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of Transportation
National Highway
Traffic Safety
Administration

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**SAFETY PROGRAMS FOR LIGHT TRUCKS
AND SPORT UTILITY VEHICLES**

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1990

U.S. Department of Transportation
National Highway Traffic Safety Administration
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NOTE:

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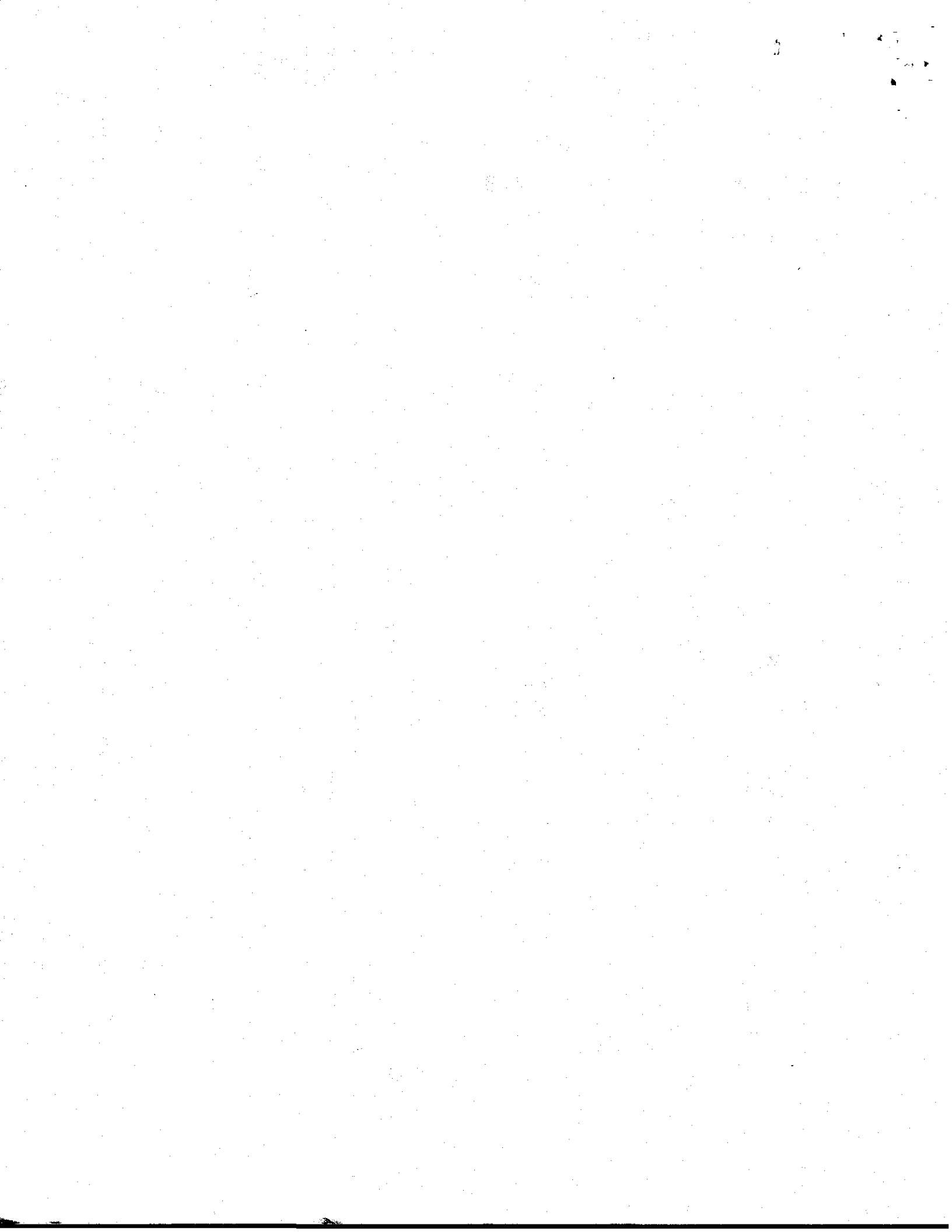
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I: EXECUTIVE SUMMARY

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The National Highway Traffic Safety Administration (NHTSA) administers the Federal government's programs to promote safe driving and safe vehicles, and is vitally concerned with all aspects of highway safety, including the Federal motor vehicle safety regulations applicable to light trucks and vans (LTVs).¹

In light of the substantial growth in LTV sales in recent years, NHTSA has been upgrading the safety standards for those vehicles, as well as for passenger cars. The agency is also continuing to emphasize the critical importance of following basic highway safety rules -- such as driving sober, using safety belts, and observing speed limits -- for all motorists in LTVs, as well as in other vehicles.

Our traffic crash data indicate that when the number of occupant deaths in cars and LTVs is compared to the number of registered vehicles, the resulting fatality rates for the two groups are virtually identical. However, there are differences among the sub-classes of LTVs, and differences according to type of crash involvement. While LTVs already have a safety record comparable to cars, NHTSA believes there are some opportunities to improve that record by upgrading vehicle safety. Most of the agency's passenger car safety standards have applied to LTVs for many years. However there are a few which do not. The agency is committed to broaden those regulations where appropriate.

The design and the applicability of light trucks began to change in the 1970's with a trend toward greater passenger use of light trucks and a shift toward more compact vehicles. Consequently NHTSA began in the late 1970's to extend the applicability of its passenger car Federal Motor Vehicle Safety Standards (FMVSSs) to light trucks.

To improve the protection provided to LTV occupants in a crash, the agency extended two crashworthiness standards to those vehicles: FMVSS No. 212, Windshield Mounting - which set windshield retention requirements, and FMVSS No. 219, Windshield Zone Intrusion - which regulates the intrusion of vehicle parts from outside the occupant compartment into a defined zone in front of the windshield during a frontal barrier crash test.

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Throughout this report "LTVs" is used as a general term referring to truck and sport utility vehicles with a gross vehicle weight rating of 10,000 pounds or less, including pickup trucks, mini-vans, and full-size vans.

Subsequently the agency also extended to LTVs FMVSS No. 115, Vehicle Identification Number - which requires a unique identification number on each vehicle to reduce the number and seriousness of vehicle accidents by increasing the accuracy and efficiency of vehicle recall campaigns.

During the late 1970's and early 1980's, to further improve the ability of LTVs to avoid crashes and to protect occupants when crashes occur, the agency extended three other crashworthiness standards to LTVs: FMVSS No. 201, Occupant Protection in Interior Impacts - which requires better instrument panel padding, FMVSS No. 203, Impact Protection for the Driver From the Steering Control - requiring the use of energy absorbing steering columns, and FMVSS No. 204, Steering Control Rearward Displacement - which requires limits on the rearward movement of the steering wheel in vehicles with an unloaded weight of 4000 pounds or less. The agency also extended the requirements of its hydraulic brake standard, FMVSS No. 105 Hydraulic Brake Systems, to LTVs. In addition, the standard on Theft Protection (FMVSS No. 114) was extended to LTVs to reduce incidents of theft and subsequent disproportionate involvement of those stolen vehicles in injury producing accidents.

More recently, during the period 1987 - 1988, NHTSA extended to LTVs the requirements of FMVSS No. 208, Occupant Crash Protection -- Dynamic Testing of Safety Belts - which set 30 mile/hour crash test criteria for manual safety belt performance, and FMVSS No. 118, Power-Operated Windows, which is essentially for the protection of children. The agency has also completed action to extend FMVSS No. 204, Steering Column Rearward Displacement, to LTVs with an unloaded weight of up to 5500 pounds or a gross vehicle weight of 10,000 pounds or less.

Since his confirmation, Transportation Secretary Samuel K. Skinner has continued to place a high priority on the safety of all transportation systems, including rulemaking for additional LTV safety standards. In a letter dated June 29, 1989, to the Honorable Ernest F. Hollings, Chairman, Senate Committee on Commerce, Science, and Transportation, the Secretary committed the Department to prompt regulatory action in five specific areas for LTVs -- Head Restraints, Side-Impact Protection, Roof-Crush Resistance, Rear-Seat Lap/Shoulder Belts, and Automatic Crash Protection.

The Department has honored these commitments to the Senate. On September 25, 1989, the agency published a final rule to extend to LTVs FMVSS No. 202, Head Restraints - to reduce the frequency and severity of neck injuries in rear-end and other collisions. On November 2, 1989, the agency also published a final rule to extend to LTVs FMVSS No. 208, Occupant Crash Protection -- Rear-Seat Lap/Shoulder Belts - to provide more effective crash protection to occupants of these vehicles. At the same time, the

agency also proposed to extend the requirements for FMVSS No. 216, Roof Crush Resistance, to LTVs, with final action expected in the summer of 1990. More recently, the agency published on December 22, 1989 a Notice of Proposed Rulemaking (NPRM) proposing to extend FMVSS No. 214, Side-Door Strength to LTVs. A decision on a final rule is expected in the fall of 1990. Finally, the agency published on January 9, 1990 a proposal with regard to FMVSS No. 208, Occupant Crash Protection -- Front-Seat Automatic Crash Protection. In this rulemaking, the agency proposes to extend the automatic crash protection requirements (i.e., air bags or automatic safety belts) to LTVs. A decision on a final rule is expected in the fall of 1990.

In addition, the agency intends to initiate rulemaking for LTVs in two other areas. One is FMVSS No. 108, Lamps, Reflective Devices, and Associated Equipment -- Center High Mounted Stop Lamps, to require those lamps on LTVs. A proposal is expected in the spring of 1990.

Also, NHTSA has already granted a petition for rulemaking to develop a rollover protection standard for all passenger cars, as well as for LTVs and has a comprehensive data collection and research program underway to provide the basis for an effective regulation. Most of the crash avoidance research should be completed by mid-1990.

Assuming that these recently accomplished and pending rulemakings are fully implemented throughout the fleet of LTVs, NHTSA estimates that approximately 2,200 lives will be saved and approximately 101,400 injuries will be prevented or reduced in severity annually. This does not include an estimate of potential savings due to rollover protection rulemaking which is still in the research stage.

This report summarizes the agency's safety regulatory activities which are planned or recently completed, as well as research to further improve the safety of LTVs. This report also updates the information in the April 1988 report titled "Safety Programs for Light Trucks and Multipurpose Passenger Vehicles" which was presented to the Committees on Appropriations, U.S. House of Representatives, and U.S. Senate, and which described occupant containment and protection rulemaking and research for LTVs.

SUMMARY OF EXTENSION OF PASSENGER CAR STANDARDS TO LTVs
SINCE 1978

STANDARD	DATE PUBLISHED	DATE EFFECTIVE
105 Hydraulic Brake Systems	Jan. 1981	Sept. 1, 1983
108 NPRM Lamps, Reflective Devices, and Associated Equipment (Center High Mounted Stop Lamps)	----- Dec. 1980	Pending Sept. 1, 1983
114 Theft Protection	Aug. 1978	Sept. 1, 1980
115 Vehicle Identification Number	June 1988	Dec. 21, 1988
118 Power-Operated Window System		
201 Occupant Protection in Interior Impact	Nov. 1979 Sept. 1989	Sept. 1, 1981 Sept. 1, 1991
202 Head Restraints		
203 Impact Protection for the Driver From the Steering Control System	Nov. 1979	Sept. 1, 1981
204 Steering Control Rearward Displacement		
a. Vehicles with a unloaded weight of 4000 pounds or less	Nov. 1979	Sept. 1, 1981
b. Vehicles with a unloaded weight of 5,500 pounds or less	Nov. 1987	Sept. 1, 1991
208 Occupant Crash Protection		
a. Dynamic crash test of seat belts	Nov. 1987 Nov. 1989	Sept. 1, 1991 Sept. 1, 1991
b. Rear-seat lap/shoulder belts		
c. NPRM automatic occupant protection	Jan. 1990	Sept. 1, 1993 (Proposed)
212 Windshield Mounting		
a. Vehicles with a GVWR of 10,000 pounds or less	Aug. 1976	Sept. 1, 1977
b. Vehicles with an unloaded weight of 5,500 pounds or less	April 1980 Dec. 1989	April 3, 1980 Sept. 1, 1992 (Proposed)
214 NPRM Side Door Strength	Nov. 1989	Sept. 1, 1991 (Proposed)
216 NPRM Roof Crush Resistance		
219 Windshield Zone Intrusion		
a. Vehicles with a GVWR of 10,000 pounds or less	June 1975	Sept. 1, 1976
b. Vehicles with an unloaded weight of 5,500 pounds or less	April 1980	April 3, 1980

II: BACKGROUND

In NHTSA's early years, the agency's regulatory and research approach was based on a clear distinction between the design and intended purpose of passenger cars and light trucks. Unlike passenger cars, light trucks were viewed as being designed and used primarily as cargo-carrying vehicles rather than as people-carrying vehicles. In addition, because light trucks were structurally different than passenger cars, the agency anticipated that occupants of light trucks would not be as vulnerable to injuries as passenger car occupants. Also, car occupants suffered far more deaths and injuries than did occupants of light trucks. Thus, the initial federal motor vehicle safety standards concentrated on requirements for passenger cars, to reduce deaths and injuries in those vehicles.

However, the trend in recent years has been toward more purchases and more passenger-oriented use of LTVs. Between 1970 and 1988 the number of registered LTVs increased from 14.2 to 37.1 million, a 161 percent increase². This compares to an increase in registered passenger cars of 58 percent over the same period. In terms of total vehicle miles of travel, small truck travel increased 256 percent while total travel by passenger cars increased only 56 percent. Therefore, not only were people purchasing more of these vehicles, but the miles per vehicle were increasing in contrast to relatively stable miles per vehicle for passenger cars.

NHTSA responded to this shift starting in the late 1970s, when the agency extended the applicability of several passenger car standards to light trucks and sport utility vehicles. This response has continued since that time, resulting in the high priority rulemakings discussed in this report.

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Federal Highway Administration annual data for the 2 axle-4 tire truck class of vehicle, which closely corresponds to the class of vehicle in this report.

This report is divided into three major sections. The first provides crash data analyses for the years 1985 through 1988 (the latest complete year for which data are available). The second section describes the regulatory activities directed at LTV safety, many of which were previously mentioned in the April 1988 report. The third section provides information on supporting research in LTV safety.

III: CRASH DATA ANALYSIS

This section expands on the April 1988 report, and presents and comments on fatality rates (vehicle occupant fatalities per million registered vehicles) for light trucks and cars by vehicle size and crash mode for 1985 through 1988. The fatality data and analyses are based on information from the Fatal Accident Reporting System (FARS). The vehicle registration data are from R. L. Polk & Co.

Table 1 combines the data for the years 1985 through 1988 to provide an overall perspective. Tables 2a through 2d address overall fatality rates, Tables 3a through 3d summarize distribution of fatalities by crash mode, and Tables 4a to 4d through 7a to 7d are by crash mode: rollover, frontal, side, and rear, respectively.

Tables 2a through 2d present fatality rates and normalized fatality rates³ for subcategories of cars and light trucks. Since the fatality rates are based on measure of exposure (number of registered vehicles), the rates can be compared to provide the relative risk of being killed in various types of vehicles. The normalized fatality rates enable one to make the direct comparison of vehicle types more easily.

The following are the conclusions drawn from the tables showing fatalities per registered vehicle.

- * The fatality rate for all light trucks is not appreciably different than it is for passenger cars, and the rates for four out five types of LTVs are lower than for either small or medium sized passenger cars.
- * The fatality rates for small and standard pickup trucks are higher than the average for LTVs; the rate for small pickups is 35 percent higher than the overall average for passenger cars and 12 percent higher than the rate for small cars.
- * The fatality rate for vans, including minivans, is less than the LTV average rate, and is only slightly higher than the rate for large cars.

³The normalized fatality rate (column four) is developed by using the third column fatality rate, "Fatalities/Million Registered Vehicle," and dividing the fatality rate for each type of vehicle by the fatality rate for total vehicles, i.e., the last line in column three.

TABLE 1

1985 - 1988 COMBINED YEARS' DATA
(NATIONAL DATA)

FATALITIES PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	58,871	233,531	252.1	1.2
MEDIUM CAR	22,273	97,872	227.6	1.1
LARGE CAR	17,198	139,919	122.9	0.6
SMALL VAN	736	6,116	120.3	0.6
STANDARD VAN	2,965	21,627	137.1	0.7
TOTAL VAN	3,701	27,743	133.4	0.6
SMALL PICKUP	8,302	29,386	282.5	1.4
STANDARD PICKUP	14,188	65,300	217.3	1.0
SPORT UTILITY VEHICLE	3,935	21,090	186.6	0.9
TOTAL CARS	98,342	471,322	208.6	1.0
TOTAL LT. TRUCKS	30,126	143,519	209.9	1.0
TOTAL	128,468	614,841	208.9	1.0

Table 2a (1988 NATIONAL DATA)
FATALITIES PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	15,917	66,264	240.2	1.1
MEDIUM CAR	6,029	25,593	235.6	1.1
LARGE CAR	3,745	29,662	126.3	0.6
SMALL VAN	238	2,480	96.0	0.5
STANDARD VAN	737	5,549	132.8	0.6
SMALL PICKUP	2,471	8,988	274.9	1.3
STANDARD PICKUP	3,706	15,924	232.7	1.1
SPORT UTILITY VEHICLE	1,062	5,147	206.3	1.0
TOTAL CARS	25,691	121,519	211.4	1.0
TOTAL LT TRUCKS	8,214	38,088	215.7	1.0
TOTAL	33,905	159,267	212.4	1.0

Table 2b (1987 NATIONAL DATA)
FATALITIES PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	15,239	59,856	254.6	1.2
MEDIUM CAR	5,639	25,349	222.5	1.1
LARGE CAR	4,098	34,364	119.3	0.6
SMALL VAN	195	1,713	113.8	0.5
STANDARD VAN	765	5,451	140.3	0.7
SMALL PICKUP	2,191	7,844	279.3	1.3
STANDARD PICKUP	3,698	16,327	226.5	1.1
SPORT UTILITY VEHICLE	1,026	4,491	228.5	1.1
TOTAL CARS	24,976	119,569	208.9	1.0
TOTAL LT TRUCKS	7,875	35,826	219.8	1.0
TOTAL	32,851	155,395	211.4	1.0

Table 2c (1986 NATIONAL DATA)
FATALITIES PER REGISTERED VEHICLE

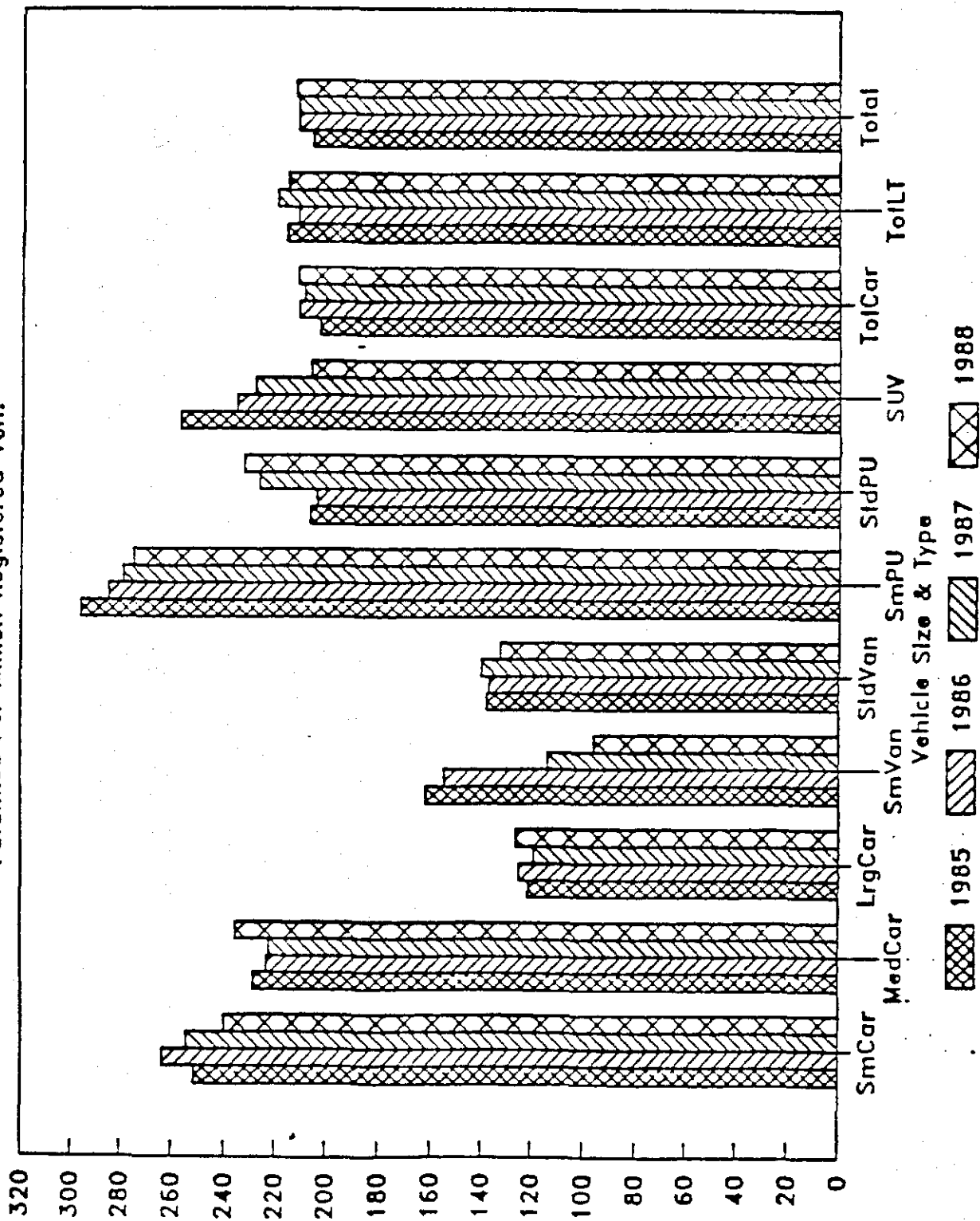
VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	14,514	54,988	263.9	1.2
MEDIUM CAR	5,528	24,738	223.5	1.1
LARGE CAR	4,670	37,284	125.3	0.6
SMALL VAN	188	1,213	154.9	0.7
STANDARD VAN	741	5,404	137.1	0.6
SMALL PICKUP	1,954	6,861	284.8	1.3
STANDARD PICKUP	3,442	16,870	204.0	1.0
SPORT UTILITY VEHICLE	949	4,027	235.7	1.1
TOTAL CARS	24,712	117,010	211.2	1.0
TOTAL LT TRUCKS	7,274	34,376	211.6	1.0
TOTAL	31,986	151,385	211.3	1.0

Table 2d (1985 NATIONAL DATA)
FATALITIES PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	13,201	52,423	251.8	1.2
MEDIUM CAR	5,077	22,192	228.8	1.1
LARGE CAR	4,685	38,609	121.3	0.6
SMALL VAN	115	710	162.2	0.8
STANDARD VAN	722	5,223	138.2	0.7
SMALL PICKUP	1,686	5,693	296.1	1.4
STANDARD PICKUP	3,342	16,179	206.6	1.0
SPORT UTILITY VEHICLE	898	3,490	257.3	1.3
TOTAL CARS	22,963	113,224	202.8	1.0
TOTAL LT TRUCKS	6,763	31,295	216.1	1.1
TOTAL	29,726	144,519	205.7	1.0

Overall Fatality Rates

Fatalities Per Million Registered Veh.



Tables 3a through 3d distribute the proportions of fatalities in each vehicle type by crash mode. A comparison of the 1985 through 1988 tables illustrates that the relative proportion of fatalities among crash modes has not changed significantly. However, the crash mode involvement of LTVs relative to passenger cars has been maintained at a notably higher level for rollover crashes and at a lower level for side impact crashes. This perspective is presented in detail in the following tables.

Table 3a (1988 NATIONAL DATA)
DISTRIBUTION OF FATALITIES BY CRASH MODE

VEHICLE TYPE	ALL FATALS	FATALS FRONTAL	FATALS SIDE	FATALS REAR	FATALS ROLLOVER	UNKNOWN	TOTAL
SMALL CAR	15,917	40%	28%	4%	26%	2%	100%
MEDIUM CAR	6,029	43%	29%	3%	22%	3%	100%
LARGE CAR	3,745	45%	28%	3%	20%	4%	100%
SMALL VAN	238	45%	15%	5%	33%	3%	100%
STANDARD VAN	737	40%	14%	2%	39%	5%	100%
SMALL PICKUP	2,471	35%	14%	1%	47%	3%	100%
STANDARD PICKUP	3,706	35%	14%	2%	45%	5%	100%
SPORT UTILITY VEHICLE	1,062	24%	10%	2%	60%	4%	100%
TOTAL CARS	25,691	41%	28%	4%	24%	3%	100%
TOTAL LT TRUCKS	8,214	34%	14%	2%	46%	4%	100%
TOTAL	33,905	40%	25%	3%	30%	3%	100%

Table 3b (1987 NATIONAL DATA)
DISTRIBUTION OF FATALITIES BY CRASH MODE

VEHICLE TYPE	ALL FATALS	FATALS. FRONTAL	FATALS SIDE	FATALS REAR	FATALS ROLLOVER	UNKNOWN	TOTAL
SMALL CAR	15,239	40%	27%	4%	25%	3%	100%
MEDIUM CAR	5,639	43%	28%	3%	23%	4%	100%
LARGE CAR	4,098	44%	26%	3%	21%	5%	100%
SMALL VAN	195	44%	13%	3%	37%	3%	100%
STANDARD VAN	765	43%	11%	4%	38%	5%	100%
SMALL PICKUP	2,191	35%	14%	1%	45%	5%	100%
STANDARD PICKUP	3,698	35%	14%	1%	44%	5%	100%
SPORT UTILITY VEHICLE	1,026	22%	10%	1%	65%	2%	100%
TOTAL CARS	24,976	41%	27%	4%	24%	4%	100%
TOTAL LT TRUCKS	7,875	34%	13%	1%	46%	5%	100%
TOTAL	32,851	40%	24%	3%	29%	4%	100%

Table 3c (1986 NATIONAL DATA)
DISTRIBUTION OF FATALITIES BY CRASH MODE

VEHICLE TYPE	ALL FATALS	FATALS FRONTAL	FATALS SIDE	FATALS REAR	FATALS ROLLOVER	UNKNOWN	TOTAL
SMALL CAR	14,514	39%	28%	3%	26%	4%	100%
MEDIUM CAR	5,528	43%	28%	4%	21%	5%	100%
LARGE CAR	4,670	43%	29%	3%	21%	4%	100%
SMALL VAN	188	46%	16%	3%	31%	4%	100%
STANDARD VAN	741	40%	14%	2%	40%	4%	100%
SMALL PICKUP	1,954	36%	13%	2%	45%	5%	100%
STANDARD PICKUP	3,442	37%	12%	1%	45%	6%	100%
SPORT UTILITY VEHICLE	949	21%	7%	2%	66%	3%	100%
TOTAL CARS	24,712	41%	28%	3%	24%	4%	100%
TOTAL LT TRUCKS	7,274	35%	12%	2%	47%	5%	100%
TOTAL	31,986	39%	24%	3%	29%	4%	100%

Table 3d (1985 NATIONAL DATA)
DISTRIBUTION OF FATALITIES BY CRASH MODE

VEHICLE TYPE	ALL FATALS	FATALS FRONTAL	FATALS SIDE	FATALS REAR	FATALS ROLLOVER	UNKNOWN	TOTAL
SMALL CAR	13,201	41%	28%	4%	25%	2%	100%
MEDIUM CAR	5,077	45%	29%	3%	20%	3%	100%
LARGE CAR	4,635	45%	28%	3%	19%	5%	100%
SMALL VAN	115	45%	15%	3%	37%	0%	100%
STANDARD VAN	772	43%	12%	3%	38%	4%	100%
SMALL PICKUP	1,686	40%	14%	1%	42%	3%	100%
STANDARD PICKUP	3,342	38%	14%	1%	41%	6%	100%
SPORT UTILITY VEHICLE	898	21%	10%	1%	65%	3%	100%
TOTAL CARS	22,963	43%	28%	3%	23%	3%	100%
TOTAL LT TRUCKS	6,763	37%	13%	1%	44%	5%	100%
TOTAL	29,726	42%	25%	3%	28%	2%	100%

Tables 4a through 4d, and the bar chart on this page, address rollover accidents. They show that for passenger cars, the fatality rate for small and medium size cars is much higher than the fatality rate for large cars. Among light trucks the fatality rate for rollover accidents is highest for sport utility vehicles and small pickup trucks, and lowest for small vans. A comparison between the rollover rates for LTVs and the average rollover rate for passenger cars indicates that throughout the 1985 - 1988 period the rates for all LTV classes except small vans have remained higher than the passenger car average. The rate for sport utility vehicles is the highest in the range of 2.4 to 3.7 times the rate for passenger cars. However this difference has been dropping throughout the period. In the 1987 to 1988 time period, the rollover rates for the standard pickup was increasing, while the rates in the remaining LTV categories was declining relative to passenger cars. The reason for these changes is not understood, but the agency will continue to monitor these trends.

ROLLOVER FATALITY RATES FOR LTVs AS COMPARED TO THE AVERAGE PASSENGER CAR ROLLOVER RATE:

YEAR	SPORT UTILITY	STD. PICKUP	SM. PICKUP	STD. VAN	SMALL VAN
1985	3.74	1.90	2.76	1.18	1.35
1986	3.06	1.79	2.51	1.07	.94
1987	2.95	2.02	2.52	1.07	.84
1988	2.43	2.03	2.51	1.03	.61

Rollover Fatality Rates

Fatalities Per Million Registered Veh.

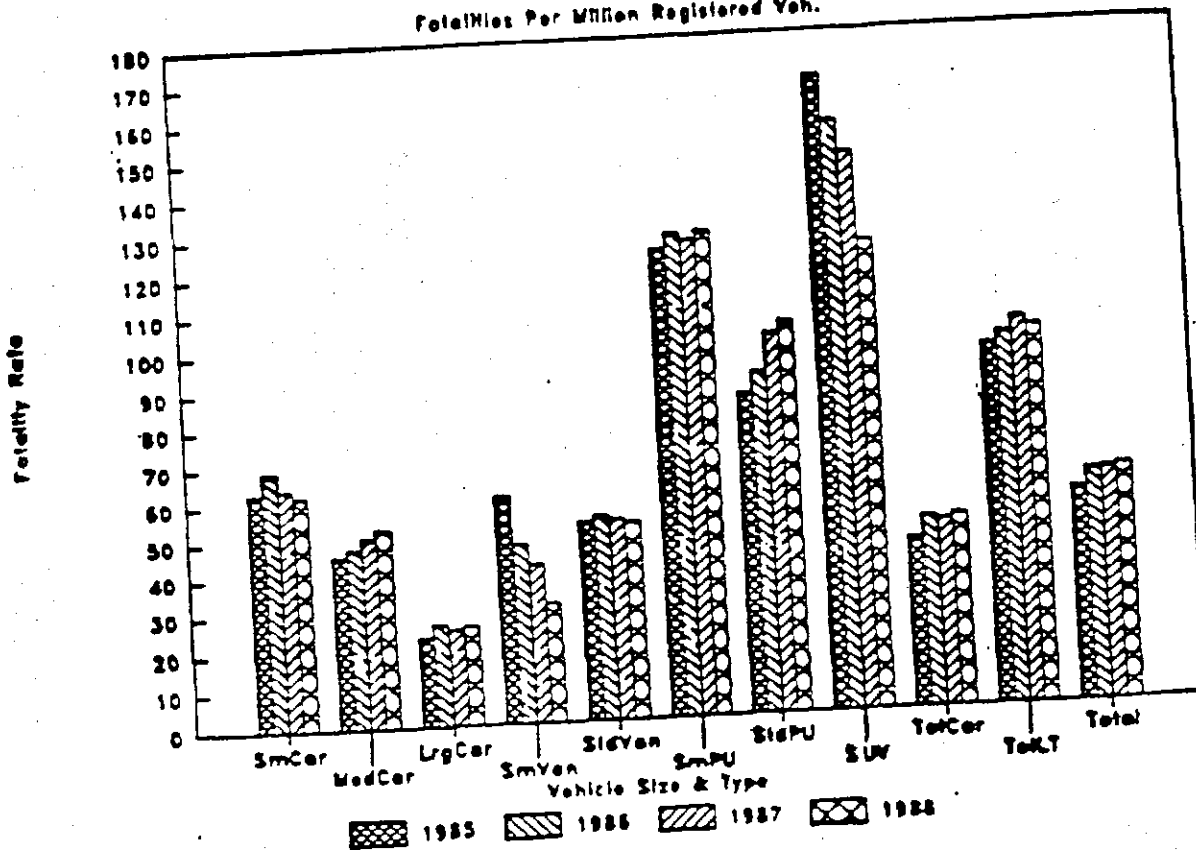


Table 4a (1988 NATIONAL DATA)
FATALITIES IN ROLLOVERS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	4,102	66,264	61.9	1.0
MEDIUM CAR	1,345	25,593	52.6	0.8
LARGE CAR	767	29,662	25.9	0.4
SMALL VAN	78	2,480	31.4	0.5
STANDARD VAN	291	5,549	52.4	0.8
SMALL PICKUP	1,152	8,988	128.2	2.1
STANDARD PICKUP	1,654	15,924	103.9	1.7
SPORT UTILITY VEHICLE	640	5,147	124.3	2.0
TOTAL CARS	6,214	121,519	51.1	0.8
TOTAL LT TRUCKS	3,815	38,088	100.2	1.6
TOTAL	10,029	159,607	62.8	1.0

Table 4b (1987 NATIONAL DATA)
FATALITIES IN ROLLOVERS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	3,832	59,856	64.0	1.0
MEDIUM CAR	1,278	25,349	50.0	0.8
LARGE CAR	866	34,364	25.4	0.4
SMALL VAN	72	1,713	42.0	0.7
STANDARD VAN	291	5,452	53.4	0.9
SMALL PICKUP	988	7,844	126.0	2.0
STANDARD PICKUP	1,645	16,327	100.8	1.6
SPORT UTILITY VEHICLE	662	4,491	147.4	2.4
TOTAL CARS	5,976	119,569	50.0	0.8
TOTAL LT TRUCKS	3,658	35,826	102.1	1.6
TOTAL	9,634	155,395	62.1	1.0

Table 4c (1986 NATIONAL DATA)
FATALITIES IN ROLLOVERS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	3,779	54,988	68.7	1.1
MEDIUM CAR	1,173	24,738	47.7	0.8
LARGE CAR	993	37,284	26.6	0.4
SMALL VAN	58	1,214	47.8	0.8
STANDARD VAN	294	5,404	54.4	0.9
SMALL PICKUP	876	6,861	127.7	2.1
STANDARD PICKUP	1,532	16,870	90.8	1.5
SPORT UTILITY VEHICLE	627	4,027	155.7	2.5
TOTAL CARS	5,945	117,010	50.8	0.8
TOTAL LT TRUCKS	3,387	34,376	98.5	1.6
TOTAL	9,332	151,386	61.6	1.0

Table 4d (1985 NATIONAL DATA)
FATALITIES IN ROLLOVERS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	3,290	52,423	62.8	1.1
MEDIUM CAR	1,011	22,192	45.6	0.8
LARGE CAR	899	38,609	23.3	0.4
SMALL VAN	43	710	60.6	1.1
STANDARD VAN	277	5,223	53.0	0.9
SMALL PICKUP	705	5,693	123.8	2.2
STANDARD PICKUP	1,384	16,179	85.5	1.5
SPORT UTILITY VEHICLE	586	3,490	167.9	3.0
TOTAL CARS	5,201	113,224	44.9	0.8
TOTAL LT TRUCKS	2,995	31,295	95.7	1.7
TOTAL	8,196	144,519	56.7	1.0

Tables 5a through 5d and the bar chart on this page address frontal impacts. They consistently show that for passenger cars, the fatality rates for small and medium size cars are quite a bit higher than the fatality rate for large cars. Among light trucks, i.e., the categories of van, pickup, and sport utility vehicle, the fatality rates for frontal impact crashes are highest for small and standard size pickup trucks. Vans of both small and standard size, as well as sport utility vehicles, have lower fatality rates. The tables also show that all light truck vehicle types continue to have lower than average fatality rates except for the small pickup which has the highest normalized fatality rate of all vehicle types for 1985. There has been a decrease in the small pickup fatality rate for 1986, 1987, and 1988. One possible source of this decrease may be a shift in miles driven from a rural to an urban context. The agency will continue to monitor this trend.

Frontal Fatality Rates

Fatalities Per Million Registered Veh.

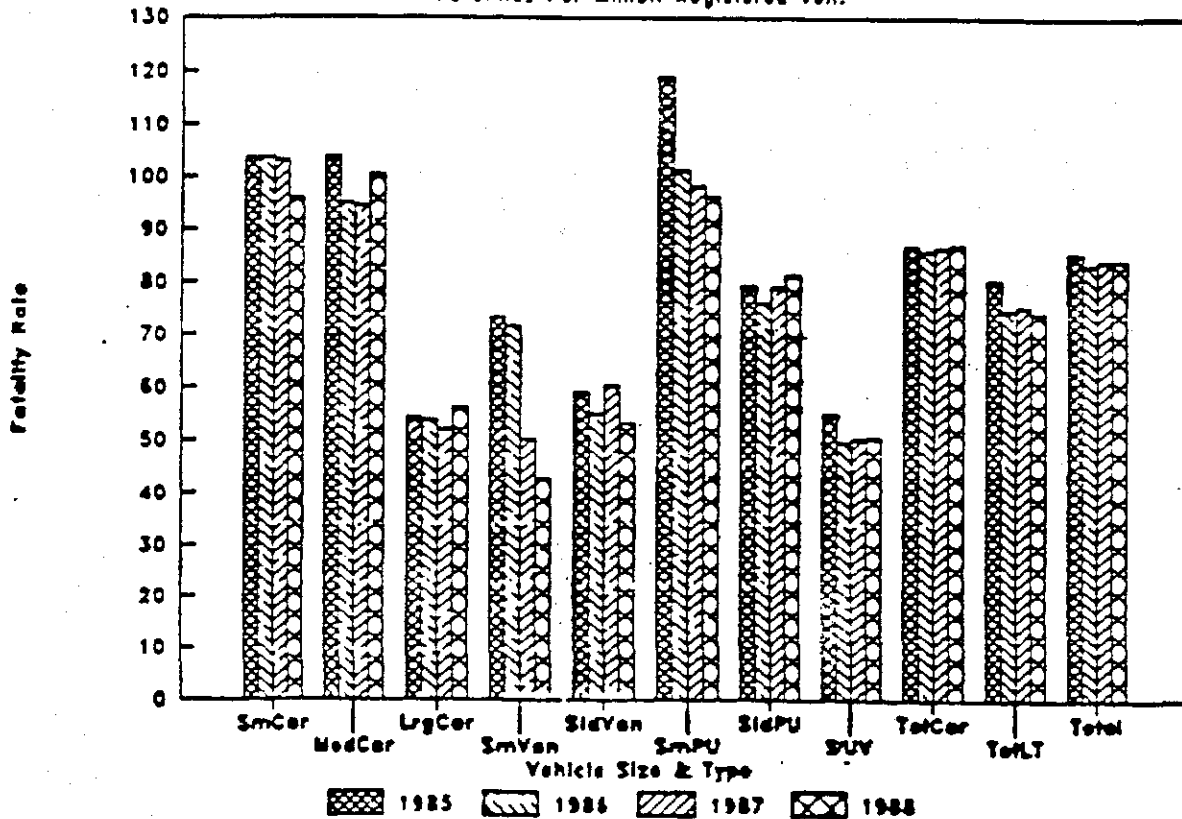


Table 5a (1988 NATIONAL DATA)
FATALITIES IN FRONTAL IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	6,369	66,264	96.1	1.1
MEDIUM CAR	2,574	25,593	100.6	1.2
LARGE CAR	1,667	29,662	56.2	0.7
SMALL VAN	106	2,480	42.7	0.5
STANDARD VAN	295	5,549	53.2	0.6
SMALL PICKUP	866	8,988	96.4	1.1
STANDARD PICKUP	1,296	15,924	81.4	1.0
SPORT UTILITY VEHICLE	260	5,147	50.5	0.6
TOTAL CARS	10,610	121,519	87.3	1.0
TOTAL LT TRUCKS	2,823	38,088	74.1	0.9
TOTAL	13,433	159,607	84.2	1.0

Table 5b (1987 NATIONAL DATA)
FATALITIES IN FRONTAL IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	6,169	59,856	103.1	1.2
MEDIUM CAR	2,397	25,349	94.6	1.1
LARGE CAR	1,795	34,363	52.2	0.6
SMALL VAN	86	1,713	50.2	0.6
STANDARD VAN	328	5,452	60.2	0.7
SMALL PICKUP	771	7,844	98.3	1.2
STANDARD PICKUP	1,291	16,327	79.1	0.9
SPORT UTILITY VEHICLE	226	4,491	50.3	0.6
TOTAL CARS	10,361	119,569	86.7	1.0
TOTAL LT TRUCKS	2,702	35,826	75.4	0.9
TOTAL	13,063	155,395	84.1	1.0

Table 5c (1986 NATIONAL DATA)
FATALITIES IN FRONTAL IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	5,708	54,988	103.8	1.2
MEDIUM CAR	2,352	24,738	95.1	1.1
LARGE CAR	2,008	37,284	53.9	0.6
SMALL VAN	87	1,214	71.7	0.9
STANDARD VAN	297	5,404	55.0	0.7
SMALL PICKUP	695	6,861	101.3	1.2
STANDARD PICKUP	1,284	16,870	76.1	0.9
SPORT UTILITY VEHICLE	200	4,027	49.7	0.6
TOTAL CARS	10,068	117,010	86.0	1.0
TOTAL LT TRUCKS	2,563	34,376	74.6	0.9
TOTAL	12,631	151,386	83.4	1.0

Table 5d (1985 NATIONAL DATA)
FATALITIES IN FRONTAL IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	5,437	52,423	103.7	1.2
MEDIUM CAR	2,303	22,192	103.8	1.2
LARGE CAR	2,095	38,609	54.3	0.6
SMALL VAN	52	710	73.2	0.9
STANDARD VAN	308	5,223	59.0	0.7
SMALL PICKUP	677	5,693	118.9	1.4
STANDARD PICKUP	1,286	16,179	79.5	0.9
SPORT UTILITY VEHICLE	192	3,490	55.0	0.6
TOTAL CARS	9,835	113,224	86.9	1.0
TOTAL LT TRUCKS	2,515	31,295	80.4	0.9
TOTAL	12,350	144,519	85.5	1.0

Tables 6a through 6d and the bar chart on this page address side impact fatalities. They show that for passenger cars, the fatality rates for small and medium size cars are much higher than the fatality rates for large cars. Among light trucks the fatality rates for side impact are highest for small and standard size pickup trucks. Vans of both small and standard size, as well as sport utility vehicles, have lower fatality rates. The tables also show that all light truck types continue to have a significantly lower fatality rate than do passenger cars. On average, light trucks have less than half the side impact fatality rate of passenger cars.

Side Fatality Rates

Fatalities Per Million Registered Veh.

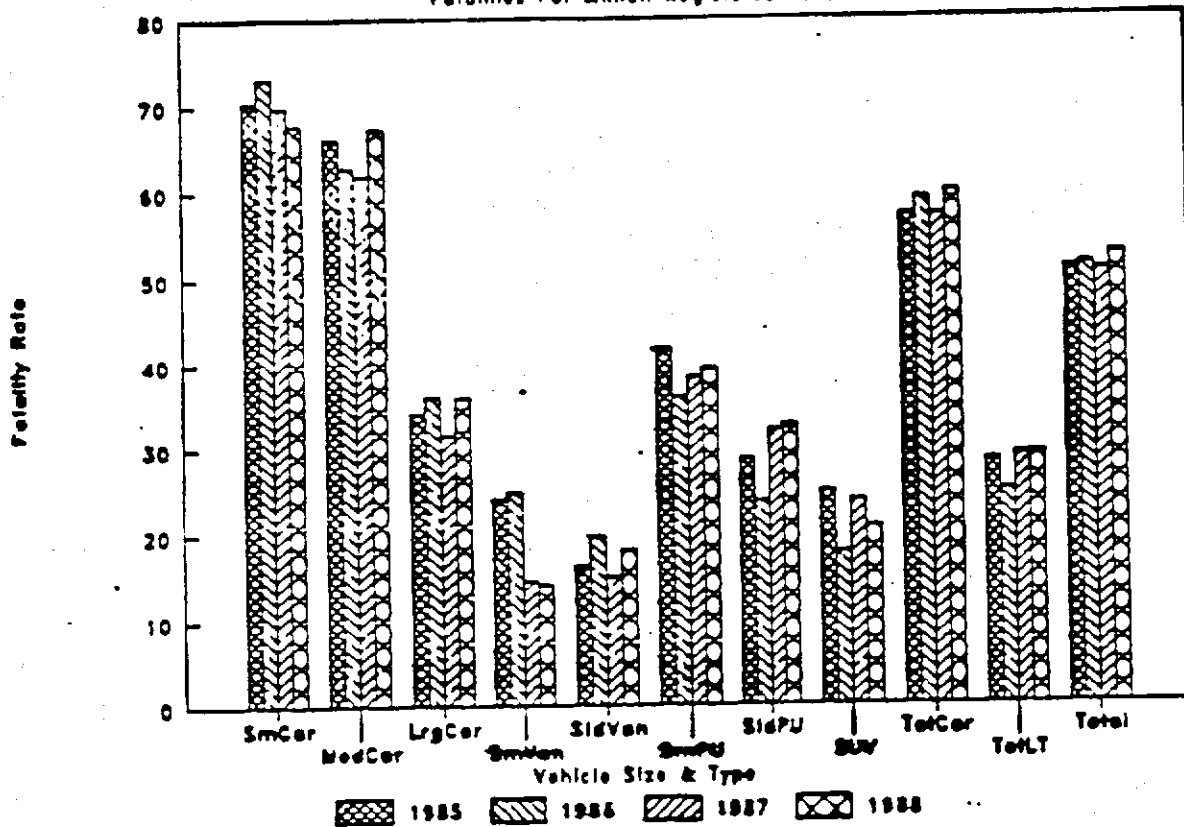


Table 6a (1988 NATIONAL DATA)
FATALITIES IN SIDE IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	4,483	66,264	67.7	1.3
MEDIUM CAR	1,722	25,593	67.3	1.3
LARGE CAR	1,066	29,662	35.9	0.7
SMALL VAN	35	2,480	14.1	0.3
STANDARD VAN	100	5,549	18.0	0.4
SMALL PICKUP	352	8,988	39.2	0.8
STANDARD PICKUP	517	15,924	32.5	0.6
SPORT UTILITY VEHICLE	106	5,147	20.6	0.4
TOTAL CARS	7,271	121,519	59.8	1.2
TOTAL LT TRUCKS	1,110	38,088	29.1	0.6
TOTAL	8,381	159,607	52.5	1.0

Table 6b (1987 NATIONAL DATA)
FATALITIES IN SIDE IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (-1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	4,175	59,856	69.8	1.4
MEDIUM CAR	1,567	25,349	61.8	1.2
LARGE CAR	1,084	34,364	31.5	0.6
SMALL VAN	25	1,713	14.6	0.3
STANDARD VAN	82	5,452	15.0	0.3
SMALL PICKUP	300	7,844	38.2	0.8
STANDARD PICKUP	523	16,327	32.0	0.6
SPORT UTILITY VEHICLE	106	4,491	23.6	0.5
TOTAL CARS	6,826	119,569	57.1	1.1
TOTAL LT TRUCKS	1,036	35,826	28.9	0.6
TOTAL	7,862	155,395	50.6	1.0

Table 6c (1986 NATIONAL DATA)
FATALITIES IN SIDE IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	4,021	54,988	73.1	1.4
MEDIUM CAR	1,553	24,738	62.8	1.2
LARGE CAR	1,344	37,284	36.0	0.7
SMALL VAN	30	1,214	24.7	0.5
STANDARD VAN	106	5,404	19.6	0.4
SMALL PICKUP	246	6,861	35.9	0.7
STANDARD PICKUP	396	16,870	23.5	0.5
SPORT UTILITY VEHICLE	71	4,027	17.6	0.3
TOTAL CARS	6,918	117,010	59.1	1.2
TOTAL LT TRUCKS	849	34,376	24.7	0.5
TOTAL	7,767	151,386	51.3	1.0

Table 6d (1985 NATIONAL DATA)
FATALITIES IN SIDE IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	3,691	52,423	70.4	1.4
MEDIUM CAR	1,466	22,192	66.1	1.3
LARGE CAR	1,318	38,609	34.1	0.7
SMALL VAN	17	710	23.9	0.5
STANDARD VAN	85	5,223	16.3	0.3
SMALL PICKUP	237	5,693	41.6	0.8
STANDARD PICKUP	461	16,179	28.5	0.6
SPORT UTILITY VEHICLE	86	3,490	24.6	0.5
TOTAL CARS	6,475	113,224	57.2	1.1
TOTAL LT TRUCKS	886	31,295	28.3	0.6
TOTAL	7,361	144,519	50.9	1.0

Tables 7a through 7d and the bar chart on this page address rear impacts. They show that for passenger cars, the fatality rates for small and medium size cars are much higher than the fatality rates for large cars. Among light trucks the fatality rate for rear impact is highest for small vans and lowest for standard pickup trucks. The tables also show that all light trucks have lower than average fatality rates in rear impact crashes. In fact, for this type of crash, overall, light trucks have less than half the fatality rates of cars. With fewer than 120 fatalities per year spread among five vehicle types, rear impact LTV fatalities represent a relatively small portion of the overall highway fatality picture, and the wide variation in yearly fatality rates reflects this.

Rear Fatality Rates

Fatalities Per Million Registered Veh.

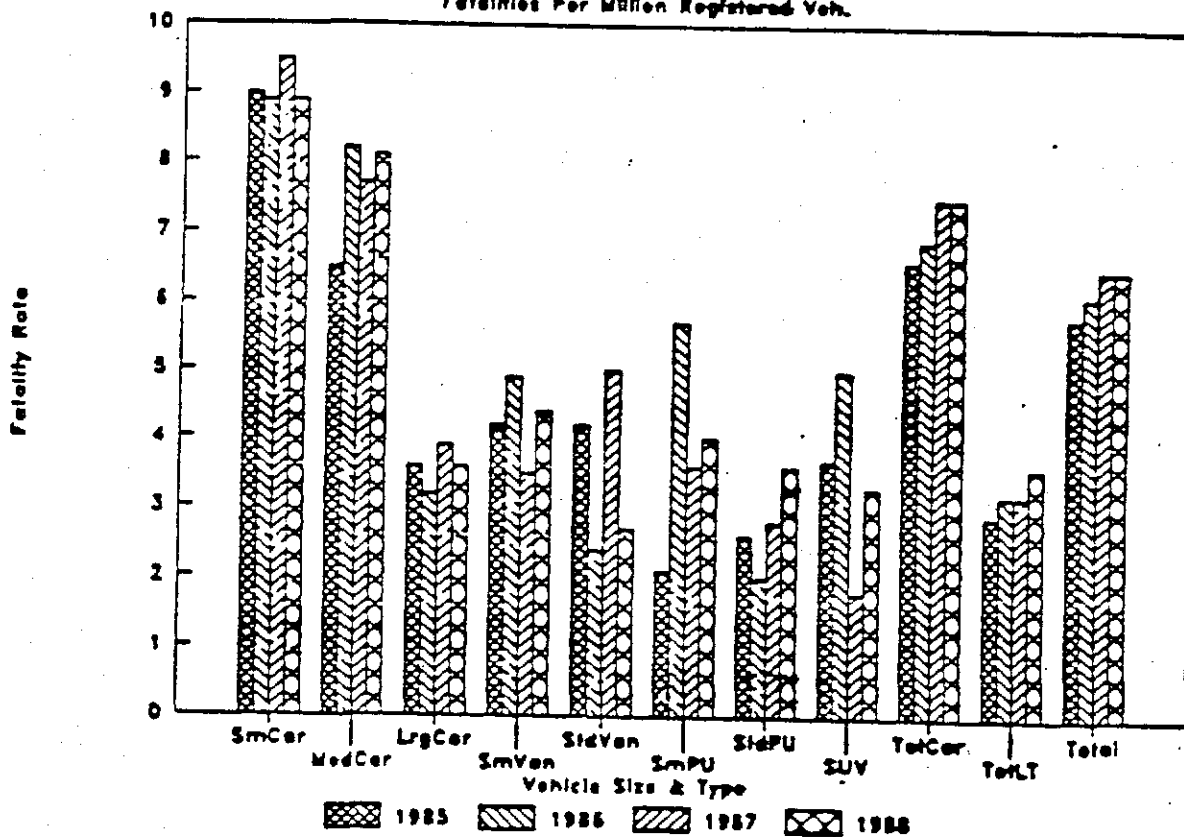


Table 7a (1988 NATIONAL DATA)
FATALITIES IN REAR IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	593	66,264	8.9	1.4
MEDIUM CAR	208	25,593	8.1	1.2
LARGE CAR	107	29,662	3.6	0.6
SMALL VAN	11	2,480	4.4	0.7
STANDARD VAN	15	5,549	2.7	0.4
SMALL PICKUP	36	8,988	4.0	0.6
STANDARD PICKUP	58	15,924	3.6	0.6
SPORT UTILITY VEHICLE	17	5,147	3.3	0.5
TOTAL CARS	908	121,519	7.5	1.1
TOTAL LT TRUCKS	137	38,088	3.6	0.6
TOTAL	1,045	159,607	6.5	1.0

Table 7b (1987 NATIONAL DATA)
FATALITIES IN REAR IMPACTS PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	571	59,856	9.5	1.5
MEDIUM CAR	195	25,349	7.7	1.2
LARGE CAR	134	34,364	3.9	0.6
SMALL VAN	6	1,713	3.5	0.5
STANDARD VAN	27	5,452	5.0	0.8
SMALL PICKUP	28	7,844	3.6	0.5
STANDARD PICKUP	46	16,327	2.8	0.4
SPORT UTILITY VEHICLE	8	4,491	1.8	0.3
TOTAL CARS	900	119,569	7.5	1.2
TOTAL LT TRUCKS	115	35,826	3.2	0.5
TOTAL	1,015	155,395	6.5	1.0