

Leading in Sustainable Safety with V2X technology in Oakland County Michigan

Dataset and 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.

1. Leading in Sustainable Safety with V2X technology in Oakland County Michigan
2. SMARTFY22N1P1G34
3. Carissa Markel
4. N/A
5. cmarkel@rcoc.org 248-645-2000 ext.2212
6. Road Commission for Oakland County
7. dcsmail@rcoc.org 877-858-4804
8. <https://www.rcocweb.org/>
9. December 14, 2023

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;
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.

In addition to this Data Management Plan, the Road Commission for Oakland County (RCOC) Sustainable Safety Project includes the following Stage 1 Deliverables that will be considered as part of the data management plan.

- Prototype Demonstration
- County Wide Deployment Plan
- Community Engagement Plan
- Business and Financial Plan
- Workforce Development Plan
- Community Engagement Plan
- Evaluation Plan
- Final Report

These deliverables will generate three categories of data:

1. **Technical System Data** - data that is stored in the hardware and software that makes up the system. It includes information such as system logs, configuration files, and performance metrics, that is essential for monitoring and maintaining the system's health and performance.
2. **Quantitative Data** - data that is captured throughout the project to report on and evaluate the project. This will include outputs from analysis and measurements such as graphs, charts, and tables. This data will be stored in electronic document format.
3. **Qualitative Data** - data that is captured throughout the project to report on and evaluate the project, as well as to plan for future Stages of the project. This will include outputs from research, interviews, surveys, and feedback from stakeholders. This data will be stored in electronic document format.

A description of each of the deliverables is included below:

Prototype Demonstration: The prototype demonstration includes 5 intersections and 10 RCOC controlled vehicles that are configured with C-V2X technology. The use cases planned to be deployed include Vulnerable Road User alerts, Signal Priority, and Fleet Intelligence. The prototype system will generate or store technical system data in three locations: 1) the prototype intersections 2) the prototype vehicles 3) the prototype functionality operating at the Traffic Management Center or Cloud. The prototype system will generate and store operational data that allows the system to function and be maintained. The prototype demonstration will also generate quantitative data that will be used to evaluate the performance of the system as part of the Evaluation Plan. The prototype demonstration will also generate qualitative data in the form of feedback from various stakeholders.

[Block Diagram RCOC Data Management Plan](#)

County Wide Deployment Plan: This is a document that will identify the technology deployment plan for Stage 2 of the SMART grant program. This document is a combination of a concept of operations, lessons learned from Stage 1, and an acquisition and installation plan suitable for RCOC to deploy C-V2X technology across the county. This deliverable will generate quantitative data in the form of traffic analysis. This deliverable will generate qualitative data in the form of recommendations and diagrams to plan for Stage 2 of the program.

Community Engagement Plan: This document will identify the plan to engage and educate the wider community on the benefits of C-V2X technology for Stage 2. This deliverable will generate qualitative data in the form of recommendations for Stage 2 and outputs of stakeholder interviews and surveys.

Business and Financial Plan: This document will identify the business and financial plan to create an economically sustainable deployment for Stage 2. This will include a financial model that demonstrates the cost and benefit determination for the Stage 2 project. This deliverable will generate quantitative data in the form of financial modeling and analysis. This deliverable will generate qualitative data in the form of recommendations for Stage 2 and outputs of financial stakeholder interviews.

Workforce Development Plan: This document will identify the plan to educate RCOC and the wider community workforce on deploying and maintaining C-V2X technology for Stage 2. This deliverable will generate qualitative data in the form of recommendations for Stage 2.

Project Evaluation Plan: This deliverable is a report that is focused on how the performance of Stage 1 of the project will be evaluated and how the performance of Stage 1 can be used to estimate benefits of the system during at-scale deployment in Stage 2. This deliverable will generate qualitative data in the form of a process for how performance will be evaluated.

Final Report: This deliverable is the final report of the project that captures the work accomplished, lessons learned and performance evaluation of Stage 1. This deliverable will generate qualitative data in the form of a summary of the project. This deliverable will generate quantitative data in the form of outputs from system analysis and measurement.

The expected nature, scope and scale of the data collected as part of the prototype development and demonstration is summarized below.

For Technical System Data:

Prototype System Operations at Intersection:

- An Enhanced V2X Hub operates on an edge computer at each intersection. The V2X Hub generates the following V2X messages which are forwarded (along with all J2735 or J3224 messages received from OBU) to a cloud-based data repository:
 - SAE J2735 Signal Phase and Timing (SPAT) at 10 hz
 - SAE J2735 MAP files at 1 hz
 - SAE J3224 Sensor Data Sharing Messages (SDSMs) at 10 hz when objects are detected at an intersection
 - SAE J2735 Signal Status Messages (SSMs) at 1 hz when the traffic signal controller is in the signal priority or signal preemption state.
- The Enhanced V2X Hub generates operational event reports and system component status reports (including exception fault handling) which are forwarded to the Operations Monitoring software at the TMC.
- Intersection cameras generate raw video data at 10 fps. This data is typically processed in real-time and not collected. There may be some instances where raw video data is collected to evaluate the object detection software and better train the computer vision model. In this case, the data is only stored for the duration of the evaluation and training and then promptly deleted.
- AI-based Object Detection Software operates on an edge computer at each intersection. This software processes the raw video data and generates Object Detection Reports on objects detected at the intersection. The Object Detection Reports adhere to the SAE J3224 data dictionary and do not contain any PII or Sensitive Information.

Prototype System Operations in Vehicles:

- C-V2X On-board Units (OBUs) generate SAE J2735 Basic Safety Messages (BSMs) at 10 hz which are collected by a cloud-based data repository.
- C-V2X OBUs generate SAE J2735 Signal Request Messages (SRMs) at 1 hz when requesting Signal Priority which are collected by cloud-based data repository.
- C-V2X OBUs generate Authorization and Authentication Request Messages (AARMs) as needed to request permission for V2X services available at an intersection which are collected by the cloud-based V2X Authorization Server.

Prototype System Operations at the Traffic Management Center or Cloud Server:

- A data repository collects data as described above and stores it in a server for future use.
- An Operations Monitoring software collects data as described above and stores it in a server for future use.
- A V2X Authorization Server collects data as described above and stores it in a server for future use.

For Quantitative Data:

- Performance measurement of the system in the Final Report
- Traffic analysis generated as part of the County-Wide Deployment Plan
- Financial modeling and analysis generated as part of the Business & Financial Plan

For Qualitative Data:

- The final deliverable documents of the project:
 - County Wide Deployment Plan
 - Community Engagement Plan
 - Business and Financial Plan
 - Workforce Development Plan
 - Community Engagement Plan
 - Evaluation Plan
 - Final Report
- Outputs from the stakeholder interviews for the Community Engagement Plan, Business & Financial Plan

For Technical System Data:

The details of the following data elements are available in the SAE standards identified below:

- Signal Phase and Timing (SPAT) - SAE J2735_202309
- MAP files - SAE J2735_202309
- Sensor Data Sharing Messages (SDSMs) - SAE J3224_202208
- Signal Status Messages (SSMs) - SAE J2735_202309
- SAE J2735 Basic Safety Messages (BSMs) - SAE J2735_202309
- Signal Request Messages (SRMs) - SAE J2735_202208

Additionally, Vehicle Identification Numbers (VINs) for the C-V2X equipped RCOC vehicles are collected in the system. It's important to note that in this scenario, VINs are not considered sensitive data or Personally Identifiable Information (PII). This is because all the VINs collected as part of Stage 1 are associated with public vehicles, rather than private individuals, and do not infringe on personal privacy.

Lastly, there may be some instances where raw video data is collected to evaluate the object detection software and better train the computer vision model. In this case, the data is only stored for the duration of the evaluation and training and then promptly deleted.

For Quantitative Data:

- Performance measurement of the system will include measurements from time studies and technical system analysis. Metrics will include travel time, number of system events, IP packet loss, and IP packet throughput.
- Traffic analysis generated as part of the County-Wide Deployment Plan will include traffic throughput and safety metrics.
- Financial modeling and analysis generated as part of the Business & Financial Plan will include the costs and benefits associated with a Stage 2 Deployment.

For Qualitative Data:

- All qualitative data captured from interviews and surveys will be anonymized to protect the individual.
- If an interview session is recorded, proper due diligence and disclosure rules will be followed.

Note: RCOC will update the DMP in the future if anything materially changes.

The objective of the project is to create a sustainable model for C-V2X deployments. The data generated and consumed has value which will be used to support the accelerated deployment of C-V2X to align with goals outlined in the USDOT national deployment plan. This data, encompassing project deliverables, traffic studies, system performance, and safety metrics, will provide valuable insights into the efficacy of C-V2X technology in improving road safety, reducing congestion, and enhancing transportation efficiency.

The accumulation of this data will allow for analysis and modeling, leading to improvements in traffic management and digital infrastructure planning. The data will support the development of more advanced C-V2X applications and inform policy decisions related to connected and autonomous vehicles. The value of this data extends beyond immediate project outcomes and supports the evolution of intelligent transportation systems nationwide.

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.

For Technical System Data:

The following data generated and collected by the system will be formatted to meet SAE standards:

- Signal Phase and Timing (SPAT) - SAE J2735_202309
- MAP files - SAE J2735_202309
- Sensor Data Sharing Messages (SDSMs) - SAE J3224_202208
- Signal Status Messages (SSMs) - SAE J2735_202309
- SAE J2735 Basic Safety Messages (BSMs) - SAE J2735_202309
- Signal Request Messages (SRMs) - SAE J2735_202208

Additionally, the Object Detection Reports generated by the system will be in common JSON format.

For Quantitative and Qualitative Data:

The data will be generated in a standard electronic document format such as .DOCX, .XLSX, or .PPTX.

For Technical System Data:

To ensure maximum utility of the data and the system in the future, the system will comply with industry standards whenever possible. SAE is the standards body that governs the data formats for V2X messages. IEEE and ITE are other standards bodies that may govern relevant standards.

Additionally, the system is based on the USDOT's V2X Hub which is an open-source platform for managing V2X operations. The operational data generated by the V2X Hub is in a common format that is familiar to other V2X Hub deployers.

The following data collected by the system does not use platform-independent and non-proprietary formats:

- Authorization and Authentication Messages - There are no currently established industry standards for this message type as this is a proprietary message type.
- Safety Alerts - There are no known industry standards for these alerts, however best practices will be followed to make the alerts relevant, actionable, and non-disruptive to the driver.

For Quantitative and Qualitative Data:

The data will be generated in a standard electronic document format such as .DOCX, .XLSX, or .PPTX. This will ensure the data is accessible and usable moving forward.

The project will include a DCAT-US v1.1 metadata standard, utilizing a .JSON file format to describe our data.

Additionally, the project will incorporate essential metadata from the three categories of data referenced in this document: Technical System Data, Qualitative Data, and Quantitative Data. This will include information such as date, time, GPS position, and Intersection-ID, all of which are integral to the context and usability of the data collected. These metadata parameters will be represented in various components of our data architecture including log files, Management Information Base (MIB) tables, device status blocks, and database schemas. Additionally, metadata will be reflected in file and directory names where appropriate, ensuring an intuitive structure for data management and retrieval.

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.**

As described above, no sensitive data is collected or used by this project. All technical system data is anonymous and does not include any personally identifiable information (PII), or confidential business information including trade secrets, or classified information.

The technical system data includes vehicle VIN, which is not considered sensitive or PII because for Stage 1 of the project all vehicles are publicly owned RCOG maintenance vehicles.

The Object Detection Reports do not contain any sensitive information since they only capture the type of object (e.g. car, person, etc.).

The raw video data does not contain sensitive including any PII or confidential business information. The project will utilize Gridsmart GS3 traffic cameras which utilize a fisheye lens design, which inherently distorts the imagery, making it impossible to discern detailed features that could lead to the identification of individuals. Furthermore, the cameras operate at a low resolution that does not allow capturing facial features or other identifiable characteristics of individuals. These factors ensure that the cameras serve their intended purpose of monitoring traffic flow and VRUs, while firmly respecting and protecting individual privacy and complying with data protection regulations.

As mentioned above, no PII, confidential business information or classified data is collected as part of this project.

For clarity, under executed definitive contracts between or among project participants, the parties have agreed to recognize the sensitive, proprietary, and confidential nature of “confidential information” and to maintain the confidentiality, privacy, and security of such information in compliance with the provisions of said definitive agreements.

For Technical System Data:

The data is only accessible to authorized project personnel.

The V2X messages generated by the system and broadcast into the world will contain Security Credential Management System (SCMS) digital certificates. These certificates ensure that the messages can only be utilized by other entities that have compatible digital certificates. This ensures privacy and trust between the entities operating in the system.

At the TMC, the Operations Monitoring software is configured to give specific users access to the system. The system uses a RBAC (Role-based access control) paradigm for authorized user accounts. A designated system administrator can create accounts for other users, limiting access to specific Web pages based on assigned “role”.

For Quantitative and Qualitative Data:

The data is only accessible to authorized project personnel.

The following considerations are being made for stewarding and protecting the data:

- RCOC will be providing a secure network to facilitate the generation of data.
- RCOC will be providing a secure network connection and access point to facilitate the movement of this data outside of the network connection.
- Project Partners will be collaborating with RCOC for creating a secure connection to access the RCOC network as needed.
- Project partners are signing agreements that govern the use and access of the connection to RCOC's network.
- The RCOC project leads will review and approve any publishing of data to external parties.

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.

The IP, rights, and transfer of the data created or used during the project will be governed by the following:

- SMART grant program requirements
- Internal RCOC policies and procedures
- Legal agreements that RCOC has in place with project partners

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 primary project deliverables, including reports, plans, and documentation, will be archived in the ROSA P (Repository & Open Science Access Portal). This is the USDOT's designated repository for transportation-related research and data. It was selected because it complies with federal open data policies, supports the DCAT-US Metadata Schema, and enables the assignment and maintenance of persistent identifiers such as DOIs to ensure long-term accessibility and discoverability of archived materials.

Link to ROSA P: <https://rosap.ntl.bts.gov/>

The dataset being archived will include project deliverables, technical design documents, evaluation reports, business model analysis, and workforce/community engagement plans. These will be submitted in standard file formats (PDF, DOCX, XLSX) and tagged with appropriate metadata.

The project does not plan to archive raw V2X message data (e.g., SPAT, MAP, BSM, SRM, SSM, SDSM, TIM) due to two main considerations: (1) the data generated by this project is not expected to be materially different than the SAE J2735-formatted datasets already publicly available from prior deployments and existing archives; and (2) the extraction, long-term storage, and curation of high-volume V2X message data imposes a significant cost and operational burden without a proportionate increase in value or insight for public dissemination.

There will be no sensitive data, including PII or confidential business information archived. Data will be stripped of any PII or sensitive data before it is archived.

This approach aligns with federal expectations by archiving meaningful, non-redundant outputs in a trusted repository that supports discoverability, metadata standards, and long-term identifier maintenance. The use of ROSA P also satisfies the data preservation and open access requirements of the USDOT while minimizing unnecessary overhead for raw message storage.

Planned Research Outputs

Text - "SMARTFY22N1P1G34_DMP_Stakeholder Interviews"

This report is a summary of the OEM, Supplier, Fleet Management stakeholder interviews conducted to enable a more comprehensive understanding of the details required in the development, deployment and adoption of C-V2X technologies. These interviews were conducted on-line and individually with a consultant facilitator.

Text - "SMARTFY22N1P1G34_DMP__Community Engagement Plan"

This document summarizes the plan to engage and educate the wider community on the benefits of C-V2X technology for Stage 2. It includes key messages, communication sequencing and methods, and stakeholder identification and considerations.

Text - "SMARTFY22N1P1G34_DMP_Workforce Development Plan"

This document identifies the plan to educate RCOC and the wider community workforce on deploying and maintaining C-V2X technology for Stage 2. The emphasis is on the IOO fleet vehicle / aftermarket installations for the vehicle OBU system.

Text - "SMARTFY22N1P1G34_DMP_Evaluation Plan"

This document introduces the V2X system piloted, targeted use cases, and the evaluation methodology from pre-deployment to intersection / vehicle validation to post deployment monitoring. The performance measures and evaluation plan for the Proof-of-Concept / Prototype are established.

Text - "SMARTFY22N1P1G34_DMP_Final_Implementation_Report"

This document is the overall project summary and report out respecting the USDOT template. This pulls together the critical work packages, deliverables, and summary plans in a cohesive manner that highlights Stage 1 results and identifies the scaled Stage 2 recommendations. It includes the results of the prototype evaluation, challenges and lessons learned, and a holistic look at deployment readiness.

Text - "SMARTFY22N1P1G34_DMP_Business Plan"

This document lays out how a business plan would be developed for V2X applications. It shows different models with recommendations for scaling V2X with public, private partnerships.

Text - "SMARTFY22N1P1G34_DMP_Installation Plan"

This document is the hardware installation guide for the intersection upgrades for the V2x pilot intersections. Topics covered include RSU preparation and installation, and traffic cabinet device installation (edge computer, power distribution unit). A site survey was conducted as a pre-requisite and is included in the appendix. The survey details the cabinet space, existing equipment capability, and RSU mounting pole observations and recommendations, including photos.

Text - "SMARTFY22N1P1G34_DMP_Intersection Crash Analysis "

This document is the crash analysis that was conducted for each of the five (5) intersections for a ten (10)-year period and within 250-ft of each intersection. The crash data was obtained using the RCOC's preferred database, the Transportation Improvement Association (TIA) Traffic Crash Analysis Tool (TCAT).

Text - "SMARTFY22N1P1G34_DMP_Prototype Demonstration Plan "

The "Prototype Demonstration Plan" serves as a comprehensive guide and blueprint for the successful prototype demonstration of C-V2X technology in Oakland County, Michigan. This document outlines the objectives of the prototype, technology architecture, deployment area, and integration considerations necessary for an effective V2X system. Importantly, this document not only guides the current prototype process but also serves as input for the future County-Wide Deployment plan, which will be developed in the final Implementation Report and executed in Stage 2 of the project.

Dataset - "SMARTFY22N1P1G34_DMP_Intersection Analysis "

This data set includes the GIS shapefiles that were used in the first phase of the project to help select the 5 pilot intersections from the more than 1400 signalized options inside Oakland County. It includes (2) shape files with the supporting elements (zip files contain the .shp/.dbf/.shx files they reference). These fed a custom tableau analytics tool that allowed visualization and reviews with the IOO.

Shapefile 1: Crash data

Shapefile 2: Includes all the intersections with fields for bike lanes, disadvantaged areas, adaptive traffic SCATS, salt routes, truck routes. Also shows Michigan DOT owned intersections.

File 3: is an intersection criteria matrix that was helpful when trying to prioritize the different stakeholder inputs received. It used the Tableau data analysis for accidents and pedestrian counts but then overlaid key inputs like cabinet space, strong wireless backhauls, room in conduit for new cables with intangibles often missed (is the intersection convenient to do field testing at?).

Image - "SMARTFY22N1P1G34_DMP_POM Plots"

This folder contains a visualization of Perception Object Messages (POMs), which are the outputs of a computer vision system that detected, classified, and tracked objects (e.g., pedestrians, vehicles) using fisheye cameras installed at the intersection. Each POM includes information such as object type and

estimated GPS location. This data was overlaid on a satellite photo of the intersection, enabling manual review and analysis. This process was used to identify performance issues such as blind spots, miscalibration, false positives, and misclassifications, and directly contributed to refining the performance of the system. The POM data was later converted to SAE J3224 Sensor Data Sharing Messages (SDSM) and broadcast via C-V2X Roadside Units (RSUs) as part of the system’s real-time V2X communications.

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?
SMARTFY22N1P1G34_DMP_Stakeholder Interviews	Text	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP__Community Engagement Plan	Text	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP_Workforce Development Plan	Text	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP_Evaluation Plan	Text	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP_Final_Implementation_Report	Text	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP_Business Plan	Text	2025-09-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP_Installation Plan	Text	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP_Intersection Crash Analysis	Text	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP_Prototype Demonstration Plan	Text	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP_Intersection Analysis	Dataset	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No
SMARTFY22N1P1G34_DMP_POM Plots	Image	2025-06-29	Open	ROSA P		Creative Commons Attribution 4.0 International	DCAT-US	No