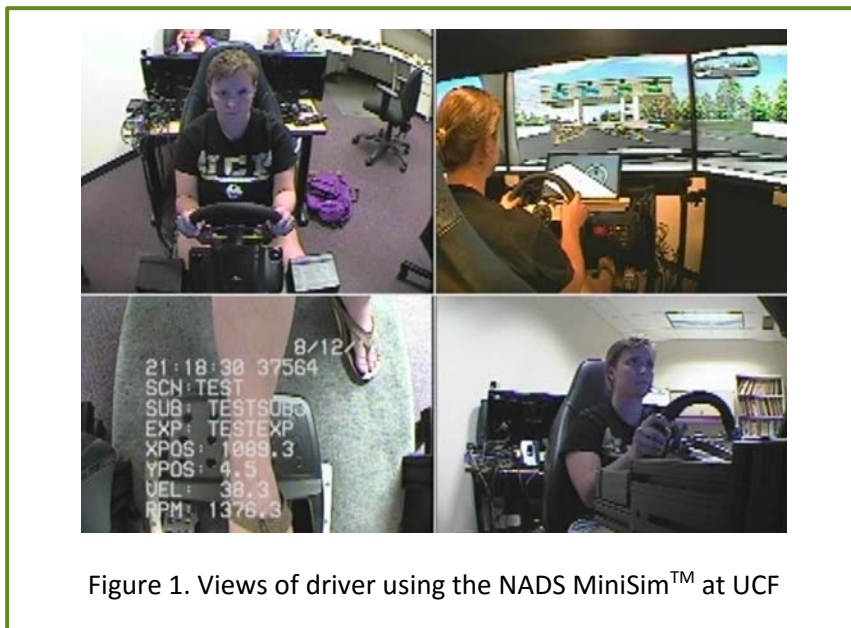


Research Report Summary

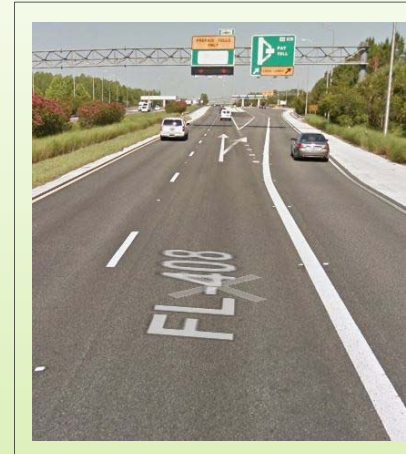
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Evaluation of Real-World Toll Plazas Using Driving Simulation



Toll plazas are an essential part of the highway system, especially within the state of Florida. A primary reason for vehicle collisions at these toll plaza facilities is the fact that each toll plaza agency has different design, signage, and marking criteria. This, in turn, causes driver confusion and possible last minute weaving maneuvers. Even though the varying design of toll plazas is a

clear highway safety factor, research in the field is very limited but expanding. This study focused on one toll plaza, the Dean Mainline Toll Plaza, located in Orlando, Florida. Using the NADS MiniSim™ Simulator, seventy-two subjects completed this study. Five factors were tested across twenty-four scenarios by means of a factorial experimental design.



Study Objectives

- 1) Create and analyze replications of real-world scenarios,
- 2) Evaluate the safety and efficiency of the current Dean Mainline Toll Plaza,
- 3) Provide recommendations to improve or maintain the current toll plaza design and to potentially contribute to a nationally set design for toll plazas.

“Toll plazas are becoming an essential part of the highway system. How to improve the safety of toll plazas is the focus of this study.”

Conclusions and Recommendations

- 1) The Dean Mainline Toll Plaza was shown to have a safe design layout. The current settings satisfy the MUTCD toll plaza guidelines.
- 2) The current signage at the Dean Mainline Toll Plaza had a positive effect on non-urgent lane changing before the toll plaza. In other words, drivers had a higher probability of changing lanes non-urgently with the current signage compared to the alternative sign scenarios.
- 3) The segment length after the toll plaza was found to influence drivers to make unsafe maneuvers. However, more analysis should be done in order to conclude whether the segment length after the Dean Mainline Toll Plaza is sufficient.

