

# Lawrence Berkeley National Laboratory

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### **Title**

Safer Vehicles for People and the Planet: Letter to the Editor

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## LETTERS TO THE EDITOR

To the Editors:

Single-vehicle crashes, which account for half of occupant fatalities, are not mentioned in "Safer Vehicles for People and the Planet," by Thomas P. Wenzel and Marc Ross (March-April). Simple physics shows that in such crashes risk declines as vehicle mass increases.

The authors write "driving imported luxury cars carries extremely low risk, for reasons that are not obvious." The reasons are obvious—the cars are purchased by low-risk drivers. If they swapped vehicles with drivers of sports cars (which have high risk), the risks would stick with the drivers, not the vehicles.

The article reflects the American belief that death on our roads can be substantially reduced by making vehicles in which it is safer to crash. From 1979 through 2002, Great Britain, Canada and Australia reduced fatalities by an average of 49 percent, compared with 16 percent in the U.S. Accumulating the differences over this time shows that by merely matching the safety performance of these other countries, about 200,000 fewer Americans would have died.

These trends continue. In 2006 the U.S. recorded 42,642 traffic deaths, a modest 22 percent decline from our all-time high. Sweden recorded 445, a reduction of 66 percent from their all-time high.

The obsessive focus on vehicles rather than on countermeasures that scientific research shows substantially reduce risk is at the core of our dramatic safety failure. The only way to substantially reduce deaths is to reduce the risk of crashing, not to make it safer to crash.

Leonard Evans  
Bloomfield Hills, MI

Drs. Wenzel and Ross respond:

Of course Dr. Evans is correct in stating that driver behavior influences crash risk. In our article we made clear that our estimates of risk include how well a vehicle/driver combination avoids a crash, as well as how crashworthy a vehicle (and robust a driver) is once a crash occurs. We also analyzed two variables that can account for driver behavior: the fraction of all driver fatalities that are young men, and a "bad driver" rating that combines information about the current crash (drug or alcohol involvement, driving without a license, or reckless driving) as well as the operator's driving record for the previous three years. For example, the high risks of sports cars, and the low risks of minivans, are clearly influenced by who drives these types of vehicles (36 percent young males and 0.77 bad driver rating for sports cars, vs. 4 percent and 0.21 for minivans; the average values for all types of cars are 20 percent and 0.50). On the other hand, we were surprised to find that the imported luxury cars, with the lowest risks, have only average

drivers (21 percent young males, 0.57 bad driver rating). That is the basis for our conclusion that the design of imported luxury vehicles, or at least specific safety features on them, overcome risky behavior taken by their drivers.

The safety of vehicles has greatly improved over the years. In our studies we have found several examples of models that greatly reduced their risks over time; for example, the Ford Focus has a much better risk to its drivers (118) than the Ford Escort it replaced (148). Our data indicate that more young males drive the Focus (21 percent) than the Escort (15 percent), and that Focus drivers are perhaps slightly more risky (0.50 vs. 0.44 bad driver rating). Clearly vehicle design does not play as small a role in vehicle safety as Dr. Evans suggests.

Dr. Evans asserts that we ignore single-vehicle crashes and that simple physics dictates that vehicle mass provides safety in single-vehicle crashes. By itself, additional vehicle mass does provide some protection from rapid deceleration in crashes with a movable object, particularly for an unbelted occupant. However, when it comes to vehicle safety, our research by vehicle model indicates that there is essentially no relationship between car mass and risk, even in frontal crashes. In his own papers, Dr. Evans appears to admit that it is not clear whether mass, or size (specifically crush space) is inherent to vehicle safety.

Additional research indicates that it is not size per se that protects in two-vehicle crashes, but how well the stiff structures on the vehicles are aligned. The auto manufacturing industry has voluntarily made design changes to their pickup trucks to increase the likelihood that truck and car bumpers will interact in a frontal crash, reducing the aggressivity of pickup trucks in recent years.

Regarding the differences in experiences between the U.S. and other countries, it is important to keep in mind that the U.S. vehicle fleet is fairly unique; about half of U.S. vehicles are light duty trucks (pickups, SUVs and minivans), which many studies have shown are dangerous to other road users.