

NCSS STATISTICS: LIGHT TRUCKS AND VANS

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<p>16. Abstract</p> <p>This document has been prepared from a subset of the National Crash Severity Study data restricted to light trucks and vans involved in sampled accidents. The report is a supplement to the <u>NCSS Statistics: Passenger Cars</u> dated June 1980.</p> <p>The National Crash Severity Study (NCSS) is a major accident data collection program of the National Center for Statistics and Analysis (NCSA) of the National Highway Traffic Safety Administration (NHTSA). Data collection began in January 1977 and terminated in March 1979. This report presents tabulations of the data for the last twelve months of the study, thus covering the period April 1, 1978 through March 31, 1979.</p> <p>Accidents were investigated in seven geographic areas within the continental United States selected so that the aggregate of the areas closely resembles the urbanization distribution of the entire country. Within each area a stratified sampling plan was used to gather detailed information on passenger cars, light trucks, and vans (and their occupants) in crashes which were severe enough to require that the vehicles be towed from the scene.</p> <p>The combined investigations presented here total 905 crashes, 951 towed light trucks and vans, 1,608 case vehicle occupants, and 104 fatalities. The tables in this report represent only a very broad treatment of the data.</p>			
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## PREFACE

This document has been prepared from a subset of the National Crash Severity Study data restricted to light trucks and vans involved in sampled accidents. This report is a supplement to the report entitled NCSS Statistics: Passenger Cars,<sup>1</sup> June 1980. Organization and format of the two reports are similar. NCSS Statistics: Passenger Cars includes a brief explanation of each table.

The types of vehicles included in this report are passenger vans, cargo vans, on/off road vehicles, and pickup trucks. The scope of this report is limited to descriptive statistics on the accidents, vehicles, and occupants in the subset. All tables in this report were prepared from computerized NCSS data files.

The National Crash Severity Study (NCSS) is a major data collection program of the National Center for Statistics and Analysis (NCSA) of the National Highway Traffic Safety Administration (NHTSA). This study collects a common set of detailed information on passenger cars, light trucks, and vans (and their occupants) involved

in accidents which were severe enough to require an eligible vehicle to be towed from the scene. Pedestrian accidents, and other accidents in which an eligible vehicle did not have to be towed away, are excluded from this study. The NCSS data set includes descriptive information on the accident, the vehicles, the occupants and their injuries, and a computed estimate of the instantaneous change in velocity of the vehicle during the impact phase of the crash (called "Delta V"). Some information on other vehicles involved in these accidents (such as heavy trucks, or non-towed passenger cars) is also included in the data set.

NCSS data collection began for passenger cars in January 1977. Light trucks and vans were added to the study in April 1978. This report presents light truck and van tabulations for the last 12 months of the study, April 1978 through March 1979.

Accident investigations are conducted in seven geographic areas of the continental United States. These areas were not selected at random, but rather were chosen because the NCSA judged that high-quality accident investigation teams could be readily established in them. The seven areas and their contractors are:

1. Erie County, New York (minus the City of Buffalo)  
Calspan Field Services
2. Sixteen counties in Southwest Indiana  
Indiana University

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<sup>1</sup>Leda Ricci, ed., NCSS Statistics: Passenger Cars. Sponsored by the National Highway Traffic Safety Administration, Department of Transportation, Washington, D.C., under contract No. DOT-HS-8-01944. Ann Arbor: Highway Safety Research Institute, University of Michigan, June 1980. Report No. UM-HSRI-80-36.

rates used during the last twelve months of the study (April 78 - March 79) are as follows:

3. Washtenaw and Lenawee Counties, Michigan University of Michigan, Highway Safety Research Institute (HSRI)
4. Miami, Florida University of Miami
5. Lexington, Kentucky, along with seven surrounding counties University of Kentucky
6. Fifteen counties in South Texas Southwest Research Institute (SWRI)
7. Los Angeles, California (three police districts only) Dynamic Science Incorporated

Stratum 1. An eligible accident in which at least one case vehicle occupant was hospitalized overnight or fatally injured. This stratum was sampled at a rate of 100% (all accidents in this stratum are investigated).

Stratum 2. An eligible accident not in Stratum 1, but in which at least one case vehicle occupant was transported from the accident scene to a hospital or other treatment facility in a police, fire, or other emergency vehicle. This stratum was sampled at a 25% rate.

Stratum 3. All other eligible accidents are in this stratum. These accidents were sampled at a 10% rate, except in Texas, where they were sampled at a 5% rate.

Within each area, the accident selection methods differ. Two of the teams, HSRI and SWRI, selected accidents using a randomization technique. The other teams used a systematic sample of days. These teams investigated all eligible accidents on every fourth day in Stratum 2 and all eligible accidents on every tenth day in Stratum 3, except in Los Angeles, where half of the eligible accidents on every fifth day were investigated in Stratum 3.

Each eligible accident is assigned to one of three strata according to the highest treatment category in a case vehicle. Definitions of the three strata and the sampling

weight equal to the inverse of its sampling

fraction: 1 in Stratum 1, 4 in Stratum 2, and 10 or 20 in Stratum 3. In tabulating data from the file, each observation may be multiplied by its case weight in order to produce an estimate of the total towaway population for the aggregate of the seven NCSS areas. For example, the NCSS truck subset file used to compile these statistics contains information on 905 investigated accidents. Multiplication of each of these investigated accidents by its appropriate weight produces an estimated total of 3,510 accidents involving a light truck or van case vehicle for the aggregate of the seven areas. Similarly, 951 towed light trucks or vans were involved in the 905 accidents, producing a weighted total of 3632 towed light trucks or vans involved in accidents for the aggregate; 1608 occupants of towed light trucks or vans were investigated, producing a weighted total of 5,633 occupants of towed light trucks or vans. Since accidents involving a fatality were always sampled at a 100% rate, the investigated and weighted number of fatalities are equal (104). Unless otherwise indicated, the statistics presented in this report are weighted and are aggregated over all seven data collection areas.

The resulting statistics are not national estimates because the areas for data collection were not selected randomly. The areas were deliberately selected to be geographically diverse and to have an overall proportion of the population located in urban areas which is close to that of the entire United States (as given in the 1970 census). Statistical methods have been

developed<sup>2</sup> to generate "national projections" based on the data from the selected areas and demographic information on all areas in the United States. These methods are complex and are not suitable for all data elements. Also, there is less assurance that the national projections generated are free from bias than if probability-based selection procedures had been used in the selection of the areas. The statistics presented in this report describe the police-reported accidents involving towed light trucks or vans for the aggregate of the seven areas.

The accident, vehicle, and occupant information presented in this report is a subset of the complete NCSS file. Included in this subset are all accidents involving one or more towed (case vehicle) light trucks or vans. Tabulations labeled "case vehicles," then, include only light trucks or vans. Similarly, tabulations labeled "case vehicle occupants" include only occupants of light trucks or vans. Tabulations which are labeled "all vehicles" include the case vehicles (light trucks and vans) plus any other vehicles (passenger cars, non-towed light trucks and vans, heavy trucks, etc.) which were involved in the accidents in the subset. Tabulations labeled "all occupants"

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<sup>2</sup>Phyllis Gimotty, National Projections from NCSS Statistics. Presented at the Society of Automotive Engineering Congress and Exposition, Detroit, Michigan, 25-29 February 1980. SAE Paper No. 800097.

include the case vehicle occupants (in light trucks and vans) plus the occupants of the other towed vehicles in the accident subset.

The body of this report is organized into five major sections. The first presents a general overview of the light truck and van subset of the NCSS data. In the second section, descriptive statistics on the accidents are presented. The third and fourth sections provide information on the vehicles and occupants, respectively. The last section presents various collision severity (Delta V) distributions.

For the most part tables are presented in two complementary forms. The upper page provides a frequency distribution of the factor under consideration; the lower page shows the corresponding injury rates. In each case the columns of these tables show the number of occupants in each of several injury categories. Injury information is categorized using the Abbreviated Injury Scale. This scale is used to define injuries which are equal to or greater than a given severity level as indicated by the column headings "AIS 2+," "AIS 3+," and "Fatal." These tabulations were produced from the NCSA-generated variables, NEWAIS2 and NEWAIS3, in which other injury information in the file was used where possible to code the generated

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<sup>3</sup>The Abbreviated Injury Scale. Morton Grove, Ill.: American Association for Automotive Medicine, 1976.

variables when the AIS code was missing. A more complete description of the injury categories may be found on page 5. The injury rates presented are basically row percentages, and are computed by taking the number of occupants injured at the indicated injury level or higher (AIS 2+) and dividing by the total number of occupants in the row.

Several caveats must be kept in mind when interpreting the statistics presented in this report.

1. Missing Data. For many variables -- in particular those relating to crash severity and to injury -- there are substantial proportions of missing data. Missing data counts and percentages are shown for all row variables, and have not been excluded in the computation of column percentages for the complete data. Consequently, the percentages shown may be underestimated somewhat.
2. Sample Size. The total sample size of the light truck and van subset is only 5% of that for the passenger cars. While data collection for the passenger cars covered 27 months (January 1977-March 1979), data collection for the light truck and van subset covered only the last 12 months of this period. In addition, the light truck and van accidents are distributed among the seven areas far less uniformly than the passenger car accidents. Nearly 39% of



the light truck and van accidents occur in the Texas area. These factors suggest that the accident experience of light trucks and vans in the aggregate of the seven areas is not described nearly as well as the accident experience of the passenger cars.

3. Comparing Light Trucks and Vans with Passenger Cars. In general, the towaway accident population for light trucks and vans is not directly comparable with that of passenger cars. In particular, the light truck and van accidents tend to occur at greater crash severities. The proportion of light truck and van accidents occurring in rural areas is about 76% greater than that of passenger cars. Even the "towaway" threshold is likely to be different for trucks as compared to passenger cars.

This publication was produced by the efforts of many people at the Highway Safety Research Institute. James O'Day and Kenneth L. Campbell were responsible for content and organization. Joseph Andary developed computer programs to produce the tables in this book. Kathleen Jackson designed the cover. Brian Wolf helped with the editing. James Hedlund, NHTSA, and Phyllis Gimotty made suggestions and comments as the publication evolved.

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## 1 GENERAL--LIGHT TRUCKS AND VANS

This section presents information about both the unweighted (investigated) counts of accidents involving towed light trucks and vans and the reconstructed, or weighted, counts. It provides an overview of the light truck and van subset of the NCSS data.

Unweighted counts presented in this section are of value to those interested in the consequences of the sampling procedures and in understanding the statistical properties of the data. The weighted distributions in this section, and in the remainder of this report, describe the accident experience in the aggregate of the seven NCSS areas.

WEIGHTED AND ACTUAL ACCIDENTS, ALL VEHICLES, CASE VEHICLES, CASE VEHICLES, AND CASE VEHICLE OCCUPANTS: NCSS APRIL 1978-MARCH 1979

SAMPLING FRACTION	ACCIDENTS <sup>a</sup>		ALL VEHICLES <sup>b</sup>		CASE VEHICLES <sup>c</sup>		CASE VEHICLE OCCUPANTS <sup>d</sup>		CASE VEHICLE FATALITIES	
	Actual	Weighted	Actual	Weighted	Actual	Weighted	Actual	Weighted	Actual	Weighted
100%	534	534	915	915	564	564	1009	1009	104	104
25%	199	796	352	1408	212	848	341	1364		
10%	126	1260	227	2270	128	1280	190	1900		
5%	46	920	69	1380	47	940	68	1360		
TOTAL	905	3510	1563	5973	951	3632	1608	5633	104	104

<sup>a</sup>Accidents are all police-reported accidents involving a towed light truck or van.

<sup>b</sup>All Vehicles include all vehicles (whatever their body type) that were involved in the above accidents.

<sup>c</sup>Case Vehicles are only those light trucks and vans involved in these accidents that were towed from the scene due to collision damage.

<sup>d</sup>Case Vehicle Occupants are the occupants of light trucks and vans towed from the scene of these accidents.



NCSS DATA BY DATA COLLECTION TEAM

GROUP	CALSPAN	HSRI	U OF IND	U OF KEN	U MIAMI	SWRI	DYN.SCI.	TOTAL
ACCIDENTS								
Weighted	322	290	474	622	334	1357	111	3510
Actual	103	98	162	151	67	294	30	905
ALL VEHICLES								
Weighted	581	483	792	1108	660	2115	234	5973
Actual	191	159	276	271	135	468	63	1563
CASE VEHICLES								
Weighted	330	297	488	638	334	1423	122	3632
Actual	108	102	170	155	67	317	32	951
ALL OCCUPANTS								
Weighted	719	746	1087	1745	960	3370	303	8930
Actual	263	257	427	449	201	821	96	2514
CASE VEH. OCCUPANTS								
Weighted	443	559	717	1038	499	2197	180	5633
Actual	152	187	282	276	106	554	51	1608
FATALITIES	9	13	26	7	0	46	3	104



## 2 ACCIDENTS--LIGHT TRUCKS AND VANS

This section presents several tables describing the characteristics of the accidents involving towed light trucks and vans investigated in the NCSS program. To be included in the tabulations, an accident must have involved at least one occupied light truck or van that was towed from the scene of the accident because of collision damage. The tables in this section show only the weighted (or reconstructed) counts, and thus describe the total number of (towaway) accidents involving light trucks or vans that occurred in the NCSS regions over the twelve-month period (April 78 - March 79).

In each of the following tables the number of accidents and the number of occupants in various injury categories are shown in the columns. To allow a better understanding of the distribution of injuries across the various accident characteristics, injuries are shown as "AIS 2+," "AIS 3+," and "Fatal." The first two headings refer to the occupant's overall injury severity as coded by the Abbreviated Injury Scale (AIS) as 2 or greater and 3 or greater, respectively. These tabulations were produced from the NCSA-generated variables, NEWAIS2 and NEWAIS3, in which other injury information in the file was used where possible to code the generated variables when the AIS code was missing.

Not shown in these tabulations are missing data on NEWAIS2 and NEWAIS3 of 15% (860 occupants). Review of a sample of missing data cases indicates that these cases have about the

same proportion of "moderate" and "severe" injuries as in the complete data. This finding implies that the "AIS 2+" and "AIS 3+" counts are somewhat underestimated in these tables.

Overall AIS 2 refers to "moderate" injuries. These include extensive cuts to the head and face, simple fractures to arms, legs, or ribs, or concussion with brief unconsciousness; these injuries usually require medical treatment. Fewer than half of those persons injured at the AIS-2 level are hospitalized overnight or longer. Overall AIS 3 refers to "severe" injuries. Among these are compound or multiple fractures to arms, legs, or ribs, or simple skull fractures; these injuries usually require hospitalization but are not often life-threatening.

NCSS ACCIDENT DISTRIBUTIONS BY TIME OF DAY

TIME OF DAY	ACCIDENTS			OCCUPANTS												
	N	%	TOTAL	TOTAL			AIS 2+			AIS 3+			FATAL			
				N	%	N	N	%	N	%	N	%	N	%		
Midnight	97	2.8	132	2.3	29	5.3	6	2.0	1	1.0						
1 AM	168	4.8	294	5.2	38	6.9	25	8.3	6	5.8						
2 AM	251	7.2	319	5.7	20	3.6	10	3.3	5	4.8						
3 AM	102	2.9	135	2.4	25	4.6	15	5.0	8	7.7						
4 AM	78	2.2	109	1.9	14	2.6	10	3.3	7	6.7						
5 AM	57	1.6	75	1.3	8	1.5	0	0.0	0	0.0						
6 AM	114	3.2	189	3.4	16	2.9	15	5.0	6	5.8						
7 AM	136	3.9	210	3.7	17	3.1	12	4.0	3	2.9						
8 AM	162	4.6	206	3.7	5	0.9	4	1.3	0	0.0						
9 AM	114	3.2	142	2.5	8	1.5	6	2.0	3	2.9						
10 AM	191	5.4	314	5.6	13	2.4	8	2.7	2	1.9						
11 AM	131	3.7	259	4.6	21	3.8	12	4.0	4	3.8						
Noon	207	5.9	367	6.5	25	4.6	15	5.0	5	4.8						
1 PM	138	3.9	175	3.1	15	2.7	9	3.0	5	4.8						
2 PM	209	6.0	316	5.6	36	6.6	10	3.3	2	1.9						
3 PM	187	5.3	329	5.8	33	6.0	14	4.7	5	4.8						
4 PM	183	5.2	330	5.9	24	4.4	9	3.0	3	2.9						
5 PM	239	6.8	359	6.4	21	3.8	7	2.3	4	3.8						
6 PM	148	4.2	278	4.9	34	6.2	12	4.0	3	2.9						
7 PM	98	2.8	197	3.5	28	5.1	18	6.0	4	3.8						
8 PM	85	2.4	210	3.7	25	4.6	14	4.7	3	2.9						
9 PM	183	5.2	282	5.0	29	5.3	23	7.7	9	8.7						
10 PM	125	3.6	204	3.6	28	5.1	24	8.0	9	8.7						
11 PM	106	3.0	197	3.5	34	6.2	20	6.7	7	6.7						
Unknown	1	0.0	5	0.1	2	0.4	2	0.7	0	0.0						
TOTAL	3510	100.0	5633	100.0	548	100.0	300	100.0	104	100.0						

NCSS INJURY RATES BY TIME OF DAY

TIME OF DAY	ACCIDENTS	TOTAL	OCCUPANTS					
			AIS 2+		AIS 3+		FATAL	
			N	RATE	N	RATE	N	RATE
Midnight	97	132	29	22.0	6	4.5	1	0.8
1 AM	168	294	38	12.9	25	8.5	6	2.0
2 AM	251	319	20	6.3	10	3.1	5	1.6
3 AM	102	135	25	18.5	15	11.1	8	5.9
4 AM	78	109	14	12.8	10	9.2	7	6.4
5 AM	57	75	8	10.7	0	0.0	0	0.0
6 AM	114	189	16	8.5	15	7.9	6	3.2
7 AM	136	210	17	8.1	12	5.7	3	1.4
8 AM	162	206	5	2.4	4	1.9	0	0.0
9 AM	114	142	8	5.6	6	4.2	3	2.1
10 AM	191	314	13	4.1	8	2.5	2	0.6
11 AM	131	259	21	8.1	12	4.6	4	1.5
Noon	207	367	25	6.8	15	4.1	5	1.4
1 PM	138	175	15	8.6	9	5.1	5	2.9
2 PM	209	316	36	11.4	10	3.2	2	0.6
3 PM	187	329	33	10.0	14	4.3	5	1.5
4 PM	183	330	24	7.3	9	2.7	3	0.9
5 PM	239	359	21	5.8	7	1.9	4	1.1
6 PM	148	278	34	12.2	12	4.3	3	1.1
7 PM	98	197	28	14.2	18	9.1	4	2.0
8 PM	85	210	25	11.9	14	6.7	3	1.4
9 PM	183	282	29	10.3	23	8.2	9	3.2
10 PM	125	204	28	13.7	24	11.8	9	4.4
11 PM	106	197	34	17.3	20	10.2	7	3.6
Unknown	1	5	2	40.0	2	40.0	0	0.0
OVERALL	3510	5633	548	9.7	300	5.3	104	1.8

NCSS ACCIDENT DISTRIBUTIONS BY DAY OF THE WEEK

DAY OF WEEK	ACCIDENTS		OCCUPANTS									
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL			
			N	%	N	%	N	%	N	%		
Sunday	457	13.0	828	14.7	91	16.6	51	17.0	13	12.5		
Monday	373	10.6	611	10.8	55	10.0	32	10.7	12	11.5		
Tuesday	359	10.2	501	8.9	42	7.7	25	8.3	9	8.7		
Wednesday	463	13.2	625	11.1	55	10.0	22	7.3	5	4.8		
Thursday	491	14.0	762	13.5	97	17.7	48	16.0	14	13.5		
Friday	681	19.4	962	17.1	95	17.3	50	16.7	21	20.2		
Saturday	686	19.5	1344	23.9	113	20.6	72	24.0	30	28.8		
TOTAL	3510	100.0	5633	100.0	548	100.0	300	100.0	104	100.0		

NCSS INJURY RATES BY DAY OF THE WEEK

DAY OF WEEK	ACCIDENTS	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
Sunday	457	828	91	11.0	51	6.2	13	1.6	
Monday	373	611	55	9.0	32	5.2	12	2.0	
Tuesday	359	501	42	8.4	25	5.0	9	1.8	
Wednesday	463	625	55	8.8	22	3.5	5	0.8	
Thursday	491	762	97	12.7	48	6.3	14	1.8	
Friday	681	962	95	9.9	50	5.2	21	2.2	
Saturday	686	1344	113	8.4	72	5.4	30	2.2	
OVERALL	3510	5633	548	9.7	300	5.3	104	1.8	

NCSS ACCIDENT DISTRIBUTIONS BY RURAL/URBAN  
ACCIDENT LOCATION

RURAL/URBAN	ACCIDENTS		OCCUPANTS						FATAL	
	N	%	TOTAL	AIS 2+	AIS 3+	N	%	N	%	
Rural	1368	39.0	2447	330	207	79	60.2	79	76.0	
Urban	2142	61.0	3186	218	93	25	39.8	25	24.0	
TOTAL	3510	100.0	5633	548	300	104	100.0	104	100.0	



NCSS INJURY RATES BY RURAL/URBAN  
ACCIDENT LOCATION

RURAL/URBAN	ACCIDENTS	OCCUPANTS						
		TOTAL	AIS 2+		AIS 3+		FATAL	
			N	RATE	N	RATE	N	RATE
Rural	1368	2447	330	13.5	207	8.5	79	3.2
Urban	2142	3186	218	6.8	93	2.9	25	0.8
OVERALL	3510	5633	548	9.7	300	5.3	104	1.8

NCSS ACCIDENT DISTRIBUTIONS BY ROADWAY TYPE

ROADWAY TYPE	ACCIDENTS		OCCUPANTS							
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL	
			N	%	N	%	N	%	N	%
Arterial Highway	764	21.8	1182	21.0	109	19.9	63	21.0	24	23.1
Expressway	74	2.1	147	2.6	7	1.3	6	2.0	2	1.9
Freeway	248	7.1	374	6.6	40	7.3	25	8.3	11	10.6
Major Roadway	648	18.5	1022	18.1	110	20.1	73	24.3	24	23.1
Collector	730	20.8	1248	22.2	111	20.3	66	22.0	21	20.2
Local Street	980	27.9	1530	27.2	167	30.5	63	21.0	21	20.2
Unknown	66	1.9	130	2.3	4	0.7	4	1.3	1	1.0
TOTAL	3510	100.0	5633	100.0	548	100.0	300	100.0	104	100.0

NCSS INJURY RATES BY ROADWAY TYPE

ROADWAY TYPE	ACCIDENTS	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
Arterial Highway	764	1182	109	9.2	63	5.3	24	2.0	
Expressway	74	147	7	4.8	6	4.1	2	1.4	
Freeway	248	374	40	10.7	25	6.7	11	2.9	
Major Roadway	648	1022	110	10.8	73	7.1	24	2.3	
Collector	730	1248	111	8.9	66	5.3	21	1.7	
Local Street	980	1530	167	10.9	63	4.1	21	1.4	
Unknown	66	130	4	3.1	4	3.1	1	0.8	
OVERALL	3510	5633	548	9.7	300	5.3	104	1.8	

NCSS ACCIDENT DISTRIBUTIONS BY ROAD CONDITION

ROAD CONDITION	ACCIDENTS			OCCUPANTS						
	N	%	TOTAL	AIS 2+		AIS 3+		FATAL		
	N	%	N	N	%	N	%	N	%	
Dry	2365	67.4	3919	392	71.5	219	73.0	76	73.1	
Wet	897	25.6	1294	133	24.3	68	22.7	25	24.0	
Ice	158	4.5	263	7	1.3	2	0.7	0	0.0	
Snow	70	2.0	127	16	2.9	11	3.7	3	2.9	
Other	20	0.6	30	0	0.0	0	0.0	0	0.0	
TOTAL	3510	100.0	5633	548	100.0	300	100.0	104	100.0	

NCSS INJURY RATES BY ROAD CONDITION

ROAD CONDITION	ACCIDENTS	OCCUPANTS					
		TOTAL	AIS 2+		AIS 3+		FATAL
		N	RATE	N	RATE	N	RATE
Dry	2365	392	10.0	219	5.6	76	1.9
Wet	897	133	10.3	68	5.3	25	1.9
Ice	158	7	2.7	2	0.8	0	0.0
Snow	70	16	12.6	11	8.7	3	2.4
Other	20	0	0.0	0	0.0	0	0.0
OVERALL	3510	548	9.7	300	5.3	104	1.8

NCSS ACCIDENT DISTRIBUTIONS BY SPEED LIMIT

SPEED LIMIT	ACCIDENTS		OCCUPANTS										
	N	%	TOTAL	N	%	AIS 2+	N	%	AIS 3+	N	%	FATAL	
None	8	0.2	8	0.1	0.1	0	0.0	0.0	0	0.0	0.0	0	0.0
Under 20 MPH	16	0.5	28	0.5	0.5	5	0.9	0.9	4	1.3	1.3	0	0.0
25 MPH	102	2.9	209	3.7	3.7	13	2.4	2.4	5	1.7	1.7	2	1.9
30 MPH	646	18.4	1074	19.1	19.1	74	13.5	13.5	19	6.3	6.3	4	3.8
35 MPH	608	17.3	910	16.2	16.2	71	13.0	13.0	31	10.3	10.3	10	9.6
40 MPH	393	11.2	564	10.0	10.0	27	4.9	4.9	13	4.3	4.3	4	3.8
45 MPH	282	8.0	439	7.8	7.8	49	8.9	8.9	31	10.3	10.3	7	6.7
50 MPH	119	3.4	188	3.3	3.3	23	4.2	4.2	12	4.0	4.0	2	1.9
55 MPH	1304	37.2	2166	38.5	38.5	280	51.1	51.1	179	59.7	59.7	73	70.2
Unknown	32	0.9	47	0.8	0.8	6	1.1	1.1	6	2.0	2.0	2	1.9
TOTAL	3510	100.0	5633	100.0	100.0	548	100.0	100.0	300	100.0	100.0	104	100.0

NCSS INJURY RATES BY SPEED LIMIT

SPEED LIMIT	ACCIDENTS	OCCUPANTS						
		TOTAL	AIS 2+		AIS 3+		FATAL	
			N	RATE	N	RATE	N	RATE
None	8	8	0	0.0	0	0.0	0	0.0
Under 20 MPH	16	28	5	17.9	4	14.3	0	0.0
25 MPH	102	209	13	6.2	5	2.4	2	1.0
30 MPH	646	1074	74	6.9	19	1.8	4	0.4
35 MPH	608	910	71	7.8	31	3.4	10	1.1
40 MPH	393	564	27	4.8	13	2.3	4	0.7
45 MPH	282	439	49	11.2	31	7.1	7	1.6
50 MPH	119	188	23	12.2	12	6.4	2	1.1
55 MPH	1304	2166	280	12.9	179	8.3	73	3.4
Unknown	32	47	6	12.8	6	12.8	2	4.3
OVERALL	3510	5633	548	9.7	300	5.3	104	1.8

NCSS ACCIDENT DISTRIBUTIONS BY NUMBER OF VEHICLES INVOLVED

TOTAL NUMBER OF VEHICLES INVOLVED IN THE ACCIDENT*	ACCIDENTS**			OCCUPANTS					
	N	%	TOTAL	AIS 2+		AIS 3+		FATAL	
				N	%	N	%	N	%
1	1454	41.4	2178	282	51.5	147	49.0	60	57.7
2	1720	49.0	2890	220	40.1	125	41.7	39	37.5
3	286	8.1	462	43	7.8	26	8.7	5	4.8
4	30	0.9	70	2	0.4	1	0.3	0	0.0
5	19	0.5	32	0	0.0	0	0.0	0	0.0
6	1	0.0	1	1	0.2	1	0.3	0	0.0
TOTAL	3510	100.0	5633	548	100.0	300	100.0	104	100.0

\*Vehicles means all vehicles including passenger cars light trucks and vans (whether case or non-case vehicles), as well as heavy trucks and buses.

\*\*Accidents are accidents involving at least one towed light truck or van.



NCSS INJURY RATES BY NUMBER OF VEHICLES INVOLVED

TOTAL NUMBER OF VEHICLES INVOLVED IN THE ACCIDENT*	ACCIDENTS**	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
1	1454	2178	282	12.9	147	6.7	60	2.8	
2	1720	2890	220	7.6	125	4.3	39	1.3	
3	286	462	43	9.3	26	5.6	5	1.1	
4	30	70	2	2.9	1	1.4	0	0.0	
5	19	32	0	0.0	0	0.0	0	0.0	
6	1	1	1	100.0	1	100.0	0	0.0	
OVERALL	3510	5633	548	9.7	300	5.3	104	1.8	

\*Vehicles means all vehicles including passenger cars, light trucks and vans (whether case or non-case vehicles), as well as heavy trucks and buses.

\*\*Accidents are accidents involving at least one towed light truck or van.

NCSS ACCIDENT DISTRIBUTIONS BY ACCIDENT TYPE

TYPE OF IMPACT	ACCIDENTS		OCCUPANTS							
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL	
			N	%	N	%	N	%	N	%
SINGLE VEHICLE	928	26.4	1326	23.5	192	35.0	95	31.7	32	30.8
Fixed Object	466	13.3	742	13.2	100	18.2	59	19.7	30	28.8
Rollover	85	2.4	145	2.6	1	0.2	0	0.0	0	0.0
Undercarriage										
TWO VEHICLE	347	9.9	644	11.4	90	16.4	58	19.3	21	20.2
Head-On	1018	29.0	1637	29.1	100	18.2	47	15.7	14	13.5
Side	284	8.1	470	8.3	19	3.5	13	4.3	2	1.9
Rear	8	0.2	24	0.4	0	0.0	0	0.0	0	0.0
Sideswipe										
THREE OR MORE	336	9.6	565	10.0	46	8.4	28	9.3	5	4.8
UNKNOWN	38	1.1	80	1.4	0	0.0	0	0.0	0	0.0
TOTAL	3510	100.0	5633	100.0	548	100.0	300	100.0	104	100.0

NCSS INJURY RATES BY ACCIDENT TYPE

TYPE OF IMPACT	ACCIDENTS	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
SINGLE VEHICLE									
Fixed Object	928	1326	192	14.5	95	7.2	32	2.4	
Rollover	466	742	100	13.5	59	8.0	30	4.0	
Undercarriage	85	145	1	0.7	0	0.0	0	0.0	
TWO VEHICLE									
Head-On	347	644	90	14.0	58	9.0	21	3.3	
Side	1018	1637	100	6.1	47	2.9	14	0.9	
Rear	284	470	19	4.0	13	2.8	2	0.4	
Sideswipe	8	24	0	0.0	0	0.0	0	0.0	
THREE OR MORE	336	565	46	8.1	28	5.0	5	0.9	
UNKNOWN	38	80	0	0.0	0	0.0	0	0.0	
OVERALL	3510	5633	548	9.7	300	5.3	104	1.8	



### 3 VEHICLES--LIGHT TRUCKS AND VANS

This section presents several tables describing the characteristics of the case vehicles involved in the NCSS crashes. Case vehicles in this subset are always towed (and occupied) light trucks and vans. The tables in this section show only weighted counts, and thus describe the total number of towed light trucks and vans involved in accidents in the aggregate of the seven NCSS areas during the last twelve months of the study (April 78 - March 79).

For each vehicle category shown, the total number of occupants, and the number of occupants injured at the AIS 2+, AIS 3+, and Fatal level, are tabulated as in the previous section. Caution with regard to the effect of missing injury data (as discussed on page 5) should also be observed in interpreting information in this section.

The early tables show distributions by the descriptive characteristics of the damaged vehicles (model year, weight, and number of occupants); these are followed by tables showing a variety of damage characteristics (direction of force, general area of damage, etc.). In addition to the information provided in this section, the last section of this report (beginning on page 67) presents several crash severity distributions (in terms of Delta V), and many of these tables are also centered on vehicle characteristics.

NCSS CASE VEHICLE DISTRIBUTIONS BY BODY STYLE

BODY STYLE	VEHICLES		OCCUPANTS									
	N	%	TOTAL	N	%	AIS 2+	N	%	AIS 3+	N	%	FATAL
Passenger Van	351	9.7	634	42	11.3	7.7	26	8.7	8	7.7		
Cargo Van	451	12.4	657	47	11.7	8.6	28	9.3	8	7.7		
On/Off Road	358	9.9	604	71	10.7	13.0	36	12.0	10	9.6		
Pickup Truck	2472	68.1	3738	388	66.4	70.8	210	70.0	78	75.0		
TOTAL	3632	100.0	5633	548	100.0	100.0	300	100.0	104	100.0		

NCSS INJURY RATES BY CASE VEHICLE BODY STYLE

BODY STYLE	VEHICLES	OCCUPANTS						
		TOTAL	AIS 2+		AIS 3+		FATAL	
			N	RATE	N	RATE	N	RATE
Passenger Van	351	634	42	6.6	26	4.1	8	1.3
Cargo Van	451	657	47	7.2	28	4.3	8	1.2
On/Off Road	358	604	71	11.8	36	6.0	10	1.7
Pickup Truck	2472	3738	388	10.4	210	5.6	78	2.1
OVERALL	3632	5633	548	9.7	300	5.3	104	1.8

NCSS CASE VEHICLE DISTRIBUTIONS BY MODEL YEAR

MODEL YEAR	VEHICLES		OCCUPANTS											
	N	%	TOTAL	AIS 2+	AIS 3+	FATAL	N	%	N	%	N	%	N	%
1960 and Older	122	3.4	240	4.3	17	3.1	12	4.0	1	1.0				
1961	23	0.6	43	0.8	1	0.2	1	0.3	1	1.0				
1962	23	0.6	52	0.9	2	0.4	0	0.0	0	0.0				
1963	30	0.8	39	0.7	1	0.2	0	0.0	0	0.0				
1964	62	1.7	67	1.2	4	0.7	3	1.0	1	1.0				
1965	68	1.9	146	2.6	12	2.2	7	2.3	1	1.0				
1966	117	3.2	177	3.1	31	5.7	6	2.0	2	1.9				
1967	77	2.1	107	1.9	8	1.5	7	2.3	3	2.9				
1968	80	2.2	131	2.3	8	1.5	3	1.0	2	1.9				
1969	126	3.5	167	3.0	14	2.6	6	2.0	1	1.0				
1970	186	5.1	258	4.6	13	2.4	9	3.0	1	1.0				
1971	177	4.9	284	5.0	36	6.6	20	6.7	4	3.8				
1972	279	7.7	444	7.9	30	5.5	16	5.3	5	4.8				
1973	328	9.0	482	8.6	50	9.1	35	11.7	9	8.7				
1974	318	8.8	468	8.3	55	10.0	30	10.0	11	10.6				
1975	257	7.1	441	7.8	45	8.2	29	9.7	8	7.7				
1976	299	8.2	415	7.4	65	11.9	36	12.0	20	19.2				
1977	515	14.2	805	14.3	81	14.8	35	11.7	15	14.4				
1978	545	15.0	867	15.4	75	13.7	45	15.0	19	18.3				
TOTAL	3632	100.0	5633	100.0	548	100.0	300	100.0	104	100.0				



NCSS INJURY RATES BY CASE VEHICLE MODEL YEAR

MODEL YEAR	VEHICLES	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
1960 and Older	122	240	17	7.1	12	5.0	1	0.4	
1961	23	43	1	2.3	1	2.3	1	2.3	
1962	23	52	2	3.8	0	0.0	0	0.0	
1963	30	39	1	2.6	0	0.0	0	0.0	
1964	62	67	4	6.0	3	4.5	1	1.5	
1965	68	146	12	8.2	7	4.8	1	0.7	
1966	117	177	31	17.5	6	3.4	2	1.1	
1967	77	107	8	7.5	7	6.5	3	2.8	
1968	80	131	8	6.1	3	2.3	2	1.5	
1969	126	167	14	8.4	6	3.6	1	0.6	
1970	186	258	13	5.0	9	3.5	1	0.4	
1971	177	284	36	12.7	20	7.0	4	1.4	
1972	279	444	30	6.8	16	3.6	5	1.1	
1973	328	482	50	10.4	35	7.3	9	1.9	
1974	318	468	55	11.8	30	6.4	11	2.4	
1975	257	441	45	10.2	29	6.6	8	1.8	
1976	299	415	65	15.7	36	8.7	20	4.8	
1977	515	805	81	10.1	35	4.3	15	1.9	
1978	545	867	75	8.7	45	5.2	19	2.2	
OVERALL	3632	5633	548	9.7	300	5.3	104	1.8	

NCSS CASE VEHICLE DISTRIBUTIONS BY VEHICLE WEIGHT

VEHICLE WEIGHT (In Pounds)	VEHICLES		OCCUPANTS									
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL			
			N	%	N	%	N	%	N	%		
1900-2199	5	0.1	6	0.1	0	0.0	0	0.0	0	0.0	0	0.0
2200-2499	99	2.7	122	2.2	22	4.0	14	4.7	8	7.7		
2500-2799	229	6.3	342	6.1	51	9.3	22	7.3	6	5.8		
2800-3099	101	2.8	237	4.2	26	4.7	15	5.0	3	2.9		
3100-3399	328	9.0	467	8.3	33	6.0	17	5.7	5	4.8		
3400-3699	688	18.9	1037	18.4	80	14.6	46	15.3	13	12.5		
3700-3999	1057	29.1	1669	29.6	166	30.3	74	24.7	29	27.9		
4000-4299	447	12.3	612	10.9	61	11.1	39	13.0	14	13.5		
4300-4599	104	2.9	207	3.7	31	5.7	19	6.3	9	8.7		
4600-4899	103	2.8	168	3.0	18	3.3	11	3.7	4	3.8		
4900-5199	79	2.2	125	2.2	5	0.9	3	1.0	0	0.0		
5200-5499	9	0.2	15	0.3	3	0.5	2	0.7	0	0.0		
5500-5799	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0		
5800-6099	43	1.2	53	0.9	1	0.2	0	0.0	0	0.0		
6100-6399	7	0.2	11	0.2	3	0.5	3	1.0	0	0.0		
Over 6400	6	0.2	6	0.1	1	0.2	0	0.0	0	0.0		
Unknown	327	9.0	556	9.9	47	8.6	35	11.7	13	12.5		
TOTAL	3632	100.0	5633	100.0	548	100.0	300	100.0	104	100.0		

NCSS INJURY RATES BY CASE VEHICLE WEIGHT

VEHICLE WEIGHT (In Pounds)	VEHICLES	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
1900-2199	5	6	0	0.0	0	0.0	0	0.0	
2200-2499	99	122	22	18.0	14	11.5	8	6.6	
2500-2799	229	342	51	14.9	22	6.4	6	1.8	
2800-3099	101	237	26	11.0	15	6.3	3	1.3	
3100-3399	328	467	33	7.1	17	3.6	5	1.1	
3400-3699	688	1037	80	7.7	46	4.4	13	1.3	
3700-3999	1057	1669	166	9.9	74	4.4	29	1.7	
4000-4299	447	612	61	10.0	39	6.4	14	2.3	
4300-4599	104	207	31	15.0	19	9.2	9	4.3	
4600-4899	103	168	18	10.7	11	6.5	4	2.4	
4900-5199	79	125	5	4.0	3	2.4	0	0.0	
5200-5499	9	15	3	20.0	2	13.3	0	0.0	
5500-5799	0	0	0	0.0	0	0.0	0	0.0	
5800-6099	43	53	1	1.9	0	0.0	0	0.0	
6100-6399	7	11	3	27.3	3	27.3	0	0.0	
Over 6400	6	6	1	16.7	0	0.0	0	0.0	
Unknown	327	556	47	8.5	35	6.3	13	2.3	
OVERALL	3632	5633	548	9.7	300	5.3	104	1.8	

NCSS CASE VEHICLE DISTRIBUTIONS BY  
NUMBER OF OCCUPANTS IN VEHICLE

NUMBER OF OCCUPANTS IN VEHICLE	VEHICLES		OCCUPANTS									
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL			
			N	%	N	%	N	%	N	%		
1	2416	66.5	2416	42.9	250	45.6	137	45.7	50	48.1		
2	803	22.1	1606	28.5	137	25.0	78	26.0	24	23.1		
3	224	6.2	672	11.9	69	12.6	35	11.7	8	7.7		
4	104	2.9	416	7.4	57	10.4	30	10.0	15	14.4		
5	39	1.1	195	3.5	9	1.6	8	2.7	3	2.9		
6	36	1.0	216	3.8	14	2.6	5	1.7	0	0.0		
7	2	0.1	14	0.2	3	0.5	2	0.7	2	1.9		
8	1	0.0	8	0.1	0	0.0	0	0.0	0	0.0		
9 or More	7	0.2	90	1.6	9	1.6	5	1.7	2	1.9		
TOTAL	3632	100.0	5633	100.0	548	100.0	300	100.0	104	100.0		

NCSS INJURY RATES BY NUMBER OF OCCUPANTS  
IN CASE VEHICLE

NUMBER OF OCCUPANTS IN VEHICLE	VEHICLES	OCCUPANTS						
		TOTAL	AIS 2+		AIS 3+		FATAL	
			N	RATE	N	RATE	N	RATE
1	2416	2416	250	10.3	137	5.7	50	2.1
2	803	1606	137	8.5	78	4.9	24	1.5
3	224	672	69	10.3	35	5.2	8	1.2
4	104	416	57	13.7	30	7.2	15	3.6
5	39	195	9	4.6	8	4.1	3	1.5
6	36	216	14	6.5	5	2.3	0	0.0
7	2	14	3	21.4	2	14.3	2	14.3
8	1	8	0	0.0	0	0.0	0	0.0
9 or More	7	90	9	10.0	5	5.6	2	2.2
OVERALL	3632	5633	548	9.7	300	5.3	104	1.8

NCSS CASE VEHICLE DISTRIBUTIONS  
BY PRINCIPAL DIRECTION OF FORCE (PDOF)

CDC DIRECTION	VEHICLES			OCCUPANTS											
	N	%	TOTAL	N	%	AIS 2+	N	%	AIS 3+	N	%	FATAL	N	%	
Non-Horizontal	500	13.8	821	101	14.6	18.4	61	20.3	31	29.8					
1 0'Clock	443	12.2	682	49	12.1	8.9	19	6.3	4	3.8					
2 0'Clock	171	4.7	247	17	4.4	3.1	12	4.0	4	3.8					
3 0'Clock	17	0.5	25	7	0.4	1.3	6	2.0	0	0.0					
4 0'Clock	9	0.2	18	1	0.3	0.2	0	0.0	0	0.0					
5 0'Clock	2	0.1	2	1	0.0	0.2	1	0.3	0	0.0					
6 0'Clock	60	1.7	95	8	1.7	1.5	6	2.0	1	1.0					
7 0'Clock	1	0.0	1	0	0.0	0.0	0	0.0	0	0.0					
8 0'Clock	8	0.2	10	2	0.2	0.4	1	0.3	1	1.0					
9 0'Clock	46	1.3	66	4	1.2	0.7	4	1.3	2	1.9					
10 0'Clock	211	5.8	297	59	5.3	10.8	20	6.7	6	5.8					
11 0'Clock	425	11.7	578	62	10.3	11.3	37	12.3	10	9.6					
12 0'Clock	955	26.3	1428	184	25.4	33.6	111	37.0	38	36.5					
Unknown	784	21.6	1363	53	24.2	9.7	22	7.3	7	6.7					
TOTAL	3632	100.0	5633	548	100.0	100.0	300	100.0	104	100.0					

NCSS INJURY RATES BY CASE VEHICLE  
PRINCIPAL DIRECTION OF FORCE (PDOF)

CDC DIRECTION	VEHICLES	OCCUPANTS						
		TOTAL	AIS 2+		AIS 3+		FATAL	
			N	RATE	N	RATE	N	RATE
Non-Horizontal	500	821	101	12.3	61	7.4	31	3.8
1 0'Clock	443	682	49	7.2	19	2.8	4	0.6
2 0'Clock	171	247	17	6.9	12	4.9	4	1.6
3 0'Clock	17	25	7	28.0	6	24.0	0	0.0
4 0'Clock	9	18	1	5.6	0	0.0	0	0.0
5 0'Clock	2	2	1	50.0	1	50.0	0	0.0
6 0'Clock	60	95	8	8.4	6	6.3	1	1.1
7 0'Clock	1	1	0	0.0	0	0.0	0	0.0
8 0'Clock	8	10	2	20.0	1	10.0	1	10.0
9 0'Clock	46	66	4	6.1	4	6.1	2	3.0
10 0'Clock	211	297	59	19.9	20	6.7	6	2.0
11 0'Clock	425	578	62	10.7	37	6.4	10	1.7
12 0'Clock	955	1428	184	12.9	111	7.8	38	2.7
Unknown	784	1363	53	3.9	22	1.6	7	0.5
OVERALL	3632	5633	548	9.7	300	5.3	104	1.8

NCSS CASE VEHICLE DISTRIBUTIONS BY GENERAL AREA OF DAMAGE

DAMAGE AREA	VEHICLES		OCCUPANTS							
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL	
			N	%	N	%	N	%	N	%
Front	1753	48.3	2602	46.2	296	54.0	163	54.3	51	49.0
Right	232	6.4	320	5.7	38	6.9	25	8.3	6	5.8
Back	62	1.7	97	1.7	9	1.6	7	2.3	1	1.0
Left	375	10.3	535	9.5	71	13.0	35	11.7	15	14.4
Top	342	9.4	572	10.2	81	14.8	48	16.0	24	23.1
Undercarriage	84	2.3	144	2.6	0	0.0	0	0.0	0	0.0
Unknown	784	21.6	1363	24.2	53	9.7	22	7.3	7	6.7
TOTAL	3632	100.0	5633	100.0	548	100.0	300	100.0	104	100.0



NCSS INJURY RATES BY CASE VEHICLE GENERAL AREA OF DAMAGE

DAMAGE AREA	VEHICLES	TOTAL	OCCUPANTS					
			AIS 2+		AIS 3+		FATAL	
			N	RATE	N	RATE	N	RATE
Front	1753	2602	296	11.4	163	6.3	51	2.0
Right	232	320	38	11.9	25	7.8	6	1.9
Back	62	97	9	9.3	7	7.2	1	1.0
Left	375	535	71	13.3	35	6.5	15	2.8
Top	342	572	81	14.2	48	8.4	24	4.2
Undercarriage	84	144	0	0.0	0	0.0	0	0.0
Unknown	784	1363	53	3.9	22	1.6	7	0.5
OVERALL	3632	5633	548	9.7	300	5.3	104	1.8

NCSS CASE VEHICLES: PRINCIPAL DIRECTION OF FORCE  
BY GENERAL AREA OF DAMAGE

CDC DIRECTION	FRONT DAMAGE	RIGHT DAMAGE	BACK DAMAGE	LEFT DAMAGE	TOP DAMAGE	UNDER- CARRIAGE	UNKNOWN	TOTAL
Non-Horizontal	4	33	0	37	342	84	0	500
1 0'Clock	387	56	0	0	0	0	0	443
2 0'Clock	50	121	0	0	0	0	0	171
3 0'Clock	4	13	0	0	0	0	0	17
4 0'Clock	0	9	0	0	0	0	0	9
5 0'Clock	0	0	2	0	0	0	0	2
6 0'Clock	0	0	60	0	0	0	0	60
7 0'Clock	0	0	0	1	0	0	0	1
8 0'Clock	0	0	0	8	0	0	0	8
9 0'Clock	0	0	0	46	0	0	0	46
10 0'Clock	32	0	0	179	0	0	0	211
11 0'Clock	335	0	0	90	0	0	0	425
12 0'Clock	941	0	0	14	0	0	0	955
Unknown	0	0	0	0	0	0	784	784
TOTAL	1753	232	62	375	342	84	784	3632

NCSS CASE VEHICLES: CDC (COLLISION DEFORMATION CLASS) EXTENT  
BY GENERAL AREA OF DAMAGE

CDC EXTENT	FRONT DAMAGE	RIGHT DAMAGE	BACK DAMAGE	LEFT DAMAGE	TOP DAMAGE	UNDER- CARRIAGE	UNKNOWN	TOTAL
1	521	38	31	32	7	64	0	693
2	636	69	21	32	42	20	0	820
3	229	111	4	258	222	0	0	824
4	133	11	0	49	21	0	0	214
5	60	2	1	2	30	0	0	95
6	88	0	4	2	9	0	0	103
7	37	1	0	0	11	0	0	49
8	21	0	0	0	0	0	0	21
9	28	0	1	0	0	0	0	29
Unknown	0	0	0	0	0	0	784	784
TOTAL	1753	232	62	375	342	84	784	3632

NCSS CASE VEHICLE CDC EXTENT DISTRIBUTIONS  
(FRONTAL AREA DAMAGE)

CDC EXTENT	VEHICLES		OCCUPANTS									
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL			
			N	%	N	%	N	%	N	%		
1	521	29.7	707	27.2	44	14.9	6	3.7	3	5.9		
2	636	36.3	927	35.6	67	22.6	35	21.5	7	13.7		
3	229	13.1	348	13.4	62	20.9	33	20.2	8	15.7		
4	133	7.6	175	6.7	33	11.1	28	17.2	10	19.6		
5	60	3.4	130	5.0	19	6.4	15	9.2	3	5.9		
6	88	5.0	159	6.1	19	6.4	15	9.2	7	13.7		
7	37	2.1	53	2.0	26	8.8	15	9.2	5	9.8		
8	21	1.2	39	1.5	6	2.0	3	1.8	1	2.0		
9	28	1.6	64	2.5	20	6.8	13	8.0	7	13.7		
TOTAL	1753	100.0	2602	100.0	296	100.0	163	100.0	51	100.0		

NCSS INJURY RATES BY CASE VEHICLE CDC EXTENT  
(FRONTAL AREA DAMAGE)

CDC EXTENT	VEHICLES	OCCUPANTS					
		TOTAL	AIS 2+		AIS 3+		FATAL
		N	RATE	N	RATE	N	RATE
1	521	707	6.2	6	0.8	3	0.4
2	636	927	7.2	35	3.8	7	0.8
3	229	348	17.8	33	9.5	8	2.3
4	133	175	18.9	28	16.0	10	5.7
5	60	130	14.6	15	11.5	3	2.3
6	88	159	11.9	15	9.4	7	4.4
7	37	53	49.1	15	28.3	5	9.4
8	21	39	15.4	3	7.7	1	2.6
9	28	64	31.3	13	20.3	7	10.9
OVERALL	1753	2602	11.4	163	6.3	51	2.0

NCSS CASE VEHICLE CDC EXTENT DISTRIBUTIONS  
(SIDE AREA DAMAGE)

CDC EXTENT	VEHICLES		OCCUPANTS							
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL	
			N	%	N	%	N	%	N	%
1	70	11.5	96	11.2	4	3.7	2	3.3	2	9.5
2	101	16.6	134	15.7	5	4.6	4	6.7	0	0.0
3	369	60.8	523	61.2	72	66.1	32	53.3	6	28.6
4	60	9.9	93	10.9	19	17.4	14	23.3	8	38.1
5	4	0.7	4	0.5	4	3.7	3	5.0	1	4.8
6	2	0.3	3	0.4	3	2.8	3	5.0	2	9.5
7	1	0.2	2	0.2	2	1.8	2	3.3	2	9.5
TOTAL	607	100.0	855	100.0	109	100.0	60	100.0	21	100.0

NCSS INJURY RATES BY CASE VEHICLE CDC EXTENT  
(SIDE AREA DAMAGE)

CDC EXTENT	VEHICLES	OCCUPANTS					
		TOTAL	AIS 2+		AIS 3+		FATAL
		N	RATE	N	RATE	N	RATE
1	70	4	4.2	2	2.1	2	2.1
2	101	5	3.7	4	3.0	0	0.0
3	369	72	13.8	32	6.1	6	1.1
4	60	19	20.4	14	15.1	8	8.6
5	4	4	100.0	3	75.0	1	25.0
6	2	3	100.0	3	100.0	2	66.7
7	1	2	100.0	2	100.0	2	100.0
OVERALL	607	109	12.7	60	7.0	21	2.5

NCSS CASE VEHICLE CDC EXTENT DISTRIBUTIONS  
(BACK AREA DAMAGE)

CDC EXTENT	VEHICLES		OCCUPANTS									
	N	%	TOTAL	N	%	AIS 2+	N	%	AIS 3+	N	%	FATAL
1	31	50.0	31	2	22.2	2	1	14.3	0	0	0.0	0
2	21	33.9	35	2	22.2	2	2	28.6	0	0	0.0	0
3	4	6.5	21	4	44.4	4	3	42.9	1	1	100.0	1
5	1	1.6	1	0	0.0	0	0	0.0	0	0	0.0	0
6	4	6.5	8	0	0.0	0	0	0.0	0	0	0.0	0
9	1	1.6	1	1	11.1	1	1	14.3	0	0	0.0	0
TOTAL	62	100.0	97	9	100.0	7	7	100.0	1	1	100.0	1



NCSS INJURY RATES BY CASE VEHICLE CDC EXTENT  
(BACK AREA DAMAGE)

CDC EXTENT	VEHICLES	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
1	31	31	2	6.5	1	3.2	0	0.0	
2	21	35	2	5.7	2	5.7	0	0.0	
3	4	21	4	19.0	3	14.3	1	4.8	
5	1	1	0	0.0	0	0.0	0	0.0	
6	4	8	0	0.0	0	0.0	0	0.0	
9	1	1	1	100.0	1	100.0	0	0.0	
OVERALL	62	97	9	9.3	7	7.2	1	1.0	

NCSS CASE VEHICLE CDC EXTENT DISTRIBUTIONS  
(TOP AREA DAMAGE)

CDC EXTENT	VEHICLES		OCCUPANTS											
	N	%	TOTAL	N	%	AIS 2+	N	%	AIS 3+	N	%	FATAL	N	%
1	7	2.0	10	4	4.9	4	4.9	4	8.3	2	8.3	2	8.3	8.3
2	42	12.3	87	1	1.2	1	1.2	1	2.1	0	0.0	0	0.0	0.0
3	222	64.9	375	46	56.8	19	56.8	19	39.6	8	33.3	8	33.3	33.3
4	21	6.1	31	13	16.0	12	16.0	12	25.0	8	33.3	8	33.3	33.3
5	30	8.8	47	7	8.6	5	8.6	5	10.4	2	8.3	2	8.3	8.3
6	9	2.6	10	8	9.9	6	9.9	6	12.5	4	16.7	4	16.7	16.7
7	11	3.2	12	2	2.5	1	2.5	1	2.1	0	0.0	0	0.0	0.0
TOTAL	342	100.0	572	81	100.0	48	100.0	48	100.0	24	100.0	24	100.0	100.0

NCSS INJURY RATES BY CASE VEHICLE CDC EXTENT  
(TOP AREA DAMAGE)

CDC EXTENT	VEHICLES	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
1	7	10	4	40.0	4	40.0	2	20.0	
2	42	87	1	1.1	1	1.1	0	0.0	
3	222	375	46	12.3	19	5.1	8	2.1	
4	21	31	13	41.9	12	38.7	8	25.8	
5	30	47	7	14.9	5	10.6	2	4.3	
6	9	10	8	80.0	6	60.0	4	40.0	
7	11	12	2	16.7	1	8.3	0	0.0	
OVERALL	342	572	81	14.2	48	8.4	24	4.2	

NCSS CASE VEHICLE CDC EXTENT DISTRIBUTIONS  
(UNDERCARRIAGE AREA DAMAGE)

CDC EXTENT	VEHICLES				OCCUPANTS							
	N	%	TOTAL	AIS 2+	AIS 3+	FATAL	N	%	N	%	N	%
1	64	76.2	124	0	0	0	0	0.0	0	0.0	0	0.0
2	20	23.8	20	0	0	0	0	0.0	0	0.0	0	0.0
TOTAL	84	100.0	144	0	0	0	0	0.0	0	0.0	0	0.0

NCSS INJURY RATES BY CASE VEHICLE CDC EXTENT  
(UNDERCARRIAGE AREA DAMAGE)

CDC EXTENT	VEHICLES	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
1	64	124	0	0.0	0	0.0	0	0.0	
2	20	20	0	0.0	0	0.0	0	0.0	
OVERALL	84	144	0	0.0	0	0.0	0	0.0	



#### 4 OCCUPANTS--LIGHT TRUCKS AND VANS

This section of the report is centered on the occupants of towed light trucks and vans in the NCSS data set. As before, tables are weighted and thus describe the total number of occupants of towed light trucks and vans involved in accidents in the aggregate of the seven NCSS areas during the last twelve months of the study ( April 78 - March 79).

A case vehicle occupant is a person who was an occupant of any light truck or van towed from the scene of the crash because of collision damage. In the following pages, distributions are shown for the reported occupant characteristics--including age, sex, seat location, restraint use, ejection and entrapment, treatment category, injury severity (Overall AIS), and the number of days spent in a hospital.

Injury information is presented in the same format as the previous sections, and the same cautions on missing data apply.

NCSS OCCUPANT DISTRIBUTIONS BY AGE

OCCUPANT AGE (5-Year Groups)	OCCUPANTS		AIS 2+		AIS 3+		FATAL	
	N	%	N	%	N	%	N	%
Infant	8	0.1	3	0.5	2	0.7	1	1.0
01-05 Years	130	2.3	7	1.3	4	1.3	1	1.0
06-10 Years	162	2.9	4	0.7	1	0.3	0	0.0
11-15 Years	193	3.4	20	3.6	8	2.7	2	1.9
16-20 Years	1332	23.6	145	26.5	71	23.7	18	17.3
21-25 Years	1095	19.4	87	15.9	40	13.3	9	8.7
26-30 Years	840	14.9	75	13.7	41	13.7	19	18.3
31-35 Years	440	7.8	44	8.0	28	9.3	11	10.6
36-40 Years	299	5.3	44	8.0	24	8.0	7	6.7
41-45 Years	265	4.7	29	5.3	21	7.0	8	7.7
46-50 Years	243	4.3	18	3.3	12	4.0	3	2.9
51-55 Years	171	3.0	16	2.9	9	3.0	4	3.8
56-60 Years	112	2.0	19	3.5	16	5.3	5	4.8
61-65 Years	63	1.1	15	2.7	8	2.7	4	3.8
66-70 Years	102	1.8	14	2.6	8	2.7	6	5.8
71-75 Years	57	1.0	2	0.4	2	0.7	2	1.9
76-80 Years	18	0.3	2	0.4	2	0.7	2	1.9
Over 80 Years	6	0.1	3	0.5	2	0.7	1	1.0
Unknown	97	1.7	1	0.2	1	0.3	1	1.0
TOTAL	5633	100.0	548	100.0	300	100.0	104	100.0



NCSS INJURY RATES BY OCCUPANT AGE

OCCUPANT AGE (5-Year Groups)	OCCUPANTS	AIS 2+		AIS 3+		FATAL	
		N	RATE	N	RATE	N	RATE
Infant	8	3	37.5	2	25.0	1	12.5
01-05 Years	130	7	5.4	4	3.1	1	0.8
06-10 Years	162	4	2.5	1	0.6	0	0.0
11-15 Years	193	20	10.4	8	4.1	2	1.0
16-20 Years	1332	145	10.9	71	5.3	18	1.4
21-25 Years	1095	87	7.9	40	3.7	9	0.8
26-30 Years	840	75	8.9	41	4.9	19	2.3
31-35 Years	440	44	10.0	28	6.4	11	2.5
36-40 Years	299	44	14.7	24	8.0	7	2.3
41-45 Years	265	29	10.9	21	7.9	8	3.0
46-50 Years	243	18	7.4	12	4.9	3	1.2
51-55 Years	171	16	9.4	9	5.3	4	2.3
56-60 Years	112	19	17.0	16	14.3	5	4.5
61-65 Years	63	15	23.8	8	12.7	4	6.3
66-70 Years	102	14	13.7	8	7.8	6	5.9
71-75 Years	57	2	3.5	2	3.5	2	3.5
76-80 Years	18	2	11.1	2	11.1	2	11.1
Over 80 Years	6	3	50.0	2	33.3	1	16.7
Unknown	97	1	1.0	1	1.0	1	1.0
OVERALL	5633	548	9.7	300	5.3	104	1.8

NCSS OCCUPANT DISTRIBUTIONS BY SEX

SEX	OCCUPANTS		AIS 2+		AIS 3+		FATAL	
	N	%	N	%	N	%	N	%
Male	4505	80.0	417	76.1	229	76.3	81	77.9
Female	1048	18.6	131	23.9	71	23.7	23	22.1
Unknown	80	1.4	0	0.0	0	0.0	0	0.0
TOTAL	5633	100.0	548	100.0	300	100.0	104	100.0

NCSS INJURY RATES BY OCCUPANT SEX

SEX	OCCUPANTS	AIS 2+		AIS 3+		FATAL	
		N	RATE	N	RATE	N	RATE
Male	4505	417	9.3	229	5.1	81	1.8
Female	1048	131	12.5	71	6.8	23	2.2
Unknown	80	0	0.0	0	0.0	0	0.0
OVERALL	5633	548	9.7	300	5.3	104	1.8

NCSS OCCUPANT DISTRIBUTIONS BY SEAT LOCATION

SEAT POSITION	OCCUPANTS		AIS 2+		AIS 3+		FATAL	
	N	%	N	%	N	%	N	%
Driver	3612	64.1	367	67.0	210	70.0	80	76.9
Front Center	360	6.4	32	5.8	18	6.0	7	6.7
Front Right	1254	22.3	114	20.8	58	19.3	13	12.5
Rear Left	57	1.0	7	1.3	2	0.7	0	0.0
Rear Center	53	0.9	4	0.7	3	1.0	0	0.0
Rear Right	68	1.2	4	0.7	1	0.3	0	0.0
Other	229	4.1	20	3.6	8	2.7	4	3.8
TOTAL	5633	100.0	548	100.0	300	100.0	104	100.0

NCSS INJURY RATES BY OCCUPANT SEAT LOCATION

SEAT POSITION	OCCUPANTS	AIS 2+		AIS 3+		FATAL	
		N	RATE	N	RATE	N	RATE
Driver	3612	367	10.2	210	5.8	80	2.2
Front Center	360	32	8.9	18	5.0	7	1.9
Front Right	1254	114	9.1	58	4.6	13	1.0
Rear Left	57	7	12.3	2	3.5	0	0.0
Rear Center	53	4	7.5	3	5.7	0	0.0
Rear Right	68	4	5.9	1	1.5	0	0.0
Other	229	20	8.7	8	3.5	4	1.7
OVERALL	5633	548	9.7	300	5.3	104	1.8

NCSS OCCUPANT DISTRIBUTIONS BY RESTRAINT USE

RESTRAINT USE	OCCUPANTS		AIS 2+		AIS 3+		FATAL	
	N	%	N	%	N	%	N	%
Not Used	4610	81.8	480	87.6	269	89.7	94	90.4
Lap and Torso	27	0.5	0	0.0	0	0.0	0	0.0
Lap Only	97	1.7	12	2.2	3	1.0	0	0.0
Child Seat	11	0.2	1	0.2	1	0.3	0	0.0
Not Installed	583	10.3	45	8.2	23	7.7	7	6.7
Unknown	305	5.4	10	1.8	4	1.3	3	2.9
TOTAL	5633	100.0	548	100.0	300	100.0	104	100.0

NCSS INJURY RATES BY OCCUPANT RESTRAINT USE

RESTRAINT USE	OCCUPANTS	AIS 2+		AIS 3+		FATAL	
		N	RATE	N	RATE	N	RATE
Not Used	4610	480	10.4	269	5.8	94	2.0
Lap and Torso	27	0	0.0	0	0.0	0	0.0
Lap Only	97	12	12.4	3	3.1	0	0.0
Child Seat	11	1	9.1	1	9.1	0	0.0
Not Installed	583	45	7.7	23	3.9	7	1.2
Unknown	305	10	3.3	4	1.3	3	1.0
OVERALL	5633	548	9.7	300	5.3	104	1.8

NCSS OCCUPANT DISTRIBUTIONS BY EJECTION AND ENTRAPMENT

EJECTION/ENTRAPMENT	OCCUPANTS		AIS 2+		AIS 3+		FATAL	
	N	%	N	%	N	%	N	%
None	5030	89.3	383	69.9	166	55.3	36	34.6
Total Ejection	169	3.0	71	13.0	55	18.3	29	27.9
Partial Ejection	34	0.6	10	1.8	7	2.3	4	3.8
Entrapped	32	0.6	23	4.2	22	7.3	12	11.5
Other	1	0.0	1	0.2	1	0.3	0	0.0
Unknown	367	6.5	60	10.9	49	16.3	23	22.1
TOTAL	5633	100.0	548	100.0	300	100.0	104	100.0



NCSS INJURY RATES BY OCCUPANT EJECTION AND ENTRAPMENT

EJECTION/ENTRAPMENT	OCCUPANTS	AIS 2+		AIS 3+		FATAL	
		N	RATE	N	RATE	N	RATE
None	5030	383	7.6	166	3.3	36	0.7
Total Ejection	169	71	42.0	55	32.5	29	17.2
Partial Ejection	34	10	29.4	7	20.6	4	11.8
Entrapped	32	23	71.9	22	68.8	12	37.5
Other	1	1	100.0	1	100.0	0	0.0
Unknown	367	60	16.3	49	13.4	23	6.3
OVERALL	5633	548	9.7	300	5.3	104	1.8

NCSS OCCUPANT DISTRIBUTIONS BY TREATMENT CATEGORY

TREATMENT	OCCUPANTS		AIS 2+		AIS 3+		FATAL	
	N	%	N	%	N	%	N	%
FATAL	104	1.8	104	19.0	103	34.3	104	100.0
INJURED								
Hospitalized	422	7.5	276	50.4	166	55.3	0	0.0
Transported	1066	18.9	148	27.0	31	10.3	0	0.0
Other Treatment	484	8.6	20	3.6	0	0.0	0	0.0
NOT TRANSPORTED								
Treatment Unknown	289	5.1	0	0.0	0	0.0	0	0.0
No Treatment	3237	57.5	0	0.0	0	0.0	0	0.0
UNKNOWN	31	0.6	0	0.0	0	0.0	0	0.0
TOTAL	5633	100.0	548	100.0	300	100.0	104	100.0

NCSS INJURY RATES BY OCCUPANT TREATMENT CATEGORY

TREATMENT	OCCUPANTS	AIS 2+		AIS 3+		FATAL	
		N	RATE	N	RATE	N	RATE
FATAL	104	104	100.0	103	99.0	104	100.0
INJURED							
Hospitalized	422	276	65.4	166	39.3	0	0.0
Transported	1066	148	13.9	31	2.9	0	0.0
Other Treatment	484	20	4.1	0	0.0	0	0.0
NOT TRANSPORTED							
Treatment Unknown	289	0	0.0	0	0.0	0	0.0
No Treatment	3237	0	0.0	0	0.0	0	0.0
UNKNOWN	31	0	0.0	0	0.0	0	0.0
OVERALL	5633	548	9.7	300	5.3	104	1.8

NCSS OCCUPANT DISTRIBUTIONS BY INJURY SEVERITY  
(OVERALL AIS)

INJURY SEVERITY	OCCUPANTS		AIS 2+		AIS 3+		FATAL	
	N	%	N	%	N	%	N	%
0 Not Injured	2639	46.8	0	0.0	0	0.0	0	0.0
1 Minor	849	15.1	0	0.0	0	0.0	0	0.0
2 Moderate	248	4.4	248	45.3	0	0.0	1	1.0
3 Severe	142	2.5	142	25.9	142	47.3	2	1.9
4 Serious	50	0.9	50	9.1	50	16.7	5	4.8
5 Critical	31	0.6	31	5.7	31	10.3	19	18.3
6 Maximum--Fatal	16	0.3	16	2.9	16	5.3	16	15.4
7 Injured/Unk Sev	680	12.1	58	10.6	58	19.3	58	55.8
Unknown	978	17.4	3	0.5	3	1.0	3	2.9
TOTAL	5633	100.0	548	100.0	300	100.0	104	100.0

NCSS INJURY RATES BY OCCUPANT INJURY SEVERITY  
(OVERALL AIS)

INJURY SEVERITY	OCCUPANTS	AIS 2+		AIS 3+		FATAL	
		N	RATE	N	RATE	N	RATE
0 Not Injured	2639	0	0.0	0	0.0	0	0.0
1 Minor	849	0	0.0	0	0.0	0	0.0
2 Moderate	248	248	100.0	0	0.0	1	0.4
3 Severe	142	142	100.0	142	100.0	2	1.4
4 Serious	50	50	100.0	50	100.0	5	10.0
5 Critical	31	31	100.0	31	100.0	19	61.3
6 Maximum--Fatal	16	16	100.0	16	100.0	16	100.0
7 Injured/Unk Sev	680	58	8.5	58	8.5	58	8.5
Unknown	978	3	0.3	3	0.3	3	0.3
OVERALL	5633	548	9.7	300	5.3	104	1.8

NCSS OCCUPANT DISTRIBUTIONS BY DAYS SPENT IN HOSPITAL

DAYS IN HOSPITAL	OCCUPANTS		AIS 2+		AIS 3+		FATAL	
	N	%	N	%	N	%	N	%
None*	5181	92.0	261	47.6	123	41.0	93	89.4
1 Day	68	1.2	35	6.4	8	2.7	2	1.9
2 Days	51	0.9	23	4.2	7	2.3	0	0.0
3 Days	32	0.6	24	4.4	10	3.3	1	1.0
4-7 Days	95	1.7	76	13.9	47	15.7	3	2.9
8-14 Days	54	1.0	44	8.0	35	11.7	3	2.9
15-21 Days	13	0.2	10	1.8	8	2.7	0	0.0
22-300 Days	48	0.9	41	7.5	39	13.0	0	0.0
Unknown	91	1.6	34	6.2	23	7.7	2	1.9
TOTAL	5633	100.0	548	100.0	300	100.0	104	100.0

\*This category includes 93 occupants who died on the day of the accident.

NCSS INJURY RATES BY OCCUPANT DAYS SPENT IN HOSPITAL

DAYS IN HOSPITAL	OCCUPANTS	AIS 2+		AIS 3+		FATAL	
		N	RATE	N	RATE	N	RATE
None*	5181	261	5.0	123	2.4	93	1.8
1 Day	68	35	51.5	8	11.8	2	2.9
2 Days	51	23	45.1	7	13.7	0	0.0
3 Days	32	24	75.0	10	31.3	1	3.1
4-7 Days	95	76	80.0	47	49.5	3	3.2
8-14 Days	54	44	81.5	35	64.8	3	5.6
15-21 Days	13	10	76.9	8	61.5	0	0.0
22-300 Days	48	41	85.4	39	81.3	0	0.0
Unknown	91	34	37.4	23	25.3	2	2.2
OVERALL	5633	548	9.7	300	5.3	104	1.8

\*This category includes 93 occupants who died on the day of the accident.





## 5 CRASH SEVERITY (DELTA V)--LIGHT TRUCKS AND VANS

A unique feature of the NCSS data set is the inclusion of a crash severity measure estimating the instantaneous change of velocity for each vehicle during the impact phase. This quantity, referred to as Delta V, is computed from a combination of information about the collision configuration (from the Collision Deformation Classification code), the crush measurements (as provided by the investigator), and certain vehicle parameters (size, weight, and stiffness). Certain crashes, such as those involving principal rollover or other non-horizontal motions, cannot have a value for Delta V computed. In other cases, the investigators were not able to gather sufficient information for the full computation. The computer algorithm<sup>4</sup> which calculates Delta V is the CRASH2 program.

For approximately 40% of the light trucks and vans investigated during the last twelve months of the NCSS program, a value for Delta V has been computed and recorded in the computerized file. The Delta V distributions shown in this section for light trucks and vans may be biased because of the missing cases. Reasons for missing data include: a low-severity

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<sup>4</sup>For further detail, see R. R. McHenry and J. P. Lynch, CRASH2 USERS MANUAL, DOT/HS 802-106, November 1976.

<sup>5</sup>All the values presented here resulted from the "damage only" runs of the CRASH2 algorithm.

crash in which the "other vehicle" was so lightly damaged that it was unavailable to the investigator for inspection, or complex multiple impacts in severe crashes for which the damage dimension assignable to the initial impact could not be determined. The first of these might bias the distribution shown here toward higher Delta V's, while the second might move the Delta V distribution toward lower values. Further, the data used to represent pickup trucks in running the CRASH2 program were evidently taken from passenger car experience, and this would likely make the calculated Delta V's lower than the actual values.

The first ten pages show the cumulative frequency distribution and injury rates for occupants of light trucks and vans with different damage areas. Pages 78 and 79 show the frequency distribution of Delta V for rural versus urban accident locations, and for restrained and unrestrained occupants. Substantial differences in the distribution of Delta V for rural and urban accident locations are shown.

NCSS CASE VEHICLE SEVERITY DISTRIBUTIONS\*  
(FRONT, SIDE, AND BACK DAMAGE COMBINED)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES		OCCUPANTS									
	N	%	TOTAL	AIS 2+	AIS 3+	FATAL	N	%	N	%	N	%
1-10 MPH	820	56.4	1188	38	17	4	11.1					
11-20 MPH	512	35.2	731	85	49	8	22.2					
21-30 MPH	93	6.4	121	66	31	9	25.0					
31-40 MPH	19	1.3	38	24	19	7	19.4					
41-50 MPH	7	0.5	24	17	13	7	19.4					
51-60 MPH	2	0.1	6	4	4	1	2.8					
TOTAL	1453	100.0	2108	234	133	36	100.0	100.0	100.0	100.0	100.0	100.0

\*Not shown in this tabulation are 969 case vehicles (40%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.

NCSS INJURY RATES BY CRASH SEVERITY\*  
(FRONT, SIDE, AND BACK DAMAGE COMBINED)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
1-10 MPH	820	1188	38	3.2	17	1.4	4	0.3	
11-20 MPH	512	731	85	11.6	49	6.7	8	1.1	
21-30 MPH	93	121	66	54.5	31	25.6	9	7.4	
31-40 MPH	19	38	24	63.2	19	50.0	7	18.4	
41-50 MPH	7	24	17	70.8	13	54.2	7	29.2	
51-60 MPH	2	6	4	66.7	4	66.7	1	16.7	
OVERALL	1453	2108	234	11.1	133	6.3	36	1.7	

\*Not shown in this tabulation are 969 case vehicles (40%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.

Crash Severity (Delta V)  
Light Trucks and Vans

NCSS CASE VEHICLE CRASH SEVERITY DISTRIBUTIONS\*  
(FRONTAL DAMAGE ONLY)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES		OCCUPANTS							
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL	
			N	%	N	%	N	%	N	%
1-10 MPH	610	57.8	867	56.1	25	14.5	6	5.8	2	6.9
11-20 MPH	368	34.9	544	35.2	74	42.8	42	40.4	7	24.1
21-30 MPH	52	4.9	72	4.7	32	18.5	23	22.1	6	20.7
31-40 MPH	17	1.6	35	2.3	24	13.9	19	18.3	7	24.1
41-50 MPH	6	0.6	21	1.4	14	8.1	10	9.6	6	20.7
51-60 MPH	2	0.2	6	0.4	4	2.3	4	3.8	1	3.4
TOTAL	1055	100.0	1545	100.0	173	100.0	104	100.0	29	100.0

\*Not shown in this tabulation are 698 case vehicles (40%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.

NCSS INJURY RATES BY CRASH SEVERITY\*  
(FRONTAL DAMAGE ONLY)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES	OCCUPANTS						
		TOTAL	N	AIS 2+ RATE	N	AIS 3+ RATE	N	FATAL RATE
1-10 MPH	610	867	25	2.9	6	0.7	2	0.2
11-20 MPH	368	544	74	13.6	42	7.7	7	1.3
21-30 MPH	52	72	32	44.4	23	31.9	6	8.3
31-40 MPH	17	35	24	68.6	19	54.3	7	20.0
41-50 MPH	6	21	14	66.7	10	47.6	6	28.6
51-60 MPH	2	6	4	66.7	4	66.7	1	16.7
OVERALL	1055	1545	173	11.2	104	6.7	29	1.9

\*Not shown in this tabulation are 698 case vehicles (40%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.

NCSS CASE VEHICLE CRASH SEVERITY DISTRIBUTIONS\*  
(RIGHT-SIDE DAMAGE ONLY)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES		OCCUPANTS							
	N	%	TOTAL	AIS 2+	AIS 3+	FATAL	N	%	N	%
1-10 MPH	68	53.5	108	61.7	10	62.5	8	72.7	0	0.0
11-20 MPH	55	43.3	61	34.9	4	25.0	2	18.2	1	100.0
21-30 MPH	3	2.4	5	2.9	2	12.5	1	9.1	0	0.0
31-40 MPH	1	0.8	1	0.6	0	0.0	0	0.0	0	0.0
TOTAL	127	100.0	175	100.0	16	100.0	11	100.0	1	100.0

\*Not shown in this tabulation are 105 case vehicles (45%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.

NCSS INJURY RATES BY CRASH SEVERITY\*  
(RIGHT-SIDE DAMAGE ONLY)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES		OCCUPANTS					
	TOTAL	N	AIS 2+ RATE	N	AIS 3+ RATE	N	FATAL RATE	
1-10 MPH	68	10	9.3	8	7.4	0	0.0	
11-20 MPH	55	4	6.6	2	3.3	1	1.6	
21-30 MPH	3	2	40.0	1	20.0	0	0.0	
31-40 MPH	1	0	0.0	0	0.0	0	0.0	
OVERALL	127	16	9.1	11	6.3	1	0.6	

\*Not shown in this tabulation are 105 case vehicles (45%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.

NCSS CASE VEHICLE CRASH SEVERITY DISTRIBUTIONS\*  
(LEFT-SIDE DAMAGE ONLY)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES		OCCUPANTS							
	N	%	TOTAL		AIS 2+		AIS 3+		FATAL	
			N	%	N	%	N	%	N	%
1-10 MPH	103	46.8	164	51.9	3	6.8	3	17.6	2	33.3
11-20 MPH	77	35.0	103	32.6	6	13.6	4	23.5	0	0.0
21-30 MPH	38	17.3	44	13.9	32	72.7	7	41.2	3	50.0
31-40 MPH	1	0.5	2	0.6	0	0.0	0	0.0	0	0.0
41-50 MPH	1	0.5	3	0.9	3	6.8	3	17.6	1	16.7
TOTAL	220	100.0	316	100.0	44	100.0	17	100.0	6	100.0

\*Not shown in this tabulation are 155 case vehicles (41%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.



NCSS INJURY RATES BY CRASH SEVERITY\*  
(LEFT-SIDE DAMAGE ONLY)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES	OCCUPANTS							
		TOTAL	AIS 2+		AIS 3+		FATAL		
			N	RATE	N	RATE	N	RATE	
1-10 MPH	103	164	3	1.8	3	1.8	2	1.2	
11-20 MPH	77	103	6	5.8	4	3.9	0	0.0	
21-30 MPH	38	44	32	72.7	7	15.9	3	6.8	
31-40 MPH	1	2	0	0.0	0	0.0	0	0.0	
41-50 MPH	1	3	3	100.0	3	100.0	1	33.3	
OVERALL	220	316	44	13.9	17	5.4	6	1.9	

\*Not shown in this tabulation are 155 case vehicles (41%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.

NCSS CASE VEHICLE CRASH SEVERITY DISTRIBUTIONS\*  
(BACK DAMAGE ONLY)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES		OCCUPANTS									
	N	%	TOTAL	AIS 2+	AIS 3+	FATAL	N	%	N	%	N	%
1-10 MPH	39	76.5	49	68.1	0	0.0	0	0.0	0	0.0	0	0.0
11-20 MPH	12	23.5	23	31.9	1	100.0	1	100.0	1	100.0	0	0.0
TOTAL	51	100.0	72	100.0	1	100.0	1	100.0	1	100.0	0	0.0

\*Not shown in this tabulation are 11 case vehicles (18%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.

NCSS INJURY RATES BY CRASH SEVERITY\*  
(BACK DAMAGE ONLY)

TOTAL DELTA V IN 10 MPH GROUPS	VEHICLES	OCCUPANTS							
		TOTAL		AIS 2+		AIS 3+		FATAL	
		N	RATE	N	RATE	N	RATE	N	RATE
1-10 MPH	39	49	0.0	0	0.0	0	0.0	0	0.0
11-20 MPH	12	23	4.3	1	4.3	1	4.3	0	0.0
OVERALL	51	72	1.4	1	1.4	1	1.4	0	0.0

\*Not shown in this tabulation are 11 case vehicles (18%) which are missing data for Delta V because there was insufficient information for the calculation, or the CRASH program algorithm was not applicable.

CRASH SEVERITY (DELTA V) BY RURAL/URBAN

DELTA V	RURAL	URBAN	TOTAL
1-10 MPH (ROW %) (COL %)	171 20.6 42.2	659 79.4 62.2	830 100.0 56.7
11-20 MPH (ROW %) (COL %)	183 35.7 45.2	330 64.3 31.2	513 100.0 35.0
21-30 MPH (ROW %) (COL %)	30 32.3 7.4	63 67.7 5.9	93 100.0 6.4
31-40 MPH (ROW %) (COL %)	12 63.2 3.0	7 36.8 0.7	19 100.0 1.3
41-50 MPH (ROW %) (COL %)	7 100.0 1.7	0 0.0 0.0	7 100.0 0.5
51-60 MPH (ROW %) (COL %)	2 100.0 0.5	0 0.0 0.0	2 100.0 0.1
TOTAL (ROW %) (COL %)	405 27.7 100.0	1059 72.3 100.0	1464 100.0 100.0

CRASH SEVERITY (DELTA V) BY RESTRAINT USAGE

DELTA V	UNRESTRAINED	RESTRAINED	NOT EQUIPPED	UNKNOWN	TOTAL
1-10 MPH	978	40	179	10	1207
(ROW %)	81.0	3.3	14.8	0.8	100.0
(COL %)	54.8	74.1	68.1	37.0	56.7
11-20 MPH	649	6	66	11	732
(ROW %)	88.7	0.8	9.0	1.5	100.0
(COL %)	36.4	11.1	25.1	40.7	34.4
21-30 MPH	103	6	9	3	121
(ROW %)	85.1	4.9	7.4	2.5	100.0
(COL %)	5.8	11.1	3.4	11.1	5.7
31-40 MPH	33	2	0	3	38
(ROW %)	86.8	5.2	0.0	7.9	100.0
(COL %)	1.8	3.7	0.0	11.1	1.8
41-50 MPH	16	0	8	0	24
(ROW %)	66.7	0.0	33.3	0.0	100.0
(COL %)	0.9	0.0	3.0	0.0	1.1
51-60 MPH	5	0	1	0	6
(ROW %)	83.3	0.0	16.7	0.0	100.0
(COL %)	0.3	0.0	0.4	0.0	0.3
TOTAL	1784	54	263	27	2128
(ROW %)	83.8	0.7	12.4	1.3	100.0
(COL %)	100.0	100.0	100.0	100.0	100.0



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