

REQUEST FOR PROPOSALS

LTRC 24-2ST / SIO DOTLT1000523

REDESIGN OF INNOVATIVE GATE ARMS (RAMP CLOSURE GATE) PHASE 1

PROBLEM STATEMENT

The Louisiana Department of Transportation and Development developed a cost-effective portable, swinging gate arm that could be deployed and installed with minimal effort. The device needed to be evaluated as roadside safety hardware because it remains in place even when the ramp is open. A project, LTRC 22-1ST, was funded by the Louisiana Department of Transportation and Development (LADOTD). The study was completed, conclusions and recommendations were made. The final report may be found at https://www.ltrc.lsu.edu/pdf/2022/FR_665.pdf

The study assessed the device's performance per *Manual for Assessing Safety Hardware* (MASH) guidelines to evaluate support structures. Researchers conducted a thorough review of the ramp gate system and identified the component sizes and material properties. A set of drawings to be used in creating the finite element model of the device was developed. Furthermore, the slip base system was validated using previous crash test data. Next, a computer simulation was performed to evaluate the device's performance according to the conditions specified in MASH, including conducting parametric analyses of the device under various configurations. The Ramp Closure Gate design that was evaluated did not pass MASH. To be efficient, the system must pass MASH and be able to remain on the roadway so that they can be deployed rapidly when a closure is declared.

OBJECTIVE

The purpose of the study is to redesign the LADOTD's existing ramp closure gate and through laboratory work and engineering analysis (crash simulations) propose a redesign that meets the functional requirement and passes MASH test protocols. The final design should utilize a majority of materials currently stocked by the Department (will be made available to the PI).

PROPOSED RESEARCH:

The proposal shall address at a minimum, the following tasks:

- Task 1.** Conduct literature review of research on the design and performance of ramp closure gates and report the findings the project review committee (PRC) in the form of a written report.
- Task 2.** Review the current design of the ramp closure gate that is being used and in light of the work done of LTRC FR 665, recommend revision of the existing system and submit a revised design for the ramp closure gate. **The PRC's approval is required before proceeding to Task 3.**
- Task 3.** For the testing of the device, the PI will submit a testing plan for conducting a laboratory testing and computer simulations following MASH Test 3-61 and 3-62

specifications. **The PI will need the PRC's approval for proceeding with the testing and the computer simulation.**

Task 4. After the testing and the computer simulations have been performed and collected data analyzed, the PI will deliver a draft technical summary and draft final report documenting all work conducted in the study. Templates are available in the links below:

https://www.ltrc.lsu.edu/pdf/tech_summary_template.docx

https://www.ltrc.lsu.edu/pdf/LTRC_Report_Template_2019.docx

https://www.ltrc.lsu.edu/pdf/LTRC_Author_User_Guide%20Word_2019.pdf

Both technical summary and final report shall be submitted to the Project Manager three (3) months before the end of the study.

Task 5. PI shall give a final presentation documenting all work done in the study two (2) weeks after Task 4 has been fulfilled.

Task 6. PI shall address all technical comments and update both technical summary and final report. PI will resubmit his updated technical summary and final report to the Project Manager.

DELIVERABLES

- Literature search report (Task 1)
- A design plan for the gate arm (Task 2)
- Testing plan (Task 3)
- Final Report documenting all work done throughout the study (Task 4)
- A presentation of findings to the PRC (Task 5).
- Updated technical summary and final report (Task 6).

SPECIAL NOTES

- A.** LTRC research projects will be conducted in accordance with the LTRC Manual of Research Procedures, 2019 edition.
https://www.ltrc.lsu.edu/downloads.html#pub_forms
- B.** Any work that is anticipated to be required from LTRC or DOTD forces 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 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.

- 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.
<http://webmail.dotd.louisiana.gov/agrestat.nsf/WebAdvertisements?OpenPage>
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.
- 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.
<http://www.sos.la.gov/tabid/1011/Default.aspx>
- K.** If Sub-Consultants/Entities are used, the Prime Consultant/Entity must perform a minimum of 51% of the work for the overall project.
- L.** LTRC reserves the right to withhold invoice payments for delinquent deliverables as defined in the proposal.

ESTIMATED COST OF RESEARCH

\$75,000

ESTIMATED COMPLETION TIME

12 Months (*includes 3 months for review and approval of final report - i.e. final report due 9 months*)

LTRC PRIMARY CONTACT

Walid Alaywan, Ph.D., P.E.
Sr. Structures Research Engineer
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AUTHORIZATION TO BEGIN WORK:

April 1, 2024 (estimated)

PROPOSAL FORMAT

All proposals are required to be formatted according to LTRC Manual of Research Procedures. Chapter 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

The proposal must be received by LTRC by **noon** on March 1, 2024. An electronic copy shall be submitted to Sheri Hughes via Sheri.Hughes@la.gov copying Samuel.Cooper@la.gov before the due date.

Proposals should be submitted to:

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