



### Project Number

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## Florida Department of Transportation Research

# I-STREET Initiative – Evaluation of Intelligent School Zone Beacon and Vehicle-Cyclist Detection and Warning System

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### Current Situation

The Florida Department of Transportation's (FDOT) multimodal approach seeks to balance the needs of all road users, including bicyclists and pedestrians. FDOT and other local agencies are adding bicycle and pedestrian features to existing roadways throughout Florida. To reduce potential conflicts between vehicles, pedestrians, and bicyclists, FDOT has pursued research and implementation to improve safety, including new designs, signage, and education, and consequential conflicts have been reduced. The routes students use between home and school have been a special focus. Engineering, education, and enforcement reinforce the message of slow and cautious driving in school zones, but drivers that fail to reduce speed, are distracted, or are driving in bad weather can still be involved in conflicts with walking or biking students. Communications and roadway instrumentation make new approaches possible that can further improve safety in the vicinity of schools.



*Children going to and from school need special protection from inattentive drivers or drivers exceeding school zone speed limits.*

### Research Objectives

University of Florida researchers evaluated the performance of a smartphone-based app that can alert drivers if they exceed a given speed threshold in an active school zone. The app can alert the driver when bicyclists that have the app are in the vicinity.

### Project Activities

The researchers evaluated an app that relies on school zone beacons that broadcast whether the school zone is active or not. A driver with the app installed on their cell phone receives an alert if their speed exceeds the limit inside the school zone. The app can also alert the driver about a bicyclist in the vicinity if both driver and bicyclist have the app installed and open.

This study evaluated driver alerts for both school zone and bicyclists using a naturalistic driving plan. Fifty recruits drove a circuit that included four school zones and road segments with a bicyclist who was using the app. All recruits drove with the app on, but for a control group, no alerts were given. A second group received audible alerts only. The third group received both audible and visual alerts. Each participant drove the circuit twice. Researchers collected trajectory and eye-tracking data.

Data were processed using both manual and automated methods to measure the app's safety effects, quantifying driver speed and attention allocation. The researchers found that when the app was active, there were fewer alerts and drivers were less likely to exceed school zone speed limits. Drivers typically looked at the school zone beacon while entering the school zone, even in the control group. The exception was when the school zone beacon was overhead rather than roadside. In bicycle encounters, drivers with the app activated tended to pay more attention to the bicyclist. The audio alert was the most useful; addition of the visual alert may have drawn the driver's attention to the cell phone rather than the surroundings.

### Project Benefits

Taking advantage of an increasingly intelligent roadway system has the potential to improve safety and reduce conflicts between vehicles and pedestrians and bicyclists.

*For more information, please see [www.fdot.gov/research/](http://www.fdot.gov/research/).*