Reducing the Risk of Rollover Crashes in 15-Passenger Vans

Fifteen-passenger vans typically have seating positions for a driver and 14 passengers. They are widely used by community organization to take members on short trips and outings. Colleges use them to drive sports teams to intercollegiate games and vanpools use them for commuters.

What increases the risk of rollover crashes?
Recent research conducted by the National Highway Traffic Safety Administration (NHTSA) has found that the risk of a rollover crash is greatly increased when 10 or more people ride in a 15-passenger van. This increased risk occurs because the passenger weight raises the vehicle’s center of gravity and causes it to shift rearward. As a result, the van has less resistance to rollover and handles differently from other commonly driven passenger vehicles, making it more difficult to control in an emergency situation. Placing any load on the roof also raises the center of gravity and increases the likelihood of a rollover.

What situations can cause a rollover?
A rollover crash is a complex event, heavily influenced by driver and road characteristics as well as the design of the vehicle. In studies of single-vehicle crashes, NHTSA has found that more than 90 percent of rollovers occur after a driver has lost control of the vehicle and has run off the road. Three major situations can lead to a rollover in a 15-passenger van.

• The van goes off a rural road. If this occurs, the van is likely to overturn when it strikes a ditch or embankment or when it is tripped by an object or runs onto soft soil.
• The driver is fatigued or driving too fast for conditions. A tired driver can doze off and lose control. The driver can also lose control when traveling at a high speed causing the van to slide sideways off the road. The grassy or dirt medians that line highways can often cause the van to overturn when the tires dig into the dirt.
• The driver overcorrects the steering as a panic reaction to an emergency or to a wheel dropping off the pavement. Especially at freeway speeds, this situation can cause the driver to lose control, resulting in the van sliding sideways and rolling over.

What can organizations do to protect their passengers?
Over the past decade, 80 percent of people killed in rollover crashes in 15-passenger vans were unbelted.

Passengers can dramatically reduce their risk of being killed or seriously injured in a rollover crash by simply using their seat belts. Organizations that own 15-passenger vans should have a written seat belt use policy. Drivers should be responsible for enforcing the policy.

Seat belt use is especially critical because large numbers of people die in rollover crashes when they are partially or completely thrown from the vehicle. NHTSA estimates that people who wear their seat belts are about 75 percent less likely to be killed in a rollover crash than people who don’t.
**Does an experienced driver make a difference?**
Significant differences in the design and handling characteristics of a 15-passenger van make it drive differently from other passenger vehicles. Therefore, an organization that owns a 15-passenger van should select one or two experienced drivers to drive the van on a regular basis. These drivers will gain valuable experience handling the van. This experience will help make each trip a safe one.

**How can rollover crashes be prevented?**
Because most rollover crashes don’t involve other vehicles, they are often preventable. Here are some tips for drivers to minimize the risk of a rollover crash and serious injury:

- Avoid conditions that lead to a loss of control. Never drive while under the influence of alcohol or other drugs. Make sure you are well rested and attentive, and always slow down if the roads are wet or icy.
- Drive cautiously on rural roads. Be particularly cautious on curved rural roads and maintain a safe speed to avoid running off the road.
- Know what to do if your wheels drop off the roadway. If your wheels drop off the roadway, or pavement, gradually reduce speed and steer back onto the roadway when it is safe to do so.
- Properly maintain your tires. Make sure your tires are properly inflated and the tread is not worn down. Worn tires can cause your van to slide sideways on wet or slippery pavement. Improper inflation can cause handling problems and can lead to catastrophic tire failures, such as blowouts. Therefore, check tire pressure and treadwear once a month.

**What are other considerations for safe driving?**
When a 15-passenger van is not full, passengers should sit in seats that are in front of the rear axle. More than 15 people should never be allowed to ride in a 15-passenger van. Because a 15-passenger van is substantially longer and wider than a car, it:

- Requires more space and additional reliance on the side-view mirrors for changing lanes
- Does not respond as well to abrupt steering maneuvers
- Requires additional braking time.

**A few things to consider about 15-Passenger Vans**

- Higher Center of Gravity
- Long, Narrow Wheel Base
- Many Passengers Usually Create More Distractions
- Size and Shape of Vehicle makes it more Unpredictable in the Wind
- 15-Passenger Van “Chassis” are different than standard vehicles
- The combined Weight of the occupants, cargo, and the higher center of gravity – 15-Passenger Vans are extremely vulnerable to Rollovers during otherwise “minor” accidents
- Take longer to stop
- Tend to “Hydroplane” in wet weather conditions
- The weight, height, occupant load, and cargo load create a “Combined Center of Gravity” that makes the Overall vehicle prone to stop/corner “sluggishly” and increase the likelihood of rolling over during a crash.
- 15-Passenger vans are difficult to maneuver and operate in close, confined areas. The driver’s “perception” of vision is most often wrong… leading to costly accidents.
- Avoid driver distractions (cell phones, two-way radios, etc)
NHTSA Study
This study was performed using the crash data from Florida, Maryland, Missouri, New Mexico, Ohio, Pennsylvania and Utah for crash years 1994 through 1999. The calculated rollover ratios are ratios of the numbers of rollovers to the numbers of all single vehicle crashes.

Looking at all rollovers, regardless of the number of vehicle occupants, fifteen-passenger vans have almost the same rollover ratio as does a comparison group: all light trucks and vans (LTVs). The rollover ratios were observed over four categories of occupancy levels: under 5, 5-9, 10-15 and over 15 occupants.

NHTSA Study (1994-1999)

<table>
<thead>
<tr>
<th>Occupancy Level</th>
<th>All SV Crashes</th>
<th>All Rollovers</th>
<th>Rollover Ratios</th>
<th>Combined Roll-Over Ratios 1 to 9 and 10 or More Occupants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5</td>
<td>1,815</td>
<td>224</td>
<td>12.3%</td>
<td>12.7 %</td>
</tr>
<tr>
<td>Five to Nine</td>
<td>77</td>
<td>16</td>
<td>20.8%</td>
<td></td>
</tr>
<tr>
<td>Ten to Fifteen</td>
<td>55</td>
<td>16</td>
<td>29.1%</td>
<td>35.4%</td>
</tr>
<tr>
<td>Over Fifteen</td>
<td>10</td>
<td>7</td>
<td>70.0%</td>
<td></td>
</tr>
</tbody>
</table>

15 Passenger Vans have a much higher propensity to rollover during a crash when carrying more than 5 passengers! Remember, adding “cargo” increases the chances of rolling as well!

As seen above, the propensity to roll over increases with the occupancy level. It can be inferred that a fifteen-passenger van that has over 15 occupants runs almost six times the risk of rolling over as compared to a fifteen-passenger van that has less than 5 occupants (70.0 vs. 12.3 rollovers per 100 crashes), when involved in a single vehicle crash. When confining the analysis to two groups, less than 10 occupants and 10 or more occupants, the rollover ratio for the vehicles with 10 occupants or more occupants is almost 3 times (35.4 percent vs. 12.7 percent) that of vehicles with less than 10 occupants.

All three sizes of vans for which rollover propensity metrics were measured during NHTSA’s field tests had an increase in rollover propensity, measured using SSF, (static stability factor) from the driver-only loading condition to the 15-occupant loading condition. However, the effects of occupant loading were greater for the fifteen-passenger van than for the seven-passenger van or the minivan.

Minimum Driver Standards
ICC requires drivers to be at least 21 years of age
Acceptable driving record
Completion of on-line training session
Avoid driver distractions (cell phone, two way radios, etc.)

Final Steps
• Print the 15-passenger van certification form located at the end of this document.
• Complete the certification form and forward it to Vice President of Business Services
• Request use of 15-passenger van through normal process for requesting use of college vehicles
• Forward any questions or comments to Vice President of Business Services

Thank you for taking the time to help the college meet the requirements set by our fleet insurance carrier.
Certification of Completion  
15-Passenger Van Training

I certify that I have viewed the complete Itawamba Community College 15-Passenger Van Training Session as presented by the college. I do understand the material as printed and am comfortable with driving a 15-passenger van for the college.

As an authorized college driver, I will follow accepted safe driving practices and will take reasonable precautions when operating any college vehicle.

____________________________________________________      ________________  
(Signature)             (Date)
____________________________________________________
(Printed Name)

*Forward completed form to the Secretary for V.P. of Business Services in the Business Office before requesting a 15-passenger van. Request for use of college vehicles are processed through the normal procedures of the college.*