

It produces predicted rollover rates in the range of 0.09 to 0.50 for vehicles ranging from tip-up to no tip-up in maneuvers and from 1.0 to 1.55 in SSF.

The other commenters in favor of combined ratings were primarily concerned that separate ratings would be too confusing to serve as consumer information. They believed a combined rating was the only viable option, but they did not comment specifically on the means used by NHTSA to develop the combined risk model. IIHS and the Alliance (along with Carr Engineering) suggested that another comment period following the notice containing the actual model (as opposed to the example given in the NPRM notice) would be necessary. GM suggested that the risk model be developed through a collaborative effort along the lines of the Motor Vehicle Safety Research Advisory Committee, and the Alliance suggested a working-level dialog between NHTSA and the auto industry to develop the risk model. TRW supported a single rating that would be computed on the basis of the SSF only model with a predetermined number of stars added or subtracted for dynamic maneuver performance (determined without a statistical relationship to risk).

Advocates expressed wariness that the combined rating could be misleading to consumers unless it corresponded to real-world rollover rates. Public Citizen preferred the combined rating developed from a risk model. It was concerned that consumers would focus more attention on the dynamic maneuvers in separate ratings although the tests represent an event (on-road untripped rollover) that occurs in less than 5 percent of actual rollover crashes.

Continental-Teves and Bosch prefer separate ratings for SSF and dynamic maneuver tests. Continental-Teves stated that "the relative effects of SSF and dynamic performance are not well understood, and may not be the same for every vehicle or every driver." Bosch stated that "static and dynamic ratings should be separate, as they are both equally important with regards to indicating stability and safety of the vehicle." Bosch further explained that "a combined rating may not adequately show the influence of such systems [Electronic Stability Control and Rollover Mitigation] which in turn would not encourage manufacturers to add systems to vehicles that increase overall vehicle safety in potential rollover as well as many other situations."

B. Crash Avoidance Technologies

Some of the stated expectations of the commenters about rollover resistance

ratings are unrealistic. The rollover resistance ratings predict the likelihood of a single-vehicle crash becoming a rollover. They do not predict the likelihood of the vehicle becoming involved in a single-vehicle crash. Similarly, the frontal and side NCAP crashworthiness ratings do not predict the likelihood of the vehicle striking an object head-on or being struck from the side. The Alliance comment anticipates the dilemma. While conceding that SSF is strongly correlated with a tripped rollover once the vehicle is already off-road, it states that "the likelihood of being involved in a single-vehicle crash in the first place "particularly one involving off-road excursion "is influenced much more by demographic and environmental influences than is the scenario examined for SSF purposes." The scenario used in the combined risk model is the same scenario used in the SSF model, namely the average demographic and environmental variables reported by the states for the entire 293,000 single-vehicle crash data base we have collected. We think this is the best scenario to characterize single-vehicle crashes.

The Alliance is concerned that our model "may fail to account for potentially beneficial technologies for avoiding single-vehicle and rollover crashes, such as electronic stability control and variable ride high suspension systems." Its concern is unnecessary for variable ride-height suspension systems, which will be tested in the highway rather than off-road height for both SSF and dynamic maneuver tests, and the technology will certainly improve the rating of vehicles so equipped.

However, the Alliance is right that the model does not predict the risk of a single-vehicle crash. NHTSA has been very clear in public notices, consumer information and web site presentations that neither the SSF risk model nor the proposed combined SSF and dynamic maneuver risk model predict the risk of having a single-vehicle crash. From the standpoint of rollover resistance, single-vehicle crashes are a measure of exposure. The prediction is of the risk of a rollover resulting from the exposure of the vehicle to a single-vehicle crash. The risk of rollover in the event of a single-vehicle crash is strongly influenced by vehicle properties, but the vehicle properties of modern vehicles have far less influence in comparison to demographic and environmental factors regarding the risk of a single-vehicle crash in the first place. However, electronic yaw stability control may

provide a real-world reduction in single-vehicle crashes.

We have been optimistic about the potential of electronic yaw stability control to reduce single-vehicle crashes. NHTSA's consumer information identifies its availability as standard or optional equipment on individual vehicles and explains how it operates to help a driver maintain control in extreme circumstances. One of the reasons we are exploring the possibility of NCAP handling ratings is to describe the effect of yaw stability control on handling predictability. However, the technology has not been in widespread use long enough to produce much crash evidence for the evaluation of its real-world effectiveness in preventing single-vehicle crashes. Our previous attempts at evaluating its effectiveness were thwarted by insufficient data.

Part of the motivation for the NAS study of NHTSA's SSF-based rollover resistance ratings was the Alliance's concern that yaw stability control was not being considered. In its public oral presentation to the NAS study committee in May 2001, NHTSA said it did not expect yaw stability control to have a large effect on the risk of rollover given a single-vehicle crash. In its view, the large majority of rollovers were the result of various types of tripping, and SSF represented the most important vehicle attributes in those circumstances. NHTSA believes that the greatest potential effect of yaw stability control was in reducing single-vehicle crashes in the first place. Therefore, we suggested to the committee that rather than trying to predict rollovers per single-vehicle crash with dynamic maneuver tests, we should keep SSF for that purpose and adjust the comparative risk for vehicles with yaw stability control by the effect of yaw stability control to reduce exposure to single-vehicle crashes. However, establishing the effectiveness of yaw stability control would require data not available for at least two or three more years. Neither the NAS committee nor the Alliance, which was active in providing the committee information, expressed interest in this suggestion. But the present comments indicate that finding a way to include the crash avoidance potential of yaw stability control is a principal concern of the Alliance and several suppliers of these systems.

IIHS's comment also shows an expectation of more than what is possible for a rollover resistance rating. It discusses a comparison of the 1997 Jeep Grand Cherokee and 1997 Toyota 4Runner made in one its reports. In that report, the Toyota had four times the number of fatal rollovers per 100,000