

UNDERSTANDING LANE KEEPING SYSTEM PERFORMANCE IN WORK ZONES

IDOT Fall Planning Conference
September 3, 2026

SRF

Project Team







What are Lane Keeping Assist Systems (LKS)

- Key feature of Advanced Driver Assist Systems (ADAS)
- Designed for highway driving
- Rely on pavement markings for function and operation

IMAGE CREDIT: FORD.COM



Why it matters?

- In 2023, about 85 percent of new cars nationwide had some form of lane keeping assistance.

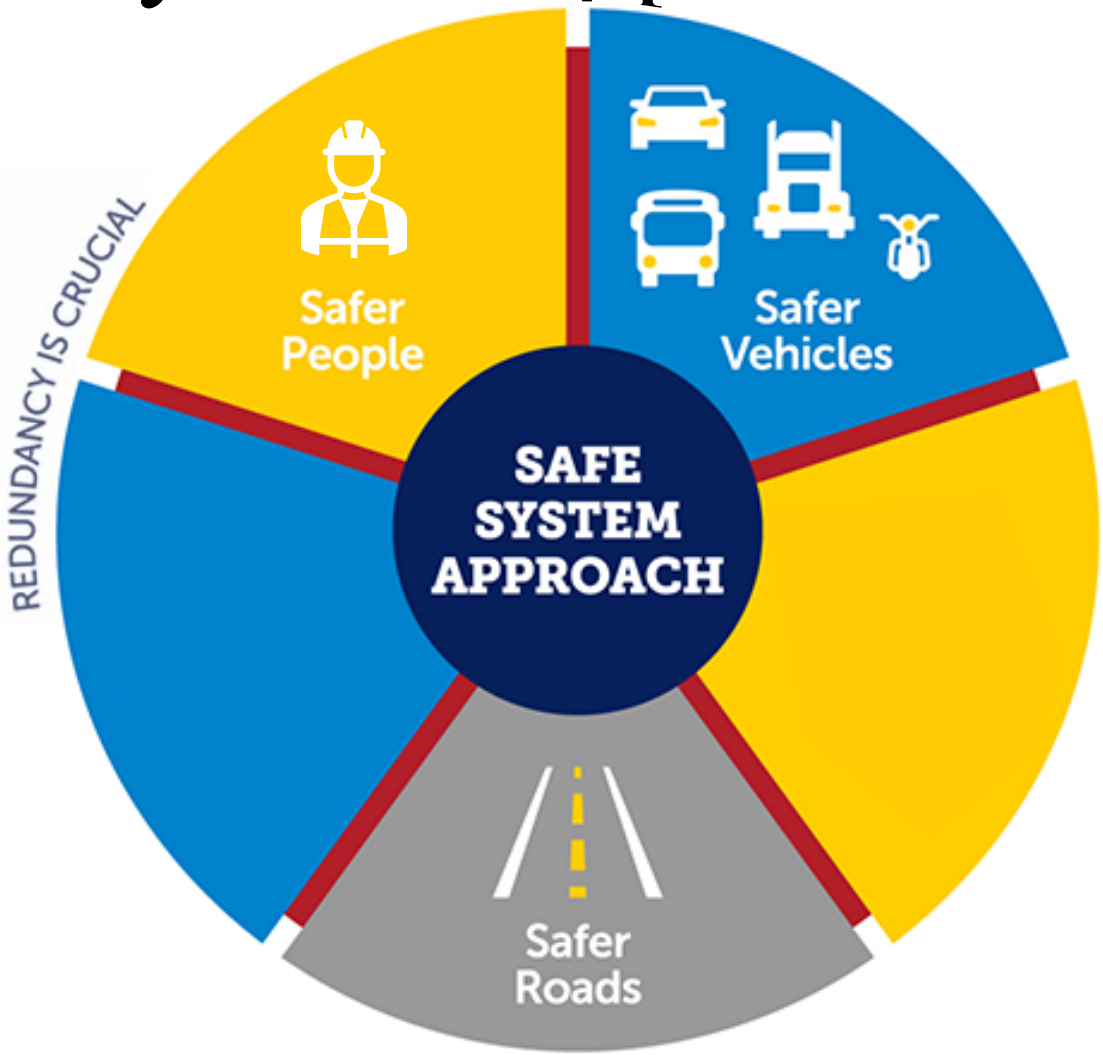


Source: AAA Via, “7 Common Car Tech Features and What They Do,” February 4, 2025.

FHWA Safe Systems Approach



FHWA Safe Systems Approach



Project Goals

Goal 1

Understand performance of LKS in work zones

Goal 2

Provide designers and traffic engineers with considerations knowing the capability of current LKS

Work Zone Delineation

Will current LKS handle the variety of lane delineation approaches used in work zones?



MnROAD Test Site

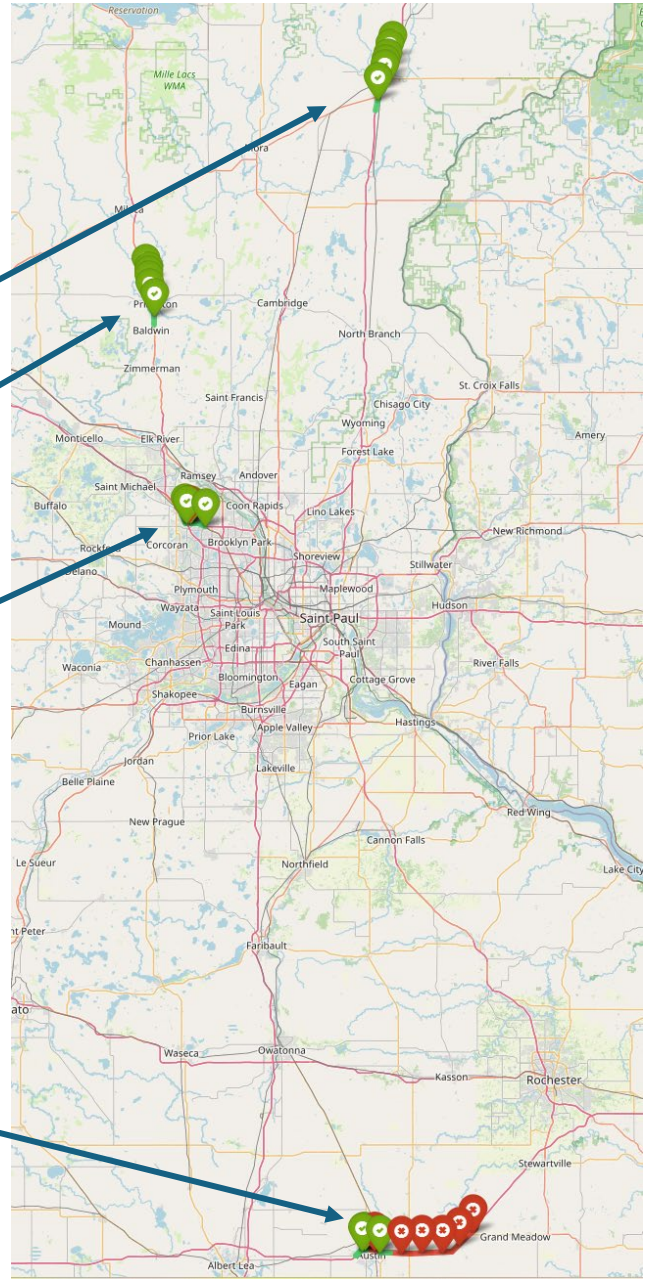
- Otsego, Minnesota
- Closed track
- 2-lane road



CONTROLLED ENVIRONMENT MNROAD RESEARCH FACILITY

Live Work Zone Tests

- Interstates and trunk highways
- Multi-lane divided roads
- Site Locations:
  - Hinkley, I-35
  - Princeton, US169
  - Maple Grove, MN610
  - Austin, I-90



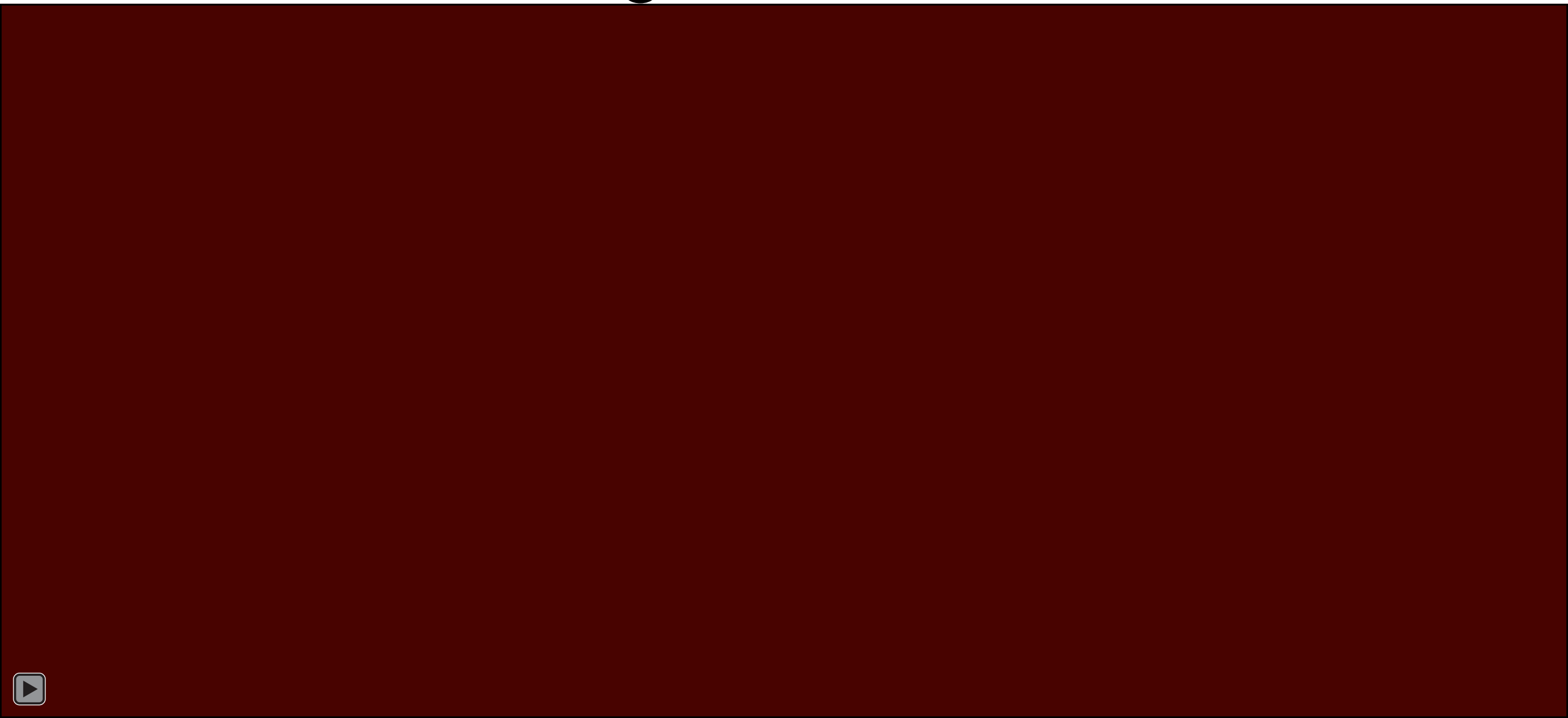
LIVE WORK ZONES IN MINNESOTA

Data Collection Strategies

- Camera facing dashboard
- Camera looking out from windshield
- ViaSight Camera
- Driver comments and notes



Real World Testing – Demonstration



LKS Don’t Recognize Delineators



Work Zone Design Considerations

Remove all conflicting pavement markings



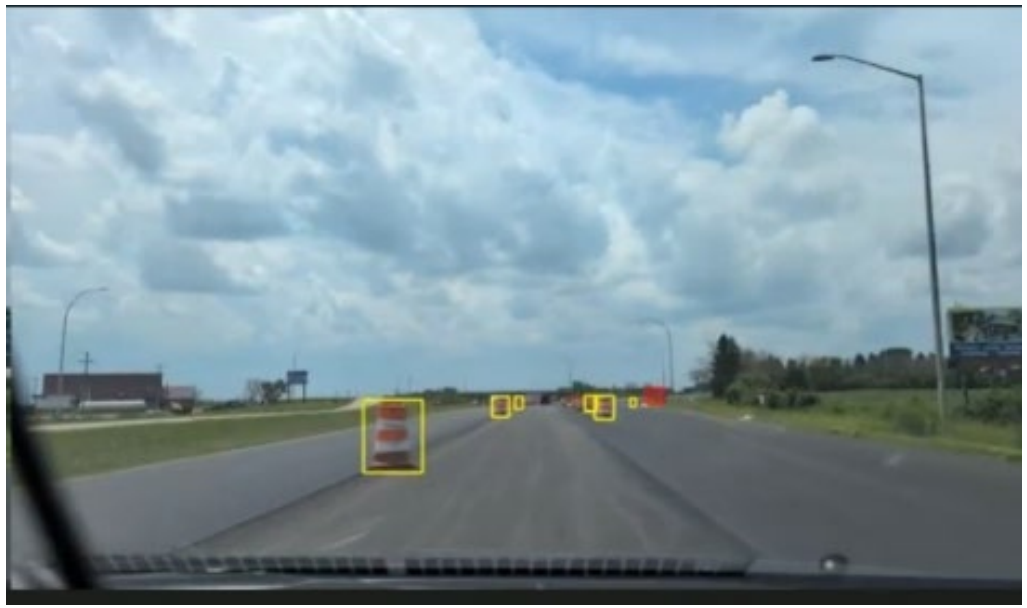
Conflicting Markings



Practice Consideration

Work Zone Design Considerations

Use pavement markings in support of barrels



Current Practice



Practice Consideration

Work Zone Design Considerations

Pavement marking removal



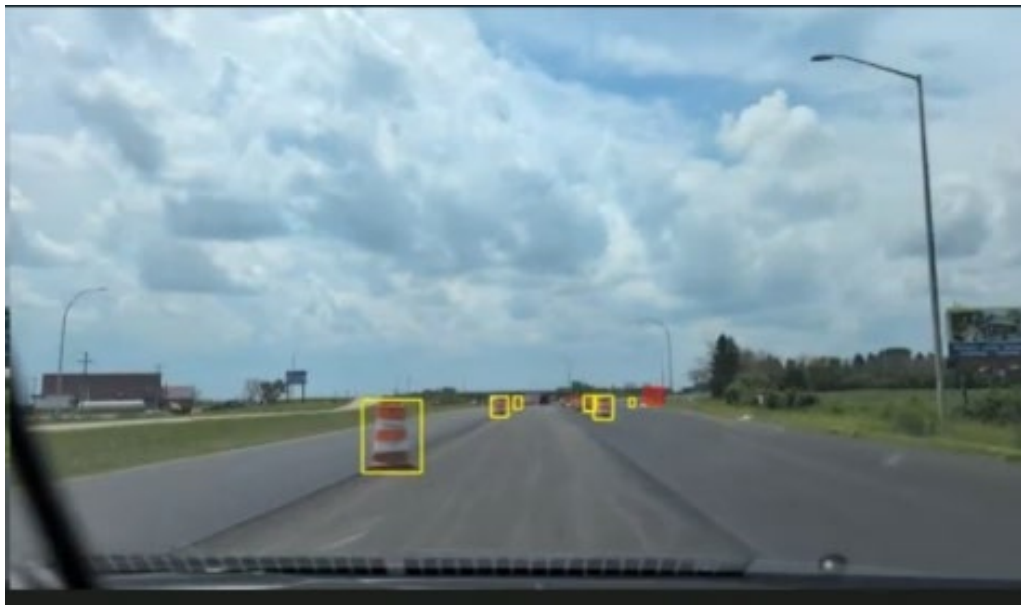
Black out tape



Water Blasting

Work Zone Design Considerations

Pavement marking addition



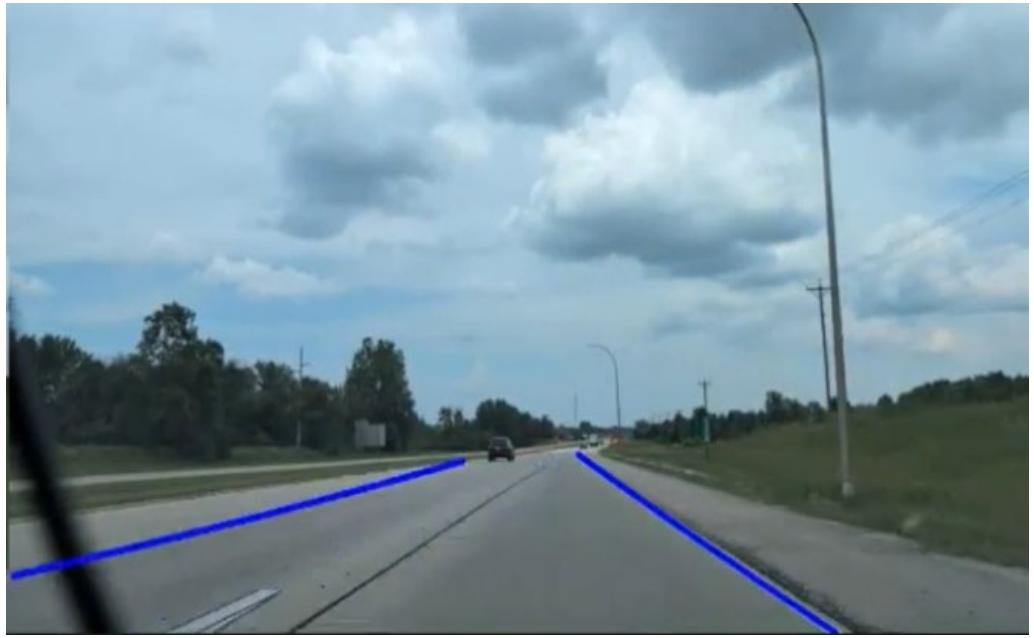
Current Practice



Practice Consideration

Work Zone Design Considerations

Provide dotted lines extensions



Current Practice



Practice Consideration

Driver Education Considerations

EDUCATE DRIVERS ON SHORTCOMINGS OF LKS

Each vehicle owner should read and understand the limitations of LKS in their vehicle's owner's manual. Most owner's manuals should/will state to disengage the LKS for unusual conditions like traveling through work zones.

Final Report

DEPARTMENT OF TRANSPORTATION

511

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Understanding Work Zone Delineation for Lane-Keeping Systems

Status: Complete
Report Date: 03/03/2026

Project Personnel:
Investigator: SRF Consulting

Technical Liaison: Thomas Johnson-Kaiser

Summary:

Lane Keeping System (LKS) assistance technologies (typically through machine vision) continue to be developed and deployed in more motor vehicles. State traffic engineers will need to understand how lane delineation methods in work zones impact the performance of those systems. This project compared different delineation methods commonly used in work zones and quantified how these methods affect the performance of lane keeping systems. By understanding these impacts, the State can make better decisions about work zone design that leverages the lane keeping systems to improve motorist and worker safety.

Reports:

- Understanding Work Zone Delineation for Lane-Keeping Systems (Report #2026CAV03)
- Project Summary: Workzone Delineation for Lane Keeping Systems (Research Summary)

Questions

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