



# GUIDELINES FOR THE APPLICATION OF REMOVEABLE RUMBLE STRIPS

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## Introduction

In 1999, work zone fatalities in the United States hit an all-time high. In 2000, a new record of 1093 fatalities represented an additional increase of 26%. Statistics such as these have served to highlight the need for transportation agencies to continue working to improve work zone safety. The Kansas Department of Transportation (KDOT) is continuously investigating new ways of improving safety for maintenance workers and travelers alike. Removable rumble strips show promise of being an improvement over asphalt rumble strips in some circumstances. This report details a comparative study to assess the viability of removable rumble strips as a substitute for asphalt strips.

## Project Objective

This work was initiated to assess the viability of removable rumble strips as replacements for asphalt rumble strips, particularly in short term highway work zones. The two rumble strips tested were the Orange Rumble Strip from Advanced Traffic Markings and the Rumbler from Swarco in black.

## Project Description

The removable strips are compared with asphalt strips in terms of the levels of in-vehicle noise, vehicle-body vibration, and roadside noise, their effect on vehicle speeds, and their cost, durability, and installation and removal processes. Sound and vibration levels were measured with a sound/vibration analyzer, microphone, and accelerometer. Speeds were monitored with pneumatic hoses and automatic traffic recorders. Additional tests were performed to explore the effects of changes in deployment configuration with respect to the sound and vibration levels produced by the orange rumble strips. Of the configurations tested, 6 strips with a center-to-center spacing of 0.6 m (2 ft) was the preferred configuration based on the sound and vibration levels produced.

## Project Results

The results of the comparisons indicated that the removable rumble strips tested are similar to asphalt rumble strips in terms of the sound and vibration levels produced and the speed reductions observed. With certain limitations, these removable rumble strips are a viable alternative to asphalt rumble strips.

## Report Information

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