



UC DAVIS

# FACT SHEET

## Wrong Way Driver Mitigation

### PROJECT TITLE

Wrong Way Driver Mitigation

### STUDY TIMELINE

June 2015 – December 2019

### INVESTIGATORS

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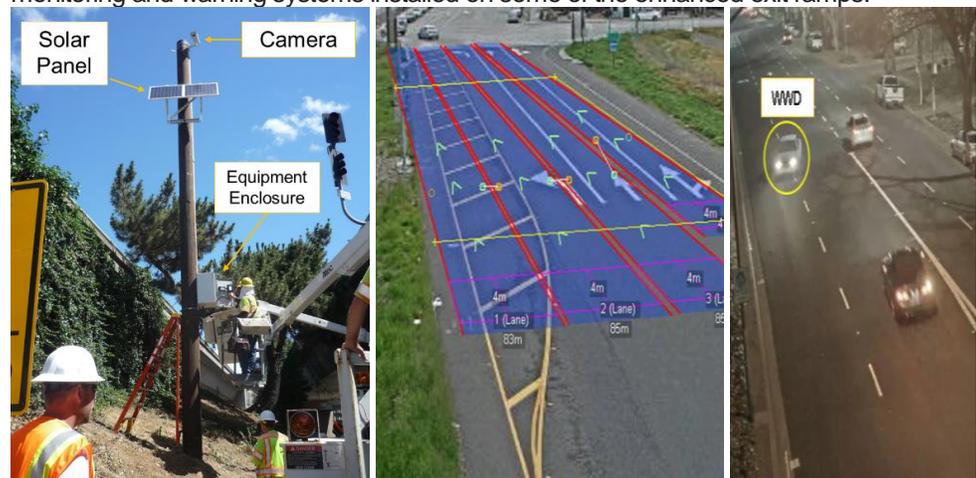
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### FURTHER RESOURCES

<https://dot.ca.gov/programs/research-innovation-system-information/wrong-way-projects>

### Problem and Objective

Wrong-Way Driving (WWD) collisions account for only about 3 percent of accidents on high-speed divided highways, but they are much more likely to result in fatalities or serious injuries than other types of highway crashes. WWD gained attention after a series of wrong-way collisions in the first half of 2015 resulted in several fatalities in the Sacramento and San Diego areas. Caltrans installed various types of wrong-way entry prevention enhancements on several exit ramps in these areas. The objective of this research was to determine 1.) the rate of wrong way drivers on the enhanced exit ramps monitored, 2.) the effectiveness of the exit ramp enhancements and 3.) the accuracy of active wrong way monitoring and warning systems installed on some of the enhanced exit ramps.



### Methodology

The researchers developed zone-triggered video image processing systems (VIPS) and installed them at a subset of the exit ramps equipped with various wrong-way entry prevention enhancements. The VIPS automatically counted all vehicles on each exit ramp. They automatically detected WWD events and recorded a short video clip of each event. A circular video buffer enabled capture of a few seconds of video before each WWD event and about 30 seconds after it. After manual review of each video clip, the researchers determined which ones constituted actual WWD events and categorized them according to driver behavior.

### Conclusion

For the Sacramento mitigated exit ramps, the WWD event rate dropped from 3.0 events/ramp/year before mitigation to 1.4 after mitigation (53% reduction). 85% of drivers recognized their WWD error and turned around before they entered the freeway. The data indicate a higher concentration of WWD events in the midnight to 6 am period, which is consistent with a connection to DUI, however, driver confusion, in general, appears to be a more significant factor in WWD events.

### Benefit

This research benefits Caltrans and the traveling public by assessing the baseline magnitude and frequency of wrong-way driving, which is essential in determining the scope of any future efforts to mitigate the hazard of drivers entering state highways in the wrong direction via exit ramps. The scientific, measurement-based approach taken will allow Caltrans to make informed, data-driven decisions regarding future detection and mitigation strategies based on their effectiveness as demonstrated by this research.