



RESEARCH REQUEST FOR PROPOSAL (RRFP) #19-01

ACTIVE TRAFFIC MANAGEMENT (ATM) PERFORMANCE ALONG THE I-90 SMART CORRIDOR

POSTED DATE: 07/18/2019; CLOSING DATE: 08/14/2019

PROJECT INFORMATION

Funds:	\$250,000
Estimated Contract Term:	18 months
Projected Start Date:	January 1, 2020
Deadline for Submitting Proposal:	4:30:00 PM (local time) August 14, 2019
Submit Proposal via Email to:	research@getipass.com

BACKGROUND

Active Traffic Management (ATM) uses Intelligent Transportation System (ITS) devices to dynamically manage recurrent and non-recurrent congestion. Strategies to manage congestions include Dynamic Lane Use Control, Part-Time Shoulder Lane Use, and Queue Warning. ATM increases throughput and safety by use of integrated technology, typically Lane Control Signs (LCS), Dynamic Message Signs (DMS), and other devices, along with automated strategies to optimize performance quickly.

In September 2017, Tollway initiated operations of an ATM system on 16 miles of I-90. Recently, the Tollway completed an initial "Before-and-After" study of the effects of the ATM system. The study was based on only a few months of data.

The initial study indicates that the ATM system has a beneficial effect on traffic operations, though a more complete analysis is desired. The intent is to further validate the initial results with a larger data set including longer term performance measures. Additional work will focus on the impact of incidents on traffic in terms of congestion. The research should verify or improve upon the existing methodology used by the Tollway.

An overview of ATM strategies is available from FHWA¹. In Europe, evaluations showed that travel times, traffic flow, crash rates, and crash severity often improved with implementation of one or more ATM techniques². An FHWA team that visited ATM systems in Europe

concluded that ATM can be used to improve safety and operations³. Washington State DOT conducted a six-year Before/After review of collision trends within the I-5 ATM corridor in the Seattle area⁴. Initial before-and-after analysis of the ATM system on I-66 in Virginia revealed that statistically significant improvements in travel times were identified during off-peak periods with the implementation of Part-Time Shoulder Lane Usage⁵. Neither of these studies looked directly at the effect national ATM projects had on traffic during an incident.

OBJECTIVE

The primary objectives of this proposed research effort are to investigate and document the following:

1. Safety aspects of ATM and its impact on driver maneuvers (both safe and unsafe) and impacts on incident occurrence
2. Measured impact of incidents on traffic flow looking at data from sensors or other sources
3. Overall benefits of the ATM system adding to the findings from the initial before-and-after study

RESEARCH TASKS AND REQUIRED DELIVERABLES

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

- A. Conduct literature review regarding evaluations of ATM implementation, as reported by other Transportation Agencies. If necessary and appropriate, telephone interviews with other agencies using ATM should be conducted to gather the most current information as to the effectiveness of ATM.

Task deliverables: Report containing a summary of literature reviewed and findings gleaned from ATM implementations undertaken by other agencies.

- B. Review Tollway's current approach to estimating impact of crashes on traffic flow using sensor data. Review additional crashes and determine validity of the current approach. Provide concepts for improving the current approach if any are identified. Incidents to be reviewed should be from the time frame of September 2017 through the present.

Task deliverables: Summary of incidents reviewed complete with date, time, location, incident description and impacts to traffic flow.

- C. Review Tollway video associated with incidents to identify impacts on traffic flow with and without ATM. After incidents to be reviewed should be from the time frame of September 2017 through the present. Video will be supplied by the Tollway.

Task deliverables: Summary of impacts to traffic flow during incidents for before and after ATM.

D. Update performance measures for I-90 since ATM. Provide baseline of before performance measures on I-294 prior to construction relative to ATM.

Task deliverables: Draft report updating I-90 after performance measures.

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.
- Final report, in electronic format, summarizing the results and recommendations developed as a result of this research effort as contained in the Tasks A, B, C, and D reports described above. 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.

REFERENCES

1. Kuhn, Beverly, Kevin Balke, and Nicholas Wood. "Active Traffic Management (ATM) Implementation and Operations Guide," Report No. FHWA-HOP-17-056, Federal Highway Administration, 2017.
<https://ops.fhwa.dot.gov/publications/fhwahop17056/index.htm>
2. Fuhs, Chuck (Parsons Brinckerhoff). "Synthesis of Active Traffic Management Experiences in Europe and United States", Report No. FHWA-HOP-10-031, Federal Highway Administration, 2010.
3. Mishahi, Jon et al, "Active Traffic Management: The Next Step in Congestion Management", United States Department of Transportation, 2007, Washington DC.
<https://transportationops.org/publications/active-traffic-management-next-step-congestion-management>
4. Washington State. Washington Department of Transportation (2014), "The 2014 Corridor Capacity Report: The 13th edition of annual Congestion Report". Olympia, WA.
5. PilJin Chun and Michael D. Fontaine, "Evaluation of Operational Effects of I-66 Active Traffic Management System", Transportation Research Record: Journal of the Transportation Research Board, January 2017, Vol 2616, pp 91-103.

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 research@getipass.com by 2:00:00 p.m. (local time) on August 7, 2019. Technical questions that are received by 2:00:00 p.m. (local time) on August 7, 2019 will have the question and answers posted on the Tollway's website at least 3 days before the proposal due date.

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) The award of this project is contingent upon the availability of funds at the time of award.
- 2) Tollway research projects are entered into through an Intergovernmental Agreement. Therefore, the lead institution in a successful proposal is required to meet the definition of a "public agency" pursuant to Illinois' Intergovernmental Cooperation Act (5 Ill. Comp. Stat. 220) in order to enter into an Intergovernmental Agreement to complete the project.

APPENDIX A: GUIDELINES FOR PREPARING A PROPOSAL FOR THE ILLINOIS TOLLWAY

Please use the following format for submitting a Tollway proposal for consideration. Please limit your total proposal to 5 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). The Illinois Tollway believes that an overhead/indirect rate of 20% is reasonable and competitive. Justification shall be provided if an indirect cost rate in excess of 20% is used. Please itemize equipment and travel requests, especially any requested out-of- state travel or planned attendance at conferences.

8. Cooperative Features (if appropriate)

If assistance or cooperation is required from other sectors, 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 work plan and multi-year line-item budget, consistent with the Tollway RRF for the newly-approved research project.
2. Meet with the Technical Review Panel (TRP) and revise the project 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 #19-01**

**ACTIVE TRAFFIC MANAGEMENT (ATM) PERFORMANCE
ALONG THE I-90 SMART CORRIDOR**

DUE: AUGUST 14, 2019
TO: research@getipass.com

Submitted by: (Include Name and Address of Organization)	
Proposed Investigator(s):	
Corresponding Investigator Name:	
Corresponding Investigator Phone:	
Corresponding Investigator Fax:	
Corresponding Investigator Email:	
Submission Date:	