

An ASIS Council White Paper

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This white paper is a part of a series prepared by the members of the School Safety and Security Council. We are an active Council and our members include security professionals from colleges and universities, K-12 schools, and consultants, all of whom are concerned about the safety and security issues for children. Other papers address issues such as "Active Shooter" (2016), "Human Trafficking and Slavery: A Global Crime" (2015), and "Bullying, Cyber-Bullying, Teasing, Hazing, Harassing" (2014).

This paper addresses various approaches to school bus safety and security issues. We must think proactively to protect our children and others. We must not be complacent. The frequency of bus accidents appears to be increasing in this country. Being prepared is the key to survival and saving lives.

In this paper, Linda Watson, CPP, and others make many great points. We ask you to carefully think about their words. Take some action. Get prepared. Research the industry and determine what works best in your situation. Above all, train everyone—employees, security personnel, students, faculty, and staff. They need to know the appropriate response and actions to take if an incident occurs.

My sincere thanks go out to all the members of the School Safety and Security Council for their hard work in putting this paper together, and also to our Council Vice-President, Leslie Cole, CPP, for his kind words of support.

Lawrence J. Fennelly

School Safety and Security Council Loss Prevention and Crime Prevention Council (Past Chair and Current Member)



SCHOOL BUS ACCIDENTS

by Linda Watson, CPP, CSC, CHS-V

"The National Highway Traffic Safety Administration (NHTSA) recommends that school children from kindergarten through high school travel to and from school in school buses, the safest means of school transportation."[1]

This paper will discuss "school bus safety" referring to the "bright yellow school buses" that have a lot of flashing lights and a stop arm. They are highly visible. A school bus can carry 54 students or more. School buses are usually operated by state, city, town, and/or regional public school systems. Private vans that are identified as "school buses" can carry up to 15 students and are used by church and boy/girl scout-type organizations, and are excluded from this definition and discussion.

- There are 55 million students enrolled in elementary and secondary schools in the United States.[2]
- School buses keep 17.3 million cars off roads surrounding schools each morning.[3]
- 50 States have laws requiring a driver to stop for a stopped school bus. Laws differ on how and when a driver may pass a school bus.[4]

Contrary to what you might think, school bus drivers generally have outstanding safety records. They are highly trained professional drivers who are held to surprisingly high standards set by state and industry. These high standards exist because of decades of lobbying for school bus safety. The lobbying on behalf of the students has emphasized the importance of school bus safety for students who ride on buses and the training of drivers. School buses operate and serve all types of areas—urban, suburban, and rural, as well as all ages of children from pre-kindergarten to high school. School buses have a low accident ratio compared to the number of miles traveled.

"The American School Bus Council supports practices that allow communities to hire, retain, and develop drivers that are not only professional drivers, but professional supervisors, educators and friends."[5]

This organization has driver hiring practices and criteria as well as driver training standards. There are about 17 federal and national organizations that help train drivers and promote professional driver's standards and school bus safety standards. One of the largest school transportation industry organizations is the National Association of Pupil Transportation. Personnel

from public and private sectors, school bus manufactures, and aftermarket services and product suppliers all belong to this association. They help develop educational and informational services for the school bus industry.

For example, prior to passing the driving tests and licensing to be a school bus driver in Massachusetts, the operator must pass the following background checks.[6]

- Have three continuous years of driving
- Pass a Criminal Offender Record Information (CORI) check
- Pass a Sex Offender Registry Information (SORI) check
- Pass a Department of Transportation (DOT) physical exam
- · Have a clean driving record
- Pass the required Registry of Motor Vehicles (RMV) written exams
- Pass a Department of Public Utilities (DPU) road test

Massachusetts and most other states require a Commercial Driver's License (CDL) with a passenger endorsement (P) and a school bus endorsement (S) to operate a full-sized school bus. To operate a school bus with air brakes, the operator must pass an additional written test at the Massachusetts Registry of Motor Vehicles. Once the operator passes the CDL test with the P and S endorsements, the permit is valid for two years. The school bus company may have additional endorsements that are required on a state-by-state basis.

School buses are designed with many specific safety features to protect occupants during a crash, such as:

- Flashing red lights
- Well-trained and screened drivers
- · Cross view mirrors
- · Reinforced sides
- Bright color
- · Stop arms

School buses typically operate Monday through Friday from about 6:00 a.m. to 9:00 a.m. and then again from 2:00 p.m. to 5:00 p.m. The school year begins in early September and runs to the middle of June—almost 180 days. In most cases, the school buses operate on a fixed route with designated stops or for "categories" of passengers (e.g., children with special needs). Many school buses provide door-to-door service.

Safety experts generally refer to motor vehicle accidents as

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"collisions," which can happen any time of the day and under any conditions. Quite frequently, "the collision" is not the fault of the bus driver. In many collisions, the school buses are rear-ended by another vehicle in traffic. In many cases a collision involving a school bus is much more serious than other traffic accidents. Factors contributing to this are the number of the passengers involved and the size of the school bus versus an automobile.

The most frequent convictions in school bus collisions[7]

- · Unsafe movement
- · Exceeding a safe speed
- · Improper backing
- · Failure to yield right of way
- · Driving on the wrong side of the road
- Following too closely

As stated previously, when a school bus collision occurs it is not always the school bus driver's fault. However, the school bus driver is usually the only adult on the bus and is responsible for the well-being and discipline of the passengers. When a collision occurs, the bus driver must follow all practiced emergency procedures that he or she is trained to employ to keep students safe. Most states mandate yearly school bus emergency drills with in-service training. Below is a short list of examples of emergency drills:

- · Front door evacuation
- · Rear floor-level emergency exit door evacuation
- · Side emergency exit door evacuation
- · Left, and rear floor-level exit doors evacuation
- Rear, side, and front level exit doors evacuation
- Front, and side floor-level exit doors evacuation
- Left rear floor-level emergency exit door evacuation

It is very important that the students riding the bus are familiar with the individual emergency exit(s) configurations of the bus. One of the most critical decisions a bus driver makes is to decide if a school bus should be evacuated quickly. Examples of these emergency situations could be a fire inside a school bus or the school bus stalls while crossing railroad tracks. Not all school buses are equipped with two-way radios for emergency communication.

The different local conditions in which a school district operates can greatly affect the number of collisions per trip. Geography and winter weather conditions contribute to many collisions involving school buses. Unforeseen weather emergencies can affect rural school bus routes. Weather hazards may happen in a matter of minutes (e.g., high water flooding, tornados, snowstorms, and high winds). These weather events demonstrate how important a professional school bus driver is to the children's safety. Knowing the bus routes and where all emergency services are located on a route can be the difference between life and death.

In contrast, the urban/suburban school bus driver has access to a multitude of emergency services in a matter of minutes. The school bus driver is the only "adult" in charge of the bus, solely responsible for the safety and security of all students. This responsibility continues until the first responders arrive on the scene. When first responders arrive, student safety responsibility transfers to the police, fire, or EMS who will take command of the collision scene.

The risks involved with school bus travel can be grouped into five categories that cut across all travel modes—human, vehicular, operational, infrastructure/environmental, and societal. Operational risk factors are governed by state and local school districts that have established programs to ensure safe travel for school children. The broader guidelines, which establish minimum recommendations for a state highway safety program for pupil transportation, may be found in the following publications: Highway Safety Program Guideline 17, Pupil Transportation Safety, issued by the NHTSA. These safety guidelines include the identification, operation, and maintenance of buses used for carrying students, training passengers, pedestrians, bicyclists, and administration.

School buses are required to pass a yearly safety inspection. It seems that many collisions are the result of defective equipment. School districts may not have the funding needed to keep on top of routine maintenance. Examples of defective equipment that could adversely affect the safety of the school buses are bald tires and suspension and/or brake issues. Maintenance is a quality control issue, as there does not seem to be enough "inspectors" to conduct random, surprise school bus yard inspections across the country.

According to the NHTSA 2003 to 2012 statistics, a total of 119 pedestrians (younger than 19) died in school-transportation vehicle crashes.[8]

- 65 percent were struck by the bus
- 30 percent were struck by another vehicle in the crash

 5 percent were struck by a vehicle operating as a bus (large van, for example)

How pedestrians can stay safe around a school bus.[9]

- Be aware of, and careful in, the Danger Zone—10 feet in front, behind, and on each side of the school bus.
- Stand far back from the approaching school bus while waiting at the bus stop.
- Wait to board the bus until the driver says it is safe.
- When getting off the bus, walk well in front of the bus and make sure the driver sees you.
- Always watch for oncoming traffic when approaching or leaving the bus.
- Keep all loose items in your backpack. If you drop something outside the bus, ask the driver for help.

NHTSA's National Center for Statistics and Analysis Traffic Safety Facts 2004-2013 Data.[10] DOT HS 812 170 Key Findings:

- From 2004-2013, there were 327 school-age children who died in school-transportation-related crashes: 54 were occupants of school transportation vehicles, 147 were occupants of other vehicles, 116 were pedestrians, 9 were pedal cyclists, and 1 was other non-occupant.
- More school-age pedestrians were killed from 7 to 8 a.m. and from 3 to 4 p.m. than any other hours of the day.
- There were 42 (36%) school-age pedestrians killed in school-transportation-related crashes who were 8 to 13 years old.
- More than two-thirds (67%) of the school-age pedestrians fatally injured in crashes were struck by school buses or vehicles functioning as school buses.
- There were almost three times more fatalities among occupants of other vehicles (147) than occupants of school transportation vehicles (54).
- There were 1,344 people of all ages killed in school-transportation-related crashes —an average of 134 fatalities per year.
- Among the 106 occupants killed in school transportation vehicles, 45 were drivers and 61 were passengers.
- Impacts to the front of school transportation vehicles occurred in 53 percent of fatal school transportation related crashes.

Driving a School Bus Intoxicated

Elements of Operating Under the Influence & Alcohol Offenses: Massachusetts General Law Chapter 90 S 24. (An abridged version of the elements and statutes for the purpose of defining what operation and operating under the influence is in Massachusetts.)

Summary: A person "operates" a motor vehicle by driving or doing any act that tends to set the vehicle in motion. Comm.v Uski, 263 Mass. 22 (1928).

- Operation is proven through observation or circumstantial evidence
- Driving: This is the most obvious and common method
- Proof of Operation: Actual Observation. Observing a person driving, or locating a witness is the most common way to prove operation.
- Summary: Public Way: Officers must show that the suspect operated a vehicle in one of three places: (1) on a public way; (2) in a place of public access; or (3) where the public has access as invitee or licensees.

Blood Alcohol Concentration (BAC) of 0.04 or greater will violate a CDL License. Most states require that a school bus driver of a full-size bus have a CDL license to operate the bus legally.

- Chemical Test Results CDL Massachusetts General Law 90F S 10 and S 11
- Any amount: Out of Service Order (OSO) for 24 hours. Driver released forthwith
- Below .04: OSO for 24 hours. Driver released forthwith
- .04 and .05: OSO for 24 hours. Driver released forthwith. CDL suspended for 1 year;
- 3 years if hazardous materials; life if 2nd CDL offense
- Above .05: OSO for 24 hours. Driver held. CDL suspended for 1 year; 3 years if hazardous materials; life if 2nd offense
- Summary: At the time the defendant is operating on a public way, he/she must have a diminished capacity to safely operate because he/she is under the influence of: (1) alcohol; or (2) marijuana; or (3) narcotic drugs; or (4) depressant or stimulant substances; or (5) glue vapors. The offense is also proven if the defendant registers a BAC of .04 (the per se law) for CDL Licenses

Definition of Under the Influence: Diminished ability to drive or BAC of .04 or higher, not actual poor driving.

• OUI Detection and Proof: NHTSA identifies three phases in the detection of impaired drivers: (1) the suspect's driving behavior; (2) the suspect's physical and mental characteristics during police contact; and (3) the suspect's

performance on sobriety tests. NHTSA reports that impaired drivers are on the roads at all times, day and night, with as many as 1 in 10 under the influence between 10:00 p.m. and 2:00 a.m. on Friday and Saturday nights.

- Driving Behaviors that help detect OUI operation of a motor vehicle: wide radius turns, straddling center line, visually appearing to be drunk, almost striking a vehicle/object, weaving, driving on other than road, swerving, more than 10 mph under the speed limit, drifting side to side, stopping without cause in lane, following too closely, tires on center line, erratic braking, driving into oncoming lane, inconsistent signaling, abrupt or illegal turns/stops and driving without headlights.
- The abridged list of Massachusetts General Laws referenced above gives a small sampling of the information regarding CDL licensing and OUI enforcement. As suggested by the data, at any time and on any day a small percentage of people will be operating a motor vehicle while intoxicated. Unfortunately, this may include a school bus driver who is driving children to school. Tragically, many people are unaware of the signs and symptoms of an intoxicated person or driver. They only learn about the operating under the influence when there is a collision or passengers alert the police to unusual driving behavior. When the police arrive on scene and arrest the operator, many co-workers are shocked.

Newspapers and television news frequently report instances of intoxicated school bus drivers. The public appears to watch in disbelief, trying to understand how or why someone would put children they have a responsibility for at risk by getting behind the wheel drunk. It seems to be happening more often or maybe, we, as a society, have become more aware of this situation that puts our nation's children in harm's way.

In conclusion

After spending three months researching this subject, I must admit that I changed my original opinion about school bus drivers and school bus transportation in general. I was struck by the fact that most school bus drivers are highly trained professional drivers. The level of training given to the drivers prior to operating a bus and the continual in-service yearly education is extensive. Training is supported by national and private organizations whose sole mission is to improve driver education and school bus safety for the pupils who travel on the school bus every day. The drivers are asked to multi-task and contend with a distracted workplace inside and outside of the school bus. Couple that with

the fact that they cannot control what other drivers are going to do on their route. Being a school bus driver is a demanding occupation. When I see acts of heroism on the news or in the newspaper of a school bus driver getting all the students off a bus after an accident or prior to the bus erupting in flames, I am amazed!

The school children need to be congratulated, too, because they are one of the facets in the equation. The students must learn their roles as participants on the school bus —how to follow the rules of the driver. For example, when evacuating the bus in an emergency, students need to be "street-smart." Many fatalities and injuries could be avoided if students were more aware of how dangerous the ten feet around the bus is to them. School districts should consider working with the parents and students annually to educate them about school bus accidents and how to avoid them. Teaching the do's and don'ts of boarding and exiting the bus—especially children ten years or younger—and stressing to them not to be distracted when getting on or off the bus because that is when most fatalities happen. School bus drivers who are impaired while driving students are everyone's responsibility. School districts should educate school bus drivers and supervisors to behaviors and cues to recognize an impaired operator. Random breath tests by law enforcement should be a part of the hiring agreement for school bus drivers. However, considering the 55 million students who are transported every year across the country and the miles driven, the statistics show that school bus transportation is one of the safest modes of transportation.

- [1] National Highway Traffic and Safety Administration. August 2014.
- [2] NCES.ED.GOV
- [3] www.trafficsafetymarketing.gov/statistics
- [4] NASDPT.org
- [5] www.americanschoolbuscouncil.org/issues/drivers#st-hash.U%zlHj8Z.dpuf
- [6] www.massrmv.com/portals/30/docs/21711.pdf.
- [7] North Carolina DOT/Division of Motor Vehicle School Bus and Traffic Sections 04/14.
- [8] National Highway Traffic and Safety Administration. August 2014.
- [9] National Highway Traffic and Safety Administration. August 2014.
- [10] NHTSA's National Center for Statistics and Analysis Traffic Safety Facts 2004-2013.

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24 EMERGENCY MANAGEMENT POINTS FOR SCHOOLS BUS OPERATIONS

by Michael Fagel, Ph.D., CEM

Introduction: I have been asked to write a list of recommendations for school bus drivers. It's easy to say, "be prepared," but that is really the secret of Emergency Management.

- 1. Be aware of the changing road and weather conditions always.
- 2. Have alternate methods for traveling to and from student pick up sites in case of floods, storms, etc.
- 3. Count all passengers at start and end of each run, BEFORE parking at end of tour.
- 4. Understand that driving a school bus is a privilege, not a job.
- 5. Make sure that the bus is equipped with adequate fuel and emergency equipment as prescribed by law.
- On longer than "normal" trips, be prepared to offer water in the event of a vehicle breakdown.
- 7. Be prepared to handle sanitation needs of kids "stuck" on the bus for long hours.
- Understand that normal traffic may wind up being abnormal in short order.
- Be prepared for detours, longer than normal routes, and other "in route" crisis elements.
- 10. Have a charged cell phone available always.
- 11. Have first aid equipment available and checked daily.
- 12. Have appropriate certifications for first aid/CPR.

- 13. Carry a flashlight at all times. (pocket LED flashlight, 2 AA cell)
- 14. Have paper regional maps available.
- 15. Be prepared for two-way radio failure.
- 16. Effectively communicate with the passengers on the bus. (do not shout, do not scream)
- 17. Have pens, pencils, and paper on the bus for notes and for helping to keep kids occupied.
- 18. Understand the community emergency plans and how to implement them.
- 19. Have backup copies of administration phone lists. (not just speed dial)
- 20. Have student family contact lists available.
- 21. In the event of an accident, get appropriate help immediately.
- 22. Take photos of the accident scene from 360-degree view, all angles, overlap shots, to accurately capture the scene.
- 23. Follow your agency's protocols and guidelines. (do not freelance)
- 24. Be prepared for any eventuality on board; it is a heavy responsibility.

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BUS SAFETY AND SECURITY ISSUES

by Lawrence J. Fennelly and Marianna Perry, CPP

We read a story in the April 2016 issue of *School Planning & Management* titled, "School-Bus-Safe" (p. 35). It was an "everything is rosy" type of article in which the author stated: a) about 26 million children ride school buses; b) crashes cause only four or five fatalities; and c) about 480,000 school buses carry 25 million students (K to 12).

The last sentence in the article read: "A school bus is a safe, environmentally friendly way for students to get to and from school, every school day of the year."

We were surprised to read this. Using keywords "bus", "accidents", "children left on buses", "intoxicated school bus drivers", we searched the internet and found horror story after horror story. The sources in the public web pages below are cited. Furthermore, we discovered in our research that school bus safety is an international issue, NOT just a problem in the United States.

INTERACTIVE



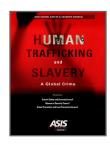
The left panel consists of hyperlinked buttons that lead to the web page results from our research. Hover your mouse cursor over a title to view a short exerpt of the article. Click the button to launch the URL and view it in your web browser.

For a printable version of this section, click the circular button below.

Note: You may be required to have the latest version of Adobe Acrobat installed to view this content. Other works authored by the ASIS School Safety and Security Council: (All links to documents require My ASIS sign-in)



Bullying, Cyber-Bullying, Teasing, Hazing, Harassing (2014)



Human Trafficking and Slavery: A Global Crime (2015)



Active Shooter (2016)



Campus Security: Responding to Rape and Sexual Assault (2016)

ASIS School Safety and Security Council in the News:

Council Members Speak at School Security Symposium

ASIS School Safety & Security Council Members Mike Fagel & Greg Benson presented at an all-day School Security Symposium held March 4, 2017. (https://www.asisonline.org/Membership/Member-Center/Councils/schoolsafety/Pages/BensonFagelSchoolSecurityMarch2017.aspx)

Recently published and/or updated ASIS Council white papers:



Houses of Worship: Security Risk Assessment Guide



Houses of Worship: Vulnerability Mitigation Scenarios



Selecting Automatic Fire Suppression Systems



Active Shooter: High-Rise Scenario

FAIRFAX COUNTY PUBLIC SCHOOLS TRANSPORTATIONS: BEST PRACTICES

by Jim McLain, CPP, FPM

Located in Virginia, Fairfax County Public Schools (FCPS) is the 10th largest school district in the United States. Along with nearly 190 thousand students and over 220 facilities, FCPS has a bus fleet of over 1,600 buses. Despite these numbers, FCPS has a low rate of incidents involving the gross negligence in driving that is widespread in school bus fleets (both public and private) across the country as evidenced by recent media coverage.

We believe our low incident rate is attributable to the County's recruiting, training, retention, and systems in place for bus drivers. Drivers are recruited for full time positions at a good salary with benefits and career ladder advancement. They must possess a Virginia State issued commercial driver's license with passenger and school bus endorsements. There is a six-week bus driver training requirement with extensions that would allow the driver to receive the necessary license with endorsements at the successful completion of training. (A syllabus of the required training is provided on the following page.)

In addition to possessing the appropriate valid license with a good driving record, background and driving record checks are done. There can be no felony convictions or multiple traffic violations. Individuals applying for the position must pass a preemployment physical with controlled substances testing.

Attendance in training does not guarantee employment—not all driver candidates pass. With successful completion of all training requirements, the driver candidate reports to one of four designated transportation areas and is offered a position as a Bus Driver I. Bus drivers are assigned supervisors who monitor their performance daily. Drivers involved in preventable accidents are subject to dismissal as restrictive as the first time depending on the circumstances and severity of the incident. Bus drivers undergo annual physicals, driving record checks, and are subject to random drug and alcohol testing.

Drivers who demonstrate mastery of all aspects of safe school bus operation, have no preventable accidents for one year, and have satisfactorily passed all state and school system performance evaluations are promoted to Bus Driver II with an increase in compensation.

The multitude of programs in Fairfax County provides ample overtime opportunities for bus drivers.

Training for all bus drivers is ongoing. Drivers must successfully complete two bus evacuation drills a year and attend annual in-service training. Additionally, all drivers receive threat assessment and emergency management training. They also attend practical tabletop exercises for school emergencies.

FCPS maintains a high retention rate with many drivers having twenty-plus years of service, and a few who have recorded 45 years of service.

System programs for the safety of the drivers and students include bus rescue drills by police specialty units on a recurring basis, daily bus inspections, two way radios, dispatch centers, and interior cameras on all buses. All FCPS buses are equipped with GPS and are monitored in the FCPS security operations center 24/7.

The FCPS Transportation Services personnel programs serve to mitigate the types of incidents being experienced across the country. As with every program there is room for improvement within the system. All FCPS school buses need more interior cameras. They each have one but should have a minimum of three to capture all cabin areas front, back, and the driver's seat. Fairfax County is a densely populated and transient area with a high volume of traffic caused by thousands of commuters passing through the county on the way to and from Washington, D.C.

FCPS experiences a high rate of passing a stopped school bus reckless driving violations. Periodically, all drivers are enlisted to keep a count of the number of times they are passed when loading and unloading students with their stop lights illuminated. In one day, the drivers collectively reported 1,453 passing violations.

The Virginia legislature has recently passed a bill in both the House and Senate that allows for school bus stop arm technology, which would automatically catch such violators. Once all approvals are completed the FCPS leadership will pursue deployment. As a final note, a synopsis of the basic FCPS new bus driver training program is provided:

Mapping Class

- Review of Northern Virginia Street Map Book and instruction for proper use
- Review of FCPS trip visa (routes)
- · Written test
- Review of road sign information from the Virginia DMV manual
- · Written test

CPR/Student Health Emergencies Class

Trainees must pass skills and written tests

Training Units (Instruction and Review)

- Roles and responsibilities
- Time sheets
- Students with special needs
- Passenger conduct
- Loading/Unloading
- Two-way radio class and hands-on radio practice
- Satisfactory completion of 21 radio drills during training is required
- Crashes and Emergencies
- Pre-trip
- · Bus maintenance
- Driving fundamentals

(After the presentation of information from each unit, there is a written review consisting of 15 questions)

Other Hands-on Classroom Training

- · Tire chain installation
- Heat rail and fuel force use
- Operation of the bus traffic warning light system (utilizing the classroom demo board)
- · Emergency exit locks
- · Child safety system

Observation Day

Trainees are transported to an overturned bus at West Ox garage during which defensive driving techniques are demonstrated; exposed parts on the underside of the bus are reviewed; trainees may enter the bus through the rear emergency exit and practice an exit through the roof hatch.

Behind-the-Wheel Instruction

- Training on both big and small (transit and conventional style) buses
- · Hands-on pre-trip instruction
- Driving sessions on neighborhood, open, interstate, and country roadways, as well as routes that include simulated student pick-ups
- For those trainees holding a CDL Learner's Permit, CDL testing per DMV guidelines is also administered

Lift Class

- Instruction in the proper use of the wheelchair bus lift
- Securement for transport of wheelchairs
- Students with special needs
- · Car seat installation
- Proper use of integrated bus seats, cam wrap/safety vest installation
- Review of driver/attendant responsibilities
- (Skills are practiced and then must be demonstrated satisfactorily, multiple times)

Class Presentations (when available)

- · Assistant Director of Transportation
- Fairfax County Police Department
- · Operations Manager

On-The-Job Training (OJT)

Trainee is assigned to drive a bus with students on board while being observed and assisted by a driver certified by the state to conduct OJT

- Minimum of 1 week on a big bus
- Minimum of 1 week on a small bus

Completion of Training

Upon successful completion of OJT, an intake interview will be scheduled at an area office where the trainee will then be hired as a school bus driver.

This document/section is not intended as a model program for all school systems. It is provided as demonstration of the best practices of one of the largest public school bus fleets in the nation.

For any questions, please contact Jim McLain, The Office of Safety and Security for FCPS, at 571-423-2010 or *jrmclain@fcps.edu*

BUS SAFETY: SWING ARM & STOP ARM VIDEO TECHNOLOGY IN PUBLIC AND PRIVATE BUSES

by Dr. Thomas J. Rzemyk, Ed.D, CHPP, CAS

Introduction

In late 2014, a survey released by the National Association of State Directors of Pupil Transportation Services (NASDPTS) estimated that out of 97,000 school bus drivers from across the United States in 29 states, data showed that nearly 76,000 illegally passed a bus each day. That is more than 7.3 million violations per year in only 29 states. This does not account for the other 21 states in the nation. It is imperative for state and federal lawmakers and other stakeholders to pass new legislation implementing new protocols and technologies to better protect children, pedestrians, and others in school pick-up and drop off locations.

Federal law 49 C.F.R. § 571.

Federal law 49 C.F.R. § 571.131 requires that all states equip buses manufactured after September 1, 1992, with, swing arms. Local towns, cities, counties, and states are now taking this federal statue one step further and introducing new legislation to install swing arm/stop arm video technology on all public and private K-12 school buses as well. According to Federal law 49 C.F.R. § 571.131, a stop signal arm means a device that can be extended outward from the side of a school bus to provide a signal to other motorists not to pass the bus because it has stopped to load or discharge passengers. (Federal law 49 C.F.R. § 571.131).

Section 5 of Federal law 49 C.F.R. § 571.131 articulates that each school bus shall be equipped with a stop signal arm meeting the requirements of S5.1 through S5.5 as depicted in Figure 1.

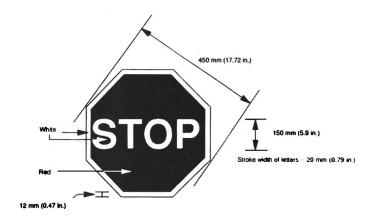


Figure 1. Characteristics of Stop Signal Device

S_{5.1} The stop signal arm shall be a regular octagon which is at least 450 mm×450 mm (17.72 inches×17.72 inches) in diameter.

S_{5.2} The stop signal arm shall be red on both sides, except as provided in S_{5.2.1} and S_{5.2.2}, and S_{5.2.3}.

Reference: https://www.law.cornell.edu/cfr/text/49/571.131

State Law(s): Swing Arm Technology

All state laws across the United States require motor vehicles to come to a complete stop in all directions when a school bus has released the "STOP" swing arm. If the highway is divided, or if a barrier exists, motorists are typically permitted to pass. However, in all other instances, it is considered a moving violation punishable by high fines. The fines and specific punishments vary from state to state. For example, in the State of Nebraska, it is a \$500 fine to illegally pass a bus when the "STOP" sign is deployed. Motorists are responsible to listen for the audible alarm and the visual flashing lights. However, one of the challenges is that the drivers must be "caught." If the motorists are not caught and held responsible, then the violation(s) will more than likely reoccur. In short, many states develop state level legislation based on Federal law 49 C.F.R. § 571.131.

Traditional Swing Arm Technology

The purpose of swing arm technology is to extend a "stop sign" a specific distance away from a bus, and to visually communicate to all oncoming and ongoing traffic that one must come to a complete stop for the safety of children and those around the area of the bus. Researchers and technology experts have been working for several years to improve the safety of stopped buses on public and private streets. One of the initial improvements was the installation of undercarriage sensors and alarms all around a bus. These sensors and alarms put out a signal to the bus driver that a person or animal is either at the front bumper, rear bumper, or under the bus. The undercarriage sensor was implemented across

the domestic United States because children have been killed and injured in the past trying to retrieve an item under a stopped bus. Children have also been known to go under the bus as a shortcut. This National Coalition for Bus Safety states that more than 20 children are injured by the undercarriage of a bus each year.

In the past, many of the swing and stop arms required manual intervention. Currently, when a bus stops and the door is opened, it is done automatically. The swing arms are equipped with a loud audible signal on the exterior of the bus so that anyone in the local vicinity knows that there is a stopped bus on the street. The swing arms typically stay open for 60-90 seconds. Bus drivers have the option to keep them extended longer if needed. After 60-90 seconds, the swing arm automatically returns to its original position.

http://www.iowadot.gov/schoolbus/technologies.html

Overview of Stop Arm Video Technology and Improving Safety for Students, Parents, Staff, and Faculty

As previously stated bus safety advocates, researchers, state and federal government agencies, and technology experts have been working for decades to make buses safer for children and passengers. One of the newest advancements is the installation of stop arm violation camera systems. There are several variations and setups of this new technology, but all of them consist of high resolution video cameras capable of recoding several frames per second. They are often calibrated and configured to record on a continual basis. The stop arm technology typically integrates with an onboard software application and additional hardware that also records the speed, braking, GPS coordinates, time stamps for swing arm deployments, and time stamps for stop arm deployments. These systems often sit locally on the bus, but others are also IP based, which permit technology professionals to remote into the systems when needed. These new systems have cameras that can take 30-60 frames per second and record license plates, faces of the drivers, the make and model of a vehicle, etc. When the stop arm records a photo, the driver of the bus typically presses a button which illuminates a sensor on the system to record the GPS location and recordings for future reference. This manual intervention does not need to take place, as it is done automatically but it offers a second opportunity to time-stamp the issue from the driver's perception. These new enhancements improve safety for students, parents, faculty, and staff when using public and private school buses.

State Legislature: Stop Arm Video Violation Systems

The demand for new safety systems on public and private K-12

school buses at the state level has increased drastically over the past 24 months. As of mid-2015, at least 12 states to include: Arkansas, Connecticut, Georgia, Illinois, Maryland, Mississippi, North Carolina, Rhode Island, South Carolina, Virginia, Washington, and West Virginia have state laws that permit the use of high resolution cameras on the exterior of buses to catch drivers passing stopped buses on public and private property. The National Conference of State Legislatures confirmed that at least 7 other states have legislation in process to implement stop camera systems (NCSL, 2015).

Impact & Success- Stop Arm Video Violation Systems

Stop arm technology has been implemented in several states and it has proven to be a great investment for public and private educational institutions. For example, in 2012 the state of North Carolina had school bus drivers keep count on the number of illegal passing of stopped school buses. In one day, bus drivers witnessed 3,196 vehicles, and motorists illegally passed 2,299 stopped buses at pick-up and drop off locations. This occurred while the bus was in normal operation, stopped, dropping off a student, and with the swing arm extended and lights illuminated. This same data collection method has been used by the state of North Carolina since 1999. Since 1999, the number of illegal passing has increased every year. In short, these statistics are from one out of 50 states in the United States and confirm a need to implement changes for public safety. Researchers and theorists believe that if a camera system was added to each bus and if individuals were fined civilly, then the illegal passing of buses would decrease.

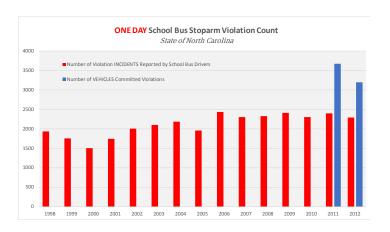


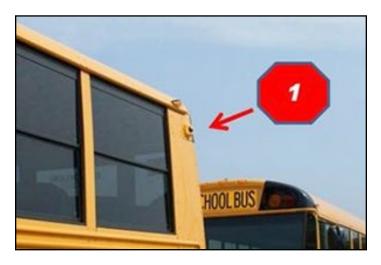
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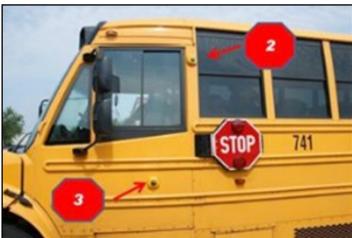
http://www.ncbussafety.org/StopArmViolationCamera/index.html

Strategic Placement-Stop Arm Video Violation Systems

Stop arm video cameras need to be placed strategically on the exterior of buses. If they are not strategically placed, it will cause issues in verifying the license plate and identity of the motorist. As the first image below depicts, it is imperative to have a camera at the rear of the bus to record the license plate and the make/ model of a motor vehicle.

In the image below, cameras two and three allow the system to record the motorist and the front license plate. In a court of law, some motorists have stated that it was not them driving the vehicle. Obtaining a photo of the motorist for full proof of a moving violation is critical for law enforcement officers and municipalities.





Challenges

There are several challenges that exist when attempting to implement a stop arm video violation system.

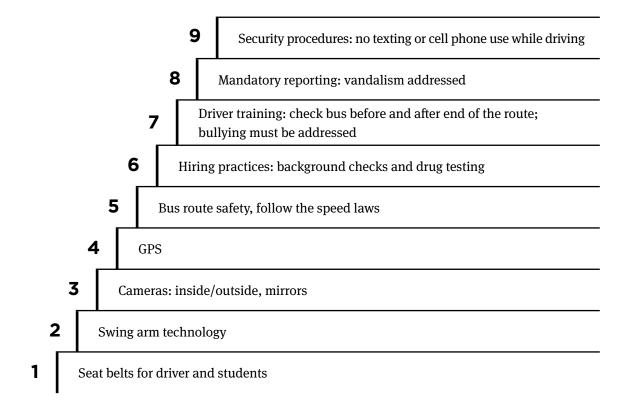
- Challenge I: Funding
- Challenge II: State Legislature
- Challenge III: Public vs. Privately Owned School Buses

Conclusion

In sum, the statistics and data presented in this paper demonstrate that there is a clear need for improvement in student and pedestrian safety at student loading zones. Implementing stop arm video violation system can help improve student safety and decrease injuries and deaths related to motorists illegally passing stopped school buses. As this paper has outlined, there are budget limitations and state legislature challenges that must be overcome. However, with patience, diligence, and research these systems can be successful in diffusing safety hazards on public and private school buses.

NINE STEPS TO IMPROVE SECURITY ON BUSES

by Tom King, CPP



As with hiring security personnel, background checks need to be thorough. Vetting needs to include an extensive interview process to ensure the candidate is a good fit for the position, which entails much more than operating the vehicle safely. The driver needs to possess classroom management skills, be able to handle and de-escalate situations that will predictably happen, and have the right temperament for the job.

CCTV inside of buses is both preventive and helps with reconstructing an incident after the fact. GPS to determine bus location will have the same effect.

Finally, a practiced and reliable way of notifying police et. al. for assistance, if needed, is vital.

SITE VULNERABILITY ASSESSMENT

by Cody Mulla, CPP

Summary

Manor Transportation Department supports a 5A School District in central Texas located near Austin. This district serves a large rural population. Daily it transports over 5,500 students with 4,200 stops a day, and services over 100 square miles.

The bus facility consists of a main administrative building, a repair shop, and an employee parking lot enclosed by a 12-foot fence (Area 1). The buses are located about half a block to the west in a separate enclosed area (Area 2). Below facts about physical security are organized from the outside in.

Mission

The mission of the Transportation Department of the Manor Independent School District (ISD) is to provide safe and dependable transportation services for its customers while simultaneously assuring that services are cost-effective for present and future district shareholders. Transportation services include: home/school route for all students, mid-day pre-kindergarten route service, extended day tutorial route service, late activity transportation, and charter service for field trips.

Fences

Area 1—Area 1 is completely enclosed by a 12-foot fence. The entrance to the facility is card access. In addition, the employee parking area is within the fence, and is enclosed by another fence with card access.

Area 2—Area 2 is enclosed by a 12-foot fence except on the northeast corner that has a 6-foot fence. There are two vehicle entrances, and a pedestrian gate to the bus storage area located on the south side. One vehicle entrance gate is card access while the other is programmed on a timer. Currently, the gate that is programmed to stay open during business hours is not functioning. The pedestrian gate is key operated.

Building Security—Area 1 has two buildings. The first building is the administrative office, and has a badge access system. Upon entrance to the main lobby there is a dispatcher to greet guests, communicate with drivers, and provide general security for the building. The second building is a mechanic shop. This building has roll away doors with no card access.

There is sufficient lighting that are set on a timer.

Area 2 has no structures. The parking lot is well maintained with smooth surfaces. The lighting is set on a timer.

Security Practices and Policy

The Manor Transportation Department realizes that employees need to be dependable and of good character when dealing with children. Each applicant who is considered for a position undergoes a thorough background check, which includes driving and criminal history. Once an applicant is hired and offered a position, he or she goes through 20 hours of video training that teaches bus management strategies. In addition, all drivers are required to complete 10 hours of video training per year for continuing development.

All drivers arriving for daily duty must be seen by the dispatcher who checks out bus keys to them. There have been no alcohol related incidents at Manor ISD. The buses are equipped with GPS so that if there is an emergency the dispatcher knows exactly where the bus is located. There have been no safety, security, or police related activities on or near the bus routes while in operation. There are no seat belts on the busses. After a driver returns from the route, a checklist is used to make sure there are no passengers left on the bus. The driver then physically returns the keys to the dispatcher where they are stored in a secured area.

During inclement weather, the director of transportation and his assistant begin checking roads at 3:00 a.m. Although the director does not make the final decision if busses run or not, he gives experienced council to the superintendent, and thus far, all recommendation have been approved.

The buses are on a regular preventative maintenance (PM) schedule that rotates them in, and out of service at 30, 60, and 90 days. Mr. Andrus, notes that, "buses take a beating and without proper PM schedules, costs can add up." He also maintains that his mechanics are not drivers. Even when President Barack Obama visited Manor ISD, Andrus rejected a request to let the mechanics drive the bus for fear of PMs not getting done.

Mr. Andrus explained that he was mostly concerned about four risks. These risks are inclement weather (mostly heavy rain), drivers avoiding complacency, student fights, and seizures or other medical emergencies.

ASIS School Safety and Security Council

Recommendations

Physical—Add card access to mechanic shop to mitigate the chance of theft. Replace the section of fence that is 6 feet, and replace with a 12-foot fence. Due to the surrounding area and low frequency of crime, a 12-foot fence is sufficient. Repair or replace damaged gate to Area 2. Install a gate to connect Area 1 and 2, so that drivers will not have to walk on HWY 20 to get to and from buses.

Addressing Identified Risks

Inclement Weather—Currently, the director of transportation is gathering information well before buses operate, and making an informed decision on road conditions. One area for improvement would be the inclusion of social media into notification. Once road conditions are known, pictures could be taken and posted on social media accounts to show dangers on the roads.

Training/Avoiding Complacency—At present, all drivers are limited to video training. This may not be the best method of delivery to engage adult learners. Due to the part-time nature of school bus drivers, training is a cost issue. To engage adult learners, a classroom or scenario training is advised. Verbal

de-escalation training would provide drivers with the skills to communicate with students in high stress situations and gain voluntary compliance. This also targets the concern for student fights, and managing a scene in a medical emergency. Communication is always a tool. Another option would be to use case study exercises and group discussion.

Student Fights—Student fights may cause disruption or injuries on buses. There is little a driver can do to stop a fight if he or she is driving. For this reason, it is important to set clear expectations. One way to help accomplish this goal is by posting bus rules, which Manor does on all buses. Another strategy is to develop a driver's ability to empathize and foster respectful relationships with the passengers. Although respectful relationships will not eliminate the chance for fighting, it will mitigate it. This coupled with de-escalation training will go far.

Medical Emergencies/Seizures—All drivers currently go through basic first aid, AED, and training regarding seizures. However, it is important to refresh this training regularly. The fact that the buses are tracked with GPS also allows first responders to arrive quickly.

All information gained from interviewing Manor Director of Transportation Greg Andrus, a site visit, and the Manor ISD website.

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