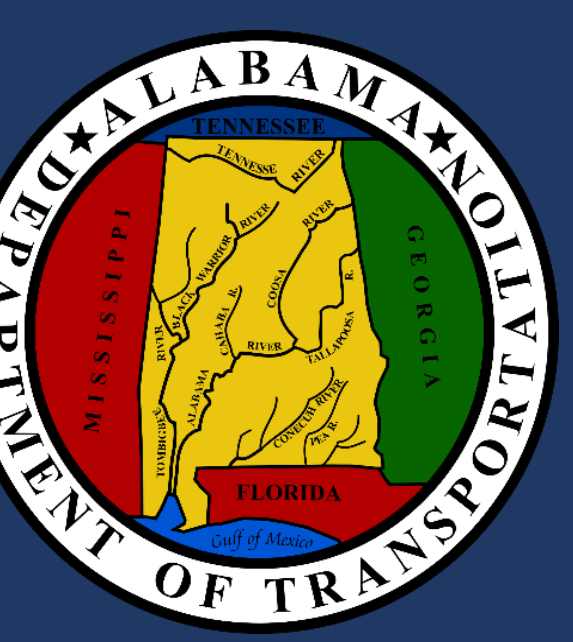




# Access Control and Geometric Features at the Interchange Terminals with a large number of Wrong-Way Incidents: Case Studies in Alabama



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## ABSTRACT

Although wrong-way driving crashes are rare in nature, they draw a lot of attention due to their severe outcomes. In this study, two partial cloverleaf interchange terminals were identified as the high-risk locations for WWD incidents. To determine the number of potential WWD incidents, the interchange terminals were monitored by video camera for 48-hours on a typical weekend (Friday, 5:00 PM to Sunday, 5:00 PM). The 48-hours video confirmed that the two locations experienced 10 and 17 WWD incidents, respectively, during this period. In this study, the access control and geometric features of these two locations have been studied to identify the potential contributing factors to such high number of WWD incidents. A number of recommendations has been provided to reduce the number of WWD incidents at these locations by improving the access control techniques and geometric design features. The findings will help the transportation agencies to better understand the impact of access control and geometric design of interchange terminals on WWD incidents.

## RESEARCH OBJECTIVES

- Conduct two case studies to investigate the access control techniques and geometric design features of the interchange terminals having high-risk of WWD
- Identify the lack of access control and deficiency in geometric design that may have contributed to the high number of WWD incidents at the study locations
- Provide recommendations to reduce WWD incidents at the study locations by improving access control techniques and geometric design

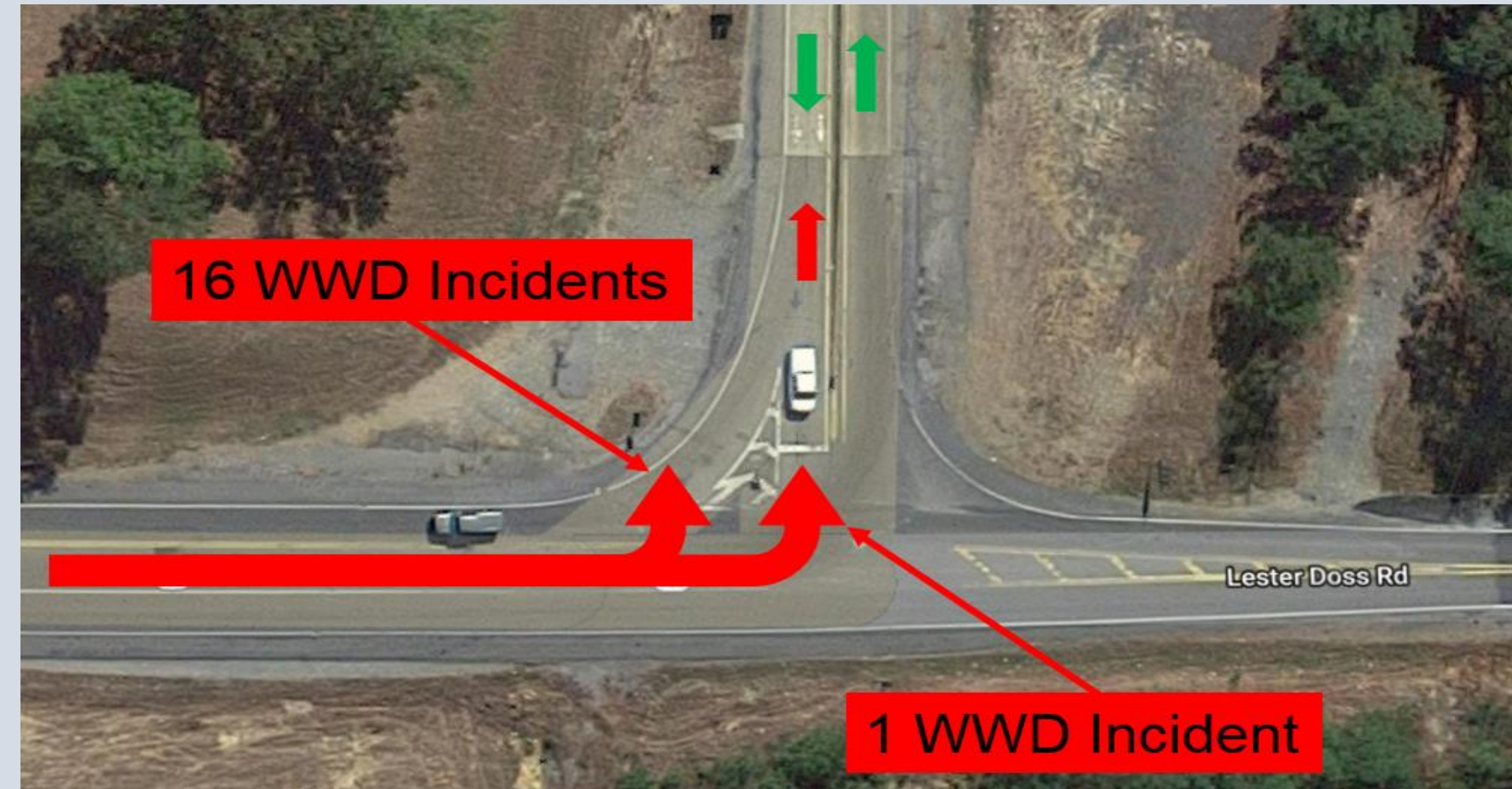
## METHOD

- Step 1** • Select possible interchange terminals having high risk of WWD
- Step 2** • Monitor the selected locations by video camera to determine the frequency of WWD incidents
- Step 3** • Conduct case studies to identify the lack of access control and deficiency in geometric design

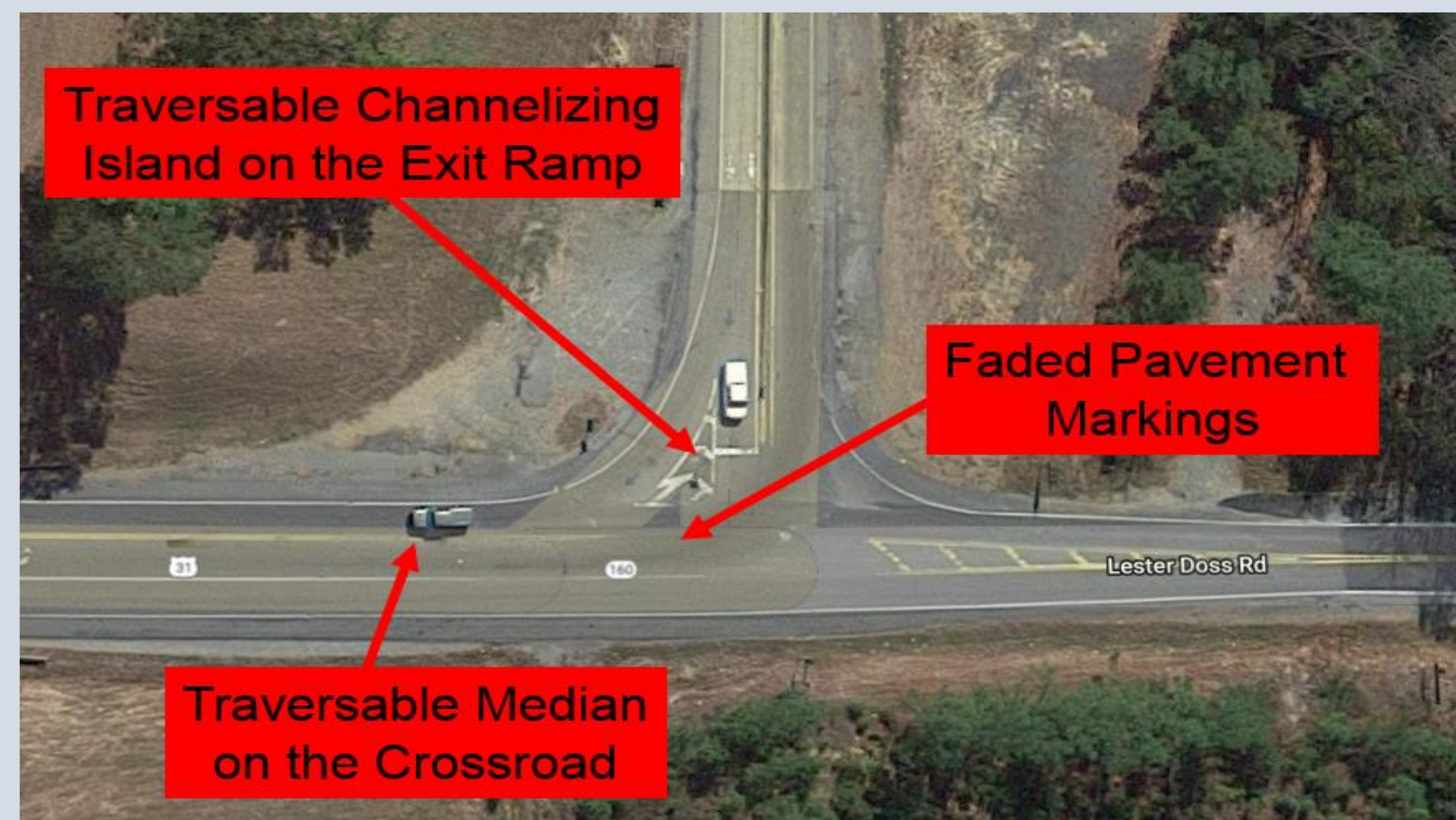
## CASE STUDY 1: I-65 EXIT 284 SOUTH

### ❑ OBSERVED WWD INCIDENTS

- 17 WWD incidents in 48 hours (May 05, 2017, Friday, 5:00 PM to May 07, 2017, Sunday, 5:00 PM)
  - Daytime – 9 WWD incidents
  - Nighttime – 8 WWD incidents



### ❑ LACK OF ACCESS CONTROL AND DEFICIENCY IN GEOMETRIC DESIGN



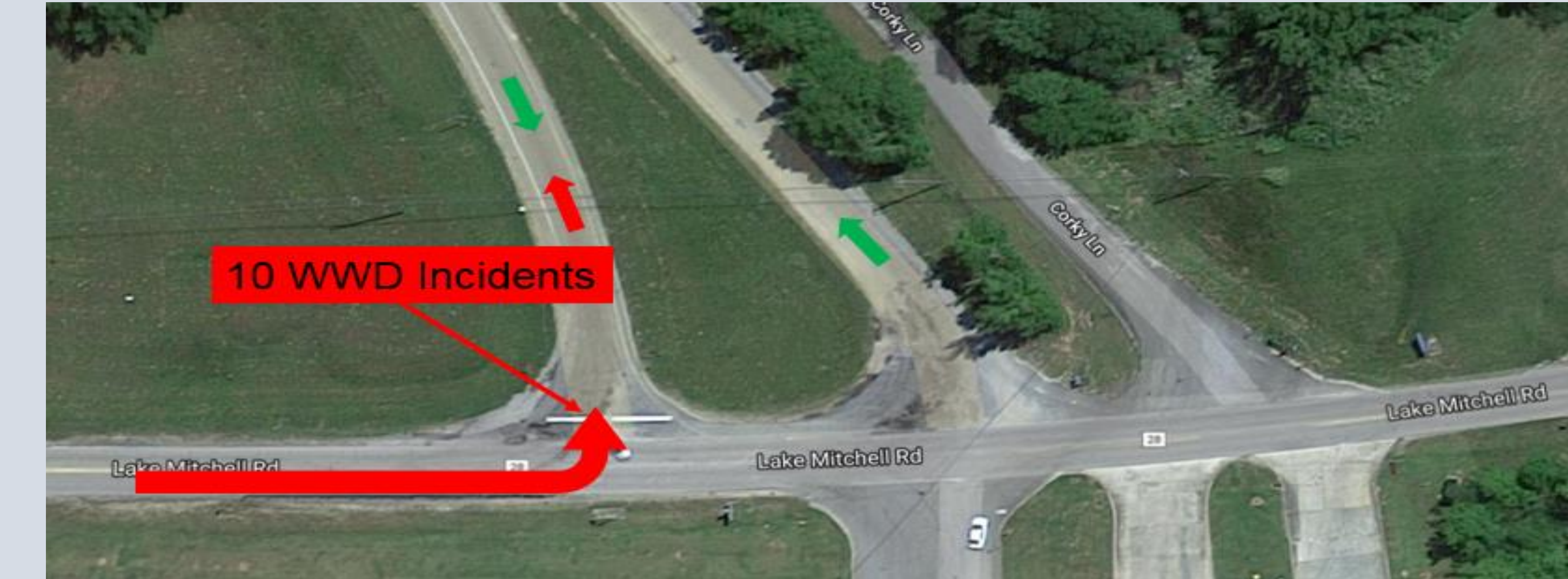
### ❑ RECOMMENDATIONS FOR REDUCING WWD INCIDENTS

- Built a non-traversable median on the crossroad to physically obstruct the wrong-way left-turning maneuvers
- Built a non-traversable channelizing island on the exit ramp throat to reduce the traversable width
- Improve visibility of the entrance ramp by moving back the raised median between on and off ramp
- Repaint the markings to improve visibility

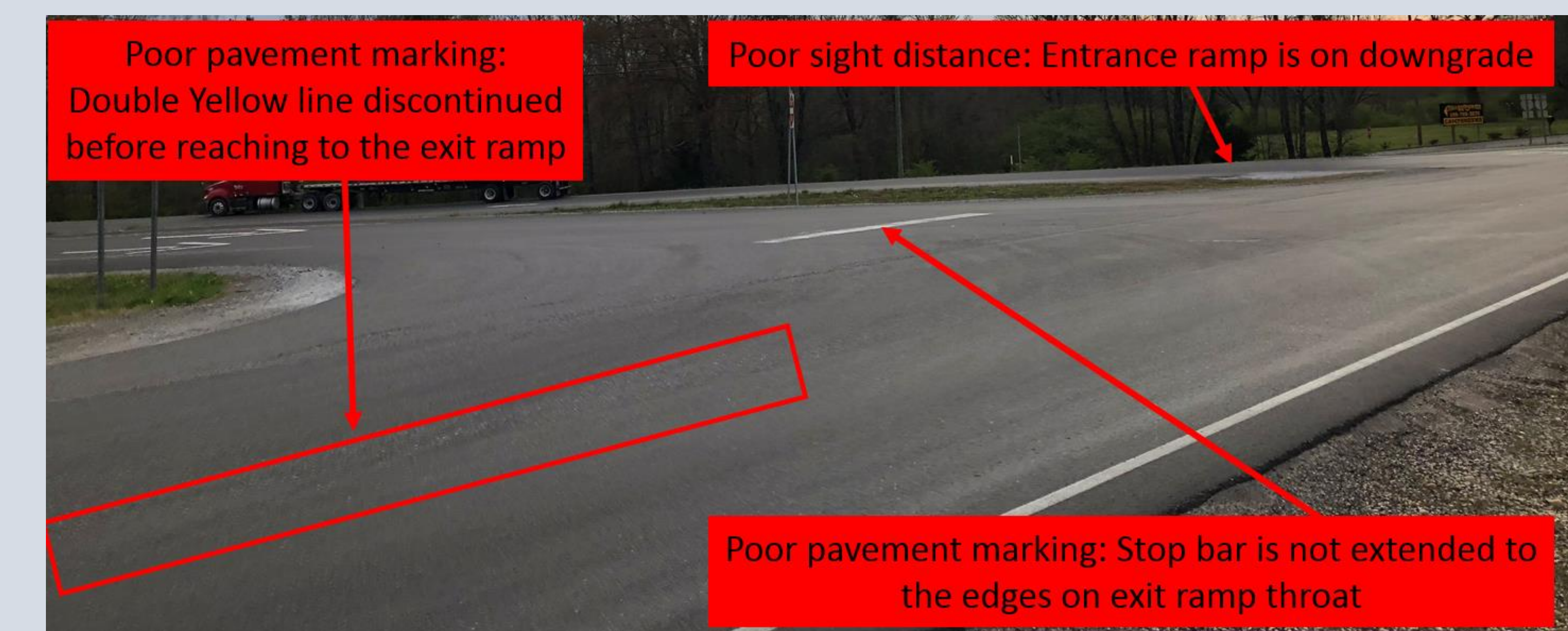
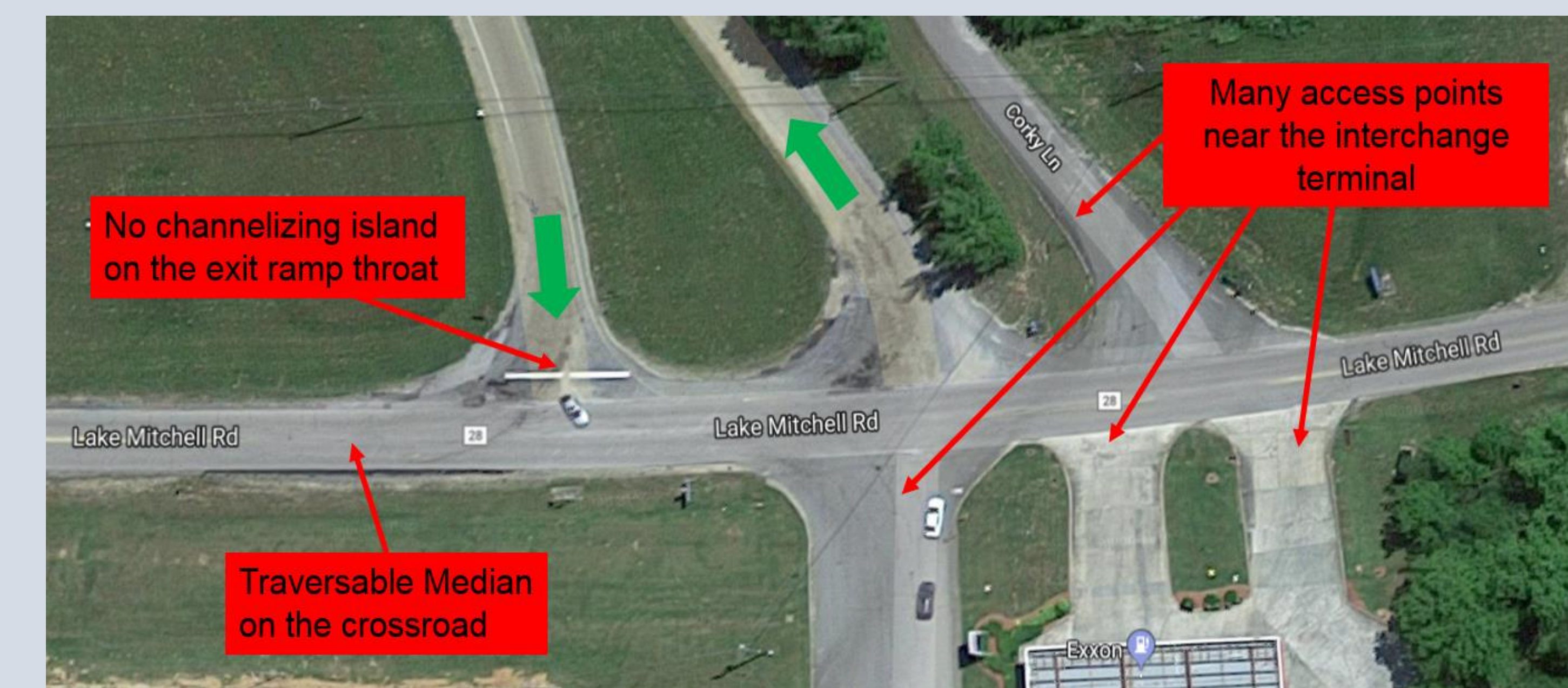
## CASE STUDY 2: I-65 EXIT 208 SOUTH

### ❑ OBSERVED WWD INCIDENTS

- 10 WWD incidents in 48 hours (March 23, 2018, Friday, 5:00 PM to March 25, 2018, Sunday, 5:00 PM)
  - Daytime – 1 WWD incident
  - Nighttime – 9 WWD incidents



### ❑ LACK OF ACCESS CONTROL AND DEFICIENCY IN GEOMETRIC DESIGN



### ❑ RECOMMENDATIONS FOR REDUCING WWD INCIDENTS

- **Short term solution:**
  - Extend the DOUBLE YELLOW line on the crossroad to the mid point of exit ramp width
  - Extend the STOP bar to the edges of the exit ramp throat
- **Long term solution:**
  - Built a non-traversable median on the crossroad to physically obstruct the wrong-way left-turning maneuvers
  - Built a non-traversable channelizing island on the exit ramp throat to reduce the traversable width
  - Reduce number of access points near the interchange terminals

**ACKNOWLEDGEMENT:** This study was developed based on the results of a research project funded by Alabama Department of Transportation (ALDOT).