



ABOUT THIS PROJECT

PROJECT NAME: [Improving Work Zone Management and Safety Through AI-Powered Connected Vehicle Data Analysis](#)

PROJECT NUMBER: TPF-5(438)

PROJECT FUNDING PROGRAM: Smart Work Zone Deployment Initiative, a nine-state collaborative research effort

PROJECTED END DATE: September 2025

PROJECT CHAMPION:
Dan Sprengeler, Iowa DOT
dan.sprengeler@iowadot.us

PROJECT MANAGER:
Khyle Clute, Iowa DOT
khyle.clute@iowadot.us

PRINCIPAL INVESTIGATOR:
Anuj Sharma, Iowa State University
anujs@iastate.edu

RESEARCH IN PROGRESS

Using AI to improve work zone management and safety

Several smart work zone technology applications have been developed and implemented to provide real-time information to drivers to improve safety in work zones, such as variable speed limits, reduce-speed warnings, and connected or automated vehicle operations. This project will extend the algorithms developed in earlier research using connected vehicle data to design a more advanced work zone management system.

Researchers will develop a data-driven automatic incident detection (AID) framework using historical traffic data and network knowledge to identify maintenance activity and traffic incidents in real time. The artificial intelligence (AI) driven framework will integrate connected

vehicle data with other data sources for developing and implementing a real-time visual monitoring system that continuously analyzes work zone performance. In addition, researchers will propose a machine learning-based algorithm to enhance lane closure detection.

Research will include a survey of state transportation agency practices. Detailed case studies will be developed based on these findings and on peer exchanges. Results will be used to develop guidelines for decision-makers. This project will enhance traffic regulation and increase safety.

“By enabling traffic forecasting and promoting data-driven decision-making, this project will help staff

make more timely and informed decisions for safer and more efficient roadways,” said Dan Sprengeler, work zone traffic control engineer for Iowa DOT’s Traffic and Safety Bureau.

The research is expected to conclude in September 2025.

To learn more about this project and subscribe to updates, visit [Idea #3497](#).

IOWA DOT RESEARCH
iowadot.gov/research
ideas.iowadot.gov