



**New Jersey Department of Transportation
Bureau of Research
RESEARCH PROJECT
Request for Proposal
2023 – 2024 SPR Program**

Project Title: Weight-In-Motion (WIM) Analysis for New Jersey Bridges for establishing various live load models for design and bridge management tasks.

Posting No.: 2023-03

Date of RFP Announcement: 06/01/2023

Closing Date: 07/11/2023

NOTE: Due to P.L. 2019, c. 196, the New Jersey Department of Transportation cannot award research grants to PRIVATE and/or OUT OF STATE institutes of higher education.

Proposals must be prepared in accordance with NJDOT's *Supplemental and Proposals guidelines*. Please visit <https://www.state.nj.us/transportation/business/research/guidelines.shtm> for the most current version.

All proposals must also have a corresponding online PreAward Risk Assessment form completed and submitted by the Principal Investigator (PIs) prior to the RFP closing date and time. This online form can be found at:

https://www.state.nj.us/transportation/business/research/risk_assessment_forms.shtm

1 - RESEARCH PROBLEM STATEMENT AND OBJECTIVES

1.1 Problem Statement

The goal of the study is to analyze the recorded weight in motion data for the New Jersey for establishing various live load model for design and bridge management tasks to evaluate the damage and calibrate the load factors for SHV's to avoid load posting of bridges for SHV's.

1.2 Research Objectives

The main objective of the study is to analyze the recorded Weigh-In-Motion (WIM) data for New Jersey for establishing various live load models for design and bridge management tasks and calibrate the live load factor for SHV's as proposed in the latest edition of "Manual of Bridge Evaluation" to eliminate load posting of bridges for SHV's.

The main tool to analyze the live load behavior on bridges is utilizing WIM data. Although there is a gigantic, collected WIM database for New Jersey, there is a need for reliability analysis to update and improve the live load models for bridges in the state of New Jersey.

- Permit trucks with various axle configurations will be identified using WIM data analysis. This will provide an opportunity for NJDOT to add additional live load models (live load models exceeding the gross weight of more than 80,000) for load rating and evaluate its permit process for annual permits.



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- Validate the existing LRFD permit load model (8 axle – 200 kip) for new design. For retrofit of existing bridges, establish a new LRFD permit load model.
- Analyze the existing steel bridge data (Rolled steel I girder with E and E' fatigue category) to identify the risk of load induced fatigue cracking.
- Analyze the existing steel bridge data (welded plate girder with skew angle equals or greater than 45 degrees with staggered cross frames/diaphragms) to identify the risk of distortion induced fatigue cracking.
- Validate the existing load factor of 1.30 for operating rating of SHV's to avoid load posting of bridges.

Task 1: Identifying various permit truck configuration: The PI must review the collected WIM database and identify various permit configurations which does not meet federal bridge formula “B” and classified as legal loads by DeIDOT, PennDOT and NYDOT between gross weights of 80,000 to 100,000, 100,000 to 120,000 and 120000 to 150000.

Task 2: Validating NJDOT LRFD permit load model: The PI must review the collected WIM database and validate the NJDOT LRFD permit load model. In the validation process, PI must consider the LRFD permit load model from PennDOT, DeIDOT and NYDOT. The validation is for a new bridge design. For retrofit of existing bridges, PI must establish a new LRFD permit load model.

Task 3: Identifying the risk of load induced fatigue cracking: After reviewing the WIM database, PI must establish the routine live load models on selected steel bridges by analyzing the existing steel bridge data (Rolled steel I girders with E and E' fatigue category) to identify the risk of load induced fatigue cracking.

Task 4: Identifying the risk of distortion induced fatigue cracking: After reviewing the WIM database, PI must establish live load models which will be generating maximum differential deflection between the girders on selected steel bridges by analyzing the existing steel bridges data (Welded plate girder with web thickness 3/8” to 7/16”, skew angle equals or greater than 45 degrees) to identify the risk of distortion induced fatigue cracking.

Task 5: Validating the load factor for operating ratings for SHV's: As proposed in the latest edition of MBE, PI must validate the load factor for operating rating for SHV's on selected bridges



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from NJDOT inventory. To select few sample bridges, PI must use previous research reports provided by NJDOT, existing SHV load rating info and information collected from WIM database.

Deliverables: The deliverables for the above tasks will be a research report which includes input/output files of software used to generate bridge models and hand calculations.

1.3 Type of Contract

It is proposed that if the Issuing Office enters a contract because of this Request for Proposal (RFP), it will be a **Cost Reimbursement, Deliverable-Based** contract containing the Standard Contract Terms and Conditions.

2 - BUDGET and CONTRACT TIME

The **TOTAL** project budget shall not exceed **\$500,000 US Dollars**. Budgets will be evaluated separately, and only after a selection has been made as to which proposal is the most qualified based on technical merit.

The PI must provide the anticipated research study duration based on the proposed tasks. Consideration should be given to potential impediments so that adjustments are incorporated into the schedule minimizing the need for time extensions. Contract time shall include sufficient time for the procurement of subcontractors, as well as no less than three months for Final Report review and acceptance. Please be advised that going forward, new task orders having permissible justification will be allowed no more than a one-time extension with the advent of 2 CFR 200.

A 36-month total project duration is preferred.

Please provide a Gantt Chart schedule, by month number (e.g., 1-24), showing tasks start/end, and deliverables. List corresponding deliverables below the chart.

3 - Oral Presentations

Oral online presentations may be requested as part of this RFP. If required, you will be notified by the Bureau of Research to schedule your oral presentation. They will be held at NJDOT headquarters in Trenton, NJ, attended by the Technical Advisory Panel (TAP), and be limited to no more than an hour, including time for questions and answers.

4 – Deadline

Proposals (no hard copies required) are due at the NJDOT Bureau of Research no later than **4:00 p.m. on July 11, 2023**. Electronic proposal documents (preferred pdf) shall be emailed to DOT-Research.Proposals@dot.nj.gov with the subject: **RFP-2023-03 University – PI's name**.

Approximate Start Date: 09/29/2023. The official start date is the date that the Bureau of Research obtains a signature from the Assistant Commissioner.



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5 – CONTACTS

Interested parties shall send all questions related to this RFP to the Research Bureau Manager by sending an e-mail to Amanda.Gendek@dot.nj.gov or by phone (609-963-2242). Questions on this topic **shall not** be directed to any Research Project Manager, Research Customer, or any other NJDOT person. All questions must be received **on or before 06/12/2023 in order to be answered.**

PROPOSAL DELIVERY INSTRUCTIONS:

Electronic proposal documents (preferred pdf) shall be emailed to DOT-Research.Proposals@dot.nj.gov with the subject: RFP-2023-03 University – PI's name.
A confirmation of receipt will be sent via email.