

## Research Project Description Form

Project Number: 210233

Project Title: Signing for Preventing End of Queue Accidents

Primary Investigator Contact Information:

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Project Objective: Investigate methods to prevent end-of-queue crashes using advanced warning systems.

Abstract: On higher ADT routes (Interstates, etc.), the traffic frequently queues beyond the end of the advance warning zone in the temporary traffic control. The end of queue changes locations as a result of multiple factors. Vehicles approaching the work zone often have no warning of stopped/slowed traffic and can have accidents at the end of the queue. The problem is especially true where the vertical alignment is such that sight distance is limited. The objective of this project is to evaluate potential mitigation measures for work zone end of queue crashes. The researchers will explore possible new ideas and make recommendations how to address end of queue crashes. The primary benefits of the proposed research are to minimize delays and crashes that occur as a result of queues that form in work zones. Solutions to this problem may also be utilized in other situations where queues might form, such as incidents and freeway bottlenecks. The results of this phase of the project will be used to determine if additional phases of research are needed. The primary deliverable of this phase of the project will be a preliminary report

summarizing existing mitigation measures for end of queue crashes and recommendations on how to implement them or develop new ones. This project is a collaborative effort with West Virginia University

**Task Descriptions:**

Task 1: Complete a literature review of the subject.

Task 2: Scan the National Work Zone Clearinghouse at TTI to determine if there is a best practice for addressing the issue.

Task 3: Analyze historical crash data records to quantify the frequency and severity of crashes that occur as a result of queueing in work zones.

Task 4: Identify existing systems that have promise for solving this problem.

Task 5a: Collect data in 3 existing work zone locations that are of higher ADT to evaluate queues. Researchers will work with the WVDOH PM and others to choose locations where queues are likely to form.

Task 5b: Perform statistical analysis of work zone data to determine queue lengths, delay, speed profiles, etc. to characterize queues based on ADT and work zone type.

Task 6: Upon completion of Tasks 1-5, the researchers will present the findings to WVDOH as a presentation and preliminary report. The scope for Phase 2 of the project will be defined by WVDOH and research team.

Task 7: Submit a research plan and budget for Phase 2 of the project to WVDOH for review and approval.

**Milestones, Dates, Schedule:**

Year	2010												2011											
Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Task 1				■	■																			
Task 2				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Task 3				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Task 4				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Task 5a				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Task 5b				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Task 6												■												
Task 7																								
Progress Meeting				■			■			■			■			■			■			■		

■ Anticipated  
 ■ If necessary

Yearly and Total Budget: Total: \$180,000

Student Involvement: Approximately two undergraduate students and one graduate students will work on this project.

Relationship to Other Research Projects: None

Technology Transfer Activities: To be determined

TRB Keywords: Work zone, incident, queue, crash analysis