Project Capsule

26-2SA

February 2026

Safety of Median Openings on High-Speed Highways in Louisiana

PROBLEM

High-speed highways are essential for mobility, safety, and economic activities. Median openings, which are strategically designed gaps in divided roadways, allow controlled access, left turns, U-turns, and indirect left turns at or near intersections and access points. However, these openings can pose safety challenges, particularly when they are placed near signalized intersections. Such placements can create overlapping influence zones, leading to confusion, driver expectancy violations, delays, and increased conflict points. Research has shown that longer median openings are associated with higher vehicle speeds and increased driver workload and decision complexity, which may elevate crash risks. Various factors, including type, placement, spacing, length, number of lanes, vehicle speed, and traffic volumes, influence the safety of median openings.

Transportation agencies face challenges in determining whether to install, modify, or replace median openings to optimize safety while balancing traffic operation, mobility, and accessibility. There is a need for additional data-driven studies to evaluate the safety performance of median openings and alternative designs such as directional median openings and restricted crossing U-turn (e.g., RCUT/J-turn) treatments. Understanding the safety effects of median openings on Louisiana highways is an important step in guiding the implementation of proactive strategies to eliminate fatal and serious injuries for all road users by reducing conflicts at high-speed highways, thereby supporting DOTD's effort to move toward the Safe System Approach (SSA). The findings will help to prioritize segments for safety improvements, inform design standards, guide policy decisions, and support proactive strategies to reduce fatal and serious injuries.

Start Date
February 1, 2026

Duration
24 months

Funding
SPR: TT-Fed/TT-Reg - 5

Principal Investigator
Elisabeta Mitran, Ph.D.
Hany Hassan, Ph.D., P.E.

Administrative Contact
Tyson Rupnow, Ph.D., P.E.
Associate Director, Research
225-767-9124

Technical Contact
Julius Codjoe, Ph.D., P.E.
Special Studies
Research Administrator
225-767-9161

4101 GOURRIER AVE.
BATON ROUGE, LA 70808

Read capsule online:
www.ltrc.lsu.edu/publications.html

OBJECTIVE

The primary goal of this research is to apply a systemic, corridor-level safety analysis within a Safe System framework to identify recurring crash patterns and risk factors related to median openings on high-speed highways (i.e., roads with posted speeds of 45 mph or higher) in Louisiana. This will facilitate the data-driven identification of corridors and segments with increased safety risks and opportunities for targeted safety enhancements.

METHODOLOGY

The research methodology for evaluating the safety performance of median openings on high-speed highways in Louisiana involves seven (7) interrelated tasks, designed to be completed within a 24-month study period.

- **Task 1:** Conduct a comprehensive literature review to summarize existing research on median opening designs, access management strategies, crash prediction methods, and risk factors.
- **Task 2:** Perform data collection, preparation, cleaning, validation, and road segmentation. This includes gathering crash data, traffic characteristics, and geometric features of median openings, followed by data integration and validation using GIS-based linear referencing.
- **Task 3:** Analyze crash data to identify patterns, severity distributions, and contributing factors associated with median openings. This analysis will use systemic safety analysis methods to understand access-related safety risks at both corridor and segment levels.
- **Task 4:** Prepare an interim report summarizing the findings from the first three tasks.
- **Task 5:** Conduct a systemic safety analysis to identify key risk factors, such as geometric, traffic, and land use variables, that contribute to increased crash frequency, severity, and rates at median openings. The analysis will prioritize recurring crash types, such as U-turn and left-turn crashes, and evaluate roadway characteristics, including median design, spacing, traffic volume, and proximity to intersections.
- **Task 6:** Prioritize segments for safety improvement and identify appropriate countermeasures.
- **Task 7:** Prepare a final report and technical summary.

IMPLEMENTATION POTENTIAL

It is expected that this research will yield practical, data-driven countermeasures to improve safety at median openings on high-speed highways in Louisiana. Additionally, the development of an integrated database of median openings, systemic network-screening results, and a prioritized list of candidate locations for safety improvement will also provide DOTD with sustainable, long-term capabilities for monitoring and managing median openings.