

# **REQUEST FOR PROPOSALS**

## **Developing Inexpensive Crash Countermeasures for Louisiana Local Roads**

### **PROBLEM STATEMENT**

Louisiana's transportation system includes nearly 60,000 miles of roads, of which approximately 44,000 miles are under the jurisdiction of local authorities and the remainder are state controlled. Of the estimated annual average of 160,000 traffic crashes which occur on Louisiana's roads, about 40% occur on the local system including 23% of the total fatalities. Thus, the local road network is important to reaching Louisiana's short and long term goals for fatality and serious injury reduction.

Local road agencies often lack the resources to adequately identify candidate locations for low cost safety improvements. They also often lack the means to estimate the cost of the safety improvements. This makes development of systematic improvement programs and investment decisions very difficult. Thus, the need exists to develop a method that allows identification of those locations in the local road network that are the most likely to experience high crash rates based on their traffic and geometric features, and to estimate the cost of those countermeasures that best address the safety problem.

### **RESEARCH OBJECTIVES**

The overall goal of the research is to develop safety performance functions that will allow local roads in Louisiana to be classified by safety level, and establish cost estimation procedures for low cost countermeasures that address the greatest safety problems. The specific objectives are to:

1. develop the methodology to identify and classify local roads based on their expected safety performance
2. identify and locate the "riskiest" local road classifications using the expected safety performance functions and over-represented crash types
3. identify packages of low cost safety improvements for candidate locations and/or road classifications
4. develop procedures to estimate the cost of low-cost countermeasures
5. identify candidate locations for inclusion in a systematic safety improvement program that considers the effectiveness and cost of candidate countermeasures

### **SCOPE**

The scope of this project is to identify the highest priority safety improvement program for Louisiana's local road system based on safety performance function analysis and cost estimates of system-wide improvements.

### **RESEARCH APPROACH**

#### **Task 1: Literature Review**

Conduct a literature review on safety performance functions and countermeasures used

on local roads. With respect to the countermeasures, the emphasis must be on low-cost, easily-implemented procedures. The literature review can include international practice and can include informal communication through internet-based communication media. A written literature review that can form a section in the final report must be prepared and presented to the PRC for review and comment.

**Task 2: Develop safety performance functions for local roads in Louisiana**

Using the data from the Louisiana Crash Database, the Local Road File of the Surface Transportation Log, and traffic volume estimates from the Highway Performance Management System, establish safety performance functions that relate traffic and geometric features of local roads to the dominant types of crashes occurring on local roads in Louisiana. The dominant types of crashes that occur on local roads in the state can be determined by using the Louisiana Crash Database to estimate an over-representation factor defined as the proportion of crashes of a certain type on local roads, over the proportion of the same type of crash on all two-lane roads in the state. The safety performance function must be capable of estimating crash rates by crash type and severity level.

**Task 3: Estimate safety risk level of local road sections in Louisiana**

Using the safety performance function developed in task 2, estimate the safety performance of individual links of the local road network in Louisiana. An index of safety risk that combines safety performance at each severity level into a single value must be developed and used to rank road sections by risk level.

**Task 4: Identify countermeasures**

From the literature review, and in consultation with the participating local authority technical personnel and the PRC, identify inexpensive candidate countermeasures for each dominant crash type identified in task 2. The Accident Modification Factor (AMF), defined as the degree of improvement a countermeasure is expected to effect, must be established for each countermeasure identified.

**Task 5: Estimate cost of candidate countermeasures**

Using cost estimates from the literature as well as individual cost estimates from unit costs and resource estimates, estimate the cost of the candidate countermeasures identified in task 4.

**Task 6: Establish program of road safety improvement**

Establish a priority of road safety improvement by using the need for improvement, expressed by the over representation factor estimated in task 2, the degree of improvement, described by the AMF of the countermeasure considered, and the cost of implementing the countermeasure as identified in task 5. Priority should be directly related to need and degree of improvement, and inversely related to cost. The priority value should establish a ranking of improvements that can be used to develop a program of improvements and provide an estimate of the overall cost of improving local roads to acceptable levels of safety as expressed by the over-representation factor.

### **Task 7: Prepare Progress and Final Reports**

Progress must be reported to the Project Review Committee (PRC) at 6-month intervals or at the discretion of the PRC. Progress will be reported in writing but may also be by audio-visual presentation if requested by the PRC. A final report must be submitted to LTRC three months before the end of the project. The research results must be presented in an audio-visual presentation to the PRC before the end of the project

### **SPECIAL NOTES**

- A. Task descriptions are intended to provide a framework for conducting the research. LTRC is seeking the insight of proposers on how best to achieve the research objectives. Proposers are expected to describe research plans that can realistically be accomplished within the constraints of available funds and contract time. Proposals must present the candidate's current thinking in sufficient detail to demonstrate their understanding of the problem and the soundness of their approach.
- B. The proposal shall include travel to LTRC as necessary to meet with the Project Review Committee and statewide for conduct of the research. Out of state travel for the conduct of the research shall be identified in the proposal. Funding shall not be included for travel to conferences for presentation of results. Principal Investigators may request support for conference travel funding outside the project budget.
- C. LTRC projects are intended to produce results that will be applied in practice. It is to be expected that an implementation plan for moving the results of the 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;
  - d. The criteria for judging the progress and consequences of implementation.
- D. To assist in the implementation process, the investigators of this research shall be prepared to present the final results to LaDOTD officials in an oral presentation to be held in Baton Rouge LaDOTD Headquarters after acceptance of the final report.

### **CONTRACT TIME**

24 months

### **COST**

\$100,000

### **AUTHORIZATION TO BEGIN WORK**

October 15, 2010 (estimated)

### **PROPOSAL FORMAT**

All proposals must be formatted according to LTRC Research Manual, 2003 edition ([http://www.ltrc.lsu.edu/pdf/research\\_man03.pdf](http://www.ltrc.lsu.edu/pdf/research_man03.pdf)).

**PROPOSAL SELECTION**

The Project Review Committee selected for this project will review, evaluate and rank all proposals received according to the criteria listed in the proposal review form shown in figure 2-6 in the LTRC Research Manual

**DEADLINE FOR RECEIPT OF PROPOSAL**

September 24, 2010, 4.30 p.m.

An electronic copy of the proposal must be submitted to:

Mr. Harold R. Paul, P.E.

Director

Louisiana Transportation Research Center

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Baton Rouge, LA 70808

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