



## Semi-Annual Progress Report

**Date of Report:** August 31, 2009 **Project Number:** 9-4973/TPF-5(106) **RMC:** 5

**Period Covered:** ☒ September 1, 2009 – February 28/29 ☐ March 1 – August 31

**Project Title:** Guidelines for Designing Bridge Piers and Abutments for Vehicle Collisions

**Research Supervisor (name & agency):** C. Eugene Buth, TTI

**Please see note about contract modification at the end of this report.**

- 1. Progress to Date, by Task** (Provide the following information for each task in the current Work Plan. List **all tasks**, even if no work was done during this reporting period. If a task was not active during this period, state “none” under Work Accomplished. Copy the following table as needed to cover all tasks.)

Task #	Task Name / Description
1a.	Literature Review
% Complete	<b>If task is complete, state when Technical Memorandum was submitted to RTI</b>
100	<i>Technical Memorandum was submitted to RTI September 17, 2009</i>
<b>Work Accomplished this Period</b> (Brief description of work done and any major problems encountered.)	
Researchers continued to monitor literature.	
<b>Work Planned for next Reporting Period</b> (Brief description of work planned.)	
None	

Task #	Task Name / Description
1b.	Computer simulations of vehicle/bridge column and abutment collisions
% Complete	<b>If task is complete, state when Technical Memorandum was submitted to RTI</b>
100%	<i>Technical Memorandum was submitted to RTI August 25, 2009</i>
<b>Work Accomplished this Period</b>	
None	
<b>Work Planned for next Reporting Period</b> (Brief description of work planned.)	
None	

Task #	Task Name / Description
1c.	Accident survey and analysis study
% Complete	<b>If task is complete, state when Technical Memorandum was submitted to RTI</b>
100%	<i>Technical Memorandum was submitted to RTI August 25, 2009</i>
<b>Work Accomplished this Period:</b>	
None	
<b>Work Planned for next Reporting Period</b> (Brief description of work planned.)	
None	

<b>Task #</b> 1d.	<b>Task Name / Description</b> Development of a risk analysis methodology for vehicle/bridge column and abutment collisions (analogous to AASHTO LRFD vessel impact requirements)
<b>% Complete</b> 100%	<b>If task is complete, state when Technical Memorandum was submitted to RTI</b> <i>Technical Memorandum was submitted to RTI August 25, 2009</i>
<b>Work Accomplished this Period</b> None	
<b>Work Planned for next Reporting Period</b> (Brief description of work planned.) None	

<b>Task #</b> 1e.	<b>Task Name / Description</b> Detailed justification and work plan for research (if any) to be conducted under Phase 2 of the project
<b>% Complete</b> 100%	<b>If task is complete, state when Technical Memorandum was submitted to RTI</b> <i>Technical Memorandum was submitted to RTI August 25, 2009</i>
<b>Work Accomplished this Period</b> (Brief description of work done and any major problems encountered.) None	
<b>Work Planned for next Reporting Period</b> None	

<b>Task #</b> 1f.	<b>Task Name / Description</b> Provide facilities and host a meeting to present Phase 1 results to project sponsors, including pooled fund project contributors from other state DOT's
<b>% Complete</b> 100%	<b>If task is complete, state when Technical Memorandum was submitted to RTI</b> <i>Technical Memorandum was submitted to RTI August 25, 2009</i>
<b>Work Accomplished this Period:</b> None	
<b>Work Planned for next Reporting Period</b> None	

<b>Task #</b> 2a.	<b>Task Name / Description</b> Crash testing with a single unit truck to verify loading from Phase 1 literature survey and computer simulations. (The Project Team Determined from April 14, 2009 Meeting to perform 1 <sup>st</sup> Full-Scale Crash Test Using 80,000 tractor trailer with an impact speed of 50 mph).
<b>% Complete</b> 95%	<b>If task is complete, state when Technical Memorandum was submitted to RTI</b> Technical memorandum has not been submitted. Results will be included in final report (R2).
<b>Work Accomplished this Period</b> (Brief description of work done and any major problems encountered.) The full scale test installation for this project consists of a 36-inch diameter steel pier attached to two instrumented load cells. The completed test installation drawings were posted on the web for bidding purposes by contractors. Three bids were received for this project. A contractor was selected and the test installation was completed. A full-scale test with an 80,000 lb tractor trailer impacting at 50 mph was performed. Alignment of the vehicle at impact was not centered as planned and only the right side of the vehicle impacted the pier. A decision to repeat the test was made in consultation with TxDOT representatives.	

**Work Planned for next Reporting Period** (Brief description of work planned.)

Completion of report.

<b>Task #</b> 2b.	<b>Task Name / Description</b> Crash testing of a 5-axle tractor trailer rig to verify loading from phase 1 literature survey and computer simulations
<b>% Complete</b> 95%	<b>If task is complete, state when Technical Memorandum was submitted to RTI</b> Technical memorandum has not been submitted. Results will be included in final report (R2).

**Work Accomplished this Period** (Brief description of work done and any major problems encountered.)

A second crash test involving a tractor trailer was performed on the instrumented pier.

**Work Planned for next Reporting Period** (Brief description of work planned.)

Completion of report.

**2. Progress to Date, by Deliverable**

<b>Deliverable #</b>	<b>Deliverable Description</b>	<b>Progress to Date &amp;/or Date Submitted to RTI</b>
P1	Guidelines supplementing current AASHTO LRFD Specifications for collision loads on piers and abutments, including example utilizing proposed methodology	Due 2-28-10  25% completed
P2	Presentation materials in suitable format for use in introducing concepts and new methodology to bridge design engineers.	Due 2-28-10  None
R1	Research report comprehensively documenting all phase 1 work performed, including recommendations for Phase 2 work (if any).	Due 04-30-10  100% completed
R2	Research report comprehensively documenting all Phase 2 work performed (if Phase 2 is conducted).	Due 04-30-10  75% completed
PSR	Summary of work performed, findings, and conclusions.	Due 04-30-10  None

**3. Equipment Purchases**

<b>Description of Equipment</b>	<b>Date Purchased</b>	<b>Task and / or Deliverable Directly Related to Equipment Purchase</b>
No Equipment Requested		

**4. Meetings / Conferences** (List any project meetings or conferences that were conducted during this reporting period and / or are planned for the next reporting period.)

<b>Date &amp; Time</b>	<b>Location</b>	<b>Purpose of Meeting / Conference</b>
April 14, 2009	Texas Transportation Institute Gilchrist Office	Reviewed Phase 1 progress and planned Phase 2 work with representatives from participating states.
November 12, 2009	Texas Transportation Institute, Riverside Campus	The purpose of this meeting was to review all available crash data obtained from the crash test and review all available crash video from the crash test performed this day (November 12, 2009). The details of the second crash test planned for this project and the date of this test was also discussed in this meeting.
December 21, 2009	Texas Transportation Institute, Riverside Campus	The purpose of this meeting was to review all available crash data obtained from the crash test and review all available crash video from the crash test performed this day (December 21, 2009).
February 23, 2010	Texas Transportation Institute, Riverside Campus and participation by teleconference	Project Close-Out Meeting to review work accomplished and status of deliverables
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