Developing Implementation Strategies for Risk Based Inspection
Progress Report – 3/31/2023

Project Number: TR201910

Principal Investigator (PI): Glenn Washer
Co-PI(s): Henry Brown

Award date:	11/1/2018		
Scheduled completion date:	6/30/2023	**% of project completed to date:**	68%
Total budget:	$850,000	**% of budget expended to date:**	66.1%
Draft report due:	3/31/2023	**Final report due:**	5/31/2023

Dates should match those listed in the contract. If unsure, contact your MoDOT project manager.

Noteworthy items achieved this quarter. *Provide a 4-5 sentence summary of work completed this quarter. Include meetings, work plan status, significant progress, etc. Additional details can be included in "Additional project information" below.*

A research update meeting with the states was conducted on January 23, 2023. The risk model spreadsheets have been updated for each state. The attributes for each state are being finalized for distribution, which is taking longer than expected. An analysis of the intersection of the risk models (i.e., attributes for occurrence and consequence factor) with FHWA requirements has been developed but has taken longer than expected to document. Additional analysis and updating was necessary to ensure the participating states could receive these attributes with a comprehensive view of how these interacted with the new FHWA requirements for RBI. Additonal changes were also implement based on analysis of NBI data - see further information below.

Anticipated work for next quarter. *Provide a 4-5 sentence summary of work planned for next quarter.*

The primary focus for the coming quarter is to finalize draft risk models to share with participating states for review and comment. The objective for the quarter is to circulate the draft risk models for comment on the data sources for the revised models. Backcasting activities will also be continuing. Work on the final report and the handbook for RBI implementation will continue in the coming quarter. Additional analysis of element-level data that impact risk criteria will also be ongoing. Meetings with FHWA to discuss requirements and initial outcomes are planned for the next quarter.

Identify any circumstances or issues that may need to be addressed. *Provide a summary of issues that are important for the TAC to know. For example, staffing difficulties or supply chain delays.*

The project was delayed by the pandemic. The research team has been working toward completing work in as timely a manner as possible. There have been staffing issues due a student leaving the project due to unavoidable circumstances. Recent changes in FHWA policy required updates to the analysis that have been more time consuming than expected. A RAP meeting needs to be held for one remaining state; early attempts to coordinate the meeting were not successful, in part because of the pandemic and its unpredictable logistics. A no-cost extension for 9 months has been requested to allow for the work to be completed and provide participating states sufficient time to consider research results. Administrative efforts for the ext. are on-going

Deadline for next deliverable. *For example, quarterly report, draft report, presentation, etc.*

Quarterly report   6/30/2023

Additional project information that MoDOT and technical committee should know.

-Analysis of NBI data has been ongoing and adjustments to attributes have been implemented into the risk models to make sure they meet FHWA requirements and will be practically implementable.
-Analysis of NBI element-level data has been intiated and is partially complete; initial results were used to update certain criteria that relied on condition state data.
-Research has also been conducted on the least squares method for Markov chain to accurately approximate Probability of Failure for the occurrence factor, in order to provide a quantitative analysis to supports the RBI extension of inspecton intervals.
-NBI data analysis for proposed consquence factor attributes of ADT, deteor lengths, and load rating have been conducted and overall analysis completed. Implementable criteria for structural redundancy were indentified. Attributes to consider the consquence factor have been developed and tested on the bridges identified for backcasting; analysis of the results are on-going as updates are being made
-Risk models (attributes and criteria) for backcasting are being updated to support re-backcasting considering updated attributes and criteria. The lack of uniformity between different states has been challenging. To address this, new spreadsheets for the backcasting population of bridge are being developed that allow more efficient analysis and will be completed in the next quarter.
-The PI is completing attributes analsysis for distribution to states for review.