



U.S. Department  
of Transportation

National Highway  
Traffic Safety  
Administration

# TRAFFIC TECH

## Technology Transfer Series



DOT HS 813 113

April 2021

# Examination of Three Districts Implementing Stop-Arm Camera Programs to Enforce Laws Against Illegal Passing of Stopped School Buses

## Background

School bus stop-arm cameras are an emerging strategy used by school jurisdictions and law enforcement agencies to address drivers illegally passing stopped school buses. The stop-arm camera typically records video of vehicles and/or drivers that pass school buses when the stop arm is extended. Several States have passed legislation allowing the use of stop-arm cameras on school buses and more States indicated plans to propose similar legislation.

Figure 1. School bus with extended stop-arm bar



## Overview

The current study included a literature review and a detailed examination of stop-arm camera program implementation in three school districts. Arlington Public Schools in Virginia, Bellevue Public Schools in Nebraska, and Rankin County School District in Mississippi participated by providing information about their experiences in implementing photo enforcement. The districts offered their experiences with legislation, reactions and experiences of their bus drivers, efforts to educate and inform the public, cooperation with law enforcement, successes and challenges in issuing citations and penalties, and lessons learned. This study also analyzed camera vendor supplied citation data previously gathered from an additional 34 school districts.

## Literature Review

The literature review described the state-of-practice regarding stop-arm enforcement legislation and practices throughout the country. Information was collected about States and localities that either have existing legislation or were considering legislation regarding automated school bus stop-arm enforcement. Specifically, the following areas were examined:

- Existing and pilot programs;
- Stop-arm initiatives under development or consideration;
- Jurisdictions that decided against a stop-arm camera program;
- Legislation regarding automated enforcement of stop-arm violations;
- Public awareness campaigns; and
- Training material related to automated enforcement procedures (including stop-arm cameras, speed enforcement cameras, and red-light cameras).

Program requirements and consequences vary. The evidence required for a conviction dictates the type of camera system required. Two prevailing methods of evidence were found to be in use: facial recognition and license plate recognition, depending on the specific requirements in the State or local legislation. Locality requirements may include the offender's vehicle make and model, image of the license plate, digitally recorded images of the driver and/or violation, time and location, school bus light status, and sworn affidavits from bus drivers. Consequences for violations also vary widely from warnings, to fines, to jail time depending on the locality. Fines can vary from flat fees processed in the same manner as parking citations that do not become documented on a driver's permanent record, to a tiered system where each subsequent violation results in a higher fine, to a tiered system based on injury severity of the person struck.

Findings from the literature review indicated that there have been successful implementations around the United States and planning and implementation of new systems can benefit from the experiences of existing programs.

Key strategies for a successful program noted in the review included:

- effective development of enforceable legislation;
- close coordination with school districts, the judicial system, and law enforcement;
- careful selection of technology and vendors able to record violations according to appropriate legislation;
- implementation of a pilot program prior to active enforcement; and
- development of a public awareness campaign so that the general public understands the laws as well as the safety reasons behind them.

## Camera Program Implementation

The three participating school districts implemented programs which phased in use of stop-arm cameras to report and deliver citations to drivers who illegally pass school buses.

Each program consisted of up to three phases.

- Pre-implementation – Illegal school bus passes were identified, but drivers did not receive citations or notices. A baseline rate of illegal passing was established during this phase.
- Warning – Offending drivers received written warnings notifying them of their recent illegal school bus pass.
- Post-implementation – Warnings were replaced with citations during this phase.

These programs, however, were not implemented consistently. For example, it was decided in Bellevue to issue citations only for repeat offenders. The programs also varied on their legislative requirements to issue a citation, the collection mode of passing data (bus driver forms, video, police issued citations), and outreach and media strategies.

Vendor data was also supplied for 34 additional school districts to analyze characteristics of violations.

## Camera Program Results

The ideal metric for assessing the effect of stop-arm cameras would be the probability of an illegal pass at each opportunity to do so (i.e., each stop made by each bus). Such information was not made available for this study, so another metric was developed: the number of illegal passes per active bus per school year. The observational data collected over the course of this research was not ideally suited to hypothesis testing. Missing values were common, and data collection methodologies were inconsistent across the districts. Some challenges and data limitations are presented in the full report.

Overall, the study showed that the number of illegal passes reported was much higher when reported by stop-arm cam-

eras as opposed to paper forms completed regularly by bus drivers; however, the number of violators reported by stop-arm cameras was fewer than the number of violators captured during one day bus driver surveys. In addition, the number of illegal passes reported was higher when reported by camera-equipped buses versus officer-observed passes.

For the three districts, there were no significant decreases in the number of violators after the implementation of stop-arm cameras. This finding was consistent across bus driver collected survey data and camera recorded violations. Analysis of vendor data obtained from 34 jurisdictions found decreases in the number of violators in some jurisdictions after implementation, while not in others. After drivers receive a citation, they do not appear to receive additional citations. In Arlington there was only one repeat citation out of 1,089. In Bellevue the recidivism rate was between 3% and 10% each year; however, Bellevue provides warnings for all first-time offenders, not citations. Across camera vendor data for 34 jurisdictions (including Arlington County), the percentage of repeat violators never exceeded 3% for any jurisdiction and of 139,913 illegal passes recorded, only 2,447 or 1.87% were repeat offenders.

## Conclusions and Discussion

The camera programs varied in implementation, evidence requirements, and observation method, all challenging when evaluating effectiveness. Although this study did not provide clear evidence of the effectiveness of stop-arm camera systems in reducing passing violations, programs may be effective. Some districts demonstrated reductions in illegal passing, while occurrences of recidivism were low in all districts. Consistent methodologies would be necessary to implement, carry out, and track effectiveness of similar programs. A multi-year evaluation in which consistent public awareness campaigns, consistent issuance of citations, and high conviction rates will be required for camera captured violations to result in discouraging violations to demonstrate a program's full effectiveness potential.

## How to Order

Download a copy of *Examination of Three Districts Implementing Stop-Arm Camera Programs to Enforce Laws Against Illegal Passing of Stopped School Buses* (100 pages), prepared by Toxcel, from [https://rosap.ntl.bts.gov/view/dot/55244/dot\\_55244\\_DS1.pdf](https://rosap.ntl.bts.gov/view/dot/55244/dot_55244_DS1.pdf). Kristie Johnson, Ph.D., was the task order manager for this project.

APA Format Citation:

National Highway Traffic Safety Administration. (2021, April). *Examination of three districts implementing stop-arm camera programs to enforce laws against illegal passing of stopped school buses* (Traffic Tech Technology Transfer Series. Report No. DOT HS 813 113).

**TRAFFIC TECH** is a publication to disseminate information about traffic safety programs, including evaluations, innovative programs, and new publications. Feel free to copy it as you wish. If you would like to be added to an email list, contact [TrafficTech@dot.gov](mailto:TrafficTech@dot.gov).



U.S. Department of Transportation  
**National Highway Traffic Safety  
Administration**  
1200 New Jersey Avenue SE, NPJ-310  
Washington, DC 20590