Plan Overview

A Data Management Plan created using DMPTool

Title: Innovative Transportation Solutions Project

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Affiliation: United States Department of Transportation (DOT) (transportation.gov)

Funder: United States Department of Transportation (DOT) (transportation.gov)

Funding opportunity number: DOT-SMART-FY22-01

Grant: SMARTFY22N1P1G22

Template: SMART Grants Stage 1 Data Management Plan (DMP)

Project abstract:

The Innovative Transportation Solutions Project will install smart, sensor-based traffic signals and monitoring across the Yellowstone Corridor (US-91) in Idaho. The current system has limited coordination with the public bussing system, police, fire, and ambulance vehicles, making travel time unreliable for its riders and reducing response times for emergency vehicles.

The critical needs have been identified through extensive analysis processes and documented in the regional plans and reports. Bannock Transportation Planning Organization's (BTPO) current traffic monitoring system is outdated, fragmented, and not integrated across the service area. The high crash rates along the Yellowstone Corridor can be partly attributed to ineffective technology and deficiencies within the current transportation network. The inability to make real-time changes in the system or detect higher vehicle and pedestrian traffic impedes safety, efficiency, and reliability.

The Stage 1 project will address these problems by replacing older detection cameras with radar and advanced video for traffic signal monitoring, advance detection, and management. It will test multiple systems used for vehicle, bicycle, and pedestrian detection to see which will be most reliable for BTPO's snowy climate and pedestrian/bicycle traffic. Chosen technologies address identified needs by improving the efficiency of traffic signal management, travel time reliability and data collection, snow removal monitoring, and incident management. In addition, they will improve emergency vehicle preemptive capabilities and connected public transport, which cannot be done currently. They will provide a comprehensive package of solutions to address priority areas and improve the integration of the signals across BTPO's service area.

Start date: 09-15-2023

End date: 03-15-2025

Last modified: 01-16-2024

Innovative Transportation Solutions Project

1. Innovation Transportation Solutions Project

2. Grant number – SMARTFY22N1P1G22

3. Name of the person submitting this DMP – Mori Byington

4. ORCiD of the person submitting this DMP – N/A

5. Email and phone number of the person submitting this DMP - mori@bannockplanning.org 1(208)233-9322

6. Name of the organization for which the person submitting this DMP is working: Bannock Transportation Planning Organization

7. Email and phone number for the organization; mori@bannockplanning.org 1(208)233-9322

8. Link to organization or project website, if applicable; and, https://www.bannockplanning.org

9. Date the DMP was written – 12/1/2023

Data Description

The data collected and used in the project are related to detecting and tracking the flow of vehicles, pedestrians, and bicycles. The data collected in the study will come from the installed sensors, existing sensors, and potential third-party applications programs or databases. The need for the third party application programs or databases will be determined at the time of selections of equipment providers.

The project installed sensors at intersections to feed data to an Advanced Transportation Controller (ATC), an open architecture hardware and software platform that can support various Intelligent Transportation Systems (ITS) applications, including traffic management, safety, security, and other applications. The ATC controllers' standards are developed and maintained under the direction of the ATC Joint Committee.

The data from the ATC controllers, which is stored in a SQL server database, is accessed by Automated Traffic Signal Performance Measures (ATSPM) / Automated Traffic Signal Performance Metrics.

The anticipated data from installed sensors includes:

· Approach Delay

· Vehicle detections – Arrival on Green, Dilemma Zone, Stop Bar and Advanced

· Pedestrian detections

· Bicycle detections

· Advance Camera Detection

Source: Automated Traffic Signal Performance Measures (ATSPM)

Nature Scope and Scale: All data is stored on a SQL server database within each ATC controller. The data are recorded detections, which are timestamped.

Characteristics of the data: The data collected are specific detections with no personally identifiable

characteristics. Some sensors capture video and images (still frames), which is used to take the vehicle/bicycle/pedestrian location data. However, the video and image data itself is not stored on the servers. If video or image data is recorded for making presentation or seminar purposes, the video and images will be edited to blur faces before being share with USDOT and partners. Within the software, there is no personal information that extracted from the data. The study team will use the any live video (without recording) to verify, validate, and evaluate the data. These data will be secured with end-to-end encryption at the Pocatello ATSPM server and will not be accessible to anybody outside the study team. Even after the completion of Stage 1, the data will only be made accessible to partner agencies and USDOT in an aggregated form, if and when requested. More detail on the characteristics of the data will be added as soon as equipment installation and data collection implementation commence.

Expected Value of the data: The data collected and analyzed have long term benefits by allowing a before-after comparison over time and different environmental conditions. The collected data will provide the added benefits to the Historically Disadvantaged Communities (HDCs) and Pocatello-Chubbuck Community as a whole.

Crash Data

Source: Idaho Transportation Department AASHTOware and WebCARS (Crash Analysis Reporting System)

Nature Scope and Scale: All data is stored on ITDs database servers and available through request via a secure system protected by a login and password. This database includes all vehicular crash data throughout the State of Idaho and can be filtered to capture information for the study areas.

Characteristics of the data: The crash data downloaded from the ITD system does not contain any personally identifiable information. It only provides data regarding environmental conditions, pavement conditions, type, manner, location, number of vehicles involved in each crash along with fatal, injury and PDO information in a tabular format.

Expected Value of the data: The intent of the crash data is to evaluate the expected benefits of the Stage 1 equipment on crash patterns. This will be done via a before/after study conducted by the study team.

Vehicle Travel Time

Source: Iteris Velocity Software and Bluetooth Sensors (licensed to the Co-op)

Nature Scope and Scale: The Iteris Velocity uses Bluetooth-based sensors that match MAC addresses of detectable Bluetooth devices to determine the travel time between fixed points (signals) within the Yellowstone Corridor. The Bluetooth sensors will be installed at all study intersections along the Yellowstone Corridor for the duration of the study, if not already actively providing travel time data.

Characteristics of the data: The data is scrambled at every detected device with a MAC ID at the sensor level and the vehicle traversal data is aggregated within the software, without any specific vehicle's identity or MAC ID numbers. This system has been in operations for almost 10 years and there are no privacy concerns with this type of data. The data is reported as average travel time and average speed in five-minute intervals by direction of travel.

Expected Value of the data: The intent of the travel time data is to assess whether the Stage 1 equipment has a positive benefit on travel times within the Yellowstone Corridor. This will be measured by the study team via a before/after study of travel times downloaded from the Iteris Velocity Software.

Data Format and Metadata Standards Employed

1. Anticipated file formats of your data and related files:

a. The data collected by the radar and advanced video detections will be stored in a SQL database within each ATC controller. This will be exported and stored in Excel or CSV files and will be shared with the public in conformance with the US DOT Public Access Plan.

b. Crash data is available in an ITD provided website interface and will be downloaded from the ITD source as excel files. This will be exported and stored in Excel or CSV files meeting the requirements of the Federal Government DCAT-US Metadata Schema (v1.1).

c. Travel Time Data is stored in the Iteris Velocity database in ASCII, delimited files and GeoJSON files and the downloaded data is tabular format that can be imported into Excel. This will be exported and stored in Excel or CSV files and will be shared with the public in conformance with the US DOT Public Access Plan. Timestamp is to the nearest second in hexadecimal 00:00:00:00:00 format.

2. To the maximum extent practicable, your DMP should address how you will use platform-independent and non-proprietary formats to ensure maximum utility of the data in the future;

a. The radar and advanced video detections data will be aggregated for approach delay (sec), vehicle detections (Arrival on Green, Dilemma Zone, Stop Bar and Advanced), pedestrian detections, bicycle detections, and advance camera detection will be compiled into Excel and CSV formats for reporting and dissemination purposes providing the maximum possible usage of this data into the future.

b. Crash data and the before/after crash analysis will be compiled into tabular excel and CSV file formats for easy reporting of the study findings and future use of the data and analysis.

c. Average travel time and average speeds of the before/after the study will be compiled into tabular formats that can be imported into Excel and CSV for reporting purpose and for use by others.

a. 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.

a. Export to both MS Excel and CSV formats. They will be the primary tools for aggregating the data and are widely available to researchers and partner public agencies to review and use the data for additional analyses. CSV is a non-propriety format making the data available to all users, even those who may not be able to afford the MicroSoft suite of products.

3. Identify the metadata standards you will use to describe the data.

The radar and advanced video detection data will be exported and stored in Excel or CSV files and will be shared with the public in conformance with the US DOT Public Access Plan.

a. The catalog field data will conform to Schema version v1.1

b. The dataset collected will be archived along with essential metadata to ensure discoverability in the “figshare” repository and on the internet. The radar and advanced video detection data will be accompanied by a .JSON metadata file meeting the requirements of the Federal Government DCAT-US Metadata Schema (v1.1):

I. Title (readable name of asset)
II. Description (readable description with adequate detail for reader understanding of the asset – whether of interest or not)

III. Keyword/tags
IV. Last update (modified) - by the study team including BTPO, City of Pocatello and the Consultant team
V. Publisher – publishing entity (BTPO)
VI. Contact Name and Email (most likely Mori Byington, BTPO)
VII. Unique Identifier (nomenclature to be determined after data collection, but will include unique identifier for the BTPO catalog or database)
VIII. Access Level – anticipated public access using "figshare"
IX. Bureau Code – 021:00
X. Program Code - 021:053

a. At least one metadata file should be a DCAT-US v1.1 (https://resources.data.gov/resources/dcat-us/ .JSON file, the federal standard for data search and discovery.

The average speed and average travel time dataset generated from Iteris Velocity will be shared as a .CSV tabular data file.

1. Describe any sensitive data that may be collected or used;

No sensitive data will be collected as part of Stage 1 or Stage 2 implementation. No video or image data will be automatically collected or stored on a server. If any video or image data is collected, it will be via a recording from a live stream video. Any recoded video or images will be edited to blur faces to mitigate the risk of re-identification before sharing it with USDOT and other partners for the purposes of presentations or seminars.

2. Describe how you will protect PII or other sensitive data, including IRB review, application of CARE Principles guidelines, or other ethical norms and practices;

PII data like name, email, telephone, address, SSN, DMV, demographic, gender, religion, bank accounts, Biometrics, Race, DOB, medical information, Credit card information, device ID, IP address will NOT be collected.

MAC IDs that are identified by the equipment level for travel time are anonymized at the device level and cannot be collected.

No video or image data will be automatically collected or stored on a server. If any video or image data is collected, it will be via a recording from a live stream video. Any recoded video or images will be edited to blur faces to mitigate the risk of re-identification before sharing it with USDOT and other partners for the purposes of presentations or seminars.

The study will not include any research that includes Indigenous populations or Tribal communities that would require adherence to CARE Principles for Indigenous Data Governance.

a. 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;

No video or image data will be automatically collected or stored on a server. If any video or image data is collected, it will be via a recording from a live stream video. Any recoded video or images will be edited to blur faces to mitigate the risk of re-identification before sharing it with USDOT and other partners for the purposes of presentations or seminars.

3. Describe any access restrictions that may apply to your data;

No access restrictions are applicable.

4. If necessary, describe any division of responsibilities for stewarding and protecting the data among Principal Investigators or other project staff.

None anticipated.

1. Describe who will hold the intellectual property rights for the data created or used during the project;

There is no intellectual property associated with the data collected using the radar and advance camera detection [Approach Delay, Vehicle detections (Arrival on Green, Dilemma Zone, Stop Bar and Advanced), Pedestrian detections, Bicycle detections], Crash data or the Iteris Velocity average travel time and average speed data.

2. Describe whether you will transfer those rights to a data archive, if appropriate;

No transfer of rights applicable. Data and analysis will be aggregated and provided to USDOT and partner public agencies as requested.

a. Identify whether any licenses apply to the data;

No licenses apply to the data.

b. If you will be enforcing terms of use or a requirement for data citation through a license, indicate as much in your DMP;

No terms of use or requirements for data citation through a license is not anticipated at this time.

1. Describe any other legal requirements that might need to be addressed.

None.

1. State where you intend to archive your data and why you have chosen that particular option;

The data collected as part of the SMART Grant will be saved on a server located in the City of Pocatello Traffic Management Center (TMC) for the duration of the Project. Then, after completion of the Project, the data will be archived on “figshare”.

“figshare” is on the list of repositories that NTL team has evaluated and are conformant with the USDOT’s Public Access Plan. We also believe that “figshare” supports the capture and provision of the US Federal Government DCAT-US Metadata Schema.

2. Provide a link to the repository; **https://figshare.com/account/home#/projects**

3. You must describe the dataset that is being archived with a minimum amount of metadata that ensures its discoverability;

The dataset collected will be archived along with essential metadata to ensure discoverability in the “figshare” repository and on the internet. The radar and advanced video detection data will be accompanied by a .JSON metadata file meeting the requirements of the Federal Government DCAT-US Metadata Schema (v1.1)

a. The catalog field data will conform to Schema version v1.1

b. The metadata file will include the following fields in conformance with Federal Government DCAT-US

Metadata Schema (v1.1) and will be in Excel or CSV file formats:

i. Title (readable name of asset)

ii. Description (readable description with adequate detail for reader understanding of the asset – whether of interest or not)

iii. Keyword/tags

iv. Last update (modified) - by the study team including BTPO, City of Pocatello and the Consultant team

v. Publisher – publishing entity (BTPO)

vi. Contact Name and Email (most likely Mori Byington, BTPO)

vii. Unique Identifier (nomenclature to be determined after data collection, but will include unique identifier for the BTPO catalog or database)

viii. Access Level – anticipated public access using "figshare"

ix. Bureau Code – 021:00

x. Program Code - 021:053

The average speed and average travel time dataset generated from Iteris Velocity will be a metadata file conforming to the DCAT-US v1.1 (https://resources.data.gov/resources/dcat-us/ .JSON (GeoJSON) file standards.

a. Whatever archive option you choose, that archive should support the capture and provision of the US Federal Government DCAT-US Metadata Schema https://resources.data.gov/resources/dcat-us/

"figshare" supports the capture and provision of the US Federal Government DCAT-US Metadata Schema as discussed above.

2. In addition, the archive you choose should support the creation and maintenance of persistent identifiers (e.g., DOIs, handles, etc.) and must provide for maintenance of those identifiers

"figshare" is on the list of repositories that NTL team has evaluated and are conformant with the USDOT's Public Access Plan. We also believe that "figshare" supports the creation and maintenance of persistent identifiers (e.g., DOIs, handles, etc.) and provides for maintenance of those identifiers.
