FACT SHEET

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Effects of Raising and Lowering Speed Limits on Selected Roadway Sections

Introduction

All too often, speed limits are considered as a cure-all for a community's traffic ills. Citizens frequently demand speed zoning changes in an effort to develop a quick solution to a complicated traffic problem. There is a need, therefore, to determine the effects of changing speed limits on traffic operations and safety for surface (non-freeway) rural and urban roadways.

Data Collection

Speed and accident data were collected in 22 States at 100 sites before and after speed limits were altered. The speed limits were lowered at 59 sites and raised at 41 sites. The sites included 63 rural sites, 22 small urban sites, and 15 urban sites. The section lengths varied from 0.3 mi to 12.6 mi (0.5 km to 20.3 km, with an average of 1.7 mi [2.7 km]). Speed and accident data were collected at 83 similar comparison sites (where the speed limits were not altered) to control for time trends and other factors.

The researcher was notified about sites where speed limits were to be changed by State traffic engineers. Traffic data were collected before and after the speed limits were changed for 24-h periods using automated roadside units connected to inductive loop mats to record speeds, headways, and types of vehicle. Data were collected for more than 1.6 million vehicles.

Accident data included more than 6,000 reported accidents. For most sections, accident data were collected for a 3-yr period before and a 2-yr period after the speed limits were changed. Data were coded for accident type, severity, and light and surface conditions.

Data Analysis

The free-flow speeds (vehicles with headways of 4 s or greater) were used for the speed analyses. mean speed, standard deviation of the speed distribution, percentile speeds, and percentage of vehicles exceeding the posted speed limits by 5, 10, 15, and 20 mi/h (8, 16, 24, and 32 km/h) were computed for all sites.

Comparisons were made for groups of sites where the speed limits were lowered by 5, 10, 15, and 15 mi/h (8, 16, and 24 km/h).

A variety of statistical tests were applied to the accident data. The analyses included a check for

comparability, paired comparison ratios, cross-product ratios or odd ratios, an empirical Bayes method, and the weighted average logit method. Because the sample sizes were small when divided up by the increments to limits that were raised or lowered, the main analyses combined all the sites where the speed limits were raised, and all the sites where the speed limits were lowered.

Results

Neither raising nor lowering the speed limit had much effect on vehicle speeds. The mean speeds and the 85th percentile speeds did not change more than 1 or 2 mi/h (1.6 or 3.2 km/h), even for speed limit changes based on the amount the posted speed limit was altered.

The percent compliance with the posted speed limits improved when the speed limits were raised. When the speed limits were lowered, the compliance decreased.

Lowering the speed limit below the 85th percentile or raising the limit to the 85th percentile speed also had little effect on drivers' speeds.

The changes in accidents at the study sites are shown in figure 2. These changes were not statistically significant at the 95th percentile confidence level.

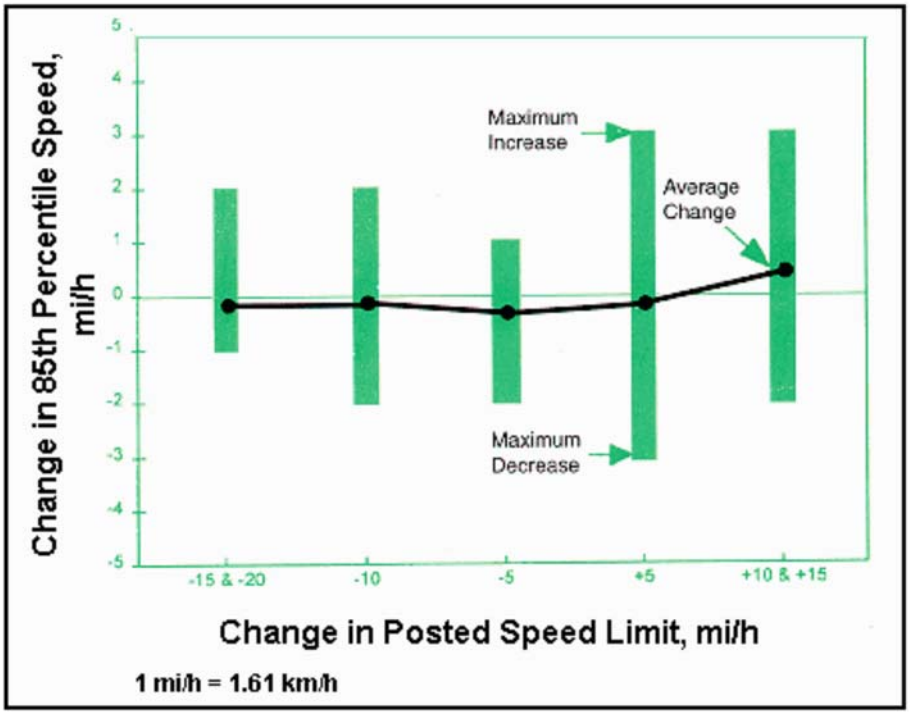

Figure 1. Maximum and average changes in 85th percentile speed at the sites where speed limits were altered.

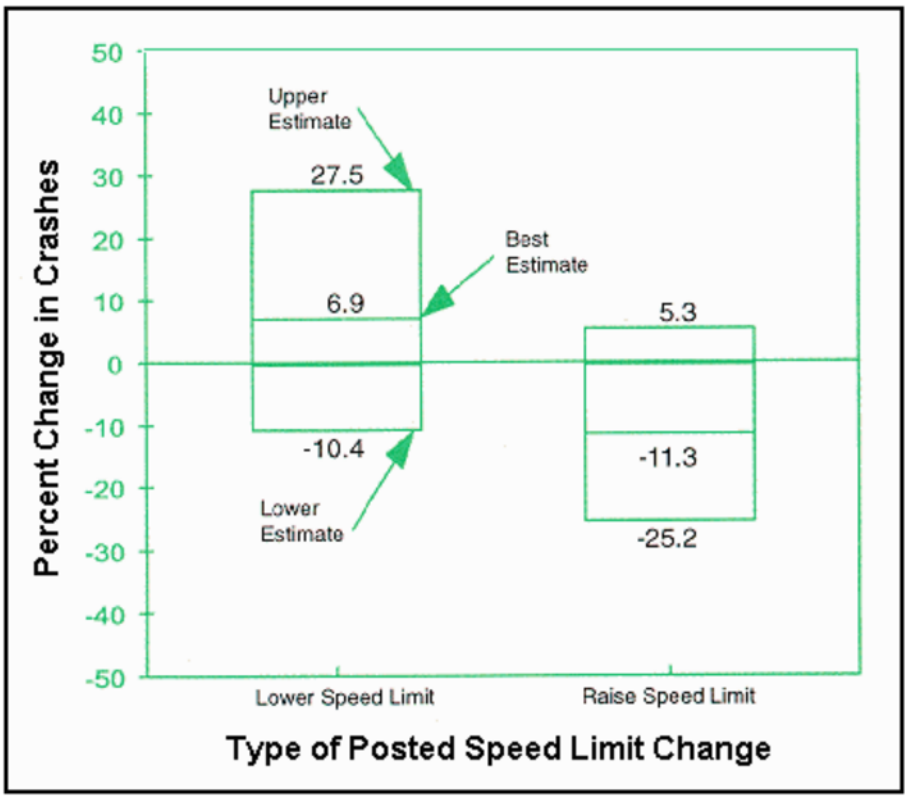

Figure 2. Summary of crash effects at sites where posted limits were altered.

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