

Traffic Safety Facts

Research Note

DOT HS 810 947

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Fatalities to Occupants of 15-Passenger Vans, 1997-2006

Summary

- In 2006, fatalities to occupants of 15-passenger vans reached the lowest level since 1992.
- As compared to 2005, fatalities to occupants of 15-passenger vans that rolled over declined by 50 percent, while overall fatalities declined by 40 percent.
- Fatalities to occupants of 15-passenger vans have been on a downward trend since 2001.
- About 50 percent of the fatalities occurred in heavily loaded (10+ occupants) vans that rolled over.
- About 59 percent of the fatally injured van occupants in rollovers were not restrained.

Introduction

The objective of this research note is to report the fatalities to occupants of 15-passenger vans in the 10-year period from 1997 to 2006. Of particular interest are fatalities that occurred to occupants in 15-passenger vans that rolled over. Prior research (Garrott et al.¹, Subramanian²) has shown that heavily loaded 15-passenger vans have a higher rate of rollover than lightly loaded vans. Loading 15-passenger vans to gross vehicle weight (GVW) also moves the center of gravity rearward and upward thereby affecting the stability and handling of the van. The research also points out speed and curved road geometry as factors affecting rollover outcome. Belt use rates among occupants in 15-passenger vans involved in fatal crashes are significantly lower compared to other passenger vehicles. Another research note (Thiriez et al.³) also stressed the importance of properly maintaining the tires in such vans. NHTSA has issued three previous consumer advisories (NHTSA^{4,5,6}) on the rollover propensity of 15-passenger vans.

Data and Methodology

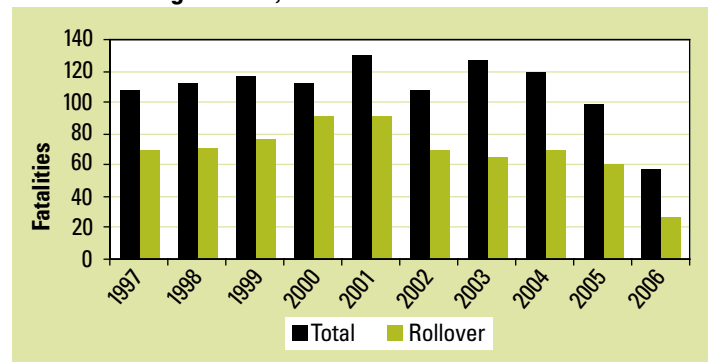
Data from NHTSA's Fatality Analysis Reporting System (FARS) has been used in this note. It is important to note that fatal crash data provided in this note should not be used to interpret rollover propensity of 15-passenger vans, as such an interpretation would be based on a small domain of crashes. Fatalities are a subsequent event to rollover causation where the crashworthiness of the vehicles and other factors such as restraint use play a role in the severity of injuries.

The 15-passenger vans were identified in FARS using the Vehicle Identification Number (VIN). Only Chrysler, Ford, and General Motors manufacture vans that can be configured to seat 15 passengers. The Dodge 15-passenger van was discontinued in 2002.

Results

Figure 1 depicts fatalities to occupants of 15-passenger vans involved in all fatal crashes and in those vans that rolled over. Fatalities, both overall and in vehicles that rolled over, have been on a downward trend since 2001.

Figure 1: Fatalities (Total and in Rollovers) to Occupants Of 15-Passenger Vans, 1997-2006



Source: NCSA FARS 1996-2005 (Final), 2006 (ARF) Files

Table 1 depicts the numbers underlying Figure 1. In 2006, fatalities, both overall and in vehicles that rolled over, were the lowest in the 10-year period from 1997 to 2006.

Table 1: Fatalities (Total and Rollovers) to Occupants of 15-Passenger Vans, 1997-2006

Crash Year	Total	In Vehicles That Rolled Over	
		Number	% of Total
1997	108	69	64%
1998	112	71	63%
1999	116	76	66%
2000	112	91	81%
2001	130	91	70%
2002	108	70	65%
2003	127	65	51%
2004	120	69	58%
2005	99	60	61%
2006	58	26	45%
Total	1,090	688	63%

Source: NCSA FARS 1996-2005 (ARF) and 2006 (Final) Files

Also shown in Table 1 are fatalities in vans that rolled over, as a proportion of total occupant fatalities in 15-passenger vans. Since reaching a high of 81 percent of total fatalities in 2000, this proportion has been on a downward trend. In fact, in 2006, about 45 percent of 15-passenger-van occupant fatalities occurred in vans that rolled over. Table 2 depicts the number of 15-passenger vans, total and those that rolled over, involved in fatal crashes from 1997 to 2006.

Table 2: 15-Passenger Vans (Total and Rollovers) Involved in Fatal Crashes, 1997-2006

Crash Year	Total	Vehicles That Rolled Over	
		Number	% of Total
1997	127	42	33%
1998	158	53	34%
1999	150	45	30%
2000	131	55	42%
2001	147	66	45%
2002	133	50	38%
2003	144	46	32%
2004	150	47	31%
2005	124	34	27%
2006	110	20	18%
Total	1,374	458	33%

Source: NCSA FARS 1996-2005 (ARF) and 2006 (Final) Files

In 2006, about 18 percent of 15-passenger vans involved in fatal crashes rolled over—the lowest proportion in the last 10 years. Table 3 depicts the number of 15-passenger vans involved in fatal crashes by the occupancy level and rollover occurrence. In the period from 1997 to 2006, in fatal crashes, 25 percent of the

15-passenger vans with fewer than 10 occupants rolled over compared to 70 percent of the vans with 10 or more occupants.

Table 3: 15-Passenger Vans (Total and Rollovers) Involved in Fatal Crashes, by Occupancy 1997-2006

Year	Fewer Than 10 Occupants			10 or More Occupants		
	Total	In Rollovers		Total	In Rollovers	
		Num	%		Num	%
1997	102	26	25%	25	16	64%
1998	125	30	24%	33	23	70%
1999	123	28	23%	26	17	65%
2000	103	35	34%	28	20	71%
2001	113	39	35%	33	27	82%
2002	105	30	29%	27	20	74%
2003	112	24	21%	31	22	71%
2004	130	33	25%	20	14	70%
2005	115	26	23%	9	8	89%
2006	96	14	15%	14	6	43%
Total	1,124	285	25%	246	173	70%

Source: NCSA FARS 1996-2005 (ARF) and 2006 (Final) Files

Table 4 depicts the fatalities in 15-passenger vans by rollover and occupancy during a 10-year period from 1997 to 2006. In vans that were heavily loaded (10+ occupants), 83 percent of the fatalities occurred when the vans rolled over. In comparison, in vans that had fewer than 10 occupants, 49 percent of the fatalities occurred when the vans rolled over. This could simply be ascribed to the increased rollover propensity under heavily loaded conditions.

Table 4: Occupant Fatalities in 15-Passenger Vans (Total And Rollovers, by Occupancy 1997-2006

Year	Fewer Than 10 Occupants			10 or More Occupants		
	Total	In Rollovers		Total	In Rollovers	
		Num	%		Num	%
1997	59	28	47%	49	41	84%
1998	67	33	49%	45	38	84%
1999	68	34	50%	48	42	88%
2000	58	41	71%	54	50	93%
2001	66	41	62%	64	50	78%
2002	61	28	46%	47	42	89%
2003	79	27	34%	48	38	79%
2004	79	36	46%	41	33	80%
2005	69	34	49%	30	26	87%
2006	38	16	42%	20	10	50%
Total	644	318	49%	446	370	83%

Source: NCSA FARS 1996-2005 (ARF) and 2006 (Final) Files

Table 5 depicts the restraint use among the occupants of 15-passenger vans that rolled over in fatal crashes. Unknown restraint use has been proportionally distributed to the belted and unbelted categories. As seen in

Table 5, in the period from 1997 to 2006, about 67 percent of the occupants in 15-passenger vans involved in fatal crashes were unrestrained. This compares to about 55 percent for occupants of passenger vehicles (NHTSA⁷).

Table 5: Restraint Use of Occupants of 15-Passenger Vans Involved in Fatal Crashes That Rolled Over 1997-2006

Year	Restrained		Unrestrained		Total
	Number	%	Number	%	
1997	95	28%	242	72%	337
1998	191	43%	259	57%	450
1999	117	32%	246	68%	363
2000	116	27%	306	73%	422
2001	156	30%	370	70%	526
2002	158	44%	199	56%	357
2003	130	32%	277	68%	407
2004	133	38%	214	62%	347
2005	70	31%	158	69%	228
2006	41	24%	132	76%	173
Total	1,199	33%	2,411	67%	3,610

Source: NCSA FARS 1996-2005 (ARF) and 2006 (Final) Files

Table 6 depicts the restraint use of fatally injured occupants of 15-passenger vans that rolled over. Unknown restraint use has been proportionally distributed between restrained and unrestrained counts. In the period from 1997 to 2006, about 83 percent of the fatally injured occupants of 15-passenger vans that rolled over were unrestrained. In fact, every seating position in a 15-passenger van is equipped with a lap/shoulder belt or a lap belt.

Table 6: Restraint Use of Fatally Injured Occupants of 15-Passenger Vans That Rolled Over 1997-2006

Year	Restrained		Unrestrained		Total
	Number	%	Number	%	
1997	6	8%	63	92%	69
1998	13	18%	58	82%	71
1999	12	16%	64	84%	76
2000	14	16%	77	84%	91
2001	13	14%	78	86%	91
2002	19	27%	51	73%	70
2003	10	16%	55	84%	65
2004	19	28%	50	72%	69
2005	11	18%	49	82%	60
2006	3	12%	23	88%	26
Total	118	17%	570	83%	714

Source: NCSA FARS 1996-2005 (ARF) and 2006 (Final) Files

15-passenger vans are also used more in the summer months as church groups and sports teams are more likely to travel. Table 7 depicts the number of fatal, 15-passenger-van rollovers and fatalities, by month.

Table 7: Fatal Rollovers Involving 15-Passenger Vans and Fatalities, by Month, 1997-2006

Month	Rollovers		Fatalities	
	Number	%	Number	%
Dec-Feb	113	25%	152	22%
Mar-May	110	24%	162	24%
Jun-Aug	144	31%	225	33%
Sep-Nov	91	20%	149	22%
Total	458	100%	688	100%

Source: NCSA FARS 1996-2005 (ARF) and 2006 (Final) Files

As seen in Table 7, the summer months (June through August), show an elevated level of the number of fatal rollovers involving 15-passenger vans as well as the resulting fatalities. In fact, about a third of fatalities in rollovers involving 15-passenger vans occur in the summer months. This increase could simply be an artifact of increased use of 15-passenger vans during those months.

Other Information of Interest

NHTSA's statute at 49 U.S. Code §30112 requires that conventional 12- to 15-passenger vans cannot be sold or leased, as new vehicles, to carry students to/from schools and child day-care facilities on a regular basis.

Electronic stability control (ESC) was introduced as standard equipment for all model year 2004 and later 15-passenger vans. The potential effect of ESC on roll-over propensity of 15-passenger vans requires more in-depth analysis, which will be forthcoming as more data becomes available.

As of July 1, 2006, the latest year for which registration data is available, there were nearly 560,000 15-passenger vans registered in the United States (Polk⁶).

Conclusions

Fatalities, both total and in vans that rolled over, have been on a declining trend since 2001. Restraint use continues to be low among occupants of 15-passenger vans involved in fatal crashes. The summer months show a slightly elevated level of fatal rollovers and fatalities among 15-passenger vans that simply could be a result of increased use of these vans during those months.

References

1. Garrott, R.W. (2001). *The Rollover Propensity of Fifteen-Passenger Vans* 2001. Washington, DC: National Highway Traffic Safety Administration.
2. Subramanian, R. (2004). *Analysis of Crashes Involving 15-Passenger Vans*. Report No. DOT-HS 809 729. Washington, DC: National Highway Traffic Safety Administration.
3. Thiriez, K., Ferguson, E., & Subramanian, R.(2006). *12- & 15-Passenger Vans Tire Pressure Study: Preliminary Results, Vans*. Report No. DOT-HS 809 846. Washington, DC: National Highway Traffic Safety Administration.
4. NHTSA (2002). *NHTSA Repeats Rollover Warning to Users of 15-Passenger Vans*. NHTSA 27-02. Washington, DC: National Highway Traffic Safety Administration.
5. NHTSA (2004). *NHTSA Repeats Rollover Warning to Users of 15-Passenger Vans*. (NHTSA 25-04) Washington, DC: National Highway Traffic Safety Administration.
6. NHTSA (2005). *NHTSA Repeats Rollover Warning to Users of 15-Passenger Vans*. NHTSA 12-05. Washington, DC: National Highway Traffic Safety Administration.
7. R. L. Polk & Co. (2006). *National Vehicle Population Profile Data*. Southfield, MI: R. L. Polk & Co.



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