Research Summary

Effective Methods to Safely Communicate with CMVs

One critical aspect of a proactive approach to improving the safety of commercial motor vehicles (CMVs) involves how to communicate with CMV drivers safely and effectively through an electronic notification system (ENS). The objectives of this project are to conduct a review of existing ENS methods in use by CMV drivers, trucking companies, and the freight industry; conduct a survey of selected state departments of transportation (DOTs) regarding their current practice in ENS for communicating with CMV drivers; conduct a needs assessment brainstorming workshop with MoDOT and other stakeholders; and develop standards and specifications for data feeds consisting of traveler information critical for CMV operators.

Results from the literature review indicate diverse technologies (e.g., Advanced Traffic Management Systems, 511 Travel Information Systems, Variable Message Signs, Emergency Alert Systems, Weather Information Systems, Commercial Vehicle Information Systems and Networks) have a wide range of applications for communication with CMV drivers.

An online survey was distributed to 30 state DOTs, and survey responses were received from 18 state DOTs. Survey results indicate that the types of information currently communicated to CMV drivers by the highest number of responding DOTs are extreme weather events, traffic incidents, and work zone lane closures.

The perceived challenges to communicating information to CMV drivers are: a need for data standardization, data availability, and funding constraints. All survey responses noted they have not developed any data standards or policies for communicating information electronically to CMV drivers.

> *"The unified API ensures that CMVs and their operators can make well-informed, timely decisions based on the data provided."*

A stakeholder workshop was conducted to discuss the desired characteristics of an ENS. There were 42 attendees at the workshop representing 27 entities, including government agencies, law enforcement, trucking associations, vendors, and other organizations. Based on discussion, a matrix of various facets (e.g., what is available, what is important and urgent, challenges) of types of information and technology used to convey that information to CMV drivers was developed. Some of the challenges to efforts to communicate information to CMVs include providing accurate and valuable information to drivers that is not overwhelming or distracting; disseminating information to drivers in different languages; differences between large and small carriers; obtaining information on the availability of

private truck parking; and ensuring consistency between states.

To address the challenges of diverse data streams for CMV drivers, a unified application programming interface (API) was developed to consolidate all relevant data into a single, cohesive platform. The unified API implements a standardized data format that applies uniformly across various incident types. It was designed with flexibility in mind, allowing users to efficiently query and filter incident data based on various criteria, such as location, time, and severity. In addition to general filtering mechanisms, the unified API supports route-based querying, which allows users to retrieve incidents that occur along a specific path.

As part of the API development for CMV communication, a web interface was developed (Figure 1) to demonstrate the API's functionality and how it interfaces with users. This interface serves as a critical tool for users to interact with the API and retrieve real-time data relevant to CMV operations. The web interface allows users to request data through start and end destinations waypoints or by submitting a predefined route.

The unified API ensures that CMVs and their operators can make well-informed, timely decisions based on the data provided. The API provides flexibility for the future through its modular and scalable design.
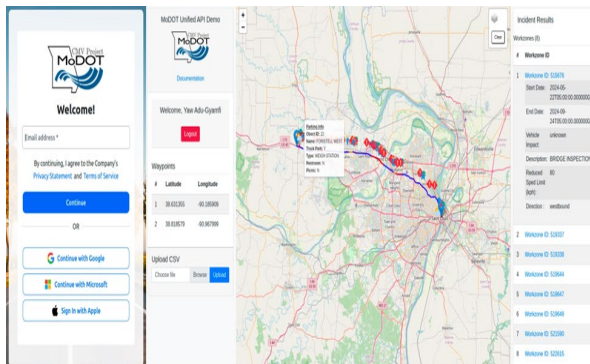

Figure 1: Schema for metadata and additional information.

Project Information
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