



**New Jersey Department of Transportation
Division of Bridge Eng. & Infrastructure Mgmt.
Bureau of Structure & RR Engineering Services, Capital
Program Management
Support Program Request for Proposal
2021-2024 Program**

Project Title: NJDOT Bridge Resource Program (BRP)

Posting No.: 2020-09

Date of RFP Announcement: 12/10/2020

Closing Date: 01/25/2021

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.

*NOTE – Submitted proposal shall not be more than 100 pages printed single side/50 pages printed both side.

All proposals must also have a corresponding online Pre-Award Risk Assessment form completed and submitted by the 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 primary mission of the Bridge Resource Program (BRP) is to provide ongoing engineering evaluation and research support to the NJDOT's Division of Bridge Engineering and Infrastructure Management. Major Goals of BRP is to (1) Preserve the state's Bridge and Structural Assets, (2) Optimize the overall condition of the state's assets within available funding limits and (3) Assist in developing the policy and standard based on new technologies to ensure structures safety and preserve NJDOT's structures.

1.2 Research Objectives

The NJDOT is attempting to develop a scientific method to evaluate the Department's annual program for bridge and structural asset maintenance, rehabilitation, and replacement. MAP-21 legislation has essentially mandated the actions outlined, providing increased urgency as well as additional requirements on how to complete the efforts. The Department is also attempting to develop a bridge preservation strategy to maintain its assets and structures in the most cost-effective manner. The NJDOT being a Public Service Agency has core competence in design, construction and maintenance activities. The Department, therefore, needs assistance with research and investigation of innovative technologies to accomplish the above objectives through academic expertise and research capabilities unique to Institutes of Higher Education/Pis.

The foundation for a successful Bridge Resource Program is to ensure that its core functional areas are flexible and responsive which can efficiently enhance the overall performance of State assets. The Bridge Resource Program will focus on the following core objectives.



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1. Enhance the NJDOT's Structural Management Activities

Develop, evaluate and support NJDOT's Bureau of Structural Evaluation and Bridge Management for the following:

- a. Develop, refine and validate Bridge Deterioration Modeling
- b. Provide data mining and technical assistance as needed with respect to the Bridge and Structural Asset Management Systems
- c. Develop and Evaluate Life Cycle Cost Analysis capabilities within the Bridge Management System (BMS) to optimize the overall structural condition within the available funding resources
- d. Develop and evaluate methods of performing Risk Based Prioritization (RBP) work and investigate where the RBP methods do not align with the Department's current practices and provide recommendations.
- e. In accordance with MAP 21 requirements,
 - Conduct research on best practices to support and validate the Department's comprehensive and methodical Bridge Preservation effort, such as development of a draft Preservation "Manual" and Strategies Playbook.
 - Conduct research to develop Bridge Asset Performance Measure Matrix to validate the existing condition and forecast future condition
 - Conduct research and investigate existing data collection processes for compliance with MAP-21 requirements, identify and report potential gaps and recommend changes.
- f. Develop documentation or guidance for creating management strategies such as, Preservation, Deterioration, Life Cycle Cost and Prediction Models for other structural assets such as noise walls on bridges, sign structures, high mast light poles, dams etc.
Research and innovate Bridge Predictive Modeling methods to reflect the effects of Bridge Preservation best practices using AASHTOWARE products

2. Structural Load Capacity Analysis

- a. Load Rating of Complex Structures: Evaluate and recommend best practices for modeling and rating analysis of complex structures and provide appropriate training to NJDOT Bridge Engineering staff.
 - i. Evaluate and recommend which bridge types requires a finite element modelling.
 - ii. Evaluate and recommend what rating software needs to be used for the above bridge types. NJDOT is planning to use AASHTOWARE BrR.
- b. Load Rating of Non-Complex Structures including Riveted/Bolted and Welded Gusset Plates
 - i. Evaluate and recommend what rating software needs to be used for the bridge types when the line girder analysis ratings are not acceptable to the bridge owner. NJDOT is planning to use AASHTOWARE BrR.



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- c. Evaluate and recommend best practices for performing Load rating on superstructure members, substructure members and Riveted/Bolted and Welded Gusset Plates.
- d. Refine and finalize draft of Load Rating Manual for Bridges.
 - i. The Principal Investigator and his/her team should have the enough experience in developing the load rating Manual in LFR/ASR and LRFR. Principal Investigator needs to document team's previous experience in developing the load rating manual in the proposal.

3. Innovative Material and Technology

- a. Review, test and pilot study of new products and technologies in the areas of structural engineering, bridge design and bridge preservation to enhance performance and constructability.
- b. Assist in the development of related design guidance, construction specifications and quality assurance test procedures to aid in the successful implementation of new methods and technologies.

4. On-Call Services

- a. Rapidly respond to NJDOT's needs for advanced bridge engineering tools and services to address ongoing bridge design, construction field issues, or maintenance issues. Perform in-depth structural inspection and evaluation using innovative testing technology to investigate structural emergencies due to unforeseen and/or special events for individual structures as well as any other structures within the corridor and provide recommendations.
(The Principal Investigator (PI) will respond to the request within one day and develop an appropriate work plan to supply the needed support and respond to NJDOT's request within 3 days).
- b. Assist in investigating the applicability of new AASHTO, TRB/NCHRP and other industry guidelines to NJDOT Standards and Specifications specifically; recommend changes to NJDOT standards, specifications, and existing policies; develop guidelines as required.

5. Technology Transfer

- a. Provide technology transfer and training to NJDOT's Division Bridge Engineering & Infrastructure Management staff on topics pertaining to but not limited to new products, policy guidelines and research products for Bridge design, construction, maintenance and preservation.
- b. Provide Ethics course for renewal of Professional Engineer license to NJDOT & FHWA staff annually.



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6. Bridge Design Manual, Standards & Policy Update

If needed PIs should work with sub-consultants with expertise in specific field of design and construction in following tasks:

- a. Assist in updating and maintaining NJDOT's Design Manual for Bridges & Structures and structural portion of the Standard Specifications for Road & Bridge Construction.
- b. Assist in updating and maintaining Bridge Construction Detail, Guide Plate, and Standard Drawings in accordance with current design manual.
- c. Provide support in MASH Implementation for bridge railing, and Bridge Railing analysis and Crash testing.
- d. Develop guidance for use of BrIM in bridge design and construction for NJDOT application.
- e. Conduct Research in support to Bridge Engineering and Infrastructure Management policy decisions. Assist in gathering and presenting information to help guide and justify NJDOT's bridge policy through data collection, surveys and literature searches.

1-3. Type of Contract

It is proposed that if the Issuing Office enters into 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. It is also proposed to contract **ONE or MORE** Institutes of Higher Education/Pis for this program. The actual work distribution will be done through subsequent task orders which will be executed as per the needs of the Department. The selected Institutes of Higher Education/Pis will be required to enter into a Basic Agreement (contract) with the Department, if it does not already exist. An absence of such a Basic Agreement at the time of awarding the contract will not disqualify the Institutes, but it may cause a delay in executing a work task order which will follow only after a Basic Agreement is executed.

2 - BUDGET and CONTRACT TIME

The project budget is anticipated to be **\$1,600,000 US Dollars per year and will be allocated between Institutes of Higher Education/Pis selected**. The Pis 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 one-time no-cost extension with the advent of 2 CFR 200.

Contract Duration – 48 Months

Please provide a Gantt chart schedule.



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3 - Oral Presentations. Oral presentations may be requested as part of this RFP. If required, you will be notified by the Bureau of Structure & RR Engineering Services 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 (10 single-bound copies & a PDF copy) are due at the NJDOT Bureau of Structure & RR Engineering Services no later than **4:00 p.m. on January 25, 2021.**

Approximate Start Date: 04/01/2021. The official start date is the date, the Bureau of Structure & RR Engineering Services obtains a signature from the Assistant Commissioner.

5 – CONTACTS

Interested parties shall send all questions related to this RFP to Bureau of Structure & RR Engineering Services, Executive Manager, by sending an e-mail to ali.najem@dot.nj.gov and structural.engr@dot.nj.gov or by phone (609)963-1410. Questions on this topic **shall not** be directed to any Project Manager, Research Customer, or any other NJDOT staff. All questions must be received **on or before 12/31/2020 in order to be answered.**

PROPOSAL DELIVERY INSTRUCTIONS:

* **During the COVID-19 pandemic, hand-carried deliveries will not be accepted.**

For private, paid messenger services such as Federal Express, DHL, UPS, etc.:

RFP No. 2020-09 PROPOSAL-NJDOT
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