

likewise excluded. The agency noted that while rear lap belts reduce the risk of death by 24–40 percent, rear lap/shoulder belts would reduce that risk by 32–50 percent. The agency postulated that there would be even more benefits if occupants were more willing to use the lap/shoulder belt than the lap belt.

Much has changed since NHTSA issued the two final rules in 1989. At present, all 50 states and the District of Columbia, Puerto Rico, and the U.S. Territories have child passenger safety laws that require children to be properly restrained in an approved child restraint or by the vehicle's belt system. In 1987, belt use in the rear seat was only 16 percent. Today, the agency estimates that the rate of belt use in the center rear seat is 50 percent in passenger cars and 57 percent in light trucks and vans (LTVs). Belt use among all rear seat passengers is 58.5 percent for passenger cars and 66.3 percent for LTVs. Over time, belt use has been increasing for these positions. It is believed that a lap/shoulder belt in the rear center position will lead to a further increase in belt use. In addition, children are increasingly riding in the back seat in response to educational campaigns designed to educate parents and other caregivers about the risk to children from riding in the front seat. NHTSA recently examined rear seat occupancy patterns for children up to nine years of age. It found that while the number of fatalities among children in this age group was evenly divided between the front and rear seat in 1991, by 2000, the front seat accounted for 56 percent fewer fatalities than the rear seat. The major change in distribution occurred between 1996 and 2000, the time frame during which consumers were urged to place their children in the back seat due to the risk of air bag-related injury or death.<sup>3</sup>

Additionally, consumer information campaigns, which advocate child restraints for children up to eight years of age, unless they are taller than 4'9" have been increasingly successful in convincing parents to keep their children in appropriate child restraints well past the age mandated by state law. Finally, states have recently begun to increase the minimum age requirements for child restraints. Nine states and the District of Columbia have enacted

legislation that requires children be restrained in a child restraint at least to age six. Seven other states require child restraint use up to age five. The increase in child restraint usage by older children has led to greater use of belt-positioning booster seats. These seats, in which the vehicle safety belt serves to hold both the child and the restraint in place, are most often designed for use with a lap/shoulder belt.

Today's proposal seeks to increase the use of belt-positioning boosters and to improve the safety of all occupants in the center rear seating position, regardless of whether the occupant is seated in a booster seat. While this seating position may not be used as often as the rear outboard seats, we believe that an individual is more likely to survive a side impact collision if seated in the center seat than if seated in the impacted outboard seat, as the empty space between the side of the vehicle and the occupant provides a significant amount of crush space. We believe that this proposal will provide these occupants with the same level of safety belt protection as the occupants of other seating positions.

## II. The Safety Problem

As indicated above, one of the primary reasons for today's proposal is the increased protection that children between the ages of four and eight gain by having a lap/shoulder belt made available in rear center seating positions. When these lap/shoulder belts are installed in the rear center seating position, there will be an additional, and potentially safer, seating position available for a child in a belt-positioning booster seat. Lap/shoulder belts are 12 percent more effective in preventing AIS 2–5 injuries and fatalities than lap belts in rear seats of passenger cars and ten percent more effective in preventing AIS 2–5 injuries and fatalities in rear seats of light trucks. These effectiveness rates assume that the belts are properly positioned. The increased effectiveness for children who are not properly positioned would likely be less. Belt positioning booster seats should enable children to attain the same effectiveness rates from lap/shoulder belts as the rest of the population, since they allow proper positioning for children in the four- to eight-year-old age group. Additionally, the presence of a center lap/shoulder belt may shift seat usage from the outboard positions to the center seat position. This would lead to some reduction of injury or death in side impact crashes.

The potential benefits associated with requiring lap/shoulder belts for rear

center seating positions is not limited to the potential for increased use of booster seats. It would also benefit older occupants. In order to estimate the number of individuals who travel in the center seats of vehicles, NHTSA examined the National Automotive Sampling System (NASS) Crashworthiness Data System (CDS) data from 1988 to 1999. Overall, the NASS CDS data indicated that, in this eleven-year period, approximately eight percent of the roughly 19.6 million individuals involved in tow away crashes were seated in a center seat. Eighty percent of the center seat occupants were in the rear. The agency then looked at the distribution of the annualized maximum abbreviated injury scale (MAIS) injury levels for occupants seated in center seating positions in passenger cars and LTVs from 1996 to 1999. The vast majority of these injuries were sustained by individuals seated in the rear center seat, with approximately 20 percent of the occupants in passenger cars seated in a front center seat and 53 percent of the occupants in LTVs seated in a front center seat.

In a 1999 study, NHTSA found that belt use was approximately seven to ten percent higher at back outboard designated seating positions with a lap/shoulder belt than at ones with only a lap belt.<sup>4</sup> While the agency cannot explain why belt use is higher, the combination of higher belt use and increased benefits related to the additional protection afforded by the shoulder belt result in greater benefits than lap belts alone. This is true for every forward-facing seating position.

Current belt use among rear center-seated passengers in passenger cars is approximately fourteen percentage points less than among occupants in the front passenger seat, 49.6 percent as opposed to 63.3 percent. The belt use among rear-seated passengers in LTVs is generally equivalent to belt use by occupants in the front passenger seat, 57.4 percent and 57.6 percent, respectively.

If the switch from lap belts to lap/shoulder belts in rear center seating positions did not lead to any increase in belt use, NHTSA estimates that the addition of a shoulder belt to the rear center seating positions of passenger cars would prevent five fatalities and 111 injuries (AIS 2–5) annually. Similar numbers, five fatalities and 134 injuries (AIS 2–5) would be achieved in

<sup>3</sup> The development and implementation of advanced air bag technologies does not obviate the need for additional rear seat protections. To the contrary, it remains imperative that children ride in the back seat regardless of the type of air bag system integrated into the vehicle. This is because the back seat provides a safer environment for all occupants, even if the vehicle has no air bag, and because even the most advanced technology cannot completely eliminate risk.

<sup>4</sup> "Effectiveness of Lap/Shoulder Belts in the Back Outboard Seating Positions," Evaluation Division, Plans and Policy, National Highway Traffic Safety Administration, Washington, DC June 1999. DOT HS 808 945.