

March 1, 2023

To: Vaneza Callejas,
From: Damon Fick, Matthew Bell

Re: Notes from February 7, 2023, kick-off meeting

Meeting attendees: In person: Matthew Bell, Andy Cullison, Damon Fick, Charles Horinek, Timothy Welter. Remote attendance: Stephanie Brandenberger, Vaneza Callejas, Henry Henning

Vaneza Callejas began the meeting with a summary of project management and reporting requirements.

Damon Fick and Matthew Bell provided an overview of the objectives, tasks, MDT involvement, and reporting. The following topics were discussed:

- Tim Welter provided a brief overview of MDT's implementation of the updated Specifications for the National Bridge Inventory (SNBI). Andy Cullison suggested that Tim share some of the relevant SNBI sections for Mat and Damon to begin the SNBI review task.
- A statistical sample size for the maintenance record review was discussed. Some maintenance records are available in electronic format. Others will require a review of plan sets where date, location, type of maintenance, and bridge information can be identified and organized electronically. The technical panel and researchers agreed that maintenance records should represent bridge datasets evaluated.
- Charles Horinek discussed MDT's heavy permitting routes. Based on findings from other Departments of Transportation, the technical panel and researchers agreed that bridges along heavily permitted routes would be a good dataset to begin reviewing for deterioration trends. These trends could be compared with trends of similar bridges, traffic characteristics, and environment to evaluate potentially significant factors related to overweight permits. Charles thought many of the heavily permitted bridges would also have electronic maintenance records available.
- Other potential bridge datasets in addition to heavy permitted routes were discussed, including those with large traffic volumes and routes with more moisture. The importance of a control route or control set of bridges to help identify significant deterioration factors was emphasized.
- The technical panel's involvement for providing updates on their BrM configuration was determined to not be a critical element of the current research. Optimization analyses with

BrM will be used for the present research, however the focus will be on the relative results of one dataset compared with another.

- The research project schedule was reviewed and dates for the SNBI discussion and Task 1 report meetings were scheduled for April 3 and May 4, respectively.

Respectfully submitted,

Damon Fick

Matthew Bell

Significant Factors for Bridge Deterioration

Damon Fick

Matthew Bell

Kick-off meeting: February 7, 2023

Objectives

The overall objective of the proposed research is to increase the confidence of deterioration prediction models by applying weighted factors to reflect different environments, traffic characteristics, and bridge types in Montana. Specific objectives are to;

- 1) Identify significant factors affecting bridge deterioration in Montana.
- 2) Determine refinements, based on the identified significant factors, to the recently established deterioration curves, and
- 3) Establish effective data collection, processing, and future research opportunities for improving the accuracy and consistency of Montana's ability to forecast bridge deterioration.

Tasks

- Literature, standards, and specification review
- Significant factors data and maintenance records review
- General Condition Rating (GCR) analyses
- Final Reporting
- Implementation

MDT and Technical Panel Involvement

- *Bridge management software*—MDT will provide access to BrM using MDT's license, and periodic updates on their ongoing bridge management configuration and input data.
- *Significant factor data*—MDT will provide de-icer, and overweight vehicle data and other potential significant factor information. Any others?
- *Bridge maintenance data*—MDT will provide relevant bridge maintenance/ rehabilitation documentation and guidance on their interpretation. MDT will provide contact information for personnel to assist with the details and practices of MDT maintenance.
- *BrM configuration*—MDT will provide updates on the configuration of BrM and cost and trigger data used to ensure significant factor analyses will be compatible.
- *Performance measures data*—MDT will provide baseline data or costs associated with their optimization analyses so that the performance of the proposed research can be quantified.
- *Review of deliverables*—MDT will review project deliverables and provide comments, suggestions, and guidance for current and future tasks of the research.
- Coordinate maintenance interview/discussion/feedback

Products

- 1) Task 1 Report – Literature and SNBI review
- 2) Task 2 Report – Significant factors data and maintenance record review.
- 3) Task 3 Report – Significant factor/General Condition Rating (GCR) analyses
- 4) Final Report
 - Project Summary Report
- 5) Implementation Report
 - Performance Measures Report
 - Poster
- 6) Journal and/or conference publications and presentations

Schedule

Activities	Dates	2023												2024								
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	
Kick-off Meeting	1/15/23	█			★			★			★			★			★					
1 – Literature, standards, and specification review			█	█	█																	
SNBI Discussion	3/15/23			█																		
Task 1 Report	4/15/23			↑	█																	
2 – Significant factors data and maintenance record review					█	█	█	█	█													
Task 2 Report	8/1/23							█														
Decision Point Meeting	8/15/23							↑	█													
3 – General Condition Rating (GCR) analyses									█	█	█	█										
Task 3 Report	12/1/23											█										
Decision Point Meeting	12/15/23											↑	█									
4 – Final Reporting													█	█	█	█	█	█	█	█	█	█
4a – Draft Final Report (with cover picture)	3/1/24															█						
4b – Project Summary Report	3/15/24															↑	█					
4c – Final Draft, Final Report	4/15/24																↑	█				
5 – Final Presentation and Implementation																		█	█	█	█	█
5a – Final Presentation and Implementation Meeting	5/15/24																	█				
5b – Implementation Report	6/15/24																	↑	█			
5c – Performance Measures Report	7/15/24																		↑	█		
5d – Poster	7/31/24																			↑	█	
Project End Date	8/15/24																				↑	█

↑ = Milestone
 ★ = Quarterly Report Due

Budget

Labor Expenses													
Person	Role	Kickoff Meeting	Task						Hourly Rate	Total Wages	Hourly Benefit Rate	Total Benefits	Total Cost
			1	2	3	4	5	Total					
Damon Fick	Principal Investigator	24	90	90	90	90	90	474	\$72.67	\$21,012	\$28.34	\$13,433	\$34,446
Matthew Bell	Co-Principal Investigator	24	150	150	150	150	150	774	\$49.24	\$23,027	\$19.49	\$15,085	\$38,112
Student	Data Analysis and Processing	0	0	240	0	0	0	240	\$18.00	\$3,888	\$1.80	\$432	\$4,320
Business Mgr.	Budget Assistance	1.5	1.5	1.5	1.5	1.5	1.5	9	\$49.63	\$270	\$19.65	\$177	\$447
Admin Staff	Admin. Support	2.5	2.5	2.5	2.5	2.5	2.5	15	\$42.64	\$354	\$19.01	\$285	\$640
Total		52	244	484	244	244	244	1512		\$48,551		\$29,412	\$77,964
In-State Travel												\$1,000	
Indirect Cost @ 25%												\$19,741	
Total Labor Cost												\$98,705	