

**NEW ENGLAND TRANSPORTATION CONSORTIUM
QUARTERLY PROJECT PROGRESS REPORT**

A. PROJECT NUMBER AND TITLE:

Project: NETC 18-1

**Title: Development of MASH Computer Simulated Steel Bridge Rail and Transition Details
State Project No.: 023430.18**

B. PRINCIPAL INVESTIGATOR(S) & UNIVERSITY(S):

Chuck A. Plaxico, Ph.D.

Roadsafe LLC

Canton, ME

C. WEB SITE ADDRESS: www.RoadsafeLLC.com

D. START DATE (Per NETC Agreement): 09-October 2018

E. END DATE (Per NETC Agreement): 1-June 2020

F. ANTICIPATED COMPLETION DATE: 28-May 2020

G. PROJECT OBJECTIVES:

Phase I

The objectives of the project are to: 1) review existing NETC bridge rail and AGT designs and assess performance aspects to determine preliminary MASH compliance/equivalency, 2) review current standard details and specifications for NETC style bridge rails and transitions used by MaineDOT, NHDOT, RIDOT and VTrans to identify differences in material specifications and dimensional details and 3) evaluate the crash performance of the NETC bridge rail and approach guardrail transition (AGT) designs using finite element analysis (FEA) computer simulation. The impact conditions and assessment procedures for the FEA will conform to the specifications in *MASH* for TL-3 or TL-4 (as appropriate) and will include evaluations of structural capacity of the railing, risk of occupant injury, and vehicle stability during impact and redirection. The systems included in the evaluation are listed below along with the target test level for each system:

- Bridge Rail Systems:
 - NETC curb-mounted 2-Bar Rail (TL3)
 - NETC curb-mounted 3-Bar Rail (TL4) (4-bar curb mounted NETC rail would be considered equivalent to this type)
 - NETC sidewalk-mounted 4-Bar Rail (TL4)
- Bridge Rail Transitions:
 - NETC Style 2-Bar Rail to Thrie Beam (TL3) (NHDOT steel rail transition)
 - NETC Style 3-Bar Rail to Thrie Beam (TL4) (NHDOT steel rail transition)
 - Concrete Transition Barrier to Thrie Beam (TL4) (MaineDOT standard detail)

Project Tasks

- Task 1: Literature Review and Preliminary Assessment of Current Designs
- Task 2: FEA Model Development and Validation of Baseline R350 Design(s)

- a) Develop model of sidewalk-mounted 4-bar bridge rail based on existing validated model reevaluate validity against Test NETC 3.
 - b) Develop model of NETC AGT for 2-Bar bridge rail and validate with Test 401181-1 (R350 Test 3-21).
- Task 3: MASH TL-4 Simulations for NETC 3-Bar Bridge Rail
 - Task 4: MASH TL-4 Simulations for NHDOT 3-Bar Transition
 - Task 5: MASH TL-4 Simulations for NETC 4-Bar Bridge Rail
 - Task 6: MASH TL-4 Simulations for MaineDOT 4-Bar Transition
 - Task 7: MASH TL-3 Simulations for NETC 2-Bar Bridge Rail
 - Task 8: MASH TL-3 Simulations for NETC 2-Bar Transition

Phase II Project Tasks

- Task 3b: Evaluation of the NETC 3-Bar Bridge Railing with Stronger Lower Rail
- Task 4b: Evaluation of 5.5-ft Post Spacing Between Transition and Bridge Rail
- Task 5b: Test 4-12 Evaluation of NETC 4-Bar Bridge Rail with W8x28 Posts

H. REPORT PERIOD: January 1, 2020 through March 31, 2020

I. ACCOMPLISHMENTS THIS PERIOD:

- Draft Final report was submitted on 4-February 2020.
- The revised final report and response to panel comments was submitted on 23-March 2020.
- A revised version of the Final Report was also submitted on 28-April 2020.
- In the previous quarter we were informed that the deliverables for NETC projects included a Poster, Fact Sheet and webinar to be provided by the contractor at the conclusion of the project. Although these deliverables were not included in our contract, we (Roadsafe) have agreed to provide those at no additional cost to the project.
 - a) A draft Fact Sheet for the project was submitted on 27-April 2020 for Panel review.
 - b) A revised Fact Sheet was submitted on 28-April 2020.
 - c) A Poster for the project was submitted on 30-April 2020.

J. PROBLEMS ENCOUNTERED (If any):

K. TECHNOLOGY TRANSFER ACTIVITIES: None.

M. PERCENT COMPLETION OF TOTAL PROJECT: 100%

N. ACTIVITIES PLANNED FOR NEXT QUARTER:

Develop and present Webinar for the project. The webinar is scheduled for May 28, 2020.

O. FINANCIAL STATUS:

As of March 31, 2020

Total Phase I Project Budget:	\$ 199,936.00
Total Phase I Expenditures:	\$ 199,936.00
Total Phase II Project Budget:	\$ 30,307.82
Total Phase II Expenditures:	\$ 30,307.82