

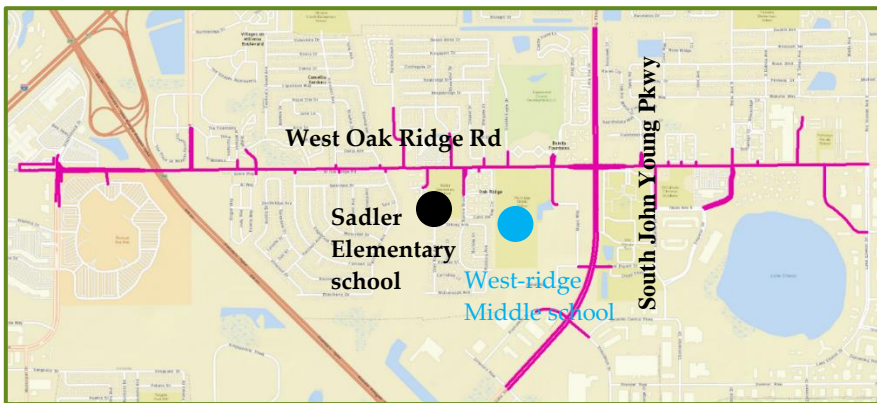
Research Report Summary



SAFER-SIM University Transportation Center, 69A3551747131

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Enhancing School Zone and School Bus Safety

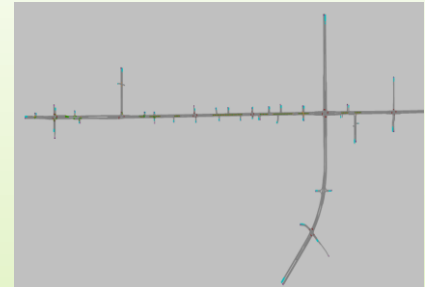


Study Area

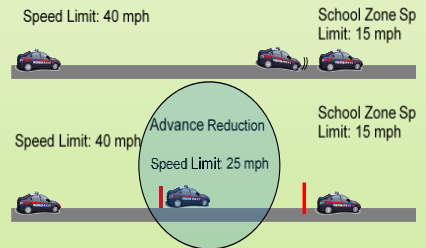
Overview

This research project was conducted to identify effective countermeasures to enhance the safety of school zones. The objectives of the study were to analyze driving behavior in response to reduced speed limits in school zones and evaluate different countermeasures. Also, the study investigated the

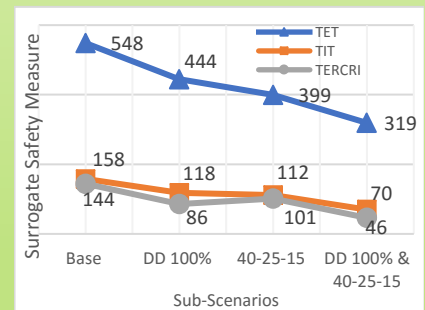
impacts of geometric design of roadways and the number of driveways on safety in school zones. In the microsimulation environment, different countermeasures were analyzed to evaluate their safety effects on school zones.



Microsimulation network



Two-step speed-reduction procedure



Surrogate measures of safety for the best three sub-scenarios with the base scenario

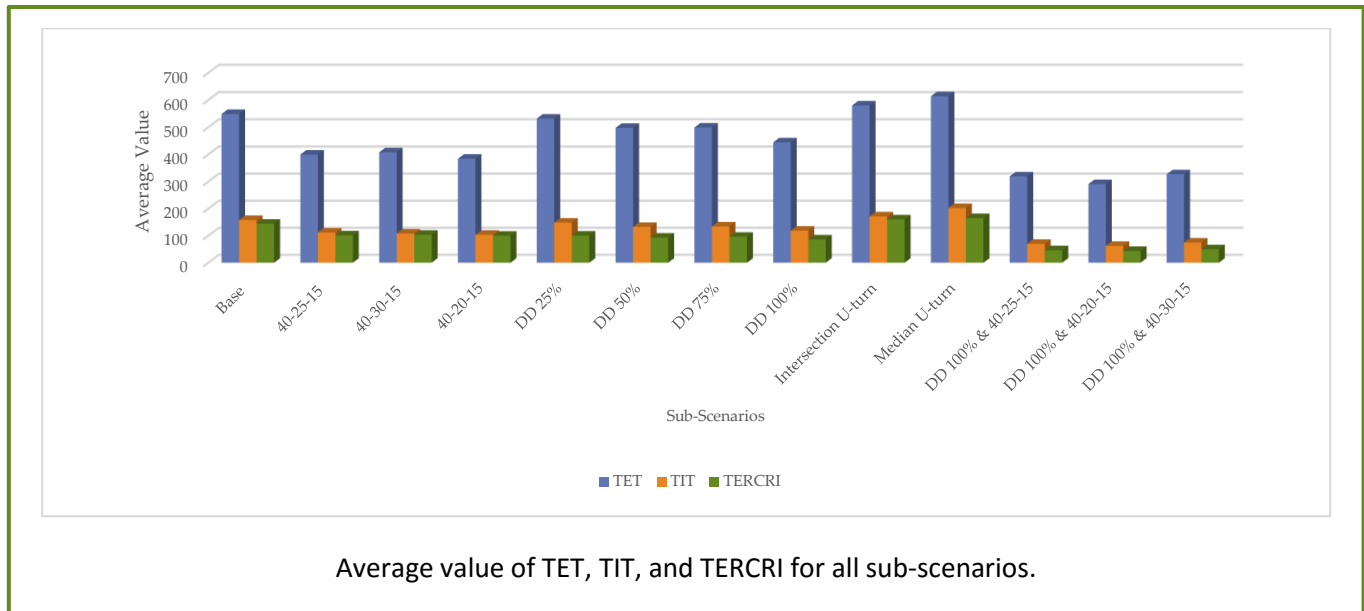
Study Area

In order to select the study area, school location data, AADT, and total crashes for the years 2012-2016 was used. A 1,000 ft. buffer around each school was created, and the crash rate was calculated.

The school zone of Westridge

Middle and Sadler Elementary School was selected for the study area because it had the highest crash rate in Orange and Seminole Counties in Central Florida.

“The microsimulation experiment revealed that two-step speed reduction and decreasing the number of driveways can reduce the surrogate safety measures compared with the field condition. Also, crash risk is higher when a two-way left-turn lane is replaced with a raised median.”



Microsimulation Study

- 1) Creating a microsimulation network around the selected school zone
- 2) Building a well-calibrated and validated VISSIM network to replicate the real field.
- 3) Testing the impact of different countermeasures.
- 4) Evaluating surrogate safety measures for different scenarios and comparing them with the field condition.

Findings and Recommendations

1) Two-step speed reduction and decreasing the number of driveway access significantly reduced time-exposed time to collision (TET), time-integrated time to collision (TIT), and time-exposed rear-end crash risk index (TERCRI) values compared with the base condition;

2) The combination of these two countermeasures outperformed their individual effects as well as the base condition;

3) In the case of replacing a two-way left-turn lane with a raised median, the values of the surrogate safety measures were higher than those of the field

condition, indicating higher crash risk;

4) One-way ANOVA analysis showed that there was a significant difference among all sub-scenarios; and
5) The sensitivity analysis indicated that different values of TTC thresholds did not significantly affect the results.