

**Traffic
Operations****MAY 2026****Project Title:** Highway Outdoor Advertising (ODA) Displays Research**Task Number:** 4461**Start Date:** January 6, 2026**Completion Date:** June 30, 2027**Task Manager:**Melissa Clark
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Impact of Outdoor Advertising (ODA) Displays Along the State Highway System on Traffic Safety

Support the development of more informed and balanced approaches to ODA placement, ensuring both driver safety and the preservation of urban visual quality.

WHAT IS THE NEED?

As the cost of constructing and installing digital outdoor advertising displays continues to decrease, their use has expanded rapidly across California. Many traditional static displays are also being converted to digital formats. This growth is occurring among State permitted off premises signs as well as on premises and non commercial displays.

The California Department of Transportation (Caltrans) needs evidence based information to understand whether digital and static displays along the State Highway System affect driver attention and roadway safety. The safety impacts of digital displays, including brightness, motion, and frequent message changes, are not yet well documented for California conditions.

To make consistent and defensible decisions, Caltrans must develop a clear traffic engineering methodology to evaluate the level of risk these displays may pose on different facility types, including freeways, expressways, and conventional highways throughout the state. Caltrans also needs information about whether these displays create visual impacts on surrounding communities that may require additional consideration.

WHAT ARE WE DOING?

The research team will conduct three major activities to understand how ODA displays influence driver safety.

First, the team will complete a comprehensive review of existing literature, including academic studies, government reports, and industry publications that address driver distraction and digital display impacts. This will provide a



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foundation for identifying key variables and potential risks.

Next, the team will carry out a human factors driving simulation study. This study will use controlled scenarios to evaluate how drivers respond to static and digital displays under different roadway and traffic conditions. The simulator will allow researchers to measure reactions, lane keeping behavior, speed control, and other performance indicators in a safe and repeatable environment.

Finally, the research team will analyze available crash data to determine whether any observable patterns or correlations exist between the presence of roadside ODA displays and collision trends. This analysis will help clarify whether real world safety outcomes align with the findings from the literature and simulator studies.

Together, these activities will provide Caltrans with a complete and evidence based understanding of how ODA displays affect driver behavior and roadway safety, supporting the development of future policies and guidance.

WHAT IS OUR GOAL?

The goal of this study is to determine how ODA displays influence driver distraction and roadway safety. The research will identify the types of cognitive distractions that may occur when drivers encounter these displays and will examine how different conditions, such as traffic volume, roadway environment, and the amount of visual information, affect driver behavior. The study will also analyze driving performance indicators such as lane keeping, reaction time, and speed consistency to better understand potential safety impacts.

To support these objectives, the research team will gather information from multiple sources, including academic studies, government agency reports, industry organizations such as Scenic America and the California State Outdoor Advertising Association, and available crash data. This work will help Caltrans understand the risks associated with digital and

static ODA displays and identify strategies that may reduce driver distraction and improve safety on the State Highway System.

WHAT IS THE BENEFIT?

This research will provide Caltrans with clear, evidence based guidance on how outdoor advertising displays affect driver attention, roadway safety, and the surrounding visual environment. The findings will help Caltrans evaluate digital and static display proposals more consistently and determine whether these installations create safety risks on State Highways. The study will also give Caltrans a stronger basis for assessing potential visual impacts on nearby communities. Overall, this research will support better permitting decisions, improve statewide policy development in accord with Caltrans goals of safety and improving mobility outcomes for all highway users.

WHAT IS THE PROGRESS TO DATE?

The contract was executed on January 6, 2026. The technical advisory group held a kick-off meeting on January 27, 2026. Following the meeting, the research group began to work on their first task deliverable for Literature Review Report.