

Date: September 6, 2005

Re: 15-Passenger Van Safety

A considerable amount of research has focused on the safety of 15-passenger vans in the United States over a number of years. Transport Canada's information does not include research in this area. The National Highway Traffic Safety Administration (NHTSA) U.S. Department, in May 2005, re-issued its consumer advisory for users of 15-passenger vans for the third time in the past four years.

Research and advisories indicate that these vehicles have an increased risk of roll-over. The risk increases as the number of passengers increases.

NHTSA recommendations included the following:

- All occupants wear seat belts at all times (“...people who wear their seat belts are about 75 percent less likely to be killed in a rollover crash than people who don't.”)¹
- Operators of 15-passenger vans must be trained, experienced drivers (“.....15-passenger vans should be operated by ‘experienced drivers’ and noted that a commercial driver’s license is required to transport 16 or more people for commercial purposes.”)²
- If possible, have passengers and cargo forward of the rear axle and avoid placing loads on the roof.
- Tires are checked at least once a week, using the manufacturers recommended pressure levels (“...the NHTSA study found that 74 per cent of passenger vans had significantly mis-inflated tires. By contrast, 39 per cent of passenger cars were found with significant inflation problems. NHTSA research has consistently shown that improperly inflated tires can change handling characteristics, increasing the prospect of a rollover crash in 15-passenger vans.”)³

Health and Safety HR recommends choosing an alternate method for transporting groups if possible. If this is not an option all recommendations noted above must be followed. Anyone that would be operating these vehicles would be required to attend Saskatchewan Safety Council driving courses including in vehicle training using a 15-passenger van.

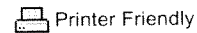
For additional information please contact Gaye Holliday, Health and Safety Consultant at 585-5487 or email gaye.holliday@uregina.ca

¹ <http://nhtsa.gov/cars/problems/studies/15PassVans/index.htm>

² <http://nhtsa.gov/cars/problems/studies/15PassVans/15passvan.html>

³ <http://www.nhtsa.cot.gov/portal/site/nhtsa/template.MAXIMIZE/menuitem.f2217bec37fb30>

Safety Information > 15-Passenger Vans



Risks Associated with Driving 15-Passenger Vans:

Fifteen-passenger vans are popular modes of transport for various people including: community groups, schools, universities and tour operators. Since these vans became available in the 1970's, there have been a number of collisions involving rollovers and fatalities. In a three-month period in 2000, there were four rollovers involving university sport teams and this probably stimulated the analysis by the US National Highway Traffic Safety Administration (NHTSA).

While driving 15-passenger vans is not always inherently dangerous, there are some situations that can result in erratic vehicle response that an inexperienced driver might not be able to control and which could result in a collision or rollover. Because of this, the University of Alberta requires drivers of these vehicles to have more driving experience and have demonstrated the medical fitness and the higher degree of driving knowledge and ability associated with having a Class 4 operator's permit. In addition, drivers will attend a training session that discusses the conditions that can result in loss of vehicle control and also, demonstrate some competency in driving a 15-passenger van.

Concerns for passenger safety arose from an analysis of the accident history of these vehicles over the period from 1994-1997 and which was presented by the NHTSA in April 2001 in a report called The Rollover Propensity of Fifteen-Passenger Vans. A consumer advisory accompanied this document and described the increased chance of rollover with a fully loaded van. A second consumer advisory was issued on April 15, 2002. Such advisories have been characterized as being "unprecedented" for the NHTSA and likely reflect their perception of the urgent nature of the rollover problem.

Some factors that contribute to rollovers include: heavy loads, road and weather conditions, tire failure, excessive speed, consumption of alcohol, driver inattention and driver over-steering during an emergency manoeuvre. Many of the factors reside with the driver including: a lack of knowledge about effects of load on van driving response and inexperience in controlling this type of vehicle in different situations. This is why the University of Alberta requires drivers to have specific training to handle these vehicles. Common sense is **not** enough.

The Problem:

Basically because of their design, and relative to passenger automobiles, these vehicles are:

- more prone to loss of control when the vehicles are heavily loaded,
- more difficult to recover after they go out of control, and
- more prone to rollover after a driver has lost control.

Table 1 in the NHTSA report shows the incidents of single vehicle accidents and

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the number of rollovers for vans containing different numbers of passengers. The data showed that when the vans contained fewer than 9 persons, rollovers occurred in 12.7% of the crashes but for vans with over 10 people, rollovers occurred in 35.4% of the crashes. Only single vehicle collisions were considered because of the complexities involved in deciding why a rollover occurred in collisions involving more than one vehicle.

Number of Crashes, Rollovers and Rollover Ratios by Occupancy level of Fifteen-Passenger Vans in Single Vehicle crashes

Occupancy Level	All Single Vehicle Crashes (n)	All Rollovers (n)	Rollover Ratio (%)	Combined Ratios (%)
< 5	1815	224	12.3	12.7
5 to 9	77	16	20.8	
10 to 15	55	16	29.1	35.4
> 15	10	7	70.0	

adapted from Table 1 in: “The Rollover Propensity of Fifteen-Passenger Vans”. W.R. Garrott, B. Rhea, R. Subramanian and G. Heydinger. National Highway Traffic Safety Administration, April 2001.

The reason for the increases frequency of rollovers when the vans are heavily loaded is because the centre of gravity for the vehicle is raised as more weight is added and the higher the centre of gravity, the less force is required to cause the van to rollover (the effect of base width and raising the center of gravity on tipping can be appreciated if you consider how hard it is to topple a brick that is laid on its side versus one that is stood on end). In addition, as load is increased, the proportion of weight on the rear axle increases and this makes the vehicle more difficult to control. Computer simulations during turns in lightly loaded versus fully-loaded vans at different speeds show that the steering characteristics change depending on van load and this was rated as “ a topic for concern”. The problem associated with a high center of gravity and rollovers has also been experienced among users of light trucks and sport utility vehicles and since 2001, there have been stability rankings posted for various vehicles. A Static Stability Factor (SSF) below 1.20 is associated with increased risk of rollover and the vehicles with values around 1.0 are of particular concern. Note: these are the values before passenger loads are added to the vehicle.

Other tidbits of information:

- most fatal rollover crashes are single vehicle crashes
- rollover crashes are more likely to result in fatalities than other types of crashes
- just below half of single vehicle rollovers were reported to be preceded by an attempt to avoid the crash by a steering manoeuver. This is compared to one third for rollovers in multiple vehicle crashes.
- US Federal laws prohibit the sale of 15 passenger vans for school-related transport of students aged high school or younger. This does not apply to college students.
- most other provinces in Canada require a Class 4 licence to drive a 15-passenger van.
- on September 02, 2002, Ford Motor Company issued a warning that drivers of full-sized 15-passenger vans should be experienced and have special training to reduce the risk of rollovers.

Links to other reading on rollovers:

Title: **Source:** **Comment:**

News Report:

1	19 Farmworkers involved in crash (near Langley BC, July13, 2003)	Canada.com News	overloaded van, tire blew and van rolled. one dead, 2 serious injuries
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Government Reports:

2	Reducing the Risk of Rollover Crashes in 15-Passenger vans (pdf)	NHTSA flyer, April 2002	accompanied the 2 nd advisory from NHTSA
3	Occurrence of Light-Duty Vehicle Rollovers in TRAIID (1993-1997) (pdf)	Transport Canada TP14031E, March 2003	data from Canada
4	Characteristics of Fatal Rollover Crashes (pdf)	US National Center for Statistics and Analysis Research and Development DOT HS 809-438 April 2002	lots of US data from 1991-2000
5	Evaluation of the Rollover Propensity of 15-Passenger vans (pdf)	US National Transportation Safety Board, Oct 2002	data from 1990-2002 and analysis; discussion of steering characteristics
6	Final Statement on SUV's	J.W. Runge, M.D. administrator, NHTSA	statement to a US Senate committee, Feb 26, 2003

Other Websites:

7	Risk Management Briefing: The 15-Passenger Van Controversy	Outdoor Ed.com	history of US transport legislation
8	Why do so many SUV's, vans & Light Trucks roll over?	RolloverLawyer.com	what a great web name! many informative articles here
9	The Physics of Rollover Accidents	C. Johnson web page	this individual has posted his opinion on a variety of subjects. I do not know if the calculations on the rollover physics are correct nor do I endorse any of the other information located here
10	Travelling down the Safer Road Alternatives to Dangerous 15-passenger vans (pdf)	Church and Worship Technology, June 2002	This publication name is runner up to the RolloverLawyer.com name
11	15-Passenger Vans: High-Riding Death Traps	Safetyforum.com	some history of accidents and US legislation
12	Vans in School Transportation: Safety Advisories	School Transportation News	links to many reports on 15-passenger vans
13	Rollover Hazards Associated with (pdf)	L. C. Moore, Registered professional engineer,	letter to the Brotherhood Mutual Insurance Co.

Operational Safety Dec 02, 2002
Problems of 15
passenger vans

Some University Policies:

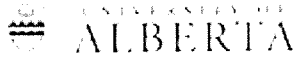
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|----|--|---|--|
| 14 | 15-passenger vans | University of Washington policy, April 2003 | also applies to vans rented from outside the university motor pool |
| 15 | Van Safety Training | Texas Tech University | requirement for special training in 15-passenger vans |
| 16 | New requirements for use of 15-passenger vans and the van policy | University of Maryland, Oct 15, 2002 | policy and requirement for on-line and hands on training for driving 15-passenger vans |

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