vehicle Head On Head On-Left Turn Angle Rear End Rear End-Left Turn Rear End-Right Turn Sideswipe-Same Sideswipe-Opposite Other/Unknown	Police report on the first impact.	UD-10 reports the first impact, which may not involve the UMIVOR case vehicle in crashes involving three or more vehicles. In two crashes involving three cars, the narratives and site drawings were examined to determine the first impact in the crash. Comparisons between the two reports were based on the first impact of the crash.
UMIVOR	Not coded	Investigator inspects vehicles and crash scene, interviews vehicle driver(s), passengers, and police officer.	

TABLE 4. CRASH TYPE
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 6 cases agreed *Single Motor Vehicle.* • 4 cases agreed *Head On.* • 2 cases agreed *Head On-Left Turn.* • 8 cases agreed *Angle.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 5. SPECIAL CIRCUMSTANCES Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	None Deer School Bus Hit and Run Fleeing Police	Police report Special Circumstances from crash scene examination.	UMIVOR has a specific code only for school bus. Other special circumstances will appear in the narrative and site drawing if relevant to the case vehicle crash.
UMIVOR	School Bus	Investigator inspects the crash scene and interviews police, case vehicle driver and passengers, and witnesses.	

TABLE 6. SPECIAL CIRCUMSTANCES Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 20 cases agreed.	• 18 cases UD-10 reported *None*, UMIVOR narrative did not report any special circumstances.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.
MISSING DATA	
General Result	Specific Results
2 of 20 cases had missing data.	• 2 cases UD-10 was not coded, UMIVOR narrative did not report any special circumstances.

TABLE 7. WEATHER
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Clear Cloudy Fog/Smoke Rain Snow/Blowing Snow Severe Wind Sleet/Hail Other/Unknown	Police report weather conditions at the crash site.	UMIVOR codes precipitation and does not specifically code cloudy or fog unless the driver states that visibility was limited because of them. Since UD-10 has separate codes for clear and cloudy and UMIVOR does not, these two UD-10 codes were collapsed into one code for comparison. Since UMIVOR has separate codes for hail and freezing rain/sleet and UD-10 does not, these two UMIVOR codes were collapsed into one code for comparison.
UMIVOR	PRECIPITATION None Rain Snow Hail Freezing Rain/Sleet Other Unknown	Investigator interviews the case vehicle driver.	

TABLE 8. WEATHER
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 16 cases agreed *Clear* or *Cloudy.* • 1 case agreed *Snow.* • 3 cases agreed *Sleet/Hail.*
DISAGREEMENT	
General Result	Specific Results
	• There were no disagreements.

TABLE 9. LIGHT
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Daylight Dawn Dusk Dark-Lighted Dark-Unlighted Other/Unknown	Police report Light conditions from crash scene examination.	Codes for light conditions were directly compared.
UMIVOR	Daylight Dawn Dusk Dark-Lighted Dark-Unlighted Dark-Unknown If Lighted Unknown	Investigator interviews the case vehicle driver, checks the UD-10, and considers the time of day of the crash.	

TABLE 10. LIGHT
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 13 cases agreed *Daylight.* • 1 case agreed *Dusk.* • 6 cases agreed *Dark-Unlighted.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 11. COUNTY Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	01 - 84, 99 from list of MSP county codes.	Police code county of crash location.	UD-10 entries were decoded using the MSP list of Michigan county codes. UMIVOR doesn't code counties, but does include this in the narrative when not Washtenaw County.
UMIVOR	Not coded	Investigator reports county in the UMIVOR narrative when not in Washtenaw County.	

TABLE 12. COUNTY Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 2 cases agreed *Livingston County.* • 1 case agreed *Oakland County.* • 17 cases agreed *Washtenaw County.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 13. TRAFFIC CONTROL Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Signal Stop Sign Yield Sign Not Present	Police report Traffic Control from site inspection.	UMIVOR does not specifically code traffic control devices. They are reported in the narrative and site drawing, which were compared to the UD-10 report.
UMIVOR	Not coded	Investigator interviews case vehicle driver and inspects crash scene.	

TABLE 14. TRAFFIC CONTROL Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
17 of 20 cases agreed.	• 4 cases agreed *Signal.* • 2 cases agreed *Stop Sign.* • 11 cases UD-10 reports *Not Present*, UMIVOR did not report any traffic control.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.
MISSING DATA	
General Result	Specific Results
3 of 20 cases had missing data.	• 3 cases UD-10 was not coded, UMIVOR did not report any traffic control.

TABLE 15. CONSTRUCTION ZONE - TYPE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Construction/ Maintenance Utility	Police report the type of construction.	UD-10 codes a construction zone only if the crash took place within one. Not coded means no construction zone. Since UMIVOR doesn't specify the type of construction zone the UD-10 codes were collapsed into one group for comparison. UMIVOR codes whether or not the crash takes place in a construction zone. The UD-10 and UMIVOR codes were compared.
UMIVOR	No Yes Unknown	Investigator interview case vehicle driver, reviews police report, and inspects crash scene.	

TABLE 16. CONSTRUCTION ZONE - TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 20 cases UD-10 did not code the presence of a construction zone, UMIVOR coded *No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 17. CONSTRUCTION ZONE - LANE CLOSED
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Yes No	Police report if any lanes were closed.	UD-10 codes lane closure only if the crash takes place in a construction zone. Not coded means no lane closure. UMIVOR reports this in the narrative and site drawing, which was compared to the UD-10 codes.
UMIVOR	Not coded	Investigator interviews case vehicle driver, reviews police report, and inspects crash scene.	

TABLE 18. CONSTRUCTION ZONE - LANE CLOSED
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 20 cases UD-10 did not code lane closed, UMIVOR did not report any lane closure.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 19. CONSTRUCTION ZONE - ACTIVITY Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	On Road Off Road None	Police report location of construction activity.	UD-10 codes construction activity only if the crash takes place in a construction zone. Not coded means no construction activity. UMIVOR reports this in the narrative and site drawing, which was compared to the UD-10 codes.
UMIVOR	Not coded	Investigator interview case vehicle driver, reviews police report, and inspects crash scene.	

TABLE 20. CONSTRUCTION ZONE - ACTIVITY Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 20 case UD-10 did not code activity, UMIVOR did not report any construction activity.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 21. LOCATION OF CRASH - NAME OF STREET Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Name of street	Police report all names and identifying numbers of street or highway.	UD-10 is compared to UMIVOR narrative and site drawing.
UMIVOR	Name of street	Investigator inspects crash site for street name and reports this in the narrative and site drawing.	

TABLE 22. LOCATION OF CRASH - NAME OF STREET Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 20 cases agreed on the name of the street.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 23. LOCATION OF CRASH - DISTANCE FROM CROSS STREET Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Distance from or at intersection in Feet/Miles	Police report distance measured from the center of the intersection, where the projected center lines intersect, in feet or tenths of a mile.	UMIVOR reports an intersection only when the crash occurs in it. In 3 cases UD-10 reported distances of 12, 15, and 20 feet from an intersection. These crashes occurred within the common portion of the roadway of the two intersecting streets and are considered to be in the intersection for this comparison.
UMIVOR	Not coded	Investigator inspects crash site for street name and reports it in the narrative and site drawing.	

TABLE 24. LOCATION OF CRASH - DISTANCE FROM CROSS STREET Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
6 of 7 cases agreed.	• 6 cases agreed the crash took place in an intersection.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.
MISSING DATA	
General Result	Specific Results
1 of 7 cases had missing data.	• 1 case UD-10 did not report the distance from the nearest cross street, UMIVOR did not report a distance. • 13 cases UD-10 reported the distance from the nearest cross street, UMIVOR did not report a distance. Since UMIVOR did not report this information, these cases were not included when considering agreement, disagreement, or missing data.

TABLE 25. LOCATION OF CRASH - DIRECTION FROM NEAREST INTERSECTION Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	North South East West Beginning of Ramp End of Ramp	Police inspect crash site. Two directions are coded if the roadway runs northeast, etc.	Information from the UMIVOR narrative and site drawing was compared to the UD-10 codes.
UMIVOR	Not coded	Investigator inspects crash scene but does not report this information unless the crash takes place very close to an intersection.	

TABLE 26. LOCATION OF CRASH - DIRECTION FROM NEAREST INTERSECTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
4 of 5 cases agreed.	• 3 cases agreed the crash took place in an intersection. • 1 case agreed *South.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.
MISSING DATA	
General Result	Specific Results
1 of 5 cases had missing data.	• 1 case UD-10 did not code a direction, UMIVOR did not report a direction. • 15 cases UD-10 coded a direction, UMIVOR did not report a direction. Since UMIVOR did not report this information, these cases were not included when considering agreement, disagreement, or missing data.

TABLE 27. LOCATION OF CRASH - NAME OF NEAREST CROSS STREET Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Name of cross street	Police report all names and identifying numbers of street or highway.	UD-10 is compared to UMIVOR narrative and site drawing.
UMIVOR	Not coded	UMIVOR reports an intersection only when the crash occurs in or close to it and reports it in the narrative and site drawing.	

TABLE 28. LOCATION OF CRASH - NAME OF NEAREST INTERSECTING STREET Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
7 of 7 cases agreed.	• 7 cases agreed on name of nearest intersecting street.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.
MISSING DATA	
General Result	Specific Results
	• There was no missing data. • 13 cases UD-10 reported the nearest intersecting street, UMIVOR did not report the intersecting street. Since UMIVOR did not report this information, these cases were not included when considering agreement, disagreement, or missing data.

TABLE 29. RELATION TO ROADWAY Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	On Road Median Shoulder Outside of Shoulder/Curb Gore Other/Unknown	Police report relation to roadway of first impact from crash scene inspection.	UMIVOR narrative and site drawing are reviewed and compared to UD-10 codes.
UMIVOR	Not coded	Investigator inspects crash site, interviews case vehicle driver and examines police report and reports the relation to road way in the narrative and site drawing.	

TABLE 30. RELATION TO ROADWAY Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 20 cases agreed.	• 14 cases agreed *On Road.* • 3 cases agreed *Shoulder.* • 1 case agreed *Outside of Shoulder/Gore.*
DISAGREEMENT	
General Result	Specific Results
2 of 20 cases disagreed.	• 1 case UD-10 coded *On Road*, UMIVOR reported *Outside of Shoulder/Gore.* The UD-10 narrative and site drawing show the vehicle sliding off the road and hitting a tree. • 1 case UD-10 coded *Median*, UMIVOR reported *Shoulder.* The UD-10 narrative and site drawing show the vehicle hitting a guardrail off the right shoulder of the road.

TABLE 31. AREA OF ROADWAY
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	FREEWAY Entrance/exit ramp related Median crossing related Transition area Rest area related Scale/weigh station related All other freeway areas NONFREEWAY INTERSECTIONSWithin intersection Driveway related Intersection related-other OTHER NONFREEWAY AREAS Straight roadway-not related to other sections Curved roadway-not related to other sections Driveway related Parking related Transition area Median crossing related Railroad grade crossing related Rest area related Scale/weigh station related Nontraffic area Other Unknown	Police inspect crash scene.	Information from the UMIVOR narrative and site drawing was compared with the UD-10 code.
UMIVOR	Not coded	Investigator inspects crash site, reviews police report, and interviews case vehicle driver. Information is reported in the narrative and site drawing.	

TABLE 32. AREA OF ROADWAY Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 1 case agreed *Entrance/exit ramp related.* • 2 cases agreed *All other freeway areas.* • 7 cases agreed *Within intersection.* • 8 cases agreed *Straight roadway-not related to other sections.* • 2 cases agreed *Curved roadway-not related to other sections.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 33. ROAD CONDITION
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Dry Wet Icy Snowy Muddy Slushy Debris Other/Unknown	Police report road condition from crash scene examination	UD-10 and UMIVOR codes were compared. UMIVOR does not specifically code muddy or debris but reports it in the narrative if mentioned by the case vehicle driver.
UMIVOR	Dry Wet Icy Snowy Slush Other/Unknown	Investigator interviews case vehicle driver.	

TABLE 34. ROAD CONDITION
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 15 cases agreed *Dry.* • 1 case agreed *Wet.* • 3 cases agreed *Icy.* • 1 case agreed *Snowy.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 35. TOTAL LANES
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Zero One Two Three Four Five Six Seven Eight Nine	Police report number of lanes, curb to curb, from crash scene examination including continuous center lanes and excluding parking lanes and left and right turn flares. On a divided roadway the lanes available where the crash took place are reported. If not on a roadway, zero is coded.	The UMIVOR narrative, site drawing, and number of lanes coded are reviewed and compared to the UD-10 narrative, site drawing, and number of lanes coded. Then UMIVOR was recoded to follow the UD-10 codes.
UMIVOR	One Two Three Four or more Divided, 4 or more Parking lot/ driveway Other Unknown	Investigator reports the total number of lanes, curb-to-curb, including continuous center-turn lanes and right and left turn flares if the crash occurs where the flares are present.	

TABLE 36. TOTAL LANES
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
18 of 20 cases agreed.	• 13 cases agreed *Two* lanes. • 1 case agreed *Three* lanes. • 3 cases agreed *Four* lanes. • 2 cases agreed *Five* lanes.
DISAGREEMENT	
General Result	Specific Results
2 of 20 cases disagreed.	• 1 case UD-10 coded *Three* lanes, UMIVOR coded *Two* lanes. • 1 case UD-10 coded *Two* lanes, UMIVOR coded *Four* lanes.

TABLE 37. SPEED LIMIT
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	5 MPH 10 MPH 15 MPH 20 MPH 25 MPH 30 MPH 35 MPH 40 MPH 45 MPH 50 MPH 55 MPH 60 MPH 65 MPH	Police report speed limit from crash scene examination.	UD-10 and UMIVOR codes were compared. Since UMIVOR has one code for 5 - 25 MPH the UD-10 codes for these speeds were collapsed into one group for comparison.
UMIVOR	5 - 25 MPH 30 MPH 35 MPH 40 MPH 45 MPH 50 MPH 55 MPH 60 MPH 65 MPH Unknown	Investigator reports speed limit from crash scene examination.	

TABLE 38. SPEED LIMIT
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
18 of 20 cases agreed.	• 2 cases agreed *5 - 25 MPH.* • 1 case agreed *30 MPH.* • 2 cases agreed *35 MPH.* • 2 cases agreed *40 MPH.* • 2 cases agreed *45 MPH.* • 8 cases agreed *55 MPH.* • 1 case agreed *65 MPH.*
DISAGREEMENT	
General Result	Specific Results
2 of 20 cases disagreed.	• 1 case UD-10 coded *45 MPH*, UMIVOR coded *5 - 25 MPH.* • 1 case UD-10 coded *45 MPH*, UMIVOR coded *35 MPH.*

TABLE 39. UMIVOR CASE VEHICLE - VEHICLE IDENTIFICATION NUMBER Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Not coded	Police inspect case vehicle and record the VIN.	The VINs reported are compared.
UMIVOR	Not coded	Investigator inspects case vehicle and record the VIN.	

TABLE 40. UMIVOR CASE VEHICLE - VEHICLE IDENTIFICATION NUMBER (VIN) Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
15 of 20 cases agreed.	• 15 cases agreed on the VIN.
DISAGREEMENT	
General Result	Specific Results
4 of 20 cases disagreed.	• 3 cases the UD-10 reported VIN had one character missing compared to the UMIVOR reported VIN. In these cases the VINs were checked with Vindicator, a VIN decoding program from the Highway Loss Data Institute. The UD-10 VINs did not match a valid pattern while the VINs reported in UMIVOR decoded to match the case vehicles. • 1 case the reported VINs are completely different. Vindicator was used to decode these VINs and found that the UD-10 VIN was for a 1990 Honda Accord while the UMIVOR VIN was for the case vehicle, a 1988 Ford Escort.
MISSING DATA	
General Result	Specific Results
1 of 20 cases had missing data.	• 1 case UD-10 did not report the VIN, UMIVOR reported the VIN.

TABLE 41. UMIVOR CASE VEHICLE - VEHICLE COLOR Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Not coded	Police inspect the case vehicle and record the color.	The color reported in UD-10 is compared to the color in the UMIVOR slides.
UMIVOR	Not coded	Investigator takes slides of case vehicle.	

TABLE 42. UMIVOR CASE VEHICLE - VEHICLE COLOR Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
7 of 20 cases agreed.	• 7 cases agreed on the color of the case vehicle.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.
MISSING DATA	
General Result	Specific Results
13 of 20 cases had missing data.	• 13 cases UD-10 did not report color. The color was available from UMIVOR slides.

TABLE 43. UMIVOR CASE VEHICLE - VEHICLE MAKE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Not coded	Police inspect the case vehicle and record the make.	The make reported in UD-10 and UMIVOR are compared.
UMIVOR	Not coded	Investigator decodes the case vehicle VIN and compares it with an inspection of the vehicle.	

TABLE 44. UMIVOR CASE VEHICLE - VEHICLE MAKE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
17 of 20 cases agreed.	• 17 cases agreed on the make of the vehicle.
DISAGREEMENT	
General Result	Specific Results
1 of 20 cases disagreed.	• 1 case UD-10 reported Escort, UMIVOR reported Ford. Instructions for completing the UD-10 do not specify what is meant by vehicle make. While "Escort" is a name unique to Ford in this country, it is not clear if this was intended as a valid response in completing the UD-10.
MISSING DATA	
General Result	Specific Results
2 of 20 cases had missing data.	• 2 cases UD-10 did not report the make, UMIVOR did report the make.

TABLE 45. UMIVOR CASE VEHICLE - VEHICLE YEAR Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Not coded	Police inspect the case vehicle and record the year.	The vehicle year reported in UD-10 and UMIVOR are compared.
UMIVOR	Not coded	Investigator decodes the case vehicle VIN.	

TABLE 46. UMIVOR CASE VEHICLE - VEHICLE YEAR Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
15 of 20 cases agreed.	• 15 cases agreed on the year of the vehicle.
DISAGREEMENT	
General Result	Specific Results
1 of 20 cases disagreed.	• 1 case UD-10 reported a 1990 model year, UMIVOR reported a 1988 model year. The VINs were checked with Vindicator, a VIN decoding program from the Highway Loss Data Institute. The UD-10 reported VIN was for a 1990 Honda Accord which was not the case vehicle. The UMIVOR reported VIN was for a 1988 Ford Escort which was the case vehicle. This was a single-vehicle crash.
MISSING DATA	
General Result	Specific Results
4 of 20 cases had missing data.	• 4 cases UD-10 did not report the vehicle year, UMIVOR did report the vehicle year.

TABLE 47. UMIVOR CASE VEHICLE - VEHICLE MODEL (Body Style)
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Not coded	Police report vehicle model from crash scene inspection.	The instructions for completing UD-10 give "two-door, four- door, etc." as examples for model. For comparison the UMIVOR codes were collapsed to two-door, four-door, station wagon, convertible, utility vehicle, van, and pickup, and compared to the UD-10.
UMIVOR	PASSENGER VEHICLE 2-door hard top 2-door sedan or coupe 4-door hard top 4-door sedan or coupe Station wagon Convertible Other Unknown passenger vehicle MULTIPURPOSE PASSENGER VEHICLE Small utility Large utility Van, size unknown Van, small Van, large MPV, type unknown TRUCK Pickup truck, unknown Pickup truck, small Pickup truck, large	Investigator decodes the vehicle VIN and compares it with vehicle inspection.	

TABLE 48. UMIVOR CASE VEHICLE - VEHICLE MODEL (Body Style) Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
10 of 20 cases agreed.	• 10 cases agreed on the vehicle model.
DISAGREEMENT	
General Result	Specific Results
1 of 20 cases disagreed.	• 1 case UD-10 reported station wagon, UMIVOR reported *Large utility.* The case vehicle was a Jeep Grand Cherokee, a large utility vehicle.
MISSING DATA	
General Result	Specific Results
9 of 20 cases had missing data.	• 4 cases UD-10 did not report the vehicle model, UMIVOR coded *Two-door.* • 4 cases UD-10 did not report the vehicle model, UMIVOR coded *Four-door.* • 1 case UD-10 did not report the vehicle model, UMIVOR coded *Van.*

TABLE 49. UMIVOR CASE VEHICLE - TOTAL OCCUPANTS Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	00 - 99 occupants	Police report total vehicle occupants from crash scene inspection.	The UD-10 and UMIVOR codes for the number of occupants were compared.
UMIVOR	00 - 98 for number of occupants 99 Unknown	Investigator interviews case vehicle driver.	

TABLE 50. UMIVOR CASE VEHICLE - TOTAL OCCUPANTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 14 cases agreed *One* occupant. • 3 cases agreed *Two* occupants. • 2 cases agreed *Three* occupants. • 1 case agreed *Four* occupants.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 51. UMIVOR CASE VEHICLE - DIRECTION OF TRAVEL
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	North South East West	Police report direction of travel from scene inspection. Two directions are coded for northwest, etc. The direction is also reported in the site drawing and narrative.	The UD-10 codes, site drawing, and narrative were compared to the UMIVOR site drawing and narrative.
UMIVOR	Not coded	Investigator inspects crash scene and reports results in narrative and site drawing.	

TABLE 52. UMIVOR CASE VEHICLE - DIRECTION OF TRAVEL
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
18 of 20 cases agreed.	• 5 cases agreed *North.* • 5 cases agreed *South.* • 3 cases agreed *East.* • 5 cases agreed *West.*
DISAGREEMENT	
General Result	Specific Results
1 of 20 cases disagreed.	• 1 case UD-10 coded *West*, UMIVOR reported *East.* UD-10 coded West but showed East on the site drawing.
MISSING DATA	
General Result	Specific Results
1 of 20 cases had missing data.	• 1 case UD-10 did not code a direction, UMIVOR reported *West.*

TABLE 53. UMIVOR CASE VEHICLE - SPECIAL VEHICLES
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Police vehicle Fire vehicle Bus Ambulance Farm equipment Construction equipment	Police inspect scene and code if the vehicle being reported was one of these special vehicles.	The UD-10 codes were compared to the UMIVOR narrative.
UMIVOR	Not coded	Investigator inspects scene and reports in narrative.	

TABLE 54. UMIVOR CASE VEHICLE - SPECIAL VEHICLES
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 20 cases agreed a special vehicle was not the UMIVOR case vehicle.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 55. UMIVOR CASE VEHICLE - GREATEST DAMAGE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Rollover Front-center Front-right corner Right-side center Rear-right corner Rear-center Rear-left corner Left-side center Front-left cornet Undercarriage Multiple Other/unknown None	Police inspect the vehicle and code the area of most severe damage. Multiple is coded if more than one area sustains equal damage.	Since UD-10 codes are more precise in locating the greatest damage, the UMIVOR codes and slides of the case vehicle were examined and UMIVOR recoded to follow the UD-10 codes.
UMIVOR	Front Left side Rear Right side Other Rollover Unknown	Investigator inspects vehicle and crash scene, interviews case vehicle driver, and records the sheet metal crush. Slides of the vehicle are also taken.	

TABLE 56. UMIVOR CASE VEHICLE - GREATEST DAMAGE
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
12 of 20 cases agreed.	• 4 cases agreed *Front-center.* • 2 cases agreed *Front-right corner.* • 3 cases agreed *Right-side center.* • 3 cases agreed *Left-front corner.*
DISAGREEMENT	
General Result	Specific Results
8 of 20 cases disagreed.	• 2 cases UD-10 coded *Multiple* damage, UMIVOR coded *Front.* In both cases UMIVOR reported the greatest crush to the front of the vehicle. • 1 case UD-10 coded *Front-left corner*, UMIVOR coded *Front-right corner.* Examination of the UMIVOR slides shows damage on the right-front corner. • 1 case UD-10 coded *Front-left corner*, UMIVOR coded *Right side.* Examination of the UMIVOR slides shows damage on the right side by the front wheel. • 1 case UD-10 coded *Front-left corner*, UMIVOR coded *Front.* Examination of the UMIVOR slides shows damage across the entire front end of the vehicle. • 1 case UD-10 coded *Front*, UMIVOR coded *Front-right corner.* Examination of the UMIVOR slides shows damage at the front-right corner. • 1 case UD-10 coded *Right-side*, UMIVOR coded *Left-side.* Examination of the UMIVOR slides and reported sheet metal crush shows both sides damaged with greater crush on the left side. • 1 case UD-10 coded *Rollover*, UMIVOR coded *Front.* Examination of the UMIVOR slides and reported sheet metal crush shows both the roof and front end damaged with greater crush on the front end.

TABLE 57. UMIVOR CASE VEHICLE - FIRST DAMAGE
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Rollover Front-center Front-right corner Right-side center Rear-right corner Rear-center Rear-left corner Left-side center Front-left cornet Undercarriage Multiple Other/unknown None	Police inspect the vehicle and code the area of first damage. Multiple is coded if more than one area sustains equal damage.	UD-10 codes are compared to the UMIVOR codes and slides of the case vehicle. The slides are used to confirm areas of damage. Because of the different codes used, in some cases UD-10 and UMIVOR report first damage differently yet refer to the same area. These will be considered agreement.
UMIVOR	Front Left side Rear Right side Other Rollover Unknown	Investigator inspects vehicle and crash scene, interviews case vehicle driver, and records the sheet metal crush. Slides of the vehicle are also taken.	

TABLE 58. UMIVOR CASE VEHICLE - FIRST DAMAGE
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
14 of 20 cases agreed.	• 8 cases agreed *Front-center.* • 2 cases agreed *Right-front corner.* • 2 cases agreed *Right-side.* • 1 case agreed *Left-front corner.* • 1 case UD-10 coded *Left-front corner*, UMIVOR coded *Left side.* The impact occurred from the left side at the front end of the vehicle. Both reports referred to the same area of the vehicle.
DISAGREEMENT	
General Result	Specific Results
5 of 20 cases disagreed.	• 1 case UD-10 coded *Front-left corner*, UMIVOR coded *Front.* This vehicle was involved in a head-on collision. Examination of the UMIVOR slides show the car heavily damaged from B-pillar to B-pillar with major damage across the entire front of the vehicle. • 1 case UD-10 coded *Front-center*, UMIVOR coded *Front-right corner.* Examination of the UMIVOR slides shows damage on the front-right corner. • 1 case UD-10 coded *Front-left corner*, UMIVOR coded *Front-right corner.* Damage occurred to both of these areas. The two report narratives disagree on the sequence of events. • 1 case UD-10 coded *Front-left corner*, UMIVOR coded *Front-right corner.* The UD-10 site drawing shows the impact occurring on the front-right corner of the vehicle. • 1 case UD-10 coded *Right-side*, UMIVOR coded *Other/unknown.* both reports agreed the case vehicle struck a road-side reflector marker before rolling over. The UMIVOR investigator could not determine where this impact took place on the case vehicle.
MISSING DATA	
General Result	Specific Results
1 of 20 cases had missing data.	• 1 case UD-10 did not code first damage, UMIVOR coded *Front-left corner.*

TABLE 59. UMIVOR CASE VEHICLE - DRIVEABLE AFTER CRASH
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Yes No	Police report whether vehicle is capable of being driven from scene. Yes is coded if vehicle is towed because of driver incapacity or disabling mechanical problem not caused by the crash.	Since UD-10 codes only yes or no, the UMIVOR codes for towing were collapsed and recoded to follow the UD-10 codes for comparison.
UMIVOR	Driven Towed due to damage Towed, not due to damage Towed, reason unknown Unknown	Investigator reviews police report and inspect vehicle.	

TABLE 60. UMIVOR CASE VEHICLE - DRIVEABLE AFTER CRASH
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
19 of 20 cases agreed.	• 19 cases agreed *No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.
MISSING DATA	
General Result	Specific Results
1 of 20 cases had missing data.	• 1 case UD-10 did not code vehicle driveability, UMIVOR coded *No.*

TABLE 61. UMIVOR CASE VEHICLE - VEHICLE TYPE
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Passenger car and station wagon Van, motor home Pickup truck	Police inspect crash scene and code vehicle type.	UMIVOR reports on only passenger cars, utility vehicles, vans, and pickup trucks. UMIVOR codes were collapsed into groups as coded in UD-10 and compared to the UD-10 codes. UD-10 codes for vehicles not examined by UMIVOR are not presented.
UMIVOR	PASSENGER VEHICLES 2-door hard top 2-door sedan or coupe 4-door hard top 4-door sedan or coupe Station wagon Convertible Other Unknown MULTIPURPOSE PASSENGER VEHICLES Small utility Large utility Van, size unknown Van, small Van, large MPV, type unknown TRUCK Pickup truck, unknown Pickup truck, small Pickup truck, large	Investigator decodes the vehicle VIN and compares it with vehicle inspection.	

TABLE 62. UMIVOR CASE VEHICLE - VEHICLE TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 15 cases agreed *Passenger car and station wagon.* • 2 cases agreed *Van.* • 3 cases agreed *Pickup truck.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 63. UMIVOR CASE VEHICLE - VEHICLE DEFECTS
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Brakes Lights/reflectors Steering Tires/wheels Windows Other	Police inspect vehicle and coded most significant defect. Other defects are noted in the narrative. No item coded means no defect.	The UD-10 and UMIVOR codes were compared.
UMIVOR	MECHANICAL MALFUNCTION No Yes Yes, did not contribute to crash Unknown MALFUNCTIONS Brake system Exhaust system Steering system Suspension system Electrical system Driver controls Power train Fuel system Visibility items Tires Other	Investigator interviews case vehicle driver, codes recognized or suspected mechanical malfunction, and also codes whether or not it contributed to the crash.	

TABLE 64. UMIVOR CASE VEHICLE - VEHICLE DEFECTS
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 20 cases UD-10 UMIVOR did not report any defects, UMIVOR coded *No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement

TABLE 65. UMIVOR CASE VEHICLE - ACTION PRIOR TO CRASH
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Going straight ahead Turning left Turning right Stopped on roadway Involved in prior crash at same location Changing lanes Backing Slowing/stopping on roadway Slowing/stopping other area Starting up on roadway Starting up other area Entering parking Leaving parking Entering roadway Leaving roadway Making U-turn Overtaking or passing Avoiding object Avoiding vehicle (front/back) Avoiding vehicle (angle) Driverless moving Parked	Police examine crash scene and choose one action that occurred just prior to the first harmful event that best describes the action of the case vehicle. This is also described in the UD-10 narrative and site drawing.	UD-10 codes, narrative, and site drawing are compared to the UMIVOR narrative and site drawing.
UMIVOR	Not coded	Investigator inspects vehicle and crash scene and interviews case vehicle driver. This is reported in the narrative and site drawing.	

TABLE 66. UMIVOR CASE VEHICLE - ACTION PRIOR TO CRASH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 20 cases agreed.	• 13 cases agreed the case vehicle was *Going straight ahead.* • 2 cases agreed the case vehicle was *Turning left.* • 1 case agreed the case vehicle was *Changing lanes.* • 1 case agreed the case vehicle was *Entering roadway.* • 1 case agreed the case vehicle was *Avoiding vehicle (front/back).*
DISAGREEMENT	
General Result	Specific Results
2 of 20 cases disagreed.	• 1 case UD-10 coded *Turning left*, UMIVOR coded *Going straight ahead.* There is no UD-10 site drawing. The UD-10 narrative reports that the case vehicle was turning left while the UMIVOR narrative reports that it had crossed over the center line and slowed to make a left turn. • 1 case UD-10 coded *Stopped on road way*, UMIVOR coded *Going straight ahead.* The UD-10 narrative states the vehicle was going straight ahead.

TABLE 67. UMIVOR CASE VEHICLE - SEQUENCE OF EVENTS, EVENT #1 Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	UD-10 has codes for 45 events that could be collisions or noncollisions.	Police examine crash scene and chronologically code events from the first unstable event. If there are more than four, only the four most significant events are coded.	The UMIVOR narrative, site drawing, and coded impacts are reviewed and recoded to follow the UD-10 codes. In some cases the UMIVOR case number is given after a comparison of results shows disagreement or missing data. These cases will be discussed further after this section on the sequence of events.
UMIVOR	UMIVOR has over 100 codes for impacts but none for noncollisions.	Investigator inspects crash scene and case vehicle and interviews case vehicle driver.	

TABLE 68. UMIVOR CASE VEHICLE - SEQUENCE OF EVENTS, EVENT #1 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 20 cases agreed.	• 12 cases agreed *Hit vehicle.* • 2 cases agreed *Loss of control.* • 3 cases agreed *Ran off road-right.* • 1 case agreed *Non-collision (driver blacked out).*
DISAGREEMENT	
General Result	Specific Results
2 of 20 cases disagreed.	• 1 case UD-10 coded *Collision with tree*, UMIVOR reported *Ran off road-right.* The UD-10 narrative reports the vehicle running off the road to the right but did not code this event. (UMIVOR case #9) • 1 case UD-10 coded *Ran off road-left*, UMIVOR reported *Loss of control.* There were significant differences in the two narratives in reporting the sequence of events for this crash. (UMIVOR case #11)

TABLE 69. UMIVOR CASE VEHICLE - SEQUENCE OF EVENTS, EVENT #2 Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	UD-10 has codes for 45 events that could be collisions or noncollisions.	Police examine crash scene and chronologically code events from the first unstable event. If there are more than four, only the four most significant events are coded.	The UMIVOR narrative, site drawing, and coded impacts are reviewed and recoded to follow the UD-10 codes. In some cases the UMIVOR case number is given after a comparison of results shows disagreement or missing data. These cases will be discussed further after this section on the sequence of events.
UMIVOR	UMIVOR has over 100 codes for impacts, but none for noncollisions.	Investigator inspects crash scene and case vehicle and interviews case vehicle driver.	

TABLE 70. UMIVOR CASE VEHICLE - SEQUENCE OF EVENTS, EVENT #2
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
5 of 11 cases with two or more events agreed.	• 2 cases agreed *Cross centerline/median.* • 1 case agreed *Ran into ditch.* • 1 case agreed *Hit tree.* • 1 case agreed *Hit vehicle.*
DISAGREEMENT	
General Result	Specific Results
5 of 11 cases with two or more events disagreed.	• 1 case UD-10 coded *Ran off road-right*, UMIVOR reported *Ran off road-left.* The UD-10 and UMIVOR site drawings show the case vehicle running off the road to the left. • 1 case UD-10 coded *Hit curb*, UMIVOR reported *Hit light support.* (UMIVOR case #8) • 1 case UD-10 coded *Overturn*, UMIVOR reported *Hit tree.* (UMIVOR case #9) • 1 case UD-10 coded *Loss of control*, UMIVOR reported *Ran off road-right.* (UMIVOR case #11) • 1 case UD-10 coded *Ran off road-right*, UMIVOR did not report a second event. The UD-10 narrative and site drawing show the case vehicle, after colliding with the other vehicle, running off the road to the left and striking a utility pole head-on. The UMIVOR narrative and site drawing show the vehicle stopping on the road and does not report any damage to the front of the vehicle.
MISSING DATA	
General Result	Specific Results
1 of 11 cases with two or more events had missing data.	• 1 case UD-10 did not code a second event, UMIVOR reported *Hit vehicle.* Both narratives show the case vehicle, the middle vehicle in a three-car crash, being hit by two other vehicles. UD-10 coded only one collision for the case vehicle and incorrectly coded two collisions for the first of the three vehicles.

TABLE 71. UMIVOR CASE VEHICLE - SEQUENCE OF EVENTS, EVENT #3 Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	UD-10 has codes for 45 events that could be collisions or noncollisions.	Police examine crash scene and chronologically code events from the first unstable event. If there are more than four, only the four most significant events are coded.	The UMIVOR narrative, site drawing, and coded impacts are reviewed and recoded to follow the UD-10 codes. In some cases the UMIVOR case number is given after a comparison of results shows disagreement or missing data. These cases will be discussed further after this section on the sequence of events.
UMIVOR	UMIVOR has over 100 codes for impacts, but none for noncollisions.	Investigator inspects crash scene and case vehicle and interviews case vehicle driver.	

TABLE 72. UMIVOR CASE VEHICLE - SEQUENCE OF EVENTS, EVENT #3 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
4 of 8 cases with three or more events agreed.	• 1 case agreed *Hit vehicle.* • 1 case agreed *Hit guardrail face.* • 1 case agreed *Hit tree.* • 1 case agreed *Hit other pole.*
DISAGREEMENT	
General Result	Specific Results
3 of 8 cases with three or more events disagreed.	• 1 case UD-10 coded *Hit fence*, UMIVOR reported *Hit traffic sign post.* • 1 case UD-10 coded *Hit utility pole*, UMIVOR reported *Hit tree.* (UMIVOR case #8) • 1 case UD-10 coded *Hit utility pole*, UMIVOR did not report a third event. The UD-10 narrative and site drawing show the case vehicle, after colliding with the other vehicle, running off the road to the left and striking a utility pole head-on. The UMIVOR narrative and site drawing show the vehicle stopping on the road and does not report any damage to the front of the vehicle.
MISSING DATA	
General Result	Specific Results
1 of 8 cases with three or more events had missing data.	• 1 case UD-10 did not code a third event, UMIVOR reported *Overturn.* (UMIVOR case #9)

TABLE 73. UMIVOR CASE VEHICLE - SEQUENCE OF EVENTS, EVENT #4
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	UD-10 has codes for 45 events that could be collisions or noncollisions.	Police examine crash scene and chronologically code events from the first unstable event. If there are more than four, only the four most significant events are coded.	The UMIVOR narrative, site drawing, and coded impacts are reviewed and recoded to follow the UD-10 codes. In some cases the UMIVOR case number is given after a comparison of results shows disagreement or missing data. These cases will be discussed further after this section on the sequence of events.
UMIVOR	UMIVOR has over 100 codes for impacts, but none for noncollisions.	Investigator inspects crash scene and case vehicle and interviews case vehicle driver.	

TABLE 74. UMIVOR CASE VEHICLE - SEQUENCE OF EVENTS, EVENT #4
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
1 of 4 cases with four events agreed.	• 1 case agreed *Overturn.*
DISAGREEMENT	
General Result	Specific Results
2 of 4 cases with four events disagreed.	• 1 case UD-10 coded *Hit tree*, UMIVOR reported *Hit highway traffic sign post.* (UMIVOR case #8) • 1 case UD-10 coded *Ran into ditch*, UMIVOR reported *Ran off road-left.* (UMIVOR case #11)
MISSING DATA	
General Result	Specific Results
1 of 4 cases with four events had missing data.	• 1 case UD-10 did not code a fourth event, UMIVOR coded *Hit other fixed object.*

UMIVOR Case Vehicle - Sequence of Events

In many of the cases involving disagreement or missing data, differences often arise from how the sequence of events was coded. Three cases account for most of these differences.

UMIVOR case #8

Event Number	UD-10 Event	UMIVOR Event
1	Ran off road-right	Ran off road-right
2	Hit curb	Hit luminaire/light support
3	Hit utility pole	Hit three small trees
4	Hit tree	Hit highway traffic sign post

In this example both the UD-10 and UMIVOR narratives agree that, in the first event, the case vehicle ran off the road to the right. In the second event UD-10 codes an impact with a curb, but UMIVOR does not code impacts with a curb unless it results in damage to the vehicle. UD-10 event three, hit utility pole, could very well be the same as UMIVOR event two, hit luminaire/light support, if this pole served both functions. UD-10 event four and UMIVOR event three both have the case vehicle hitting a tree. UD-10 is limited to coding the four most significant events and does not code the traffic sign in UMIVOR event four.

UMIVOR case #9

Event Number	UD-10 Event	UMIVOR Event
1	Hit tree	Ran off road-right
2	Overturn	Hit tree
3	None	Overturn

In this case the vehicle was out of control before it hit the tree and overturned. This event, ran off road-right, was not coded on UD-10.

UMIVOR case #11

Event Number	UD-10 Event	UMIVOR Event
1	Ran off road-left	Loss of control
2	Loss of control	Ran off road-right
3	Hit guardrail face	Hit guardrail face
4	Ran into ditch	Ran off road-left

There was substantial disagreement on the sequence of events on this case. The UD-10 narrative reports, "Driver #1 was W/B M-14 passing Vehicle A, when Vehicle A drove into #1s lane cutting off Driver #1. Causing Driver #1 to swerve and hit guardrail, lose control, hit n/s (nearside) guardrail and come to rest in the median." When the coded sequence of events was compared to the narrative and site drawing, the limit of allowing only four events to be coded on UD-10 becomes apparent.

The UMIVOR narrative reports, "Case vehicle (A) was westbound on M-14. Unknown vehicle (X) was westbound on M-14 in front of case vehicle (A) in the right lane. As case vehicle (A) began to pass vehicle (X), vehicle (X) drove into the left lane causing the driver of case vehicle (A) to lose control of the vehicle. Case vehicle (A) veered to the left and then to the right across both lanes and struck the guardrail on the right

shoulder. Case vehicle (A) then went back across the road, where it contacted and vaulted the guardrail on the left shoulder of the road."

Comparing the two narratives shows disagreement on the order of the two contacts with the guardrails with UD-10 reporting contact with the left and then the right guardrails, while UMIVOR has these reversed.

TABLE 75. UMIVOR CASE VEHICLE - MOST HARMFUL EVENT
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	1 - 4	Police code sequence of events as described above, then select the one event that was most harmful. This includes harm to a person.	The UMIVOR sequence of events developed for the comparison above was used along with the reported sheet metal crush to determine the most harmful event and then compared to UD-10.
UMIVOR	Not coded	Investigator inspects case vehicle and crash site, reports sheet metal crush on all areas of vehicle.	

TABLE 76. UMIVOR CASE VEHICLE - MOST HARMFUL EVENT
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
18 of 20 cases agreed.	• 12 cases agreed the first event was most harmful. • 2 cases agreed the second event was most harmful. • 2 cases agreed the third event was most harmful. • 1 case agreed the fourth event was most harmful. • 1 case agreed which action was most harmful, but disagreed on the event number because of differences in the way events were coded.
DISAGREEMENT	
General Result	Specific Results
2 of 20 cases disagreed.	• 1 case disagreed on the event number and the action which was most harmful. UD-10 coded event two, loss of control and UMIVOR reported event three, hit guardrail face. UD-10 instructions say that the most harmful event is that which caused the greatest overall harm in the crash. Noncollision events are not used in any of the examples. • 1 case UD-10 coded event #3, *Hit utility pole*, UMIVOR reported event #2, *Hit luminaire/light support.* It is possible that the utility pole was also a luminaire/light support.

TABLE 77. UMIVOR CASE VEHICLE DRIVER - SEX Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Male Female	Police report driver's sex from crash scene examination.	UD-10 and UMIVOR codes were directly compared.
UMIVOR	Male Female Unknown	Investigator reviews police report and interviews case vehicle driver.	

TABLE 78. UMIVOR CASE VEHICLE DRIVER - SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 10 cases agreed *Male.* • 10 cases agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 79. UMIVOR CASE VEHICLE DRIVER - ALCOHOL USE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes No	Police indicate whether, in their opinion, the driver had been drinking.	UD-10 and UMIVOR codes are compared.
UMIVOR	None Yes Unknown/Not Reported	Investigator reviews police report and hospital records.	

TABLE 80. UMIVOR CASE VEHICLE DRIVER - ALCOHOL USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
17 of 20 cases agreed.	• 1 cases agreed *Yes.* • 16 cases agreed *No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.
MISSING DATA	
General Result	Specific Results
3 of 20 cases had missing data.	• 2 cases UD-10 did not code driver drinking, UD-10 coded *No.* In one of these cases, UD-10 coded "Not Offered" under a code for Test Type. Instructions for completing the UD-10 state, "If the driver had been drinking, but was not tested, indicate whether the test was "refused" by the driver, or "not offered" by the officer." To be coded correctly, "Yes" and "Not Offered" or "No" should be coded. • 1 case UD-10 had marks by the Yes and No bubbles, UMIVOR coded *Yes.*

TABLE 81. UMIVOR CASE VEHICLE DRIVER - SEATING POSITION Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Front-left Front-center Front-right Second-left Second-center Second-right Third-left Third-center Third-right Sleeper section Other enclosed pass/cargo area Other unenclosed pass/cargo area Trailing unit Riding on vehicle exterior Unknown	Police examine vehicle and determine driver position.	The UD-10 and UMIVOR codes are compared.
UMIVOR	ROW LOCATION Front Second Third Forth Other External to passenger compartment Unknown LATERAL LOCATION Left Left-center Center Right-center Right All (Lying on seat) External to passenger compartment Unknown	Investigator interviews the case vehicle driver.	

TABLE 82. UMIVOR CASE VEHICLE DRIVER - SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 20 cases agreed the driver was seated in the *Front-left* position.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 83. UMIVOR CASE VEHICLE DRIVER - RESTRAINT USE
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	No belts available Shoulder belt only used Lap belt only used Shoulder and lap belt used No belts used Child restraint used Child restraint not used, not available, or improper Restraint failure Unknown	Police examine crash scene.	UD-10 and UMIVOR codes were compared. Since UD-10 does nor code passive and active safety belt systems separately, the UMIVOR codes were collapsed to conform to the UD-10 codes.
UMIVOR	ACTIVE RESTRAINT SYSTEM USAGE None (Available but not used) Lap belt only Shoulder harness only Both lap belt & shoulder harness Improper usage Unknown PASSIVE RESTRAINT SYSTEM USAGE System defeated Airbag not deployed Airbag deployed Airbag not reinstalled Passive upper torso used Passive lap & upper torso used System used in manual mode Improper usage Not applicable (not originally equipped) Unknown	Investigator interviews case vehicle driver and inspects vehicle.	

TABLE 84. UMIVOR CASE VEHICLE DRIVER - RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
19 of 20 cases agreed.	• 1 case agreed *Shoulder belt only used.* • 17 cases agreed *Shoulder and lap belt used.* • 1 case agreed *No belts used.*
DISAGREEMENT	
General Result	Specific Results
1 of 20 cases disagreed.	• 1 case UD-10 coded *No belts used*, UMIVOR coded *Shoulder and lap belt used.* UMIVOR reported that the left B-pillar, behind the driver's shoulder, was deformed forward and to the right indicating that the driver was using the shoulder and lap belts. The case vehicle, a 1989 Ford pickup, is equipped with lap and shoulder belts.

TABLE 85. UMIVOR CASE VEHICLE DRIVER - EJECTED FROM VEHICLE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes	Police examine crash scene. Not coding Yes means no ejection.	UD-10 and UMIVOR codes are compared.
UMIVOR	Yes No Unknown	Investigator interviews case vehicle driver and inspects case vehicle.	

TABLE 86. UMIVOR CASE VEHICLE DRIVER - EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 20 cases UD-10 did not code ejection, UMIVOR coded *No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 87. UMIVOR CASE VEHICLE DRIVER - TRAPPED IN VEHICLE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes	Police examine crash scene. Not coding Yes means not trapped.	UD-10 codes are compared to UMIVOR narrative.
UMIVOR	Not coded	Investigator interviews case vehicle driver and reports this in the narrative if mentioned by the driver.	

TABLE 88. UMIVOR CASE VEHICLE DRIVER - TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
20 of 20 cases agreed.	• 20 cases UD-10 did not code *Yes*, UMIVOR narrative did not report that the driver was trapped.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 89. UMIVOR CASE VEHICLE DRIVER - AIRBAG DEPLOYED Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes No Not available	Police inspect vehicle.	UD-10 and UMIVOR codes were compared.
UMIVOR	No Yes Not applicable (no airbag) Unknown	Investigator inspects vehicle and interviews case vehicle driver.	

TABLE 90. UMIVOR CASE VEHICLE DRIVER - AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
16 of 20 cases agreed.	• 8 cases agreed *Yes.* • 1 case agreed *No.* • 7 cases agreed an airbag was *Not available.*
DISAGREEMENT	
General Result	Specific Results
2 of 20 cases disagreed.	• 2 cases UD-10 coded *No*, UMIVOR coded *Not available.* The case vehicle VINs were checked with Vindicator, a VIN decoding program from the Highway Loss Data Institute. This confirmed that the reported VINs matched the case vehicles and that neither vehicle was equipped with an airbag.
MISSING DATA	
General Result	Specific Results
2 of 20 cases had missing data.	• 2 cases UD-10 was not coded, UMIVOR coded *Not available.*

TABLE 91. UMIVOR CASE VEHICLE PASSENGER #1 - SEX Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Male Female	Police examine crash scene.	UD-10 and UMIVOR codes were compared.
UMIVOR	Male Female Unknown	Investigator reviews police report and interviews case vehicle passenger or a parent or guardian if permission is not obtained.	

TABLE 92. UMIVOR CASE VEHICLE PASSENGER #1 - SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
6 of 6 cases with passenger #1 agreed.	• 2 cases agreed *Male.* • 4 cases agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 93. UMIVOR CASE VEHICLE PASSENGER #1 - EJECTED FROM VEHICLE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes	Police examine crash scene. Not coding Yes means no ejection.	UD-10 and UMIVOR codes are compared.
UMIVOR	Yes No Unknown	Investigator reviews police report and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 94. UMIVOR CASE VEHICLE PASSENGER #1 - EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
6 of 6 cases with passenger #1 agreed.	• 6 cases UD-10 did not code ejection, UMIVOR coded *No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 95. UMIVOR CASE VEHICLE PASSENGER #1 - TRAPPED IN VEHICLE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes	Police examine crash scene. Not coding Yes means not trapped.	UD-10 codes are compared to UMIVOR narrative.
UMIVOR	Not coded	Investigator reviews police report and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained. Reports this in the narrative if mentioned by the driver.	

TABLE 96. UMIVOR CASE VEHICLE PASSENGER #1 - TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
6 of 6 cases with passenger #1 agreed.	• 6 cases UD-10 did not code trapped, UMIVOR narrative did not report that passenger #1 was trapped.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 97. UMIVOR CASE PASSENGER #1 - SEATING POSITION
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Front-left Front-center Front-right Second-left Second-center Second-right Third-left Third-center Third-right Sleeper section Other enclosed pass/cargo area Other unenclosed pass/cargo area Trailing unit Riding on vehicle exterior Unknown	Police inspect crash scene.	The UD-10 and UMIVOR codes are compared.
UMIVOR	ROW LOCATION Front Second Third Forth Other External to passenger compartment Unknown LATERAL LOCATION Left Left-center Center Right-center Right All (Lying on seat) External to passenger compartment Unknown	Investigator interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 98. UMIVOR CASE VEHICLE PASSENGER #1 - SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
4 of 6 cases with passenger #1 agreed.	• 3 cases agreed *Front-right.* • 1 case agreed *Rear-left.*
DISAGREEMENT	
General Result	Specific Results
2 of 6 cases with passenger #1 disagreed.	• 1 case UD-10 coded *Rear-center*, UMIVOR coded *Other enclosed passenger area.* UMIVOR reports the passenger was lying down on the third row seat. UD-10 has no code for lying down. • 1 case UD-10 coded *Third-right*, UMIVOR coded *Third-center.*

TABLE 99. UMIVOR CASE VEHICLE PASSENGER #1 - RESTRAINT USE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	No belts available Shoulder belt only used Lap belt only used Shoulder and lap belt used No belts used Child restraint used Child restraint not used, not available, or improper Restraint failure Unknown	Police examine crash scene.	UD-10 and UMIVOR codes were compared. Since UD-10 does nor code passive and active systems separately the UMIVOR codes were collapsed to follow the UD-10 codes.
UMIVOR	ACTIVE RESTRAINT SYSTEM USAGE None (Available but not used) Lap belt only Shoulder harness only Both lap belt & shoulder harness Improper usage Unknown ACTIVE RESTRAINT SYSTEM USAGE System defeated Airbag not deployed Airbag deployed Airbag not reinstalled Passive upper torso used Passive lap & upper torso used System used in manual mode Improper usage Not applicable (not originally equipped) Unknown	Investigator inspects case vehicle and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 100. UMIVOR CASE VEHICLE PASSENGER #1 - RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 6 cases with passenger #1 agreed.	• 2 cases agreed *Shoulder and lap belt used.* • 1 case agreed *No belts used.*
DISAGREEMENT	
General Result	Specific Results
3 of 6 cases with passenger #1 disagreed.	• 1 case UD-10 coded *Shoulder and lap belt*, UMIVOR coded *Lap belt only.* Both reports show passenger #1 in the third row of seats in a mini-van with UD-10 coding the right seat and UMIVOR coding the center seat. The restraint use coded in both reports is consistent with the restraints available for the reported seating positions. • 1 case UD-10 coded *Shoulder and lap belt*, UMIVOR coded *Lap belt only.* The 1991 FARS Coding and Validation Manual reports that three-points restraints were not standard on this car, a 1988 Pontiac Grand Prix, until the 1989 model year. • 1 case UD-10 coded *Lap belt only*, UMIVOR coded *Improper* use with the shoulder belt behind the back.

TABLE 101. UMIVOR CASE VEHICLE PASSENGER #1 - AIRBAG DEPLOYED Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes No Not available	Police inspect crash scene.	UD-10 and UMIVOR codes were compared.
UMIVOR	No Yes Not applicable (no airbag) Unknown	Investigator inspects case vehicle and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 102. UMIVOR CASE VEHICLE PASSENGER #1 - AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 6 cases with passenger #1 agreed.	• 5 cases agreed *Not available.*
DISAGREEMENT	
General Result	Specific Results
1 of 6 cases with passenger #1 disagreed.	• 1 case UD-10 coded *No deployment*, UMIVOR coded *Not available.* The VINs were checked with Vindicator, a VIN decoding program from the Highway Loss Data Institute. This confirmed that the reported VIN matched the case vehicle and that the vehicle was not equipped with an airbag.

TABLE 103. UMIVOR CASE VEHICLE PASSENGER #2 - SEX Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Male Female	Police examine crash scene.	UD-10 and UMIVOR codes were compared.
UMIVOR	Male Female Unknown	Investigator reviews police report and interviews case vehicle passenger or a parent or guardian if permission is not obtained.	

TABLE 104. UMIVOR CASE VEHICLE PASSENGER #2 - SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 2 cases agreed *Male.* • 1 case agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 105. UMIVOR CASE VEHICLE PASSENGER #2 - EJECTED FROM VEHICLE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes	Police examine crash scene. Not coding Yes means no ejection.	UD-10 and UMIVOR codes are compared.
UMIVOR	Yes No Unknown	Investigator reviews police report and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 106. UMIVOR CASE VEHICLE PASSENGER #2 - EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases UD-10 did not code ejection, UMIVOR coded *No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 107. UMIVOR CASE VEHICLE PASSENGER #2 - TRAPPED IN VEHICLE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes	Police examine crash scene. Not coding Yes means not trapped.	UD-10 codes are compared to UMIVOR narrative.
UMIVOR	Not coded	Investigator reviews police report and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained. Reports this in the narrative if mentioned by the driver.	

TABLE 108. UMIVOR CASE VEHICLE PASSENGER #2 - TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases UD-10 did not code trapped, UMIVOR narrative did not report that passenger #2 was trapped.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 109. UMIVOR CASE PASSENGER #2 - SEATING POSITION
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Front-left Front-center Front-right Second-left Second-center Second-right Third-left Third-center Third-right Sleeper section Other enclosed pass/cargo area Other unenclosed pass/cargo area Trailing unit Riding on vehicle exterior Unknown	Police inspect crash scene.	The UD-10 and UMIVOR codes are compared.
UMIVOR	ROW LOCATION Front Second Third Forth Other External to pass compartment Unknown LATERAL LOCATION Left Left-center Center Right-center Right All (Lying on seat) External to pass compartment Unknown	Investigator interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 110. UMIVOR CASE VEHICLE PASSENGER #2 - SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 2 cases agreed *Front-right.* • 1 case agreed *Third row-left.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 111. UMIVOR CASE VEHICLE PASSENGER #2 - RESTRAINT USE
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	No belts available Shoulder belt only used Lap belt only used Shoulder and lap belt used No belts used Child restraint used Child restraint not used, not available, or improper Restraint failure Unknown	Police examine crash scene.	UD-10 and UMIVOR codes were compared. Since UD-10 does nor code passive and active systems separately the UMIVOR codes were collapsed to follow the UD-10 codes.
UMIVOR	ACTIVE RESTRAINT SYSTEM USAGE None (Available but not used) Lap belt only Shoulder harness only Both lap belt & shoulder harness Improper usage Unknown PASSIVE RESTRAINT SYSTEM USAGE System defeated Airbag not deployed Airbag deployed Airbag not reinstalled Passive upper torso used Passive lap & upper torso used System used in manual mode Improper usage Not applicable (not originally equipped) Unknown	Investigator inspects case vehicle and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 112. UMIVOR CASE VEHICLE PASSENGER #2 - RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases agreed *Shoulder and lap belt used.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 113. UMIVOR CASE VEHICLE PASSENGER #2 - AIRBAG DEPLOYED Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes No Not available	Police inspect crash scene.	UD-10 and UMIVOR codes were compared.
UMIVOR	No Yes Not applicable (no airbag) Unknown	Investigator inspects case vehicle and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 114. UMIVOR CASE VEHICLE PASSENGER #2 - AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases agreed *Not available.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 115. UMIVOR CASE VEHICLE PASSENGER #3 - SEX Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Male Female	Police examine crash scene.	UD-10 and UMIVOR codes were compared.
UMIVOR	Male Female Unknown	Investigator reviews police report and interviews case vehicle passenger or a parent or guardian if permission is not obtained.	

TABLE 116. UMIVOR CASE VEHICLE PASSENGER #3 - SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 117. UMIVOR CASE VEHICLE PASSENGER #3 - EJECTED FROM VEHICLE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes	Police examine crash scene. Not coding Yes means no ejection.	UD-10 and UMIVOR codes are compared.
UMIVOR	Yes No Unknown	Investigator reviews police report and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 118. UMIVOR CASE VEHICLE PASSENGER #3 - EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case UD-10 did not code ejection, UMIVOR coded *No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 119. UMIVOR CASE VEHICLE PASSENGER #3 - TRAPPED IN VEHICLE Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes	Police examine crash scene. Not coding Yes means not trapped.	UD-10 codes are compared to UMIVOR narrative.
UMIVOR	Not coded	Investigator reviews police report and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained. Reports this in the narrative if mentioned by the driver.	

TABLE 120. UMIVOR CASE VEHICLE PASSENGER #3 - TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case UD-10 did not code trapped, UMIVOR narrative does not report that passenger #3 was trapped.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 121. UMIVOR CASE PASSENGER #3 - SEATING POSITION
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	Front-left Front-center Front-right Second-left Second-center Second-right Third-left Third-center Third-right Sleeper section Other enclosed pass/cargo area Other unenclosed pass/cargo area Trailing unit Riding on vehicle exterior Unknown	Police inspect crash scene.	The UD-10 and UMIVOR codes are compared.
UMIVOR	ROW LOCATION Front Second Third Forth Other External to pass compartment Unknown LATERAL LOCATION Left Left-center Center Right-center Right All (Lying on seat) External to pass compartment Unknown	Investigator interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 122. UMIVOR CASE VEHICLE PASSENGER #3 - SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case agreed *Rear-right.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 123. UMIVOR CASE VEHICLE PASSENGER #3 - RESTRAINT USE
Methods

Report Form	Possible Codes	Collection Method	Comparison Method
UD-10	No belts available Shoulder belt only used Lap belt only used Shoulder and lap belt used No belts used Child restraint used Child restraint not used, not available, or improper Restraint failure Unknown	Police examine crash scene.	UD-10 and UMIVOR codes were compared. Since UD-10 does nor code passive and active systems separately the UMIVOR codes were collapsed to follow the UD-10 codes.
UMIVOR	ACTIVE RESTRAINT SYSTEM USAGE None (Available but not used) Lap belt only Shoulder harness only Both lap belt & shoulder harness Improper usage Unknown PASSIVE RESTRAINT SYSTEM USAGE System defeated Airbag not deployed Airbag deployed Airbag not reinstalled Passive upper torso used Passive lap & upper torso used System used in manual mode Improper usage Not applicable (not originally equipped) Unknown	Investigator inspects case vehicle and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 124. UMIVOR CASE VEHICLE PASSENGER #3 - RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
	• There was no agreement.
DISAGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 disagreed.	• 1 case UD-10 coded *Lap and shoulder belt used*, UMIVOR coded *Lap belt only used.*

TABLE 125. UMIVOR CASE VEHICLE PASSENGER #3 - AIRBAG DEPLOYED Methods			
Report Form	**Possible Codes**	**Collection Method**	**Comparison Method**
UD-10	Yes No Not available	Police inspect crash scene.	UD-10 and UMIVOR codes were compared.
UMIVOR	No Yes Not applicable (no airbag) Unknown	Investigator inspects case vehicle and interviews case vehicle passenger or a parent or guardian if a minor and permission is not obtained.	

TABLE 126. UMIVOR CASE VEHICLE PASSENGER #3 - AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case UD-10 coded *Not available*, UMIVOR coded *Not applicable.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

Discussion and Conclusions

The UD-10 is a standard form used by Michigan law enforcement agencies to record and report information on all traffic crashes. The University of Michigan In-depth Vehicle Occupant Report (UMIVOR) results from an extensive investigation of the crash by field personnel from the University of Michigan Transportation Research Institute's Biosciences group. These two crash reports were compared to evaluate the validity of data reported on the UD-10. Comparisons were made on 63 data items in 20 crashes for a total of 882 data entries, with UMIVOR used as the validity check and the UD-10 compared to it. Universal agreement between the two reports was found on 34 data items. These items are:

Number of Vehicles
Crash Type
Weather
Light
County
Construction Zone - Type
Construction Zone - Lane Closed
Construction Zone - Activity
Location of Crash - Name of Street
Location of Crash - Name of Nearest Intersecting Street
Area of Roadway
Road Condition
UMIVOR Case Vehicle - Total Occupants
UMIVOR Case Vehicle - Special Vehicles
UMIVOR Case Vehicle - Vehicle Type
UMIVOR Case Vehicle - Vehicle Defects
UMIVOR Case Vehicle Driver - Sex
UMIVOR Case Vehicle Driver - Seating Position
UMIVOR Case Vehicle Driver - Ejected From Vehicle
UMIVOR Case Vehicle Driver - Trapped In Vehicle
UMIVOR Case Vehicle Passenger #1 - Sex
UMIVOR Case Vehicle Passenger #1 - Ejected From Vehicle
UMIVOR Case Vehicle Passenger #1 - Trapped In Vehicle
UMIVOR Case Vehicle Passenger #2 - Sex
UMIVOR Case Vehicle Passenger #2 - Ejected From Vehicle
UMIVOR Case Vehicle Passenger #2 - Trapped In Vehicle
UMIVOR Case Vehicle Passenger #2 - Seating Position
UMIVOR Case Vehicle Passenger #2 - Restraint Use
UMIVOR Case Vehicle Passenger #2 - Airbag Deployed
UMIVOR Case Vehicle Passenger #3 - Sex
UMIVOR Case Vehicle Passenger #3 - Ejected From Vehicle
UMIVOR Case Vehicle Passenger #3 - Trapped In Vehicle
UMIVOR Case Vehicle Passenger #3 - Seating Position
UMIVOR Case Vehicle Passenger #3 - Airbag Deployed

The remaining 29 items had at least one or more crashes in which UD-10 disagreed with UMIVOR or had missing data. In these 29 data items there were 101 data entries with disagreement or missing data, or 11.4 percent of the total data entries. Cases of disagreement and missing data for each case are summarized in Table 1. The right column contains the total cases of disagreement and missing data (D;M) for each item. The last row contains the total cases of disagreement and missing data (D;M) for each case.

DATA ITEM / CASE NO.	TABLE 127 UMIVOR-UD-10 COMPARISON DATA SUMMARY																			TOTAL D ; M
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Special Circumstances										M			M								0;2
Traffic Control								M					M			M					0;3
Distance From Intersecting Street																				M	0;1
Direction From Intersecting Street																				M	0;1
Relation to Roadway									D		D										2;0
Total Lanes				D										D							2;0
Speed Limit				D										D							2;0
Vehicle ID No.	D								D				D			M			D		4;1
Vehicle Color			M		M	M		M	M	M	M	M	M		M	M			M	M	0;13
Vehicle Make												M				M			D		1;2
Vehicle Year		M	M						D			M				M					1;4
Vehicle Model (Body Style)	M		M	M			M	M	M	M	M					D				M	1;9
Direction of Travel			D				M														1;1
Driveable													M								0;1
Most Harmful									D		D										2;0

DATA ITEM / CASE NO.	TABLE 127 (Con't) UMIVOR-UD-10 COMPARISON DATA SUMMARY																				TOTAL D ; M ITEM
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Greatest Damage	D		D				D	D	D	D	D				D						8;0
First Damage	D		D				D				D		M		D			D			6;1
Action Prior																D			D		2;0
Event #1									D		D										2;0
Event #2			D					D	D	M	D				D						5;1
Event #3			D					D	M						D						3;1
Event #4			M					D			D										2;1
Driver HBD													M		M		M				0;3
Driver Restraint Use																				D	1;0
Driver Airbag Deployed				D					M				M						D		2;2
Passenger #1 Seating Position										D					D						2;0
Passenger #1 Restraint Use		D													D					D	3;0
Pass. #1 Airbag Deploy				D																	1;0
Passenger #3 Restraint Use																				D	1;0
TOTAL D;M CASE	3; 1	1; 1	5; 4	4; 1	0; 1	0; 1	2; 2	4; 3	7; 4	2; 4	7; 2	0; 3	1; 7	2; 0	6; 2	2; 5	0; 1	1; 0	4; 1	3; 4	54;47

The items with greatest incidence of disagreement and missing data are clustered into four general data areas. The first area identifies the vehicle and includes the vehicle identification number (VIN), color, make, year, and model (body style). Of the 882 data entries, 4.1 percent (36) were in this cluster and were either in disagreement with UMIVOR (N = 7) or had missing data (N = 29). This information is necessary for tracking occupant safety in vehicles of different makes, years, and body styles. The VIN is especially important since it can be decoded to confirm the make, year, and model as well as the presence of safety features, such as the driver and front passenger safety belt type, airbags, three-point safety belts for the outboard rear passengers, and antilock brake system. These items account for 35.6 percent of the total errors.

The second area concerns the events surrounding the crash; the most harmful event, the greatest damage, first damage, action prior to the first unstable event, and the sequence of unstable events, 1 - 4. In this group, 3.8 percent (34) of 882 data entries were in disagreement with UMIVOR (N= 30) or had missing data (N = 4). This information is important for determining occupant kinematics during the crash and determining sources of injury. It is also needed by traffic engineers to determine what kinds of crashes (head on, broadside, etc.) are occurring on what types of roads (interstate, secondary, etc.) and at what locations (intersections, rural, urban, etc.), in crash avoidance studies, and to examine the effects of roadway design, traffic signals and signs, etc. on crashes. These items account for 33.7 percent of the total errors.

The third area concerns occupant safety-related issues; driver drinking behavior and driver and passenger restraint use, seating position, and airbag deployment. In this group, 1.7 percent of 882 data entries were in disagreement (N = 10) with UMIVOR or had missing data (N = 5). This group of items is also important in determining occupant kinematics, as discussed above, and injuries experienced when a driver is impaired, as well as injuries under different restraint types and usage, and seating position. Also, documenting the use of safety belts is important in confirming the need to use them with airbags to maximize the safety benefits of the complete restraint system. This group accounts for 14.8 percent of the total errors.

The remaining data items describe the crash location and other crash details and had 1.8 percent (16) of 882 data entries either in disagreement (N = 7) with UMIVOR or with missing data (N = 9). These items included special circumstances, traffic control, distance from intersecting street, direction from intersecting street, relation to roadway, total lanes, speed limit, direction of travel, and vehicle driveable after crash. These data further describe the crash and crash location and are also important for traffic engineers, crash avoidance studies, and roadway design. This group accounts for 16 percent of the total errors.

Reliability Check: UD-10 and Michigan State Police Computer Data Base Comparison

In order to check the reliability of crash data entered into the Michigan State Police (MSP) data base, data from the same eighteen UD-10s described earlier were compared to printouts of crash data from the Michigan State Police data base for these UD-10s. Most of the information on the UD-10 is coded by filling in circles or "bubbles" on the form, following instructions given in the State of Michigan UD-10 Traffic Crash Report Instruction Manual. This information can be read by an optical scanner to facilitate data entry into the Michigan State Police data base. Other information, such as the street name and vehicle description, are recorded in spaces provided on UD-10 and manually entered into the data base.

Methods

The same eighteen UD-10s selected for reviewing in the UD-10/UMIVOR comparison were used for the UD-10/Michigan State Police data base comparison. A review form was created that listed the individual data items to be compared in one column with headings for UD-10 and Michigan State Police data base entries in a two other columns. One form was used for each UD-10/Michigan State Police data base pair with the UD-10 being reviewed first and the Michigan State Police data base second. After the reviews were completed, one more review form was used to tally the responses and arrive at the Ns for each item. Finally, a table was prepared for each item that summarizes the results of the comparison for that item giving results for cases of agreement and disagreement.

Some data reported on UD-10 are not included in the public Michigan State Police data base. They are the driver and witness names, addresses and phone numbers, unit type, driver alcohol test results, vehicle identification number, vehicle insurance company, vehicle towed to/by, and first damage.

Results

TABLE 128. ORIGINATING AGENCY NUMBER
Form Comparison Summary

AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 7 cases agreed *8121800.* • 8 cases agreed *8118100.* • 1 case agreed *8190600.* • 1 case agreed *4714700* • 1 case agreed *6338900.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 129. CRASH DATE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
17 of 18 cases agreed.	• 17 cases agreed on the crash date.
DISAGREEMENT	
General Result	Specific Results
1 of 18 cases disagreed.	• 1 case UD-10 did not code or write in the last digit of the year, MSP data base contained the complete date.

TABLE 130. CRASH TIME Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases agreed on the hour the crash took place. MSP data base does not include the minute.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 131. NUMBER OF UNITS INVOLVED IN CRASH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 6 cases agreed *One unit.* • 10 cases agreed *Two units.* • 2 cases agreed *Three units.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 132. CRASH TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 6 cases agreed *Single motor vehicle.* • 3 cases agreed *Head on.* • 2 cases agreed *Head on-left turn.* • 7 cases agreed *Angle.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 133. SPECIAL CIRCUMSTANCES Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
4 of 18 cases agreed.	• 4 cases agreed *None.*
DISAGREEMENT	
General Result	Specific Results
14 of 18 cases disagreed.	• 14 cases UD-10 coded *None*, MSP data base reported *Uncoded & Errors.*

TABLE 134. SPECIAL STUDY Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
17 of 18 cases agreed.	• 17 cases UD-10 did not code this item, MSP data base reported *Uncoded and Errors.*
DISAGREEMENT	
General Result	Specific Results
1 of 18 cases disagreed.	• 1 case UD-10 coded *State*, MSP data base reported *Uncoded and Errors.*

TABLE 135. WEATHER Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 8 cases agreed *Clear.* • 7 cases agreed *Cloudy.* • 1 case agreed *Snow/Blowing snow.* • 2 cases agreed *Sleet/Hail.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 136. LIGHT Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 12 cases agreed *Daylight.* • 1 case agreed *Dusk.* • 1 case agreed *Dark-Lighted.* • 4 cases agreed *Dark-Unlighted.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 137. COUNTY Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 1 case agreed *#47.* • 1 case agreed *#63.* • 16 cases agreed *#81.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 138. CITY/TOWNSHIP Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
17 of 18 cases agreed.	• 1 case agreed *#03.* • 1 case agreed *#07.* • 1 case agreed *#09.* • 2 cases agreed *#11.* • 2 cases agreed *#14.* • 1 case agreed *#15.* • 1 case agreed *#17.* • 1 case agreed *#20.* • 7 cases agreed *#89.*
DISAGREEMENT	
General Result	Specific Results
1 of 18 cases disagreed	• 1 case UD-10 coded *80*, MSP data base reported *89.*

TABLE 139. TRAFFIC CONTROL Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
8 of 18 cases agreed.	• 1 case agreed *Signal.* • 1 case agreed *Stop sign.* • 2 cases agreed *Not present.* • 4 cases UD-10 coded did not code traffic control, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
10 of 18 cases disagreed.	• 3 cases UD-10 coded *Signal*, MSP data base reported *Uncoded & Errors.* • 1 case UD-10 coded *Stop sign*, MSP data base reported *Uncoded & Errors.* • 6 cases UD-10 coded *Not present*, MSP data base reported *Uncoded & Errors.*

TABLE 140. CONSTRUCTION ZONE - TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases UD-10 did not code this item, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 141. CONSTRUCTION ZONE - LANE CLOSED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 17 cases UD-10 did not code this item, MSP data base reported *Uncoded & Errors.* • 1 case agreed *No.* In this case UD-10 was coded incorrectly. In the absence of a construction zone this item should not be coded.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 142. CONSTRUCTION ZONE - ACTIVITY Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 17 cases UD-10 did not code this item, MSP data base reported *Uncoded & Errors.* • 1 case agreed *None.* In this case UD-10 was coded incorrectly. In the absence of a construction zone, activity should not be coded.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 143. LOCATION OF CRASH - STREET NAME Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
15 of 18 cases agreed.	• 15 cases agreed on the name of the street on which the crash took place.
DISAGREEMENT	
General Result	Specific Results
3 of 18 cases disagreed	• 1 case UD-10 reported Maple, MSP data base reported Mapl3. • 1 case UD-10 reported Textile, MSP data base reported Text3. • 1 case UD-10 reported Bradley, MSP data base reported Brad4.

TABLE 144. LOCATION OF CRASH - DISTANCE TO NEAREST INTERSECTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
17 of 18 cases agreed.	• 8 cases agreed on the distance in feet. • 6 cases agreed on the distance with UD-10 reporting in fractions of a mile and MSP data base reporting this distance in feet. • 3 cases agreed the crash took place in an intersection.
DISAGREEMENT	
General Result	Specific Results
1 of 18 cases disagreed.	• 1 case UD-10 did not report a distance, MSP data base reported *At intersection.*

TABLE 145. LOCATION OF CRASH - DIRECTION FROM NEAREST INTERSECTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
15 of 18 cases agreed.	• 4 cases agreed *North.* • 3 cases agreed *South.* • 1 case agreed *East.* • 4 cases agreed *West.* • 3 cases agreed *At intersection.*
DISAGREEMENT	
General Result	Specific Results
3 of 18 cases disagreed.	• 1 case UD-10 coded *East*, MSP data base reported *Northeast.* • 1 case UD-10 coded *Northwest*, MSP data base reported *Southeast.* • 1 case UD-10 did not code a direction, MSP data base reported *At intersection.*

TABLE 146. LOCATION OF CRASH - NAME OF NEAREST INTERSECTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
16 of 18 cases agreed.	• 16 cases agreed on the name of the nearest intersecting street.
DISAGREEMENT	
General Result	Specific Results
2 of 18 cases disagreed.	• 1 case UD-10 reported M-14 east entrance ramp, MSP data base reported M-14-3. • 1 case UD-10 reported Huron Parkway, MSP data base reported Huro4.

TABLE 147. LOCATION OF CRASH - RELATION TO ROADWAY Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 13 cases agreed *On road.* • 1 case agreed *Median.* • 3 cases agreed *Shoulder.* • 1 case agreed *Outside of shoulder/Curb.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 148. LOCATION OF CRASH - AREA Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 1 case agreed *Entrance/exit ramp related.* • 2 cases agreed *All other freeway areas.* • 7 cases agreed *Within intersection.* • 6 case agreed *Straight roadway-not related to other sections.* • 2 case agreed *Curved roadway-not related to other sections.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 149. ROAD CONDITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 14 cases agreed *Dry.* • 1 case agreed *Wet.* • 2 cases agreed *Icy.* • 1 case agreed *Snowy.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 150. TOTAL LANES Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 11 cases agreed *Two lanes.* • 2 cases agreed *Three lanes.* • 3 cases agreed *Four lanes.* • 2 cases agreed *Five Lanes.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 151. SPEED LIMIT Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 2 cases agreed *25 MPH.* • 1 case agreed *30 MPH.* • 2 cases agreed *35 MPH.* • 2 cases agreed *40 MPH.* • 3 cases agreed *45 MPH.* • 7 cases agreed *55 MPH.* • 1 case agreed *65 MPH.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 152. SPEED LIMIT - POSTED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 12 cases agreed *Yes.* • 6 cases agreed *No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 153. UNIT NUMBER #1 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases agreed *Unit #1.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 154. UNIT NUMBER #2 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
11 of 12 cases agreed.	• 18 cases agreed *Unit #2.*
DISAGREEMENT	
General Result	Specific Results
1 of 12 cases disagreed.	• 1 case UD-10 coded *Unit #1*, MSP database reported *Unit #2.* In this case UD-10 incorrectly coded both units as Unit #1.

TABLE 155. UNIT NUMBER #3 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Unit #3.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 156. UNIT #1 - ACTION PRIOR TO CRASH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 14 cases agreed *Going straight ahead.* • 1 case agreed *Turning left.* • 1 case agreed *Stopped on roadway.* • 1 case agreed *Changing lanes.* • 1 case agreed *Entering roadway.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 157. UNIT #1 - SEQUENCE OF EVENTS, EVENT #1 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 3 cases agreed *Loss of control.* • 1 case agreed *Ran off road-left.* • 3 cases agreed *Ran off road-right.* • 2 cases agreed *Other non-collision.* • 8 cases agreed *Collision with motor vehicle in transport.* • 1 case agreed *Collision with tree.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 158. UNIT #1 - SEQUENCE OF EVENTS, EVENT #2 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 1 cases agreed *Loss of control.* • 2 cases agreed *Cross centerline/median.* • 1 case agreed *Overturn.* • 3 cases agreed *Collision with motor vehicle in transport.* • 2 cases agreed *Collision with curb.* • 1 case agreed *Collision with ditch.* • 1 case agreed *Collision with tree.* • 7 cases UD-10 did not code a second event, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 159. UNIT #1 - SEQUENCE OF EVENTS, EVENT #3 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 1 case agreed *Ran off road-right.* • 2 cases agreed *Collision with motor vehicle in transport.* • 1 case agreed *Collision with guardrail face.* • 1 case agreed *Collision with utility pole.* • 1 case agreed *Collision with other pole.* • 1 case agreed *Collision with tree.* • 11 cases UD-10 did not code a third event, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 160. UNIT #1 - SEQUENCE OF EVENTS, EVENT #4 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 2 cases agreed *Overturn.* • 1 case agreed *Collision with ditch.* • 1 case agreed *Collision with tree.* • 14 cases UD-10 did not code a fourth event, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 161. UNIT #1 - SEQUENCE OF EVENTS, MOST HARMFUL EVENT Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
4 of 18 cases agreed.	• 2 cases agreed *Event #1.* • 1 case agreed *Event #2.* • 1 case agreed *Event #3.*
DISAGREEMENT	
General Result	Specific Results
14 of 18 cases disagreed.	• 6 cases UD-10 coded *Event #1*, MSP reported *Uncoded & Errors.* • 5 cases UD-10 coded *Event #2*, MSP reported *Uncoded & Errors.* • 2 cases UD-10 coded *Event #3*, MSP reported *Uncoded & Errors.* • 1 case UD-10 coded *Event #4*, MSP reported *Uncoded & Errors.*

TABLE 162. UNIT #2 - ACTION PRIOR TO CRASH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 8 cases agreed *Going straight ahead.* • 3 cases agreed *Turning left.* • 1 case agreed *Avoiding vehicle (front/back).*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 163. UNIT #2 - SEQUENCE OF EVENTS, EVENT #1 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 3 cases agreed *Collision with motor vehicle in transport.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 164. UNIT #2 - SEQUENCE OF EVENTS, EVENT #2 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 2 cases agreed *Ran off road-right.* • 1 case agreed *Collision with highway traffic sign post.* • 9 cases UD-10 did not code a second event, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 165. UNIT #2 - SEQUENCE OF EVENTS, EVENT #3 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 2 cases agreed *Collision with utility pole.* • 1 case agreed *Collision with fence.* • 9 cases UD-10 did not code a third event, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 166. UNIT #2 - SEQUENCE OF EVENTS, EVENT #4 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases UD-10 did not code a fourth event, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 167. UNIT #2 - SEQUENCE OF EVENTS, MOST HARMFUL EVENT Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 12 cases agreed.	• 3 cases agreed *Event #1.*
DISAGREEMENT	
General Result	Specific Results
9 of 12 cases disagreed.	• 9 cases UD-10 coded *Event #1*, MSP reported *Uncoded & Errors.*

TABLE 168. UNIT #3 - ACTION PRIOR TO CRASH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Going straight ahead.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 169. UNIT #3 - SEQUENCE OF EVENTS, EVENT #1 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Collision with motor vehicle in transport.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 170. UNIT #3 - SEQUENCE OF EVENTS, EVENT #2 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not code a second event, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 171. UNIT #3 - SEQUENCE OF EVENTS, EVENT #3 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not code a third event, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 172. UNIT #3 - SEQUENCE OF EVENTS, EVENT #4 Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not code a fourth event, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 173. UNIT #3 - SEQUENCE OF EVENTS, MOST HARMFUL EVENT Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
	• There was no agreement.
DISAGREEMENT	
General Result	Specific Results
2 of 2 cases disagreed.	• 2 cases UD-10 coded *Event #1*, MSP reported *Uncoded & Errors.*

TABLE 174. UNIT #1 - LICENSE PLATE NUMBER Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases agreed on the license plate number.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 175. UNIT #1 - LICENSE PLATE STATE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases agreed on the license plate state.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 176. UNIT #1 - TOTAL OCCUPANTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 15 cases agreed *One.* • 3 cases agreed *Two.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 177. UNIT #1 - VEHICLE DIRECTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
16 of 18 cases agreed.	• 3 cases agreed *North.* • 5 cases agreed *South.* • 1 case agreed *Southeast.* • 5 cases agreed *East.* • 2 cases agreed *West.*
DISAGREEMENT	
General Result	Specific Results
2 of 18 cases disagreed.	• 1 case UD-10 coded *West* but the "Towed To/By" entry extends into this field over the "North" bubble, MSP data base reported *Northwest.* • 1 case UD-10 did not code this item, MSP database reported *West.*

TABLE 178. UNIT #1 - SPECIAL VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases UD-10 did not code a special vehicle, MSP database reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 179. UNIT #1 - GREATEST DAMAGE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 1 case agreed *Overturn.* • 7 cases agreed *Front-center.* • 1 case agreed *Right-front.* • 2 cases agreed *Right-side.* • 6 cases agreed *Left-front.* • 1 case agreed *Multiple.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 180. UNIT #1 - EXTENT OF VEHICLE DAMAGE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 4 cases agreed *Three.* • 4 cases agreed *Four.* • 5 cases agreed *Five.* • 3 cases agreed *Six.* • 2 cases agreed *Seven.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 181. UNIT #1 - DRIVEABLE AFTER CRASH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
6 of 18 cases agreed.	• 5 cases agreed *No.* • 1 case UD-10 did not code this item, MSP database reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
13 of 18 cases disagreed.	• 12 cases UD-10 coded *No*, MSP database reported *Uncoded & Errors.*

TABLE 182. UNIT #1 - VEHICLE TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 15 cases agreed *Passenger car and station wagon.* • 3 cases agreed *Pickup truck.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 183. UNIT #1 - VEHICLE USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases agreed *Private.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 184. UNIT #1 - VEHICLE DEFECTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases UD-10 did not code a vehicle defect, MSP database reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 185. UNIT #1 - PRIVATE TRAILER TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases UD-10 did not code a private trailer type, MSP database reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 186. UNIT #2 - LICENSE PLATE NUMBER Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases agreed on the license plate number.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 187. UNIT #2 - LICENSE PLATE STATE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases agreed on the license plate state.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 188. UNIT #2 - TOTAL OCCUPANTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 7 cases agreed *One.* • 2 cases agreed *Two.* • 2 cases agreed *Three.* • 1 case agreed *Four.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 189. UNIT #2 - VEHICLE DIRECTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 3 cases agreed *North.* • 3 cases agreed *South.* • 1 case agreed *East.* • 5 cases agreed *West.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 190. UNIT #2 - SPECIAL VEHICLES Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases UD-10 did not code a special vehicle, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 191. UNIT #2 - GREATEST DAMAGE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 2 cases agreed *Front-center.* • 4 cases agreed *Right-front.* • 2 cases agreed *Right-side.* • 3 cases agreed *Left-front.* • 1 case agreed *Multiple.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 192. UNIT #2 - EXTENT OF VEHICLE DAMAGE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 1 case agreed *Two.* • 3 cases agreed *Three.* • 3 cases agreed *Four.* • 3 cases agreed *Five.* • 2 cases agreed *Seven.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 193. UNIT #2 - DRIVEABLE AFTER CRASH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 12 cases agreed.	• 3 cases agreed *No.*
DISAGREEMENT	
General Result	Specific Results
9 of 12 cases disagreed.	• 9 cases UD-10 coded *No*, MSP data base reported *Uncoded & Errors.*

TABLE 194. UNIT #2 - VEHICLE TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
11 of 12 cases agreed.	• 9 cases agreed *Passenger car and station wagon.* • 1 case agreed *Van.* • 1 case agreed *Truck/bus.*
DISAGREEMENT	
General Result	Specific Results
1 of 12 cases disagreed.	• 1 case UD-10 coded *Passenger car and station wagon* then crossed this out and coded *Van*, MSP data base reported *Uncoded & Errors.*

TABLE 195. UNIT #2 - VEHICLE USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 11 cases agreed *Private.* • 1 case agreed *Commercial.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 196. UNIT #2 - VEHICLE DEFECTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases UD-10 did not code a vehicle defect, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 197. UNIT #2 - PRIVATE TRAILER TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases UD-10 did not code a private trailer type, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 198. UNIT #3 - LICENSE PLATE NUMBER Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed on the license plate number.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 199. UNIT #3 - LICENSE PLATE STATE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed on the license plate state.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 200. UNIT #3 - TOTAL OCCUPANTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 1 case agreed *One.* • 1 case agreed *Two.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 201. UNIT #3 - VEHICLE DIRECTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 1 case agreed *South.* • 1 case agreed *East.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 202. UNIT #3 - SPECIAL VEHICLES Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not code a special vehicle, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 203. UNIT #3 - GREATEST DAMAGE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 1 case agreed *Front-center.* • 1 case agreed *Right-front.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 204. UNIT #3 - EXTENT OF VEHICLE DAMAGE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 1 case agreed *Two.* • 1 case agreed *Three.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 205. UNIT #3 - DRIVEABLE AFTER CRASH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
	• There was no agreement.
DISAGREEMENT	
General Result	Specific Results
2 of 2 cases disagreed.	• 1 case UD-10 coded *No*, MSP data base reported *Uncoded & Errors.* • 1 case UD-10 coded *Yes*, MSP data base reported *Uncoded & Errors.*

TABLE 206. UNIT #3 - VEHICLE TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Passenger car and station wagon.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 207. UNIT #3 - VEHICLE USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Private.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 208. UNIT #3 - VEHICLE DEFECTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not code a vehicle defect, MSP data base reported *Uncoded.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 209. UNIT #3 - PRIVATE TRAILER TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not code a private trailer type, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 210. UNIT #1 - STATE OF DRIVER LICENSE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases agreed *Michigan.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 211. UNIT #1 - DRIVER LICENSE NUMBER Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases agreed on the driver license number.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 212. UNIT #1 - DRIVER DATE OF BIRTH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases agreed on the driver date of birth.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 213. UNIT #1 - DRIVER LICENSE ENDORSEMENTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 16 cases agreed *Operator.* • 2 cases agreed *Operator, Cycle.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 214. UNIT #1 - DRIVER SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 9 cases agreed *Male.* • 9 cases agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 215. UNIT #1 - DRIVER HAZARDOUS ACTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 4 cases agreed *None.* • 3 cases agreed *Speed too fast.* • 3 cases agreed *Failed to yield.* • 4 cases agreed *Disregard traffic control.* • 1 case agreed *Drove wrong way.* • 1 case agreed *Unable to stop in assured clear distance.* • 2 cases agreed *Other.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 216. UNIT #1 - DRIVER ALCOHOL USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
17 of 18 cases agreed.	• 16 cases agreed *HBD No.* • 1 case agreed *HBD Yes.*
DISAGREEMENT	
General Result	Specific Results
1 of 18 cases disagreed.	• 1 case UD-10 did not code this item, MSP data base reported *HBD No.*

TABLE 217. UNIT #1 - DRIVER ALCOHOL TEST TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
16 of 18 cases agreed.	• 3 cases agreed *Not offered.* • 13 cases UD-10 did not code Test Type, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
2 of 18 cases disagreed.	• 1 case UD-10 coded *PBT*, MSP data base reported *Not offered.* • 1 case UD-10 coded *Blood*, MSP data base reported *Uncoded & Errors.*

TABLE 218. UNIT #1 - DRIVER SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 18 cases agreed *Front-left.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 219. UNIT #1 - DRIVER RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 1 case agreed *Shoulder belt only used.* • 15 cases agreed *Shoulder and lap belt used.* • 1 case agreed *No belts used.* • 1 case agreed *Restraint use unknown.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 220. UNIT #1 - DRIVER AMBULANCE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
8 of 18 cases agreed.	• 4 cases UD-10 did not report the driver ambulance, MSP data base reported *Uncoded & Errors.* • 4 cases UD-10 reported *Refused*, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
10 of 18 cases disagreed.	• 10 cases UD-10 reported the name of the driver ambulance, MSP data base reported *Uncoded & Errors.*

TABLE 221. UNIT #1 - DRIVER INJURY LEVEL Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 1 case agreed *K.* • 2 cases agreed *A.* • 4 cases agreed *B.* • 10 cases agreed *C.* • 1 case agreed *O.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 222. UNIT #1 - DRIVER EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 17 cases UD-10 did not code ejection, MSP data base reported *0.* • 1 case UD-10 coded *Yes*, MSP data base reported *1.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 223. UNIT #1 - DRIVER TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 16 cases UD-10 did not code trapped, MSP data base reported *0.* • 2 cases UD-10 coded *Yes*, MSP data base reported *1.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 224. UNIT #1 - DRIVER AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
18 of 18 cases agreed.	• 4 cases agreed *Yes.* • 4 cases agreed *No.* • 9 cases agreed *Not available.* • 1 case UD-10 did not code this item, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 225. UNIT #1 - DRIVER CITATION ISSUED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
10 of 18 cases agreed.	• 2 cases agreed *Hazardous.* • 8 cases UD-10 did not report a citation issued, MSP data base reported *0.*
DISAGREEMENT	
General Result	Specific Results
8 of 18 cases disagreed.	• 7 cases UD-10 coded *Hazardous*, MSP data base reported *Uncoded & Errors.* • 1 case UD-10 coded *Other*, MSP data base reported *Uncoded & Errors.*

TABLE 226. UNIT #1 - PASSENGER #1 NAME Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 agreed.	• 3 cases agreed on Passenger #1 name.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 227. UNIT #1 - PASSENGER #1 DATE OF BIRTH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 agreed.	• 3 cases agreed on the date of birth.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 228. UNIT #1 - PASSENGER #1 SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 agreed.	• 2 cases agreed *Male.* • 1 case agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 229. UNIT #1 - PASSENGER #1 EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 agreed.	• 1 case agreed *Yes.* • 2 cases UD-10 did not code ejected, MSP database reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 230. UNIT #1 - PASSENGER #1 TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 agreed.	• 3 cases UD-10 did not code trapped, MSP database reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 231. UNIT #1 - PASSENGER #1 INJURY LEVEL Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 agreed.	• 1 case agreed *A.* • 1 case agreed *B.* • 1 case agreed *C.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 232. UNIT #1 - PASSENGER #1 SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 agreed.	• 3 cases agreed *Front-right.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 233. UNIT #1 - PASSENGER #1 RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 agreed.	• 2 cases agreed *Shoulder and lap belt used.* • 1 case agreed *No belts used.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 234. UNIT #1 - PASSENGER #1 AMBULANCE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
	• There was no agreement.
DISAGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 disagreed.	• 3 cases UD-10 reported ambulance, MSP database reported *Uncoded & Errors.*

TABLE 235. UNIT #1 - PASSENGER #1 AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #1 agreed.	• 1 case agreed *No.* • 2 cases agreed *Not available.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 236. UNIT #2 - STATE OF DRIVER LICENSE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases agreed *Michigan.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 237. UNIT #2 - DRIVER LICENSE NUMBER Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases agreed on the driver license number.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 238. UNIT #2 - DRIVER DATE OF BIRTH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases agreed on driver date of birth.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 239. UNIT #2 - DRIVER LICENSE ENDORSEMENTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
10 of 12 cases agreed.	• 10 cases agreed *Operator.*
DISAGREEMENT	
General Result	Specific Results
2 of 12 cases disagreed.	• 1 case UD-10 coded *Chauffeur*, MSP data base reported *Operator.* • 1 case UD-10 coded *Cycle*, MSP data base reported *Operator, Cycle.*

TABLE 240. UNIT #2 - DRIVER SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 7 cases agreed *Male.* • 5 cases agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 241. UNIT #2 - DRIVER HAZARDOUS ACTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 11 cases agreed *None.* • 1 case agreed *Failed to yield.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 242. UNIT #2 - DRIVER ALCOHOL USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 10 cases agreed *HBD No.* • 2 cases UD-10 did not code alcohol use, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 243. UNIT #2 - DRIVER ALCOHOL TEST TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 9 cases UD-10 did not code Test Type, MSP data base reported *Uncoded & Errors.* UD-10 does not code Test Type unless driver impairment is suspected or a test is given. • 3 cases agreed *Not offered.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 244. UNIT #2 - DRIVER SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases agreed *Front-left.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 245. UNIT #2 - DRIVER RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 11 cases agreed *Shoulder and lap belt used.* • 1 case agreed *No belts used.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 246. UNIT #2 - DRIVER AMBULANCE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
7 of 12 cases agreed.	• 3 cases UD-10 did not code ambulance, MSP data base reported *Uncoded & Errors.* • 4 cases UD-10 reported refused, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
5 of 12 cases disagreed.	• 5 cases UD-10 reported the driver ambulance, MSP data base reported *Uncoded & Errors.*

TABLE 247. UNIT #2 - DRIVER INJURY LEVEL Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 3 cases agreed *A.* • 2 cases agreed *B.* • 5 cases agreed *C.* • 2 cases agreed *O.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 248. UNIT #2 - DRIVER EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases UD-10 did not code ejected, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 249. UNIT #2 - DRIVER TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
12 of 12 cases agreed.	• 12 cases UD-10 did not code trapped, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 250. UNIT #2 - DRIVER AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
11 of 12 cases agreed.	• 5 cases agreed *Yes.* • 6 cases agreed *Not available.*
DISAGREEMENT	
General Result	Specific Results
1 of 12 cases disagreed.	• 1 case UD-10 did not code airbag deployment, MSP data base reported *Not available.*

TABLE 251. UNIT #2 - DRIVER CITATION ISSUED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
10 of 12 cases agreed.	• 10 cases UD-10 did not code Citation Issued, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
2 of 12 cases disagreed.	• 1 case UD-10 coded *Hazardous*, MSP data base reported *Hazardous* and *Other.* • 1 case UD-10 coded *Hazardous*, MSP data base reported *Uncoded & Errors.*

TABLE 252. UNIT #2 - PASSENGER #1 NAME Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 5 cases with passenger #1 agreed.	• 5 cases agreed on Passenger #1 name.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 253. UNIT #2 - PASSENGER #1 DATE OF BIRTH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 5 cases with passenger #1 agreed.	• 4 cases agreed on Passenger #1 date of birth. • 1 case UD-10 reported month and date of birth were not legible, MSP data base reported *00/00/1976.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 254. UNIT #2 - PASSENGER #1 SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 5 cases with passenger #1 agreed.	• 1 case agreed *Male.* • 4 cases agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 255. UNIT #2 - PASSENGER #1 EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 5 cases with passenger #1 agreed.	• 5 cases UD-10 did not code ejected, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 256. UNIT #2 - PASSENGER #1 TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 5 cases with passenger #1 agreed.	• 5 cases UD-10 did not code trapped, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 257. UNIT #2 - PASSENGER #1 INJURY LEVEL Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 5 cases with passenger #1 agreed.	• 1 case agreed *A.* • 1 case agreed *B.* • 3 cases agreed *C.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 258. UNIT #2 - PASSENGER #1 SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 5 cases with passenger #1 agreed.	• 2 cases agreed *Front-right.* • 1 case agreed *Rear-left.* • 1 case agreed *Third row-right.* • 1 case agreed *Rear-center.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 259. UNIT #2 - PASSENGER #1 RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 5 cases with passenger #1 agreed.	• 1 case agreed *Lap belt only used.* • 3 cases agreed *Shoulder and lap belt used.* • 1 case agreed *No belts used.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 260. UNIT #2 - PASSENGER #1 AMBULANCE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 5 cases with passenger #1 agreed.	• 1 case UD-10 did not report ambulance, MSP data base reported *Uncoded & Errors.* • 2 cases UD-10 reported ambulance refused, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
2 of 5 cases with passenger #1 disagreed.	• 2 cases UD-10 reported ambulance, MSP data base reported *Uncoded & Errors.*

TABLE 261. UNIT #2 - PASSENGER #1 AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
5 of 5 cases with passenger #1 agreed.	• 5 cases agreed *Not available.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 262. UNIT #2 - PASSENGER #2 NAME Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases agreed on Passenger #2 name.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 263. UNIT #2 - PASSENGER #2 DATE OF BIRTH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases agreed on date of birth.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 264. UNIT #2 - PASSENGER #2 SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 2 cases agreed *Male.* • 1 case agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 265. UNIT #2 - PASSENGER #2 EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases UD-10 did not code ejected, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 266. UNIT #2 - PASSENGER #2 TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases UD-10 did not code trapped, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 267. UNIT #2 - PASSENGER #2 INJURY LEVEL Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 1 case agreed *B.* • 2 cases agreed *C.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 268. UNIT #2 - PASSENGER #2 SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 3 cases with passenger #2 agreed.	• 2 cases agreed *Front-right.* • 1 case agreed *Third row-left.*
DISAGREEMENT	
General Result	Specific Results
1 of 3 cases with passenger #2 disagreed.	• 1 case UD-10 coded *Rear-center* then crossed this out and coded *Third row-right*, MSP data base reported *Rear-center.*

TABLE 269. UNIT #2 - PASSENGER #2 RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases agreed *Shoulder and lap belt used.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 270. UNIT #2 - PASSENGER #2 AMBULANCE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 1 case UD-10 did not report ambulance, MSP data base reported *Uncoded & Errors.* • 2 cases UD-10 reported ambulance refused, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 271. UNIT #2 - PASSENGER #2 AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
3 of 3 cases with passenger #2 agreed.	• 3 cases agreed *Not available.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 272. UNIT #2 - PASSENGER #3 NAME Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case agreed on Passenger #3 name.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 273. UNIT #2 - PASSENGER #3 DATE OF BIRTH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case agreed on date of birth.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 274. UNIT #2 - PASSENGER #3 SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 275. UNIT #2 - PASSENGER #3 EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case UD-10 did not code ejected, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 276. UNIT #2 - PASSENGER #3 TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case UD-10 did not code trapped, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 277. UNIT #2 - PASSENGER #3 INJURY LEVEL Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 2 cases agreed *C.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 278. UNIT #2 - PASSENGER #3 SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case agreed *Rear-right.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 279. UNIT #2 - PASSENGER #3 RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case agreed *Shoulder and lap belt used.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 280. UNIT #2 - PASSENGER #3 AMBULANCE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case UD-10 reported ambulance refused, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 281. UNIT #2 - PASSENGER #3 AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
1 of 1 case with passenger #3 agreed.	• 1 case agreed *Not available.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 282. UNIT #3 - STATE OF DRIVER LICENSE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Michigan.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 283. UNIT #3 - DRIVER LICENSE NUMBER Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed on the driver license number.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 284. UNIT #3 - DRIVER DATE OF BIRTH Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed on driver date of birth.
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 285. UNIT #3 - DRIVER LICENSE ENDORSEMENTS Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Operator.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 286. UNIT #3 - DRIVER SEX Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 1 cases agreed *Male.* • 1 cases agreed *Female.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 287. UNIT #3 - DRIVER HAZARDOUS ACTION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *None.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 288. UNIT #3 - DRIVER ALCOHOL USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *HBD No.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 289. UNIT #3 - DRIVER ALCOHOL TEST TYPE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 1 case agreed *Not offered.* • 1 case UD-10 did not code test type, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 290. UNIT #3 - DRIVER SEATING POSITION Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Front-left.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 291. UNIT #3 - DRIVER RESTRAINT USE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Shoulder and lap belt used.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 292. UNIT #3 - DRIVER AMBULANCE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not report ambulance, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 293. UNIT #3 - DRIVER INJURY LEVEL Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *O.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 294. UNIT #3 - DRIVER EJECTED FROM VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not code ejected, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 295. UNIT #3 - DRIVER TRAPPED IN VEHICLE Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not code trapped, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 296. UNIT #3 - DRIVER AIRBAG DEPLOYED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases agreed *Not available.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

TABLE 297. UNIT #3 - DRIVER CITATION ISSUED Form Comparison Summary	
AGREEMENT	
General Result	Specific Results
2 of 2 cases agreed.	• 2 cases UD-10 did not code Citation Issued, MSP data base reported *Uncoded & Errors.*
DISAGREEMENT	
General Result	Specific Results
	• There was no disagreement.

Discussion and Conclusions

Comparisons were between made between UD-10 crash reports and the Michigan State Police (MSP) data base printouts for 18 crashes. Comparisons were made on 189 data items in each crash report and for a total of 1713 data entries on the 18 UD-10s. Agreement between the UD-10s and Michigan State Police data base print outs was found for 160 of these 189 data items. The remaining 29 data items had one or more crashes in which there was disagreement. In these 29 data items there were 125 data entries, or 7.3 percent of the total data entries, with disagreement. These data entries were made on the UD-10 in one of three ways; by filling in a "bubble," by printing the data on the UD-10, or both.

Data entered on the UD-10 by filling in a "bubble" accounted for 77.6 percent (97) of the disagreements. These disagreements can be further divided into two subgroups according to kind of disagreement. In the first, the UD-10 was coded correctly while the Michigan State Police data base reported uncoded and errors. This possible misreading of the optically scanned UD-10 represents 68 percent (85) of the disagreements. The second subgroup represents 9.6 percent (12) of the disagreements and contains twelve cases in which the Michigan State Police data base reports data different from that coded on the UD-10. Two of these were most likely caused by extraneous markings on the UD-10, which prevented accurate scanning by the optical reader. These disagreements are summarized on the following pages.

Bubble Disagreements - Michigan State Police Reported Uncoded & Errors

Data Item (N)

Special Circumstances (14)
UD-10 is coded, MSP reported Uncoded & Errors in 14 cases.

Special Study (1)
UD-10 is coded, MSP reported Uncoded and Errors in 1 case.

Traffic Control (10)
UD-10 is coded, MSP reported Uncoded and Errors in 10 cases.

Unit #1 - Sequence of Events, Most Harmful (14)
UD-10 is coded, MSP reported Uncoded and Errors in 14 cases.

Unit #2 - Sequence of Events, Most Harmful (9)
UD-10 is coded, MSP reported Uncoded and Errors in 9 cases.

Unit #3 - Sequence of Events, Most Harmful (2)
UD-10 is coded, MSP reported Uncoded and Errors in 2 cases.

Unit #1 - Driveable After Crash (12)
UD-10 is coded, MSP reported Uncoded and Errors in 12 cases.

Unit #2 - Driveable After Crash (9)
UD-10 is coded, MSP reported Uncoded and Errors in 9 cases.

Unit #3 - Driveable After Crash (2)
UD-10 is coded, MSP reported Uncoded and Errors in 2 cases.

Unit #1 - Driver Alcohol Test Type (2)
UD-10 is coded, MSP reported Uncoded and Errors in 1 case.
UD-10 is coded, MSP reported Uncoded and Errors in 1 case.

Unit #1 - Driver Citation Issued (8)
UD-10 is coded, MSP reported Uncoded and Errors in 8 cases.

Unit #2 - Driver Citation Issued (1)
UD-10 is coded, MSP reported Uncoded and Errors in 1 case.

Commercial Truck Type (1)
UD-10 is coded, MSP reported Uncoded and Errors in 1 case.

Bubble Disagreements - Michigan State Police Other Disagreements

Data Item (N)

Location of Crash - Direction from Intersection (3)
UD-10 is not coded, MSP reported at intersection in 1 case.
UD-10 is coded E, MSP reported NE in 1 case.
UD-10 is coded SW, MSP reported NW, 1 case.

Unit #2 (1)
UD-10 is coded 1, MSP reported 2 in 1 case.

Unit #1 - Vehicle Direction (2)
UD-10 is not coded, MSP reported West in 1 case.
UD-10 is coded West, MSP reported NW in 1 case. The printed note in the "Towed To/By" field extends into direction field and over the North bubble.

Unit #2 - Vehicle Type (1)
UD-10 coded then crossed out PA, then filled VA bubble, MSP reported Uncoded and Errors in 1 case.

Unit #1 - Driver Alcohol Use (1)
UD-10 is not coded, MSP reported No in 1 case.

Unit #2 - Driver License Endorsements (2)
UD-10 is coded Chauffeur, MSP reported Operator in 1 case.
UD-10 is coded Cycle, MSP reported Operator, Cycle in 1 case.

Unit #2 - Driver Airbag Deployed (1)
UD-10 is not coded, MSP reported Unavailable in 1 case.

Unit #2 - Driver Citation Issued (2)
UD-10 is coded Other, MSP reported Hazardous and Other in 1 case.

The second kind of disagreement involved data printed on the UD-10 by the investigating officer. These errors accounted for 20.8 percent (26) of the disagreements. In 20 of these, the Michigan State Police data base reported uncoded and errors for driver or passenger ambulance. In five cases of disagreement the Michigan State Police data base reported a street name with an odd alphanumeric combination, (i.e. Huro4 rather than Huron Parkway). In one case, the UD-10 did not code the distance to the nearest intersection while the Michigan State Police data base reported zero.

Printed Disagreements

Data Item (N)

Location of Crash - Street Name (3)
UD-10 reported Maple, MSP reported Mapl3 in 1 case.
UD-10 reported Textile, MSP reported Text3 in 1 case.
UD-10 reported Bradley, MSP reported Brad4 in 1 case.

Location of Crash - Distance to Intersection (1)
UD-10 did not report a distance, MSP reported 0 in 1 case.

Location of Crash - Name of Intersection (2)
UD-10 reported M-14 east entrance ramp, MSP reported M-14-3 in 1 case.
UD-10 reported Huron Parkway, MSP reported Huro4 in 1 case.

Unit #1 - Driver Ambulance (10)
UD-10 reported ambulance name, MSP reported Uncoded and Errors in 10 cases.

Unit #1 - Passenger #1 Ambulance (3)
UD-10 reported ambulance name, MSP reported Uncoded and Errors in 3 cases.

Unit #2 - Driver Ambulance (5)
UD-10 reported ambulance name, MSP reported Uncoded and Errors in 5 cases.

Unit #2 - Passenger #1 Ambulance (2)
UD-10 reported ambulance name, MSP reported Uncoded and Errors in 2 cases.

In 1.6 percent (2) of the disagreements in which data were recorded with both a "bubble" and printed on the UD-10 by the investigating officer, data were incorrectly reported on the Michigan State Police data base printout. In one case the year of the crash was omitted from the UD-10 while the Michigan State Police data base reported a year. In the second case there was disagreement on the city/township code.

Printed and Bubble Disagreements

Data Item (N)

Crash Date (1)

UD-10 did not print year or fill bubble, MSP has correct date in 1 case.

City/Township (1)

UD-10 printed and coded 80, MSP reported 89 in 1 case.

Summary and Discussion

The purpose of this study was to evaluate the validity of data entered on the new State of Michigan Traffic Crash Report form, or UD-10, and the reliability of data entered from this form into the Michigan State Police (MSP) data base.

The UD-10 had not been revised since 1978 and, in April, 1991, the Michigan State Police Office of Highway Safety Planning (OHSP) began to develop a new UD-10 for implementation in January, 1992. The resulting UD-10 minimizes manual data reporting and entry, provides for uniformity in the completion of the information, and allows 80 percent of the data to be read and entered into the data base with an optical scanner. The new UD-10 was revised in May, 1992 and again in January, 1993.

Validity Check

In order to check the validity of crash data reported on the new UD-10, data from eighteen crashes reported on UD-10s were compared to data from a second report on the same crashes, collected by independent investigators for the University of Michigan In-depth Vehicle Occupant Report (UMIVOR). The investigators average about one hour inspecting the crash scene, two hours inspecting the case vehicle and taking photographic slides, one hour interviewing the case vehicle driver and passengers, police, and witnesses, and sixteen hours completing UMIVOR. Data for this report come from crash site and vehicle inspections, interviews with vehicle occupants, police, and witnesses, and from hospital records.

Comparisons were made on 63 data items in 20 crashes for a total of 882 data entries, with UMIVOR used as the validity check and the UD-10 compared to it. Universal agreement between the two reports was found on 34 data items. The remaining 29 items had at least one or more crashes in which UD-10 disagreed with UMIVOR or had missing data. In these 29 data items there were 101 data entries with disagreement or missing data, or 11.4 percent of the total data entries.

The items with greatest incidence of disagreement and missing data are clustered into four general data areas. The first area identifies the vehicle and includes the vehicle identification number (VIN), color, make, year, and model (body style). Of the 882 data entries, 4.1 percent (36) were in this cluster and were either in disagreement with UMIVOR (N = 7) or had missing data (N = 29). These items account for 35.6 percent of the total errors.

The second area concerns the events surrounding the crash-- the most harmful event, the greatest damage, first damage, action prior to the first unstable event, and the sequence of unstable events, 1 - 4. In this group, 3.8 percent (34) of 882 data entries were in disagreement with UMIVOR (N= 30) or had missing data (N = 4). These items account for 33.7 percent of the total errors.

The third area concerns occupant safety-related issues-- driver drinking behavior and driver and passenger restraint use, seating position, and airbag deployment. In this group, 1.7 percent of 882 data entries were in disagreement (N = 10) with UMIVOR or had missing data (N = 5). This group accounts for 14.8 percent of the total errors.

The remaining data items describe the crash location and other crash details and had 1.8 percent (16) of 882 data entries either in disagreement (N = 7) with UMIVOR or with missing data (N = 9). These items included special circumstances, traffic control, distance from intersecting street, direction from intersecting street, relation to roadway, total lanes, speed limit, direction of travel, and vehicle driveable after crash. This group accounts for 16 percent of the total errors.

Reliability Check

In order to check the reliability of crash data entered into the Michigan State Police (MSP) data base, data from the same eighteen UD-10s described earlier were compared to printouts of crash data from the Michigan State Police data base for these UD-10s.

The majority of the disagreements occurred in areas of the UD-10 where data was coded by filling in a "bubble" alone (77.6 percent) or by filling in a "bubble" and printing the data (1.6 percent) for a total of 79.2 percent of the disagreements. At this time it is not clear how the errors occurred in reading the optically scanned part of the UD-10. The remaining errors, 20.8 percent, occurred in data printed on the UD-10 and incorrectly entered into the Michigan State Police data base.

Data entered on the UD-10 by filling in a "bubble" accounted for 77.6 percent (97) of the disagreements. These disagreements can be further divided into two subgroups according to kind of disagreement. In the first, the UD-10 was coded correctly, while the Michigan State Police data base reported uncoded and errors. This possible misreading of the optically scanned UD-10 represents 68 percent (85) of the disagreements. The second subgroup represents 9.6 percent (12) of the disagreements and contains twelve cases in which the Michigan State Police data base reports data different from that coded on the UD-10. Two of these were most likely caused by extraneous markings on the UD-10 which prevented accurate scanning by the optical reader.

Errors involving data printed on the UD-10 by the investigating officer accounted for 20.8 percent (26) of the disagreements. In 20 of these, the Michigan State Police data base reported uncoded and errors for driver or passenger ambulance. In five cases of disagreement the Michigan State Police data base reported a street name with an odd alphanumeric combination, (i.e. Huro4 rather than Huron Parkway). In one case, the UD-10 did not code the distance to the nearest intersection while the Michigan State Police data base reported zero.

Additional Analysis

In addition to the planned analyses detailed in the body of this report, additional comparisons were made of those data items that remained unchanged between 1991-1994. In this way, we were able to examine the distribution of responses for each item across years to determine, in a general sense, whether or not the changes to the UD-10 resulted in noticeable changes to the relative distribution of responses for any item or block of items.

Univariate codebooks were prepared for each of the Michigan State Police computerized data sets for calendar years 1991-1994. Items that remained unchanged between those years were identified, and the univariate response frequencies for each item and each year were catalogued together to allow comparisons to be made more easily.

These comparisons showed no significant or systematic variation from year to year in the distribution of responses for each of the items examined. In other words, there was no demonstrable effect of the change to the new, optical scan form UD-10 on overall response distributions for any item.

References

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