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## Further Evaluation of the Relationship between Enhanced Consistency Model and Safety of Two-Lane Rural Roads in Israel and Germany

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### Abstract

Crashes on two-lane rural highways are over-represented at horizontal curves, and speed inconsistency is a common contributing factor to these crashes. Road Consistency reflects the similarity or lack thereof of vehicle performance along an entire road segment. Consistency is measured by estimating the speed variation along successive geometric elements and evaluation of the speed deviation from the average speed. Because it has been shown in the past that speed variability has an impact on safety, it was hypothesized that design consistency is also related to safety. The purpose of this study is to examine the relationship between road design consistency and crash probability on two-lane rural highways. An enhanced consistency model is applied to examine this relationship in Israel and Germany. This consistency model is based on both the horizontal and vertical alignments and takes into account the impact of trucks and grades on road consistency. A statistically significant model that showed a reduction in average crash numbers per year with an increase in consistency is presented and discussed. It was found that the Israeli and German models have a similar trend. The enhanced-consistency model and the software may be used relatively easily to determine consistencies of different alternatives during the planning of new highways or the reconstruction of existing roads. Planners and decision-makers could be advised of potential design deficiencies during the design process and consequently, modify a proposed design and thus improve safety levels and save lives.

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