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## Guardrail influence on pedestrian crossing behavior at roundabouts

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### Abstract

Pedestrians account for 10-30% of all road accident fatalities in western countries, and therefore efforts to improve pedestrian safety are of major importance. Research can support these efforts in various ways, particularly by studying road crossing patterns, and by exploring pedestrian compliance rates to safety laws and guidelines.

This paper focuses on pedestrian crossing behavior at roundabouts. The main goal of the present study was to quantify the effect of guardrails at roundabouts as a tool to direct pedestrians to crosswalks. We examined these effects under various conditions, such as: guardrail type, traffic volume, estimated age group, gender, road type, and crosswalk type.

The present study was based on field observations at 20 arms at 10 roundabouts in Israel, conducted during 2009. 60 hours of video recordings were analyzed. 11,116 pedestrian crossings were observed, of which 2749 (24.7%) were not at a crosswalk, thus violating the law. Binary Logit model results suggest that the rate of violations without guardrail is 20-30% higher than the rate with full guardrail (depending on specific conditions). Compliance rates were found to be higher when traffic volumes were higher.

The findings reported in the present study are a valuable contribution to support practical decisions regarding guardrails at roundabouts. Insights from this study on pedestrian crossing patterns at roundabouts can also provide a basis for suggestions of other pedestrian safety improvements.

**Keywords:** pedestrian; roundabout; traffic safety; compliance; guardrail

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