

Plan Overview

A Data Management Plan created using DMP Tool

DMP ID: <https://doi.org/10.48321/D13C8B7A9E>

Title: Emergency Life Saving through Multi-Modal Mobility (ELSa-M3)

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

Funding opportunity number: 20.941

Grant: 69A3552441031

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

Project abstract:

The Emergency Life Saving through Multi-Modal Mobility (ELSa-M3) project will demonstrate the requirements for the use of emergency drone delivery to underserved communities in the southwestern region of Pennsylvania. ELSa-M3 proposes, through the development of a cost-effective and affordable public network, an innovative use of uncrewed aircraft systems (UAS) to enhance emergency services logistics in the region through a public ground-based sensor network integrated with airspace management. ELSa-M3 will utilize advanced technology to improve emergency response time and improve resiliency by responding to emergency calls with drones delivering NARCAN (Opioid overdose), EpiPen (allergic shock), and AEDs (cardiac arrest).

Start date: 07-01-2024

End date: 01-31-2026

Last modified: 07-29-2026

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Emergency Life Saving through Multi-Modal Mobility (ELSa-M3)

Project Contact Information

Please provide as much of the the following information as possible:

1. Name of the project;
2. Grant number;
3. Name of the person submitting this DMP;
4. ORCID of the person submitting this DMP (need an ORCID? Register here: <https://orcid.org/>);
5. Email and phone number of the person submitting this DMP;
6. Name of the organization for which the person submitting this DMP is working;
7. Email and phone number for the organization;
8. Link to organization or project website, if applicable; and,
9. Date the DMP was written.

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8. www.sapdc.net
9. 12/12/2024

Data Description

Please provide as much information as possible:

1. Provide a description of the data that you will be gathering in the course of your project or data from a third party that you will re-use, if any;
 1. If there will be no data collected or re-used from another source, state that this is case;
 1. If you answered "No data" above, then you are finished and may skip the most of the steps and sections below, after you:
 1. Save your DMP as it exists;
 2. Submit it to your Grant Manager or the NTL staff for review.
2. Address the expected nature, scope, and scale of the data that will be collected, as best as you can at this stage;
3. As best as you can, 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;
 1. If data might be sensitive, please describe how you will protect privacy and security, if you know that now;
 2. You may need to update your DMP later to add more detail;
4. Discuss the expected value of the data over the long-term.

Description of Planned Data

- System Performance and Intervention Benefit Data Set consisting of time to dispatch, time to response, time on scene, distance traveled, and adverse events. Data was collected by Cambria County Emergency Services and Somerset County Emergency Management; this data set contained PII during initial collection which has been removed for final publication(see below).
- Infrastructure Design Document consisting of a siting plan, risk and siting analyses, deployed service volume maps, bill of materials, deployment guides and data and collected by Cambria County Emergency Services and ATA Aviation.

- Infrastructure Cost and Performance Data Set consisting of site costs, sensor and materials costs, deployment costs, sensor detection characterization, sensor accuracy and error, sensor uptime and availability characterization, system and network latency, system uptime and availability, characterized service volume. Data collected by Cambria County Emergency Services and ATA Aviation
- Flight Safety Data Set – UAS Safety consisting of deidentified flight plans, flight tracks, diversions, reason for diversion, malfunctions or adverse events and collected by DroneUp, ATAA, Aloft, OneSky; this data set contained PII during initial collection which has been removed for final publication (see below)
- Flight Safety Data Set – Airspace Characterization consisting of flight tracks and collected by ATA Aviation

Expected Scope and Scale of Data Collection

All data sets were collected within Cambria county in the following census tracts: 42021000100, 42021000200, 42021000300, 42021000500, 42021000600, 42021000700, 42021010200, 42021011000, 42021011200, 42021013200, 42021013400

Data Characteristics

Stage 1 data will be collected from Cambria County Emergency Services systems, integrated airspace surveillance and flight management systems, public economic development and healthcare reporting data, and community interview.

Privacy and Security Protection

No Protected Health Information (PHI) will be collected under the ELSa-M3 study protocols, nor will any health or medical data be used outside of the current, normal course of business in the Cambria County dispatch center. Limited Personally Identifying Information (PII) will be transmitted from the dispatch center to DroneUp to facilitate delivery, however this data will not be published as part of the study data sets and shall only be retained during the project for FAA regulatory purposes. Further, pursuant to 45 CFR 46 (HHS Office for Human Research Protections Common Rule) we will seek a determination from the Cambria County Medical Director as to whether the ELSa-M3 project is exempt from Institutional Review Board (IRB) review as a quality improvement activity, or requires expedited IRB review, pursuant to Commonwealth of Pennsylvania and Cambria County emergency services protocols. All data will be stored in NIST 800-53 accredited stores at the FIPS 199 Moderate control baseline.

Long Term Value of the Data

This data has two potential long-term benefits: i) it will provide valuable information to public safety departments seeking augment or enhance response using automated vehicles and ii) it will provide valuable planning and performance data for communities seeking to develop safe, scalable, drone-based services.

Data Format and Metadata Standards Employed

Please provide as much information as you can:

1. Describe the anticipated file formats of your data and related files;
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;
 1. 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.
3. Identify the metadata standards you will use to describe the data.
 1. 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.

Anticipated File Formats

This project aims to achieve open access to the fullest extent by releasing the data to the public. As such, the project will use all open source file formats: PDF, RTF, .MD, and CSV files.

Non-proprietary Formats

The project will use all open source file formats.

Metadata Standards

All data sets will be published with background and explanatory documentation, including metadata. The final data will have a DCAT-US v1.1 (<https://resources.data.gov/resources/dcat-us/>) .JSON metadata file, which is the federal standard for data search and discovery in compliance with the USDOT Public Access Plan.

Access Policies

In general, data from DOT-funded projects must be made publicly accessible. Exceptions to this policy are: data that contain personally identifiable information (PII) that cannot be anonymized; confidential business information; or classified information. 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 to protect privacy and confidentiality prior to archiving your data, and any additional concerns. 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. Additionally, when working with, or conducting research that includes Indigenous populations or Tribal communities, researcher will adhere to the CARE Principles for Indigenous Data Governance <https://www.gida-global.org/care> and make an explicit statement to that effect in this portion of the DMP. Please provide as much information as possible:

- 1. Describe any sensitive data that may be collected or used;**
- 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;**
 - 1. 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;**
- 3. Describe any access restrictions that may apply to your data;**
- 4. If necessary, describe any division of responsibilities for stewarding and protecting the data among Principal Investigators or other project staff.**

Description of Sensitive Data

No Protected Health Information (PHI) will be collected under the ELSa-M3 study protocols, nor will any health or medical data be used outside of the current, normal course of business in the Cambria County dispatch center. Limited Personally Identifying Information (PII) consisting of dispatch address will be transmitted from the dispatch center to DroneUp to facilitate delivery, however this data will not be published as part of the study data sets and shall only be retained during the project for FAA regulatory purposes.

Protections of Data

No PHI data will be collected for us in the project. PII data will remain in the Cambria County Emergency Services dispatch systems under their normal course of business, with the exception of dispatch location, which will only be retained for FAA regulatory requirements and subsequently destroyed. Pursuant to 45 CFR 46 (HHS Office for Human Research Protections Common Rule) we will seek a determination from the Cambria County Medical Director as to whether the ELSa-M3 project is exempt from Institutional Review Board (IRB) review as a quality improvement activity, or requires expedited IRB review, pursuant to Commonwealth of Pennsylvania and Cambria County emergency services protocols. All data will be stored in NIST 800-53 accredited stores at the FIPS 199 Moderate control baseline.

Restrictions of Use or Dissemination of Data

There are no commercial or licensing restrictions on ELSa-M3 project data. PII sharing within the project will be governed by Cambria County Emergency services policies and procedures, non-disclosure agreements, and security

accreditations.

Responsibilities for Data Collection and Handling

Roles and responsibilities for data collection and handling are described in the Project Evaluation Plan, contracting and subcontracting agreements, Cambria County Emergency Services policies and procedures, and the internal project plan.

Re-use, Redistribution, and Derivatives Products Policies

Recipients are reminded:

- 1. Data, as a collection of facts, cannot be copyrighted under US copyright law;**
- 2. Projects carried out under a US DOT SMART Grants is federally funded; therefore, as stated in grant language:**
 - 1. Recipients must comply with the US DOT Public Access Plan, meaning, among other requirements, project data must be shared with the public, either by the researchers or by US DOT;**
 - 2. That by accepting US DOT funding through this grant, recipients have granted to US DOT a comprehensive non-exclusive, paid-up, royalty-free copyright license for all project outputs (publications, datasets, software, code, etc.). This includes all rights under copyright, including, but not limited to the rights to copy, distribute, prepare derivative works, and the right to display and/or perform a work in public; and,**
 - 3. In accordance with Chapter 18 of Title 35 of the United States Code, also known as the Bayh-Dole Act, where grant recipients elect to retain title to any invention developed under this grant, US DOT retains a statutory nonexclusive, nontransferrable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any such invention throughout the world.**

Please provide as much information as possible:

- 1. Describe who will hold the intellectual property rights for the data created or used during the project;**
- 2. Describe whether you will transfer those rights to a data archive, if appropriate;**
- 3. Identify whether any licenses apply to the data;**
 - 1. If you will be enforcing terms of use or a requirement for data citation through a license, indicate as much in your DMP;**
- 4. Describe any other legal requirements that might need to be addressed.**

Intellectual Property Rights

By receiving USDOT funding, this projects has granted the USDOT a comprehensive non-exclusive, paid-up, royalty-free copyright license for all project outputs, including but not limited to publications, datasets, software, code, and other derivate products. This includes all rights under copyright, including but not limited to the rights to copy, distribute, prepare derivative works, and the right to display and/or perform a work in public. In accordance with Chapter 18 of Title 35 of the United States Code, also known as the Bayh-Dole Act, if this project elects to retain title to any invention developed under this grant, USDOT retains a statutory nonexclusive, nontransferrable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any such invention throughout the world.

Applicable Licenses

No commercial licensing rights are asserted for the study data sets.

Other Legal Requirements

Data are subject to compliance and reporting requirements under Commonwealth of Pennsylvania and Cambria County Emergency Services protocols, policies, and procedures and Title 14, Code of Federal Regulations (Federal Aviation Administration).

In compliance with the USDOT Public Access Plan, this project will transfer data rights to a public data repository, ensuring the data and project outputs are accessible to the public and other stakeholders.

Archiving and Preservation Plan

Please provide as much information as possible:

- 1. State where you intend to archive your data and why you have chosen that particular option;**
- 2. Provide a link to the repository;**
- 3. You must describe the dataset that is being archived with a minimum amount of metadata that ensures its discoverability;**
 - 1. 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/>
- 4. 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 throughout the preservation lifecycle of the data;**
- 5. Your plan should address how your archiving and preservation choices meet these requirements.**

The data sets described in the Data Management Plan will be published and archived through ROSA P, the United States Department of Transportation (US DOT) National Transportation Library's (NTL) Repository and Open Science Access Portal (ROSA P).

The ROSA-P repository supports the capture and provision of US Federal Government DCAT-US Metadata Schema. This repository also meets USDOT SMART grant requirements for the creation and maintenance of a persistent identifier (DOI) for future access and preservation of the data described within this plan.

Planned Research Outputs

Dataset - "ELSA-M3 Data Dictionary"

This CSV file contains a data dictionary describing each variable of our project's datasets in detail. Each line represents one variable and contains five fields:

1. Filename: the file in which the variable appears
2. Variable: the name of the variable within that file
3. Description: a brief, qualitative description that describes what the variable represents
4. Data Type: the schema or type in which the variable is displayed
5. Missing Data Coding Format: the method in which missing data is represented (i.e. Null, Blank)

Dataset - "Infrastructure Cost Data Set"

This dataset contains two files which detail the infrastructural cost associated with the ELSa-M3 program.

1. 'ELSa-M3 Program Costs.csv': This is a CSV file containing a list of program costs incurred during the grant's period of performance itemized by budget category as well as estimates of annual and de novo program costs.
2. ELSa-M3 Costing Model.pdf: This PDF contains a cost model that itemizes various cost categories within the project budget. It is a companion to Appendix H of the project's implementation report.

Further discussion on this dataset can be found in Appendix H of the project's implementation report. Further description of variables and additional documentation can be found in the project's data dictionary, "elsam3datadictionary.csv", and readme, "README.txt"

Dataset - "System Performance and Intervention Benefit Data Set"

This dataset contains three CSV files which detail the results of ELSa-M3's UAS medical dispatch testing and flight performance. Additional information regarding the files in this dataset can be found in the project's data dictionary, "elsam3datadictionary.csv", and readme, "README.txt". Further discussion of this data-set, collection and analysis methodology, and limitations can be found in Appendices E and F of this project's implementation report.

1. Overall_Stat.csv: This CSV contains summary statistical analyses of performance metrics for specified days of system testing.
2. Optimized_Drone_Dispatch.csv: This CSV contains a record of unique, de-identified CAD dispatches with calculated pro forma and optimized drone performance.
3. Input_Completed_Drone_Flight_ExportTable.csv: This CSV contains a record for each complete delivery flight made by ELSa-M3, associated performance statistics, and any notable occurrences. All PII collected in the original dataset has been removed for publication.
4. Drone_DroneTelemetry_ExportTable_CompletedDelivery.csv: This CSV contains drone telemetry data for each completed delivery flight by ELSa-M3.

Text - "Infrastructure Design Document"

This research output describes in detail the infrastructural design and implementation of the ELSa-M3 project, including the project's siting plan, risk analyses, deployed service volume maps, deployment guides, and other descriptive data. This research output is also included as Appendix B of this project's final implementation report.

Dataset - "UAS Flight Safety Data Set"

This dataset contains de-identified flight plans, flight tracks, diversions, reasons for diversion, malfunctions or adverse events contained in two CSV files.

- 1) DroneUpTelem_JohnstownSummary.csv: This CSV file contains a summary of each of the test flights recorded during the project's period of performance.
- 2) DroneUpTelem_JohnstownTelemetry.csv : This CSV file contains telemetry data from each of the test flights recorded during the project's period of performance.

Dataset - "Fight Safety Airspace Characterization Data Set"

This dataset consists of CSVs that contain telemetry data from project sensor arrays which were used to ensure flight safety during ELSa-M3's active operational periods. This data contains flight tracks from other aircraft collected while the drone was in operation for use in routing and de-confliction of flight paths.

1. OpticalMerge_jtwn6nm_811thru27.csv: This CSV contains a list of unique detection points obtained from optical sensors during testing conducted between 8/11 - 8/27.
2. Converted_ADSB_ConvertedADSB_All_ADSB_jtwn6nm_8XX.csv: This series of 10 CSV files contain a list of ADS-B telemetry messages gathered from project sensors during flight testing. Each CSV contains telemetry from a single day in August, which is noted by the final two digits of the filename.
3. OpticalVADSB_1km10sMin3s_TrueDedupe.csv: This CSV file contains identified, unique pairs of optical detection points and ADS-B telemetry information representing co-occurrent points, used to assess range, sensitivity of detection, and to estimate false positives.
4. Corrected__3D_Sensor_to_Optical_Points_Prj_SensorXXX_SensorLinetoPt..csv: This series of 5 CSV files represent a single telemetry message from the sensor array and its range to target. The specific sensor is noted by the three digits in the filename.

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
ELSA-M3 Data Dictionary	Dataset	2026-07-30	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No	No
Infrastructure Cost Data Set	Dataset	2026-07-30	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No	No
System Performance and Intervention Benefit Data S ...	Dataset	2026-07-30	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No	No
Infrastructure Design Document	Text	2026-07-30	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No	No
UAS Flight Safety Data Set	Dataset	2026-07-30	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No	No
Fight Safety Airspace Characterization Data Set	Dataset	2026-07-30	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No	No