Memorandum

U.S. Department of Transportation

National Highway Traffic Safety Administration

Subject: Review of Draft SAE Paper on Rollover Risk Evaluation Using CARDfile

Date: MAY 14 1987

From: Adele Spielberger
Associate Administrator for
Plans and Policy

Reply to Attn of:

To: Michael M. Finkelstein
Associate Administrator for
Research and Development

Our comments are directed to the above SAE paper and Rulemaking's recent draft evaluation of the Senator Wirth petition because both of these documents are attempting to address the subject of rollover and to date, they have taken conflicting positions. The authors of both documents have made commendable attempts to analyze the rollover issue. However, the SAE paper has over-emphasized the importance of track width while understating the role of wheelbase, vehicle size and other factors. At the same time, the draft evaluation has over-emphasized the importance of these other factors while understating the role of track width. Both documents should be revised to more objectively discuss the rollover issue. We believe that there is a common, middle-ground position reflected in these documents, and that is that track width, wheelbase, c.g. height, and size all were found to correlate with rollover risk.

The SAE paper also needs to be sensitive to and discuss the potential impact of attempting to regulate via the above factors. Otherwise, as discussed in the draft evaluation, we could be giving too strong an indication that we were thinking about regulatory measures that would threaten to outlaw certain vehicle classes. We believe there has to be a greater appreciation of the general purpose of particular vehicle designs, e.g., the short, narrow, and high-ground-clearance jeep, when considering any attempts to generally limit the rollover propensity of all passenger-carrying vehicles.

The discussion of the "suitability" of FARS and CARDfile also needs toning down in the SAE paper. One could also criticize CARDfile for its high percentage of property-damage-only and minor injury accidents and hypothesize that while it showed high correlations, the correlations may only be significant for more minor accidents. Thus, even though there was

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a relatively high rollover tendency, injury severity levels might not be excessive. We believe it would be more appropriate to characterize the CARDfile analysis as a complement to other analyses using FARS and other files rather than over-promoting its "suitability."

Other, more detailed comments on the SAE paper are attached for your consideration.

Attachment

cc: Chief Counsel
AA/Rulemaking
AA/Enforcement

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Attachment to Memorandum -- Review of Draft SAE Paper on Rollover Risk Evaluation Using CARDfile

(1) The vehicle stability factor -- half-track width divided by the height of the vehicle's center of gravity (T/2H) -- is not fully defined or discussed. Why was half-track width selected rather than track width? Why is the inverse relationship (T/2H) used rather than 2H/T, when the former results in a negative coefficient for this measure?

(2) As shown in Table 5, the ratio of wheelbase to height of the center of gravity (L/H) is slightly more strongly correlated to the ratio RO/SVA, the dependent variable, than is the measure of vehicle rollover stability that is used in the regression analysis, half-track width to center of gravity height. The respective correlation coefficients are -0.94 for L/H and -0.92 for T/2H. We also note in Table 5 that the simple correlation between wheel base and RO/SVA (-0.65) is better than that between track width and RO/SVA (-0.52)). This type of information should be highlighted to support the point that a number of factors were found to correlate with rollover risk.

(3) On page 13, it is stated that including two additional variables into the regression equation -- percent drivers under 25 years old, percent male drivers -- increased the R-square value only "slightly" from 0.84 to 0.92. The addition of these two variables reduces the unexplained variability of the dependent variable by half to 8 percent, which seems more in the category of "quite good." It would be interesting to know the R-square if these two additional variables were regressed against RO/SVA.

(4) 1981 NASS data are reported on page two to indicate the importance of rollover accidents. These data are conspicuously out of date. While the relationship has likely remained essentially the same, the question that comes to mind is why hasn't the agency produced more recent accident data analyses of this fundamental relationship related to the paper's topic?

(5) The tables in the appendix should be more self-standing; variables should be defined. In table four, the variables for which values are provided in the table do not correspond to the variables included in the equation at the top of the page.