Research Request for Proposal

Ohio Department of Transportation
Office of Statewide Planning & Research
Research Section
Research Request for Proposal
Fiscal Year 2022

RFP Solicitation Number: 2022-07

Research Title: Achieving Efficiencies within ODOT with the Event Streaming Platform

Problem Statement
The Ohio Department of Transportation (ODOT) currently has a vast amount of data that is being used within each division/office. This data has traditionally been housed separately within those divisions/offices and limited data sharing has been performed. This restricts innovative improvements to processes from being imagined and developed, due to the lack of knowledge of available data. As a result, some divisions/offices may be performing burdensome and extensive manual processing of data unnecessarily.

DriveOhio has been working with ODOT’s Division of Information Technology to create the Event Streaming Platform (ESP), which is a data platform with the capability to remove silos within the departments’ data sets and provide a level of automation to the operation and management of state-maintained roadways. An example of an automation solution the ESP is trying to provide is the utilization of external third-party data to improve traffic flow and safety. Eventually this timely information can be provided to motorists automatically via digital message boards and other ITS strategies, thus reducing slow-downs and queue-related accidents. As the ESP is nearing completion within a production-level environment, ODOT wishes to further define use cases for applications to reside on the platform. Research is needed to examine all aspects of ODOT activities to identify opportunities for automation of the department’s more repetitive daily tasks to consider for inclusion in the ESP.

Goals
The goal of this research is to identify methods in which automation can be utilized to improve and make existing ODOT processes more efficient.

Objectives
The objectives of this research include the following:

- Identify ways in which data automation processes may be used/developed to support the functions of each division/office within ODOT.
- Define use case requirements and workflows including identifying problem statements, inputs, processing method, outputs and quality measures and validations.
- Develop statements of work to define requirements, data gaps and needs for future application development.
- Identify available third-party data sets that can be used to support transportation use cases.

Special Considerations
Researchers should take the following items into consideration when developing the work plan:

- This research is focused on developing use cases, work flows and statements of work and obtaining insight from ODOT technical areas that can be used to further develop the ESP. This research is not intended to build the platform or develop/modify any software.
- The ESP is based on an open architecture utilizing tools, such as AWS, Kafka, Kubernetes, and the Confluent platform.
- ODOT consists of a central office (CO) and has 12 districts offices. District offices may have varying operational protocols due to their locations and differing environmental challenges (e.g., rural and urban). The research team shall organize outreach activities within ODOT CO and districts to define requirements that support ODOT as a whole.
As interviews and outreach is underway, it will be important to identify common challenges or improvement opportunities and how each workflow can be developed to integrate seamlessly across district and division boundaries.

A significant amount of work/collaboration has already been performed in the Division of Operations related to the development of automation opportunities. Specifically, as it relates to traffic management, TSMO, and traffic operations. Therefore, it is recommended that researchers start their efforts with this division.

Within the first 6 months of the project, the researcher is expected to submit all required documents and recommendations for the Division of Operations. This should include identification of any 3rd party data needed to support each identified use case for the Division of Operations and possible sources for those data sets. Following a review by the ODOT Technical Advisory Committee (TAC), a determination will be made if this project should move forward with an evaluation of the rest of the agency or be terminated. If the project proceeds, adjustments to the work plan/approach/interview process may be made at the request of the TAC.

The research team is expected to respond to comments provided by the TAC on use cases, work flows and statements of work within two weeks of receipt.

The use cases and coordinating statements of work developed through this research will be used to identify requirements and needs of future application developments that would reside on the ESP.

Requirements of the Research Team
The research team must include individuals with the following expertise:
1. Understanding of data platform tools.
2. Understanding of data and operational workflow creation, as defined in the project objectives, within a DOT environment.
3. Experience in outreach and interview skills.
4. Understanding of types of third-party data available that could support DOT use cases.
5. Understanding of ODOT operations, as well as the transportation industry in general.

Assistance from ODOT
The researcher can expect to receive the following assistance from the Technical Advisory Committee:
1. Assistance with identification of appropriate contacts within each applicable division/office.
2. Coordination with ODOT ESP Architect Team for any clarifications on the ESP structure and abilities.
3. Technical direction and clarification.
4. Review of work flows and project reports.
5. Participation in project meetings.

Project Specific Deliverables
- Submission of draft versions of use cases, work flows and statements of work for the Division of Operations within 6 months of the contract state date.
- Draft and final versions of use cases, work flows and statements of work for each division/office.
- A matrix outlining available/future external 3rd party data that may be applicable to transportation industry
- Electronic Word version of the draft final report and draft fact sheet shall be submitted 120 days prior to the contract completion date.
- MS Word version of the approved final report and fact sheet shall be submitted by the contract completion date.
- An article for the Research newsletter (to be provided upon request).
- Participation in the following meetings: project start-up, bi-weekly status calls, and research results presentation.

Benefits
This research will take a deep dive into how ODOT's daily operations occur in regard to data and resulting decisions. In addition to identifying existing data, this research may identify gaps in data that could be helpful in developing more robust decisions. This research is seen as a kaizen approach to identifying process improvements for data availability and usage. As a result, ODOT may become more efficient in our use of data which could result in improved operational efficiencies and cost savings in the long-term. Examples of possible benefits include the following:
- Creating departmental business efficiencies
• Utilization of existing staff more efficiently
• Utilizing roadway maintenance resources more efficiently, creating a safer roadway for the public
• Providing more timely roadway safety information to the traveling public
• Defining data needs to assist with automation of traffic management functions

**Estimated Duration**
24 months (includes the 4-month review and publication period for the final report)

**Specific Assurances with Respect to Federally-Assisted Projects**
The Ohio Department of Transportation in accordance with Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, all bidders including disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, sex, age, disability, low-income status, or limited English proficiency in consideration for an award.