

# Systems Engineering for Work Zone Data Initiatives and Warning Systems – Phase 1

The Minnesota Department of Transportation (MnDOT) continues its efforts to conduct engineering analysis for specific Intelligent Transportation Systems (ITS)/Connected and Automated Vehicle (CAV) systems to ensure compliance of 23 CFR 940. MnDOT joined the FHWA Work Zone Data Initiative (WZDI) and will support Phase I of the WZDI pilot project by generating a holistic vision and systems engineering documentation for work zones in Minnesota. In addition, MnDOT and local transportation agencies in Minnesota may wish to develop, deploy, and operate ITS applications to warn drivers in advance of potentially hazardous conditions, such as icy pavements, reduced visibility due to fog, and roadway curves. In order to consider the necessary interoperability, expansion, and integration needs and requirements, systems engineering analysis will guide planned and future deployments.

## Project Overview

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This project is performing systems engineering activities to support MnDOT in their involvement in the WZDI by developing systems engineering documents and an implementation roadmap that include a view of work zone data assembly, processing, and dissemination, as well as documents operational concepts for work zone data to support and be supported by CAVs. The project is also developing systems engineering documents for specific ITS applications including ice warning, fog warning, and curve warning. The ITS warning application documents will be used as these systems are planned, procured, and deployed, allowing entities to modify and tailor the documents as necessary, to meet specific needs, ensure consistency and conformance with 23 CFR 940, and account for CAV Infrastructure Systems and CAV Vehicle Systems needs and requirements.

## Project Deliverables

- WZDI Concept of Operations, System Requirements, and Pilot Implementation Roadmap; and
- Concept of Operations, System Requirements, and Test Plans (with CAV concepts and requirements), for three (3) separate ITS applications: ice warning, fog warning, and curve warning

## Project Partners

- MnDOT Office of Connected and Automated Vehicles (CAV-X)
- MnDOT Regional Transportation Management Center (RTMC)
- MnDOT Districts
- Minnesota City and County Transportation Agencies
- Federal Highway Administration (FHWA)
- Athey Creek Consultants