



FY 2025 Annual Program Research Project Statement 25-074

Title:	Develop Crash Predictive Methods for Frontage Roads including ramp terminals, and intersections with crossroads in Texas
The Problem:	<p>The mileage of frontage roads accounts for 7.7 percent of all the state-maintained roadways in Texas; however, crashes on frontage roads account for 14.4 percent of all the crashes that occurred in 2021. The number of annual frontage road crashes has increased in the last 3 years.</p> <p>Development of Safety Performance Functions (SPFs) and Crash Modification Factors (CMFs) have been widely used to quantitatively analyze roadway safety. SPFs and CMFs for frontage roads are relatively limited. The AASHTO Highway Safety Manual does not cover predictive methods on frontage roads.</p> <p>Frontage road segments have different design standards and traffic characteristics from other roadways. Examples include:</p> <ul style="list-style-type: none"> • Entrance and exit ramps connecting to the freeway mainlane. • Factors, including distance between adjacent ramps and/or intersections, ramp type and their orders, distance between ramps and driveways, affect safety on frontage roads. <p>Currently, no frontage specific intersection predictive methods are available, and transportation engineers typically apply methods developed for non-frontage road intersections. The crash predictive methods developed from this research shall be used to predict number of crashes on frontage road segments and intersections in Texas. Analysis shall assist TxDOT with a more efficient evaluation and management of frontage road, improve frontage roadway safety, and save lives.</p>
Technical Objectives:	<p>The research objectives are:</p> <ul style="list-style-type: none"> • Conduct a literature review pertaining to frontage road SPFs and investigate their accuracy in predicting crashes on Texas frontage roadways. • Develop Texas-specific frontage road crash predictive methods, including: <ul style="list-style-type: none"> ○ Combinations between rural and urban areas, ○ One-way versus two-way, ○ Both segments and intersections. • Develop methods to: <ul style="list-style-type: none"> ○ Systematically locate intersections along frontage roads, ○ Assign crashes on frontage segments and intersections. • Investigate whether models of common intersections can be applied to similar type of intersections on frontage roads. • Analyze data requirement for establishing Texas frontage road SPFs; developing data sets of the various geographical areas in Texas. • Evaluate safety impact of weaving on frontage road, distance between the ramp terminals and intersections; and effect of lane addition. <p>The expected technology readiness level (TRL) for this project is 8.</p>
Anticipated Deliverables:	<ol style="list-style-type: none"> 1. Technical memorandum for each task completed. 2. Monthly progress reports. 3. Project Summary Report 4. Research report documenting the findings of this research, including: <ul style="list-style-type: none"> • Develop framework that incorporates variables such as traffic volume, heavy vehicle mix, speed, number of lanes, ramp configuration and spacing, pedestrian & bike volume/facilities, and access point density to select an appropriate cross-section for frontage roads. • Texas-specific frontage road crash predictive methods. • Frontage road specific intersection predictive methods. • Guidance on the minimum distance from ramp terminal to intersection • Incorporate the crash predictive methods into spreadsheet tools to facilitate the analysis and to support project design decisions related to frontage roads segments and intersections. • Develop and present workshops and trainings.

Proposal Requirements:

1. RFP#1 Q&A Deadline: 12:00 p.m. Central Time, **Tuesday, February 20, 2024.**
2. Proposal Deadline: 12:00 p.m. Central Time, **Thursday, March 21, 2024.**
3. Use the current “ProjAgre” and “PA Forms” templates located at the [RTI Forms webpage](#).
4. Proposals will be considered non-responsive and will not be accepted for technical evaluation if they are not received by the deadline or do not meet the requirements stated in RTI's [University Handbook](#).
5. Proposals should be submitted by the University Liaison in PDF format; (1) PDF file per proposal. File name should include project name and university abbreviation.
6. This project will be tracked during the life of the project using the Technology Readiness Level ([TRL](#)) scale.
7. The 2021 Texas Legislative Session requires that universities be in compliance with Senate Bill 475 by submitting a completed and signed TxDOT Security Questionnaire (TSQ) to RTIMAIN@txdot.gov. Universities that have not submitted a completed and signed TSQ one week after award will be considered non-compliant and unable to participate in the Program.