Data Management Plan

Name of Contractor: Noriaki Ohara, Ph.D., Associate Professor (0000-0002-7829-0779)
Name of the Project: Characterization of Blowover Risk in the Wyoming Highway System
Project Duration: Start Date: 7/1/2019   End Date: 6/30/2021
DMP Version:
Date Amended, if any: N/A
Name of all authors, and ORCID number for each:
WYDOT Project Number: RS07219

- **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**

What constitutes data will be determined by the Principle Investigator, Project Champion, and the Research Manager. In general, your plan should address final research data. This includes recorded factual material commonly accepted in the scientific community as necessary to validate research findings. Final research data do not include laboratory notebooks, partial datasets, preliminary analyses, drafts of scientific papers, plans for future research, peer review reports, communications with colleagues, or physical objects, such as gels or laboratory specimens. As part of your research, you may also generate unique data, which are data that cannot be readily replicated. Your DMP should also address unique data that may arise from your research.

WYDOT expects the timely release and sharing of data to be no later than the acceptance for publication of the main findings from the final dataset, unless the Principle Investigator will be embargoing the data. In such a case, the data cannot be embargoed for a period longer than 12 months. See Chapter 11 for information on retention and embargos.

1.   Introduction

The purpose of this research project is to:

The objective of this research is to fill the gap between the existing operational practices utilizing weather data from RWIS and the risk available from high resolution modeled data and the high frequency gust wind observation system. The rollover crash risk at every tenth of a mile will be quantified by the analytical rollover model based on the wind speed, wind direction, and road geometry. Specifically, this project aims to quantify the recommended vehicle speed and the load weight for rollover crash during strong wind periods.

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.

3. Data Types and Storage

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

There are two types of data: observed time series data and the derived rollover crash risk variables. The time series data include high frequency wind speed data, visibility, temperature,

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and humidity from the high-frequency wind monitoring tower.   Also, the concurrent RWIS data nearby will be archived. The derived rollover crash risk variables will be spatial data along the Wyoming Highways.

All intermediate data including the model outputs will be maintained by the PI and UW. To achieve statewide coverage, a great amount of data will be analyzed and condensed to a smaller, though still large, amount of data is expected to be delivered through this project. The spatial data will be provided both in gridded (raster) format as well as ArcGIS shapefile format. To run the GIS shapefile, a GIS program will be required, however, the data can be brought into MicroStation, Google Earth, and tables can be created.

The rollover crash risk data will be stored on WYDOT servers and hard drive purchased. The Wyoming CV Pilot system at the WYDOT office will incorporate the project outcomes.

Provide a description of the data that you will be gathering in the course of your project. You should address the nature, scope, and scale of the data that will be collected. Describe the characteristics of the data, their relationship to other data, and provide sufficient detail so that reviewers will understand any disclosure risks that may apply. Discuss value of the data over the long-term. Please provide the name of all repositories where the data will be housed during the lifetime of the project.

       Checklist
- What type of data will be produced?
- How will data be collected? In what formats?
- How will the data collection be documented?
- Will it be reproducible? What would happen if it got lost or became unusable later?
- How much data will it be, and at what growth rate? How often will it change?
- Are there tools or software needed to create/process/visualize the data?
- Will you use pre-existing data? From where?
- Storage and backup strategy?

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 …

> The documentation and metadata will meet current standards for the type of data received. Naming conventions will be standard for Windows OS and ESRI ArcGIS and incorporate the project identifier.

Your DMP should describe the anticipated formats that your data and related files will use. To the maximum extent practicable, and in accordance with generally accepted practices in your field, your DMP should address how you will use platform-independent and non-proprietary formats to ensure maximum utility of the data in the future. If you are unable to use platform-independent and non-proprietary formats, you should specify the standards and formats that will be used and the rationale for using those standards and formats.

NOTE: Attach the Metadata Schema, URL for data generated, and all peer reviewed publications from this project.

Checklist
- What standards will be used for documentation and metadata?
- Is there good project and data documentation format/standard?
- What directory and file naming convention will be used?
- What project and data identifiers will be assigned?
- Is there a community standard for metadata sharing/integration?

5.   Data and/or Database Access and Intellectual Property

What access and ownership concerns are there…

> The data will be available to WYDOT and potential consultants based on need. The data will be identified as a time sensitive document. All data sharing will be done in a protected format to prohibit alteration by others. Control of the final data product will be done by WYDOT Winter Research and by the PI.

Protecting research participants and guarding against the disclosure of identities and/or confidential business information is an essential norm in scientific research. Your DMP should address these issues and outline the efforts you will take to provide informed consent statements to participants, the steps you will take the protect privacy and confidentiality prior to archiving your data, and any additional concerns. If necessary, describe any division of responsibilities for stewarding and protecting the data among Principal Investigators.

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If you will not be able to deidentify the data in a manner that protects privacy and confidentiality while maintaining the utility of the dataset, you should describe the necessary restrictions on access and use. In general, in matters of human subject research, your DMP should describe how your informed consent forms will permit sharing with the research community and whether additional steps, such as an Institutional Review Board (IRB), may be used to protect privacy and confidentiality.

Checklist
- What steps will be taken to protect privacy, security, confidentiality, intellectual property or other rights?
- Does your data have any access concerns? Describe the process someone would take to access your data.
- Who controls it (e.g., PI, student, lab, University, funder) ?
- Any special privacy or security requirements (e.g., personal data, high-security data) ?
- Any embargo periods to uphold?

6.   Data Sharing and Reuse

The data will be released for sharing in the following way …

The data will be shared with other WYDOT programs when requested and stored on the Maintenance G: drive with a backup on the external snow fence inventory drive. As interest in the dataset grows, the data will be shared on the intranet viewer.

Describe who will hold the intellectual property rights for the data created by your project. Describe whether you will transfer those rights to a data archive, if appropriate. Identify whether any copyrights apply to the data, as might be the case when using copyrighted instruments. If you will be enforcing terms of use or a requirement for data citation through a license, indicate as much in your DMP. Describe any other legal requirements that might need to be addressed.

Checklist
- If you allow others to reuse your data, how will the data be discovered and, shared?
- Any sharing requirements (e.g., funder data sharing policy) ?
- Audience for reuse? Who will use it now? Who will use it later?
- When will I publish it and where?
- Tools/software needed to work with data?

7. Data Preservation and Archiving

The data will be preserved and archived in the following ways …

The data will be stored on WYDOT servers until replaced by updated data. Access to the data will be made available to those who are in need and will be maintained by Winter Research. The data format will be in a GIS format but can be used by MicroStation or converted into .xslx, .pdf, and .kmz file formats. The observed weather data will be in ASCII format (.csv) that can be read by standard text editors and MS Excel. Part of the project is to determine how often this dataset will need to be updated. If it is determined that this dataset should be superseded in the future, the dataset will be archived and saved until server space is needed.

Describe how you intend to archive your data and why you have chosen that particular option. You may select from a variety of options including, but not limited to:

- Use of an institutional repository.
- Use of an archive or other community-accepted data storage facility.
- Self-dissemination.

You must describe the dataset that is being archived with a minimum amount of metadata that ensures its discoverability. Whatever archive option you choose, that archive must support the capture and provision of the National Transportation Library metadata requirements. In addition, the archive you choose must support the creation and maintenance of persistent identifiers and must provide for maintenance of those identifiers throughout the preservation lifecycle of the data. Your plan should address how your archiving and preservation choices meet these requirements.

Checklist
- How will the data be archived for preservation and long-term access?
- How long should it be retained (e.g., 3-5 years, 10-20 years, permanently) ?
- What file formats? Are they long-lived?
- Are there data archives that my data is appropriate for (subject-based? Or institutional)?
- Who will maintain my data for the long-term?

NOTE:
Researchers evaluating data repositories as the option(s) for storing and preserving their data should examine evidence demonstrating that the repository:

a. Promotes an explicit mission of digital data archiving.

b. Ensures compliance with legal regulations, and maintains all applicable licenses covering data access and use, including, if applicable, mechanisms to protect privacy rights and maintain the confidentiality of respondents.

c. Has a documented plan for long-term preservation of its holdings.

d. Applies documented processes and procedures in managing data storage.

e. Performs archiving according to explicit workflows across the data life cycle.

f. Enables the users to discover and use the data, and refer to them in a persistent way through proper citation.

g. Enables reuse of data, ensuring appropriate formats and application of metadata.

h. Ensures the integrity and authenticity of the data.

i. Is adequately funded and staffed, and has a system of governance in place to support its mission.

j. Possesses a technical infrastructure that explicitly supports the tasks and functions described in internationally accepted archival standards like Open Archival Information System (OAIS).

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

Metadata Schema

Elements	Example of what is expected for each element
Title[1]	Blowover Risk in the Wyoming Highway System
Creator/contact point	Noriaki Ohara, Ph.D., Associate Professor (0000-0002-7829-0779)
Publication Date(s)	TBD
Description/Abstract	The rollover crash risk at every tenth of a mile is quantified by the analytical rollover model based on the wind speed, wind direction, and road geometry. The rollover risk may be characterized as the recommended vehicle speed and the load weight for rollover crash during strong wind periods.
Subject and Keywords	Threshold vehicle speed and load weight with given gust wind speed from RWIS
Identifier[2] and/or source	TBD
Collection and Related Documents	TBD
Edition	TBD
Related Documents	TBD
Coverage	Wyoming
Language	English
Publisher/Distributor	FHWA and Wyoming Department of Transportation
Funding agency	FHWA and Wyoming Department of Transportation
Access Restrictions	The degree to which this dataset could be made publicly available, *regardless of whether it has been made available.* Choices: public (Data asset is or could be made publicly available to all without restrictions), restricted public (Data asset is available under certain use restrictions), or non-public (Data asset is not available to members of the public).

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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
Intellectual Property and Other Rights	This may include information regarding access or restrictions based on privacy, security, or other policies. This should also serve as an explanation for the selected "accessLevel" including instructions for how to access a restricted file, if applicable, or explanation for why a "non-public" or "restricted public" data asset is not "public," if applicable.
License	The license or non-license (i.e. Public Domain) status with which the dataset or API has been published.
Code and software needs	List all code specific information. Is there specific software needed to run the database or data.
Format	The machine-readable file format. May include media type or dimensions. Used to determine the software, hardware or other equipment needed to display or operate the resources.
Choice of Repository	If you have a preference, list the repository where you will archive your data/datasets.

NOTE: Each separate report, dataset, collection, existing collection, and software developed must have its own table. All fields in this Schema must be completed at the time of the final report.

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/.