Data Management Plan

Name of Contractor: BridgeTech, Inc.
Name of the Project: Assessment and Evaluations of I-80 Truck Loads and Their Load Effects: Phase 2: Service
Project Duration: Start Date: 3/26/2018   End Date: 3/31/2020
DMP Version: 1
Date Amended, if any:
Name of all authors, and ORCID number for each:
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WYDOT Project Number: RS07218

- **Name of all peer reviewed publications, which have been generated using data from this project to include: N/A**

- **Any Digital Object Identifier (DOI), assigned to any peer reviewed publication or data generated by this project: N/A**

- **URLs for all peer reviewed publications which have been generated using data from this project: N/A**

- **Dataset URL, if available: N/A**

1.   Introduction

The purpose of this research project is to examine the safety of Wyoming bridges on the I-80 corridor considering the truck traffic on the interstate based upon weigh in motion (WIM) data. Statistical analyses were performed to determine reliability indices for a set of archetype bridges, including simple-span bridges with lengths between 30 ft and 200 ft (positive moments) and two-span bridges with equal spans lengths of 30 ft to 200 ft (negative moments). Adequate safety, as defined by AASHTO Bridge Specifications, is a reliability index of at least 3.50. Wyoming DOT has several years of truck characteristics that were used to develop a live load model in a manner similar to the NCHRP used to calibrate the LRFD Specifications. The results are the live load bias values and coefficients of variations for the different bridge archetypes that are used to

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determine the 75-year maximum load statistical properties for the service reliability analyses.

More information will be added once the study is completed.

2.   **Definitions**

    a.   Code or scripts include code used in the collection, manipulation, processing, analysis or visualization of data, but may also include software developed for other purposes.

    b.   Copyright is a set of legal rights extended to copyright owners that govern such activities as reproducing, distributing, adapting, or exhibiting original works fixed in tangible forms.

    c.   Data means the recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, communications with colleagues. Recorded material excludes physical objects (e.g. laboratory samples). Research data also does not include trade secrets, commercial information, materials necessary to be held confidential; and personnel and medical information and similar information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

    d.   Data Archive is a site where machine-readable materials are stored, preserved or possibly redistributed to individuals interested in the materials.

    e.   Data Management Plan is a document that specifies your plans for managing your data and files for a research project.

    f.   Dataset means collection of data.

    g.   Metadata refers to structured data about data that helps define administrative, technical, or structural characteristics of the digital content.

    h.   WIM trucks means weigh-in-motion trucks.

    i.   BRASS-GIRDER™ is software designed to assist the bridge engineer in the design review or rating of highway bridge girders for a variety of bridge types.

3.   **Data Types and Storage**

The types of data and/or datasets generated and/or used in this project include:

- Bridge definitions stored as Wyoming Department of Transportation's BRASS-GIRDER™ data files
- WIM trucks and design vehicle definitions consisting of axle weights and spacings stored as BRASS™ Vehicle Library text files
- Live load moment results from BRASS-GIRDER™ stored as .csv files

The data were collected by analyzing the bridges using the Wyoming Department of Transportation's BRASS-GIRDER™ software, which generates a .csv results file. The .csv file is filtered using Microsoft Excel to extract only the live load moments. Multiple vehicle library files were developed to define the various trucks with a fixed longitudinal spacing between the trucks, e.g., 10 feet and 50 feet, which were used to determine live load moments on one-span bridges. For the two-span bridges, a variable spacing was used from 10 feet to 50 feet.

Any of the bridge definitions and vehicle definitions can be reproduced and the live load moments can be regenerated. These data are stored on the BridgeTech FTP server, which is backed up weekly.

4.   Data Organization, Documentation, and Metadata

The plan for organizing, documenting, and using descriptive metadata to assure quality control and reproducibility of these data include using BRASS-GIRDER™ data files, which are self-documented XML-based files, BRASS™ Vehicle Library files, which are documented in the corresponding help system, and .csv result files, which are documented in NCHRP 12-50.

These existing files are expected to be readable by future versions of the programs. The NCHRP 12-50 format outlines a mechanism for storing analysis results where new data identifiers are added but existing ones persist indefinitely.

5.   Data and/or Database Access and Intellectual Property

No access and ownership concerns exist with these data because it could be reproduced using other methods. Additionally, the bridge definitions developed for this study are parametric bridges so no ownership issues exist. However, the BRASS™ software used to analyze the bridges and define the vehicles for analysis is owned by the Wyoming Department of Transportation.

6.   Data Sharing and Reuse

The data will be released for sharing upon request.

7.   Data Preservation and Archiving

The data will be preserved and archived in the following ways. BRASS-GIRDER™ bridge data files, BRASS™ Vehicle library files, and live load moment spreadsheets will be stored on the BridgeTech FTP server, which is backed up weekly. The data will be self-disseminated.

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The keywords listed in the Assessment and Evaluations of I-80 Truck Loads and Their Load Effects: Phase 2: Service report ensure discoverability of the pertinent information regarding this study.

The configuration of vehicles changes over time, so this data is likely relevant for another five to ten years at which time new WIM data can be obtained.

NOTE: This DMP is created as a derivative from the DMP belonging to the University of Minnesota and can be found at https://www.lib.umn.edu/datamanagement/DMP

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Metadata Schema

Elements	Example of what is expected for each element
Title[1]	BRASS-GIRDER™ Data File
Creator/contact point	BridgeTech, Inc. Brian Goodrich, P.E. goodrich@bridgetech-laramie.com
Publication Date(s)	TBD
Description/Abstract	BRASS-GIRDER™ data file containing parametric bridge geometry, materials, load factors, and live loads.
Subject and Keywords	BRASS-GIRDER™ data file Bridge design, bridge analysis, bridge geometry, truck load, live load, live load factor, load and resistance design, LRFD, Wyoming, BRASS
Identifier[2] and/or source	Bridge.xml
Collection and Related Documents	N/A
Edition	Date TBD
Related Documents	BRASS-GIRDER™ help system
Coverage	N/A
Language	English
Publisher/Distributor	BridgeTech, Inc. and Wyoming Department of Transportation
Funding agency	Wyoming Department of Transportation
Access Restrictions	Restricted public
Intellectual Property and	All rights reserved, State of Wyoming, Wyoming

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[1] *To include alternate title; conference title; and journal title, if they are different.*

[2] *To include record numbers; report numbers; NTIS number; TRIS Accession Number; OCLC Number; ISBN; ISSN; contract number; and DOI if available.*

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Elements	Example of what is expected for each element
Other Rights	Department of Transportation, and BridgeTech, Inc. Access depends on State of Wyoming policy on making Wyoming's bridge geometry and materials public knowledge.
License	This dataset has not been published and is available upon request.
Code and software needs	BRASS-GIRDER™ Version 8.4
Format	BRASS-GIRDER™ Version 8.4 data file (human and machine readable file); Size: 2-3 MB (varies by bridge)
Choice of Repository	BridgeTech FTP Server

NOTE: This Metadata Schema is created as a derivative from the Common Core required fields which can be found at https://project-open-data.cio.gov/schema/.

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Metadata Schema

Elements	Example of what is expected for each element
Title[3]	BRASS™ vehicle library containing LRFD design vehicles and 1000 trucks from Wyoming WIM data along I-80
Creator/contact point	BridgeTech, Inc. Brian Goodrich, P.E. goodrich@bridgetech-laramie.com
Publication Date(s)	TBD
Description/Abstract	BRASS™ vehicle library containing LRFD design vehicles and 1000 trucks from Wyoming WIM data along I-80. The 1000 trucks those deemed most critical from the WIM data at two different sites along I-80.
Subject and Keywords	BRASS™ vehicle library Bridge design, weigh in motion, WIM data, bridge analysis, truck load, live load, load and resistance design, LRFD, interstate vehicle loads, Wyoming, BRASS
Identifier[4] and/or source	I-80-Vehicles.blv
Collection and Related Documents	N/A
Edition	Date TBD
Related Documents	BRASS™ Library Utility help system
Coverage	Wyoming
Language	English
Publisher/Distributor	BridgeTech, Inc. and Wyoming Department of Transportation
Funding agency	Wyoming Department of Transportation

[3] *To include alternate title; conference title; and journal title, if they are different.*
[4] *To include record numbers; report numbers; NTIS number; TRIS Accession Number; OCLC Number; ISBN; ISSN; contract number; and DOI if available.*

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Elements	Example of what is expected for each element
Access Restrictions	Public
Intellectual Property and Other Rights	All rights reserved, State of Wyoming, Wyoming Department of Transportation, and BridgeTech, Inc.
License	This dataset has not been published and is available upon request.
Code and software needs	BRASS™ Library Utility Version 2.6
Format	BRASS™ Vehicle Library (.blv) (human and machine readable file); Size: 422 KB
Choice of Repository	BridgeTech FTP Server

NOTE: This Metadata Schema is created as a derivative from the Common Core required fields which can be found at https://project-open-data.cio.gov/schema/.

Metadata Schema

Elements	Example of what is expected for each element
Title[5]	Live Load Moments from LRFD design vehicles and 1000 trucks from Wyoming WIM data along I-80
Creator/contact point	BridgeTech, Inc. Brian Goodrich, P.E. goodrich@bridgetech-laramie.com
Publication Date(s)	TBD
Description/Abstract	Spreadsheet containing live load moment results from analysis of parametric bridges to which LRFD design vehicles and 1000 trucks from Wyoming WIM data along I-80 were applied.
Subject and Keywords	Live Load Moments Bridge design, bridge analysis, bridge geometry, weigh in motion, WIM data, truck load, live load, live load factor, load and resistance design, LRFD, interstate vehicle loads, Wyoming, BRASS
Identifier[6] and/or source	Bridge.xlsm
Collection and Related Documents	N/A
Edition	Date TBD
Related Documents	N/A
Coverage	Wyoming
Language	English
Publisher/Distributor	BridgeTech, Inc. and Wyoming Department of Transportation

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[5] *To include alternate title; conference title; and journal title, if they are different.*
[6] *To include record numbers; report numbers; NTIS number; TRIS Accession Number; OCLC Number; ISBN; ISSN; contract number; and DOI if available.*

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Elements	Example of what is expected for each element
Funding agency	Wyoming Department of Transportation
Access Restrictions	Public
Intellectual Property and Other Rights	All rights reserved, State of Wyoming, Wyoming Department of Transportation, and BridgeTech, Inc.
License	This dataset has not been published and is available upon request.
Code and software needs	Excel 2013
Format	Excel spreadsheet; Size: TBD
Choice of Repository	BridgeTech FTP Server

NOTE: This Metadata Schema is created as a derivative from the Common Core required fields which can be found at https://project-open-data.cio.gov/schema/.