Summary of Final Report, BC352-10
May 2004

QUANTIFYING THE EFFECTS OF RAISING THE MINIMUM SPEED ON RURAL FREEWAYS AND THE EFFECTS OF RESTRICTING THE TRUCK LANES ONLY IN DAYTIME

Volume 1: Evaluating the Relevance of 40 MPH Posted Minimum Speed Limit on Rural Interstate Freeways in Florida

PROBLEM STATEMENT

Following the repeal of the federally sanctioned 55 mph maximum speed limit through the enactment of the National Highway System (NHS) Designation Act in 1995, Florida was among the first states to raise the maximum speed limit on Interstate freeways from 65 mph to 70 mph. Prior to raising the maximum speed limit, Florida had a practice of posting 40 mph minimum speed limit on rural Interstate freeways. However, the minimum speed limit was not revised after the maximum speed limit was raised. The existence of a 70 mph/40 mph maximum/minimum permissable speed range allows a 30 mph gap between fast and slow vehicles traveling on rural interstate freeways. This gap could result in several unsafe phenomena associated with speed differentials, including improper and poor lane changing, tailgating, frustration to drivers desiring to maximize their speed, and the formation of platoons in the traffic stream.

OBJECTIVES

The goal of this study was to evaluate the relevance of the 40 mph posted minimum speed limits on rural Interstate freeways in Florida by evaluating individual vehicle speeds collected from various sites on rural interstate freeways. Researchers also evaluated crashes that occurred on these sites to determine the influence of low speed vehicles on safety. The theme throughout the analysis was to examine traffic operating speeds at the lower end of the speed distribution (esp., close to the 40 mph minimum speed limit value).

FINDINGS AND CONCLUSIONS

This study evaluated speed and safety characteristics of eight sites located on rural Interstate freeways in Florida. Examination of the speed data collected on these sites indicated that about 0.14 percent of the vehicles were traveling below the 40 mph posted minimum speed limit, and only 1 percent of the vehicles were traveling with speeds below 55 mph. The results further revealed that raising the speed limit to 70 mph in 1996 increased average speeds on rural Interstate freeways. The comparison of the 1996 data to 2002 data demonstrated that average speeds on these facilities have increased by 5 mph, which is equivalent to the speed limit increase. However, speed variance did not change much, although the average of 15th percentile speeds on all sites increase by 3 mph.

While the operational data showed that only 0.14 percent of vehicles had speeds below 40 mph, the crash data indicated that about 9 percent of vehicles involved in crashes were estimated to be traveling at speeds less than 40 mph. This finding suggests that a small proportion of vehicles traveling with low speeds had a significant impact on the safety characteristics of these freeways. Thus, any strategy for dealing with the issue of posting of minimum speed limit must take this fact into account. A general loglinear crash model developed showed that increasing the median speed significantly reduced the number of crashes while increasing the variation between fast and slow moving traffic significantly increased the number of crashes. The field data suggests that posting a minimum speed limit of 40 mph does not have significant operational impact; thus, the practice should be abandoned following careful review of other relevant factors.

BENEFITS

The results of this study provide decision makers with a a thorough review and understanding of the safety and operating characteristics associated with the posting of minimum speed limit signs. If further analysis indicates that the practice of posting minimum speed limit signs should be abandoned, the department could save substantial resources associated with the maintenance of traffic signs.

This research was conducted by Dr. Renatus N. Mussa, P.E., at Florida A&M University - Florida State University College of Engineering. For more information, contact Eric Larson, Project Manager, at (850) 414-4868, eric.larson@dot.state.fl.us