

REQUEST FOR PROPOSALS
LTRC Project No. 18-4SA, SIO No. DOTL1000217
Intersection on Horizontal Curves: Problems and Potential Solutions

PROBLEM STATEMENT

Horizontal curves pose challenges to drivers due to the differentiation in roadway alignment and limitation in available sight distance for safe maneuvering. If an intersection is located within these curves, this increases the safety challenge. According to the *Guide for Reducing Collisions on Horizontal Curves* (NCHRP Report 500), the most typical crashes encountered on horizontal curves are single vehicle roadway departure crashes and head-on crashes.

In Louisiana there are many intersections on horizontal curves located on state-owned and locally-owned roads. To improve the safety of our roads, the Infrastructure and Operations Emphasis Area Team of Louisiana's Strategic Highway Safety Plan (SHSP) aims to reduce roadway departure, intersection, and non-motorized user fatalities and severe injuries by 50% by 2030. Unfortunately, in 2016 in Louisiana intersection-related fatalities and severe injuries accounted for 19.1% of total fatalities and 39.9% of total severe injuries, respectively. Furthermore, roadway departures-related fatalities and severe injuries accounted for 57.7% of total fatalities and 40.5% of total severe injuries. In order to decrease these numbers, achieve the target, and prevent further intersection crashes, we need to better understand the magnitude of the problem and identify the risk factors or roadway characteristics that contribute to fatalities and serious injuries at intersections on horizontal curves on all public roads in Louisiana. This will provide a basis for selecting sites for potential mitigation.

OBJECTIVES

The objective of this research is to (1) quantify safety performance at unsignalized intersections on curves on all Louisiana public roads, (2) determine significance, magnitude, and relevance of the problem, (3) identify risk factors or roadway characteristics (e.g. curve radius, skew angle, presence of lighting, traffic volume, speed) that are common among similar sites, and (4) develop a list of possible countermeasures that target identified risk factors.

RESEARCH APPROACH

The Louisiana Transportation Research Center (LTRC) is seeking the insight of proposers on how best to achieve the research objectives. Proposers shall describe research plans that can be realistically accomplished within the constraints of available funds and contract time as allowed in this RFP. Proposals must present the candidate's current thinking in sufficient detail to demonstrate their understanding of the problem and the soundness of their approach to meeting the research objective.

For each phase of the proposed research, itemize and discuss the tasks necessary to fulfill the objectives. Task descriptions are intended to provide a framework for conducting the research and identifying deliverables. *Refer to section 3.3.5 of the LTRC Manual of Research*

Procedures (2016 edition) for more guidance.

http://www.ltrc.lsu.edu/pdf/2016/LTRC_RESEARCH_MANUAL_FINAL.pdf

The research shall address, at a minimum, the following issues related to intersections on horizontal curves on public roads:

- Literature review of relevant studies and analysis approaches;
- Identification of all intersections and horizontal curve locations, including state and locally owned roads using readily available data (roadway characteristics, traffic volumes, and crashes);
- Analysis of safety data and identification of high risk roadway characteristics;
- Identification of relationships between horizontal curve and intersection characteristics and crashes;
- Quantification of crashes for different contexts (e.g. urban, rural);
- Identification of risk factors that contribute to fatalities and serious injuries at intersections in horizontal curves;
- Quantification of safety performance at unsignalized intersections on curves on all of Louisiana's public roads;
- Documented step-by-step methodology for identifying sites that possess the identified high risk roadway characteristics; and
- Development of possible countermeasures (specific to risk factors) to reduce crashes on intersections on horizontal curves in Louisiana.

Note: DOTD/LTRC contracts to collect, maintain, store, analyze, and distribute crash related data captured from law enforcement and other agencies throughout the state of Louisiana. DOTD Data Collection and Management Systems contracts to collect, maintain, store, and distribute roadway and traffic data. LTRC will facilitate any coordination with that contractor, as needed.

DELIVERABLES

The proposal shall include project deliverables for appropriate tasks. Deliverables shall be due as defined in the proposal. The proposal shall include at a minimum the following deliverables:

- Interim Report
- Biannual Reports
- Presentations to the PRC
- Final Report, Technical Summary, and Implementation Plan

SPECIAL NOTES

- A. LTRC research projects will be conducted in accordance with the LTRC Manual of
 - a. Research Procedures, 2016 edition.
 - b. http://www.ltrc.lsu.edu/pdf/2016/LTRC_RESEARCH_MANUAL_FINAL.pdf
- B. Any work that is anticipated to be required from LTRC or DOTD shall be specifically detailed in the proposal.
- C. Any surveys or questionnaires developed by the research team shall be reviewed and approved by the PRC prior to distribution.

- D. LTRC projects are intended to produce results that will be applied in practice. It is expected that the implementation of the results of this research into practice will evolve as a concerted effort during this project. The final report must contain an implementation plan to include, as a minimum, the following:
 - a. The “product” expected from the research;
 - b. A realistic assessment of impediments to successful implementation;
 - c. The activities necessary for successful implementation; and
 - d. The criteria for judging the progress and consequences of implementation.
- E. To assist in the implementation process, the investigators of this research shall present the final results to LA DOTD officials in an oral presentation to be held in Baton Rouge, Louisiana at LA DOTD Headquarters after acceptance of the final report.
- F. The proposal should include travel to meet with the Project Review Committee for a “kick off” meeting, presentation of interim report, and presentation of the final report at a minimum. Funds budgeted for travel shall be limited to what is necessary for the conduct of the research. Funds shall not be budgeted for conference travel. Funding for technology transfer of research results are available upon request subject to LTRC approval and available funds.
- G. LTRC’s mission includes the support of higher education in Louisiana. Consultant and out-of-state institutions submitting proposals are encouraged to cooperate and collaborate with Louisiana universities for the purpose of sharing of knowledge and increasing transportation expertise in the academic community.
- H. Graduate assistance stipends are allowed. Tuition reimbursement or tuition remission rates applied to stipends are not allowed.
- I. To equitably answer any questions regarding this Request for Proposals, the Louisiana Department of Transportation and Development (LA DOTD) website will be updated with questions and answers and related documents regarding the project.
- J. <http://webmail.dotd.louisiana.gov/AgreStat.nsf/BWebAdvertisements?OpenPage>
- K. LA DOTD makes these documents available for informational purposes only to aid in the efficient dissemination of information to interested parties. LA DOTD does not warrant the documents against deficiencies of any kind. The data contained within this web site will be periodically updated. Interested parties are responsible to be aware of any updates. Questions regarding this RFP should be submitted in writing to the LTRC contact person. Questions must be received by close of business seven calendar days prior to deadline date.
- L. J. Consultants and business entities shall be registered with the Secretary of State in order to be able to work in Louisiana prior to award of contract.
- M. <http://www.sos.la.gov/Pages/default.aspx>
- N. K. If Sub-Consultants/Entities are used, the Prime Consultant/Entity must perform a minimum of 51% of the work for the overall project.
- O. L. LTRC reserves the right to withhold invoice payments for delinquent deliverables as defined in the proposal.

ESTIMATED COST OF RESEARCH

\$150,000

ESTIMATED COMPLETION TIME

18 Months (*includes 3 months for review and approval of final report*)

LTRC PRIMARY CONTACT

Kirk Zeringue, P.E.
Special Studies Research Administrator
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AUTHORIZATION TO BEGIN WORK:

August 1, 2018 (estimated)

PROPOSAL FORMAT

All proposals are required to be formatted according to LTRC Manual of Research Procedures. Section 3.3 provides guidance on proposal development. A copy of the Manual may be downloaded from our website (http://www.ltrc.lsu.edu/pdf/2016/LTRC_RESEARCH_MANUAL_FINAL.pdf).

PROPOSAL SELECTION

The Project Review Committee selected for this project will review, evaluate and rank all proposals received using the criteria established on the attached proposal review form.

DEADLINE FOR RECEIPT OF PROPOSALS

Ten copies of the proposal must be received by LTRC by the close of business day of July 19, 2018.

Proposals should be submitted to:

Samuel B. Cooper, Ph.D., P.E.
Director Louisiana Transportation Research Center
4101 Gourrier Ave.
Baton Rouge, LA 70808