REQUEST FOR PROPOSAL (RFP) #17-01

DEVELOPMENT OF A PERFORMANCE-RELATED ASPHALT MIX DESIGN SPECIFICATION

POSTED DATE: 1/10/17; CLOSING DATE: 2/28/17

PROJECT INFORMATION

Funds: $425,000
Estimated Contract Term: 30 months
Projected Start Date: September 1, 2017
Deadline for Submitting Proposals: February 28, 2017
Submit Proposals via Email to: Steven Gillen at sgillen@getipass.com

BACKGROUND

The current state-of-the-practice reported for asphalt pavement mixture design and acceptance is to use volumetric properties in conjunction with performance properties through prescriptive specifications. Asphalt mix design practices generally only relate empirically to field performance – laboratory design techniques rely on tests where the results are not directly related to field performance. This leads to a situation where surrogate mix design properties are used to control performance properties (e.g. aggregate properties are used to control rutting).

The recently-completed NCHRP Synthesis 492 notes that “some agencies have investigated performance specifications for asphalt mixtures,” but a full performance specification has not been completed by any agency. The Illinois Tollway is included as one of the agencies that have investigated performance-related specifications for asphalt pavements.
Numerous tests (Hamburg wheel, DCT, Texas overlay tester, SCB, etc.) have attempted to quantify the performance requirements of asphalt mixes. Research begun with the Strategic Highway Research Program in the 1980s continues to evaluate and investigate possible performance tests. A soon-to-be published study on mixture cracking has evaluated a number of asphalt mixture cracking performance tests, with an emphasis on evaluating the repeatability, practicality, degree of standardization, and ability to predict various cracking modes (NCHRP 9-57).

At this time, the Tollway uses the IDOT prescriptive mix design process (or special provisions of a similar format) which incorporates only a few tests (tensile stress ratio and Hamburg wheel) that have mixed success in evaluating pavement performance. With the Tollway needing to focus on building and maintaining high traffic volume expressways, high performance asphalt mixes are needed to ensure the Tollway is constructing the longest lasting pavements possible. The use of performance-related specifications to develop high performance mix designs for Tollway pavements would prove beneficial by providing more durable pavements that will require less maintenance (and less interruption to users of the Tollway). Any performance-related specification test methods must be repeatable and applicable in order for the asphalt industry to adopt them, and they must directly relate to the expected field performance of the mixes.

OBJECTIVE

The objectives of this research include:

1. Reviewing previous literature and project documentation in order to identify the state-of-the-art for asphalt mixture performance-related testing methods.
2. Evaluating available performance tests used to predict or measure the resistance of asphalt mixtures to distresses such as rutting, cold temperature cracking, fatigue cracking, and moisture damage.
3. Developing a performance-related asphalt mix design specification, incorporating specification limits for Tollway mix designs based on the testing of samples obtained from existing Tollway pavements, and reviewing existing performance and testing data.
4. Updating the Tollway with quarterly briefings of progress-to-date.
5. Summarizing all efforts in a comprehensive final report that will include, as an appendix, a recommended performance-related specification for Tollway asphalt mixtures.

RESEARCH TASKS AND REQUIRED DELIVERABLES

The research shall be divided into tasks, as described below:

A. Literature review – Conduct a thorough review of the available literature and ongoing project documentation to determine the current state-of-the-practice for
asphalt mixtures testing and to identify those tests that may be included in a performance-related specification for asphalt mixtures.

Task deliverables: Draft synopsis, Final synopsis (incorporating Tollway comments and suggestions for Draft document).

B. Develop a draft performance-related specification for asphalt mixtures, complete with sampling and testing recommendations for implementation on near-term Tollway rehabilitation and reconstruction projects.

Task deliverables: Draft specification for performance-related asphalt mixtures.

C. Perform laboratory testing on samples obtained from Tollway projects to collect data on actual values for performance indicators that can be expected as part of asphalt mixture production (sample collection and materials testing will be performed as a shadow monitoring activity during asphalt mixture production for Tollway projects).

Task deliverables: Report documenting testing values obtained during shadow monitoring of ongoing Tollway asphalt mixture production.

D. Generate a final report documenting the laboratory results obtained, initial field performance observations for pavements where mixtures were subjected to the shadow monitoring effort, and a revised performance-related specification based on the data collected.


Deliverables that will be required throughout this project will include:

- Quarterly progress reports, in electronic format, containing a summary of effort performed during the quarter and expected progress for the following quarter.
- Draft performance-related specification for asphalt mixtures.
- Interim results report documenting data collected during shadow monitoring activities.
- Final report, in electronic format, summarizing the results and recommendations developed as a result of this research effort. A draft final report shall be submitted 45 days prior to the end date of the research contract. The Tollway will review and provide comments and feedback within 15 days of receipt of the draft final report. Then, the researcher shall have 30 days to address the comments and questions, make revisions, and resubmit the final report.
- Two hard copies and one electronic copy (pdf) of the final report shall be submitted.
- A one-page technical briefing document summarizing the results of the research effort.
INSTRUCTIONS FOR SUBMITTING A PROPOSAL

The proposal shall be prepared in accordance with the guidelines presented in Appendix A. The contact name/email and due date are presented on the first page. All potential Principal Investigators (PIs) should read and understand the responsibilities of Illinois Tollway Principal Investigators, which are presented in Appendix B.

Technical questions regarding the research project or questions regarding the RFP procedures should be submitted to Steven Gillen, via email at sgillen@getipass.com. Technical questions received by the Tollway and answers will be posted on the Tollway website as they are received.

SPECIAL CONDITIONS FOR REVIEWING PROPOSALS AND AWARDING ILLINOIS TOLLWAY FUNDS

Please note that the following two conditions will be applied in reviewing all proposals received and in awarding Tollway funds:

1) In reviewing and evaluating the proposals received from this solicitation, preference will be given to Illinois public universities over others.

2) The award of this project is contingent upon the availability of funds at the time of award.
APPENDIX A:
GUIDELINES FOR PREPARING PROPOSALS FOR THE
ILLINOIS TOLLWAY

Please use the following format for submitting Tollway proposals for consideration.
Please limit your total proposal to 15 pages in length (not including the Cover/Summary
Page or optional Appendices), ensure file size is less than 5 MB, and use a font size no
smaller than 10. We suggest Arial font with 1.5 spacing between lines.

1. **Cover/Summary Page**

   Use the cover page included in Appendix C.

2. **Research Plan**

   The research plan should describe in a specific and straightforward manner the
   proposed approach for solving the problem described in the problem statement.
   The research plan should be subdivided into the following sections:

   (a) **Introduction, including Research Idea Statement**

   Provide an introduction to the proposal and a concise overview of the research
   approach. Outline the objectives of the research project and explain the
   questions that will be answered by the research.

   (b) **Research Approach/Work Plan**

   Include the details of how the investigator will carry out the project and
   accomplish the project objectives. Itemize the tasks to be completed, explaining
   each in sufficient detail so the reviewers understand what will be done for each
   task and what will be produced or completed with each task.

   (c) **Anticipated Research Results**

   Specifically state the anticipated research results and deliverables.

   (d) **Applicability of Results to Illinois Tollway Practice**

   Describe how the anticipated research results can be used to improve Tollway
   practices.

3. **Qualifications and Accomplishments of the Research Team**

   Identify who will perform the research and provide a brief explanation of each
   researcher’s qualifications to perform the research. Please provide examples of
   similar research that the proposed individuals have performed.
4. **Other Commitments of the Research Team**

   Briefly outline the other commitments of the proposed principal and co-principal investigators to demonstrate that both will be able to fulfill the commitments of the proposal.

5. **Equipment and Facilities**

   Describe the facilities and equipment available to undertake the research proposal.

6. **Time Requirements**

   Describe the time that will be required to complete the research proposal, including final report preparation, Tollway editing, review of the report by the Technical Review Panel (TRP), and final review/publishing of the report. Include a timeline for each task. Please plan on submitting the draft final report to the Tollway for initial editing at least three months before the end date for the project.

7. **Itemized Budget**

   Provide an itemized budget for each of the Phases of the project and for the entire project, including the cost of personnel, consultants, subcontracts, equipment, materials, travel, overhead/indirect costs and cost share (match). Please itemize equipment and travel requests, especially any requested out-of-state travel or planned attendance at conferences. If you anticipate having a sub-award for extra support from outside your agency, please be aware that the sub-award cannot exceed 50% of the total project budget without prior approval.

8. **Cooperative Features (if appropriate)**

   If assistance or cooperation is required from other agencies, public or private, to complete this proposed research, describe the plans for securing this assistance.

9. **Appendices (if appropriate)**

   You may include such things as statements regarding previous work on the problem or related problems, abstracts of related projects, a bibliography or list of references, or materials describing the submitting organization.
APPENDIX B:
RESPONSIBILITIES OF ILLINOIS TOLLWAY PRINCIPAL INVESTIGATORS

1. Prepare and submit a project proposal/work plan and multi-year line-item budget, consistent with the Illinois Tollway RFP for the newly-approved research project.

2. Meet with the Technical Review Panel (TRP) and revise the project proposal/work plan and multi-year budget, as agreed with the TRP.

3. Assist the TRP chair in preparing an Implementation Planning Worksheet and work throughout the project to identify the expected benefits of the research, e.g., construction savings, operation and maintenance savings, increased lifecycle, safety, etc.

4. Carry out the project as agreed with the TRP, or notify the TRP if any problem develops regarding the project.

5. Provide online quarterly progress reports to the TRP chair for review and approval.

6. Attend quarterly meetings of the TRP to provide project updates and answer TRP members’ questions about the project.

7. Provide the TRP a synopsis of the project’s implementation potential as well as implementation strategies. In conjunction with the TRP, develop Implementation activities/tools such as draft specifications, policy guidelines, software, and training on new test/practice/equipment/software and develop an implementation cost estimate, if applicable.

8. Near the completion of the research project, draft a final research report in accordance with the Tollway report format. (The timeline for the work plan must allow adequate time to prepare the report, typically three months.)

9. At least three months before the end date for the project, submit the draft final report to the Tollway for preliminary editing (prior to submission to the TRP).

10. After the Tollway returns the edited draft final report, submit the report to the TRP chair for review and work with the TRP chair to finalize the content of the report.

11. Re-submit the final report to the Tollway for publication. The Tollway will post the final report to the Tollway website and will arrange to publish the final report.

12. The publication or release of all work products, any information that is deemed confidential by the Tollway, or information which includes patentable results may not be published/released without the Tollway’s approval.
13. Include the Illinois Tollway acknowledgement statement and disclaimer statement (available on the Tollway website) in all publications and presentations regarding research sponsored partially or fully by the Tollway.
APPENDIX C:
PROPOSAL COVER SHEET FOR
SOLICITATION #17-01

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DUE FEBRUARY 28, 2017
TO sgillen@getipass.com

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