

INFO BRIEF

Preventing Pedestrian Injuries and Deaths Among School Bus Riders



Pedestrian and Bicycle
Information Center
www.pedbikeinfo.org

Background

Whether walking to school, riding a bike, traveling by private vehicle, or riding public transit or a yellow school bus, every student is a pedestrian for at least some portion of their trip between home and school. The circumstances and nature of pedestrian injuries and deaths experienced by K-12 students walking between home and the school bus stop and while waiting for the school bus merit special consideration given that approximately one-third of K-12 students use this mode.¹ From 2008 to 2017, 97 school-age pedestrians died in school-transportation-related crashes (crashes where a school bus was directly or indirectly involved). Fifty-five percent were struck by school buses, one percent by vehicles functioning as school buses, and 44 percent by other vehicles (passenger cars, light trucks and vans, large trucks, and motorcycles, etc.) involved in the crashes.² No data collection system exists to count the number of child pedestrians hit while walking to a bus stop or when a bus is not present at a bus stop, leaving a void in the full picture of pedestrian injuries and deaths for yellow school bus riders.

School bus riders encounter many of the same risks that students who walk to school experience, including high speed vehicles, high traffic volumes and insufficient space to walk along a roadway or cross with pedestrian infrastructure. While school bus stop arms aim to protect riders as they cross to or from a stop while the bus is present, drivers

sometimes do not stop. The National Association of State Directors of Pupil Transportation Services 2019 survey tallied more than 95,000 vehicles passing school bus stop arms in a single day, voluntary count from 39 states.³

This report provides an overview of research related to school bus rider pedestrian injuries and deaths. The team also conducted an original media scan of student pedestrian injuries and deaths sustained traveling to or at school bus stops in order to create a fuller picture of the characteristics of pedestrian injuries and deaths for this group. To understand the roles of policies and practices, PBIC examined policies of six school districts, including interviews with three transportation directors.

After reviewing existing school bus rider safety materials and discussing options with NHTSA, the team developed an **information brief for parents**⁴ to support their child's pedestrian safety behaviors between home and the bus stop and while at the stop. The brief was released during Pedestrian Safety Month. However, school bus rider safety training, and caregiver and student understanding of the factors that influence safe walking conditions comprise one small part of a host of strategies necessary to improve safety. Much work remains to be done to recognize and address the safety risks school bus riders encounter along their route to the bus stop. Thusly, this report concludes with recommendations for future research and action.

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- 1 Federal Highway Administration. (2019, March). *Children's Travel to School*. Retrieved from https://nhts.ornl.gov/assets/FHWA_NHTS_%20Brief_Traveltoschool_032519.pdf.
 - 2 National Center for Statistics and Analysis. (2019, July). *Traffic Safety Facts: School Transportation-Related Crashes (DOT HS 812 712)*. Retrieved from <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812712>.
 - 3 National Association of State Directors of Pupil Transportation Services. (2019). *2019 Survey on Illegal Passing of School Buses--Summary Results*. Retrieved from <https://nasdpts.org/resources/Documents/2019%20NASDPTS%20Illegal%20Passing%20Results%20Summary-7-24-19-v2-Updated%201-3-20%20to%20Include%20DC.pdf>.
 - 4 Pedestrian and Bicycle Information Center. (October 2020). *Safe Steps to the School Bus Stop: How Parents Can Encourage Safe Walking*. Retrieved from http://www.pedbikeinfo.org/resources/resources_details.cfm?id=5237.

Literature review

The PBIC team performed a review of literature on child pedestrian crashes related to school bus stops. The review included both academic literature and reports from government agencies. In the review, literature is divided into one section highlighting issues surrounding safety for pedestrians on the way to and from school bus stops and a second section detailing existing recommendations for addressing these safety issues.

Issues

Research and reports have detailed issues that impact the safety of school bus riders as they arrive at the bus stop or leave the bus at the end of the day. Illegal passing of school buses has received the most attention. Reports from the National Association of State Directors of Pupil Transportation Services (NASDPTS) have detailed the frequency of such violations over time through annual single-day surveys of passing violations in the United States. From 2018 to 2019 the surveys found an increase from 83,944 to 95,494 illegal passes across 38 states and DC.^{5,6} Through a period from 2016 to 2019, NASDPTS surveys revealed that 60% of illegal passes originate in front of the bus and 98% passing on the driver side of the bus. Passes were evenly distributed between morning and afternoon.^{7,8}

An undated report from the National Highway Traffic Safety Administration (NHTSA) on reducing illegal passing attributed the inability to reduce violations to three main factors. First, motorists disobey the law because of a lack of awareness of the law or lack of compliance. Second, there is an underreporting of violations. Finally, illegal passing has been underenforced.⁹

The National Transportation Safety Board (NTSB) report in response to a high-profile crash in Rochester, Indiana on October 30, 2018, identified several factors that contributed to the crash. The crash resulted in the death of three children and injury of one. The primary cause noted by the NTSB was the driver's failure to stop for a stop arm with lights flashing. In addition, the NTSB also identified inadequate stop placement as a secondary cause. The bus stop in this case required children to cross a 55-mph road. A final factor noted was an unclear policy related to when a driver should give students a signal to cross the road.¹⁰

Existing recommendations and potential solutions

Academic literature, government reports, and legislation numerate recommendations to improve the safety of students when outside of the bus. The literature includes methods to reduce stop arm violations, suggestions to improve stop placement to avoid dangerous locations, best practices for driver signaling policy, and recommendations for signage related to bus stops.

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- 5 National Association of State Directors of Pupil Transportation Services. (2018). *2018 Survey on Illegal Passing of School Buses - Survey Results*. National Association of State Directors of Pupil Transportation Services.
 - 6 National Association of State Directors of Pupil Transportation Services. (2019). *2019 Survey on Illegal Passing of School Buses - Survey Results*. National Association of State Directors of Pupil Transportation Services.
 - 7 National Association of State Directors of Pupil Transportation Services. (2016). *2016 Survey on Illegal Passing of School Buses - Survey Results*. National Association of State Directors of Pupil Transportation Services.
 - 8 National Association of State Directors of Pupil Transportation Services. (2017). *2017 Survey on Illegal Passing of School Buses - Survey Results*. National Association of State Directors of Pupil Transportation Services.
 - 9 National Highway Traffic Safety Administration. (n.d.). Reducing the Illegal Passing of School Buses. Retrieved March 31, 2020, from <https://www.nhtsa.gov/school-bus-safety/reducing-illegal-passing-school-buses>
 - 10 National Transportation Safety Board. (2020). *Vehicle Collision With Student Pedestrians Crossing High-Speed Roadway to Board School Bus Rochester, Indiana*. National Transportation Safety Board.

The 2020 report by the NTSB on the Rochester, IN crash recommended a review of the effectiveness of technologies aimed at illegal passing. The report also recommends that states enact or modify legislation to permit the use of stop arm cameras.¹⁰

According to the National Conference of State Legislatures, at least 22 States permit school bus stop arm cameras to identify stop arm violators.¹¹ In Iowa, Kady's Law requires minimum fines for stop arm violation. A 2012 study of the law, commissioned by the State, found the most critical factor in the law effectiveness was swift enforcement. This requires quick review of stop arm camera footage.¹²

NHTSA includes recommendations for both States and local agencies in the Reducing Illegal Passing Guide. First is a public education campaign with messaging about penalties to deter motorists from passing school buses illegally. This would include continuously pairing literature with driver's license renewal mailings, utility bills, billboards, and driver education programs. Additionally, the campaign would train bus drivers about what constitutes a violation and how to report it. Following the education phase, NHTSA recommends an enforcement initiative that increases officer patrolling or following the school bus at stops or on routes identified as hotspots for illegal passing.⁹

Driver signaling is a practice that requires drivers to use specific hand signals to indicate to children when it is safe or unsafe to cross the road. The NTSB report on the school bus crash in Rochester,

IN recommended that NASDPTS advise members on how to train bus drivers for safe crossing procedures, including the use of hand signals.¹⁰ Additionally, research considers including illustrations of safe practices in bus driver training manuals to be a best practice for improving safety of students on their way to the bus stop.¹²

Further research has looked at signage and markings both at and in the approach to a bus stop. A 1996 study measured the effectiveness of pavement stencils in the shape of a school bus next to stops. The stencil outlined an area considered a child safety zone at the stop. The study found that children were more likely to wait in bus stop safety zones at stops with stencils than without.¹³ In a study by the Ohio Department of Transportation in 2016, researchers evaluated 13 different bus stop sensors and four warning devices for bus stops. The combination of a flashing beacons on "bus stop ahead" signage activated by Bluetooth on the school bus had the highest potential benefit among the options studied for crash reduction at school bus stops.¹⁴

School bus injury media scan

To understand some of the patterns related to child pedestrian crashes near – or en route to - bus stops, the PBIC team performed a scan of media reports on crashes that took place from January 2018 to March 2020. This media scan allowed the inclusion of details on crashes that may not have appeared in the academic literature.

¹¹ National Conference of State Legislatures. (2020, Jan). *State School Bus Stop Arm Camera Laws*. Retrieved from <https://www.ncsl.org/research/transportation/state-school-bus-stop-arm-camera-laws.aspx>.

¹² McGehee, D., Hawkins, N., Hoover, R., Hallmark, S., Chrysler, S., & O'Neal, E. (2012). *School Bus Safety Study – Kady's Law*. Center for Transportation Research and Education - Iowa State University.

¹³ Burke, G. S., Lapidus, G. D., Zavoski, R. W., Wallace, L., & Banco, L. I. (1996). Pavement stencils marking safe areas promoted safe behaviour at school bus stops. *Pediatrics*, *97*, 520–523.

¹⁴ Katz, B., Kehoe, N., Cobb, D., & Senger, S. (2016). *Evaluation of school bus stop sign ahead signs*. Ohio Department of Transportation.

Method

The media scan involved repeated searches using Google for both newspaper and broadcast media for keywords related to school bus crashes (school bus, crash, hit, walk, wait, child, and injury). The team then collected results until they showed consistent repeats of incidents or irrelevant results. This involved reviewing approximately 100 results for each search term. Based on this review, the team compiled a list of reports on incidents in which a K-12 student was struck, injured, or killed by a motor vehicle while walking to or from a school bus stop, waiting at a school bus stop, or boarding a school bus. We recorded the following details on each incident and the individual victims based on the report and a Google street view image of the intersection or roadway: date, time, location, vehicle type, school bus presence, community and road type, severity of crash, specific circumstances, and victim age.

Results

The PBIC team's media scan resulted in a total of 45 reports of pedestrian crashes at or near school bus stops during the 27-month period. With some crashes including more than one child, a total of sixty children were injured or killed. More specifically: 25 were killed, 16 seriously injured, and 18 had minor injuries (according to the news coverage). Pedestrian ages ranged from four to 17 years with approximately one-half of the victims between ages six and nine. Search results are summarized next by time, vehicle involvement and location. In addition, we relate the findings from this media scan to the literature. See Appendix for the full records.

Time

Crash events found in the media scan were most prevalent in the fall and winter. Of the 45 events, 21 occurred in fall and 14 in winter. The majority of these crashes happened in the morning (35 out of 45). Of these morning incidents 19 occurred between 7:00 AM and 8:00 AM and 10 between 6:00 AM and 7:00 AM. The remaining events were

disbursed between 8:00 AM and 8:30 AM (six events) and between 3:00 PM and 6:00 PM (eight events). Four events did not have a specified time of day. The season and time of day reflect that 35 out of 45 incidents happened before daylight. This aligns with a previous NHTSA analysis that found the 7:00 AM to 8:00 AM period to have the highest number of school-age pedestrian deaths between 2008 and 2017.¹⁵

Vehicle involvement

The school bus was present at the scene of the crash in 29 events. However, the scan found that only four out of the total of 45 crashes involved the school bus. Most incidents involved a private passenger vehicle. This differs from findings by NHTSA that showed 56% of school-age pedestrians involved in school bus stop crashes were hit by school buses between 2008 and 2017. The difference is most likely because the scan included pedestrian crashes with a trip purpose of the bus stop whereas NHTSA results only capture the crash when a school bus is directly or indirectly involved.¹⁵

Location

The media scan identified crashes in twenty states. Among these, Florida had the highest share with eight of the 45 recorded incidents followed by Ohio with five. Looking at the crash locations, the PBIC team categorized the areas as suburban, rural, and urban based on development density and land use type near the crash site. Most crashes, 26 out of 45, occurred in suburban areas. There were 15 in rural areas, and four occurred in urban areas. The crashes more often happened when a child was crossing or walking in the road and not in a crosswalk. For the incidents where a child was struck crossing the road, no crosswalk was present. In the incidents in which a child was struck walking in the road, there were no sidewalks present. This finding aligns with research that found 73% of school transportation child pedestrian fatalities between 2008 and 2017 occurred midblock rather than at an intersection.¹⁵

¹⁵ National Highway Traffic Safety Administration. (2019). *Traffic Safety Facts 2008-2017 Data: School-Transportation-Related Crashes*. U.S. Department of Transportation.

School District Practice

A review of seven school district's transportation policy information found online^{16,17,18,19,20,21,22} supported by interviews with three of the school district's transportation staff, revealed patterns related to the route between home and stop, school bus rider safety in street crossing to load or unload, and the handling of stop arm violations. School districts selected for the study represent a range of district sizes and states.

Context

A combination of school district transportation policies and state statutes typically define a "no transport zone" of approximately one to two miles around a school where school bus service is not provided, with some exceptions for hazardous conditions (such as Wake, Hillsborough, Indianapolis, Philadelphia). One school district of those studied served all students regardless of distance from the school (Clark-Pleasant).

Pedestrian exposure

Some districts (sometimes controlled by state statute) have policies about the maximum distance between home and stop, thereby limiting pedestrian exposure by limiting walking distance. For example, in Hillsborough County School District, FL, stops are within one-quarter mile

from elementary student homes, one-third mile in Wake County School District, NC and one-half mile in Cleveland Metropolitan Schools, OH. On the other end of the spectrum, the School District of Philadelphia articulates the Pennsylvania State Statute, requiring a bus stop to be within 1.5 miles of a student's home. While policies did not explicitly address infrastructure, speed or other characteristics that might influence pedestrian safety between a student's home and the bus stop, interviewed school district transportation staff noted that route planners try to avoid routes requiring crossing of high-speed or high-volume roads.

Crossing to load/unload the school bus

School districts in the review had shifted to majority right-side stops to prevent the need for students to cross to load or unload. Interview subjects also noted that they use driver and school bus router local knowledge to make determinations on bus routes that would require a student to cross a street.

Bus drivers play a large role in school bus rider safety. When crossing at a stop is required, school bus drivers often use a special hand sign to indicate when it is safe for students to cross (such as Cleveland Metropolitan Schools, Wake, Clark-Pleasant). As an exception, California requires bus drivers to accompany students across the street

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- 16 Hillsborough County Public Schools. (2020.) Transportation. Retrieved from <https://www.sdhc.k12.fl.us/doc/1979/transportation-services/resources/families/?tab=1>.
 - 17 San Francisco Public Schools. (n.d.) Transportation Safety Plan. Retrieved from https://docs.google.com/document/d/1tQwNyEkaalYjaRVL8kWi6hZTZWydMHAeal7_-ndqNkk/edit#heading=h.8pmy41oybyk5.
 - 18 Wake County School District (2020). *Transportation Guidelines*. Retrieved from <https://www.wcpss.net/Page/175>.
 - 19 Indianapolis Public Schools. (2020). *Transportation*. Retrieved from <https://myips.org/central-services/transportation/>.
 - 20 Clark-Pleasant Community School Corporation. (n.d.). *Student and Parent Transportation Handbook*. Retrieved from https://core-docs.s3.amazonaws.com/documents/asset/uploaded_file/791925/STUDENT_AND_PARENT_TRANSPORTATION_HANDBOOK.pdf.
 - 21 Cleveland Metropolitan School District. *Transportation Division FAQs*. Retrieved from <https://www.clevelandmetroschools.org/Page/596>.
 - 22 School District of Philadelphia. *Pupil Transportation FAQs*. Retrieved from <https://www.education.pa.gov/Teachers%20-%20Administrators/Pupil%20Transportation/Pages/Pupil-Transportation-FAQs.aspx>

Table 1. School Districts in Practice Scan

District	State	Number of students enrolled in the school district (2018-2019)	Internet-based policy review or stakeholder interview
Wake County School District	North Carolina	161,907 ²³	Both
Hillsborough County School District	Florida	220,252 ²⁴	Both
Cleveland Metro Schools	Ohio	38,012 ²⁵	Interview
San Francisco Unified School District	California	52,498 ²⁶	Internet
Indianapolis School District	Indiana	26,410 ²⁷	Internet
Clark-Pleasant Community School Corp	Indiana	6,866 ²⁸	Internet
School District of Philadelphia	Pennsylvania	202,767 ²⁹ (2019-2020)	Internet

with crossover lights and signs being activated. Interview subjects also noted that drivers were important sources of information about route safety concerns and that that information was incorporated into route decisions.

Stop arm violations

While at least 22 States permit school bus stop arm cameras to identify stop arm violators, 11 usage of stop arm cameras was met with questions by some of those interviewed due to a lack of evidence of effectiveness. Those interviewed did note other ways that stop arm violations are

being addressed, including identifying areas of repeat violations to engage law enforcement and/or to seek to understand underlying traffic issues that may be inadvertently supporting violations. Bus drivers report violations which cannot, for the districts we interviewed, directly result in a citation. Interview subjects noted that bus stop placement decisions incorporated a consideration of avoiding locations known for high-frequency vehicle passing, for example near a turn lane where vehicles have extra space to pass a stop arm. Identification of high-frequency vehicle passing relied on bus driver report.

²³ <https://www.wcpss.net/domain/100>.

²⁴ https://nces.ed.gov/ccd/districtsearch/district_detail.asp?ID2=1200870.

²⁵ https://nces.ed.gov/ccd/districtsearch/district_detail.asp?Search=2&details=1&ID2=3904378&DistrictID=3904378.

²⁶ https://nces.ed.gov/ccd/districtsearch/district_detail.asp?Search=1&details=1&InstName=san+francisco+unified&DistrictType=1&DistrictType=2&DistrictType=3&DistrictType=4&DistrictType=5&DistrictType=6&DistrictType=7&DistrictType=8&NumOfStudentsRange=more&NumOfSchoolsRange=more&ID2=0634410.

²⁷ https://nces.ed.gov/ccd/districtsearch/district_detail.asp?Search=1&details=1&InstName=indianapolis+&DistrictType=1&DistrictType=2&DistrictType=3&DistrictType=4&DistrictType=5&DistrictType=6&DistrictType=7&DistrictType=8&NumOfStudentsRange=more&NumOfSchoolsRange=more&ID2=1804770.

²⁸ https://nces.ed.gov/ccd/districtsearch/district_detail.asp?Search=1&details=1&InstName=Clark-Pleasant+Community+School+Corp+&DistrictType=1&DistrictType=2&DistrictType=3&DistrictType=4&DistrictType=5&DistrictType=6&DistrictType=7&DistrictType=8&NumOfStudentsRange=more&NumOfSchoolsRange=more&ID2=1801890.

²⁹ <https://www.philasd.org/fast-facts/>.

Recommendations

- Development of a system to track pedestrian injuries among school bus riders. Right now, NHTSA Crash Facts only capture injuries where a yellow school bus is present, leaving a gap in quantifying injuries and deaths to schoolchildren as they walk to the bus stop, including crossing high volume, high speed roads.
- Findings from the school bus scan, in addition to past NHTSA data, point toward a potential safety benefit from improved lighting and visibility conditions at school bus stops. Crashes identified in media reports were more likely to occur in the morning and during fall and winter, when children are potentially walking to and waiting at bus stops in the dark. Coupled with the finding that crashes occurred more frequently at midblock locations, this suggests a combination of efforts is necessary to both make children more visible in any low-light situations and avoid the need to cross the street or walk in the street. While the scan did not capture posted speed limits, placing bus stops on low volume, low speed streets aligns with what's known about preventing pedestrian crashes. School bus stop placement criteria should include this recommendation, but school transportation directors and city planners will both need encouragement and guidance on taking a coordinated approach to prioritize needed lighting improvements.
- Coordination between city and pupil transportation professionals could be an important way to (a) identify and address safety deficiencies between home and school and (b) assess and resolve infrastructure and policy weaknesses that may be inadvertently supporting continued stop arm violations.
- While land use does not allow for school bus stops to be placed on low speed, low volume roads in all cases, whenever possible cities should make changes to make those stops possible, including design of subdivisions that allow easy entry/exit to permit a stop located off of the main arterial and within the subdivision.
- Support the involvement of school bus transportation directors in broad-based pedestrian safety efforts such as Vision Zero. Right now, many cities are shifting to a safe systems approach, including a shift in thinking beyond individual-level approaches. School transportation directors bring vast experience in navigating city streets, driver behavior and understanding of traffic planning needs for school transportation that could be harnessed. Exposure to these concepts and inclusion in strategic planning could help shift school bus transportation directors' prevailing individual-level intervention mindset and perhaps generate new solutions to entrenched problems.
- Identify best practices in engagement of school transportation directors in Safe Route to School. Right now, school transportation directors primarily focus on yellow school bus transportation and do not relate to promotion of public transit, walking or biking as a large part of their role. Amplifying examples of successful school transportation director involvement in all modes and promoting those examples among directors could help advance that connection, particularly with the shared goal of student safety and reducing private vehicle traffic at schools.
- Widespread dissemination of findings of the NHTSA study underway now to evaluate enforcement of illegal passing of stopped school buses using stop arm bar cameras.

Appendix A. Media Scan Results

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ID	Date of Event	Season	Time	TOD	City	State	Age	Level	Conditions	Lighting	Location
1	8/22/18	Summer	4:27 PM	Afternoon	Jacksonville	FL	11	Middle		Light	Road
2	9/27/18	Fall	7:00 AM	Morning	Joplin	MO	8	Elementary		Dark	Road
3	10/9/18	Fall	7:00 AM	Morning	Aspen Hill	MD	15	High		Dark	Sidewalk
3	10/9/18	Fall	7:00 AM	Morning	Aspen Hill	MD	15	High		Dark	Sidewalk
3	10/9/18	Fall	7:00 AM	Morning	Aspen Hill	MD	14	High		Dark	Sidewalk
3	10/9/18	Fall	7:00 AM	Morning	Aspen Hill	MD	14	High		Dark	Sidewalk
3	10/9/18	Fall	6:42 AM	Morning	Harford	MD	16	High		Dark	Road
4	10/25/18	Fall	6:45 AM	Morning	Hartsfield	GA	10	Elementary		Dark	Road
4	10/25/18	Fall	6:45 AM	Morning	Hartsfield	GA	7	Elementary		Dark	Road
5	10/30/18	Fall	7:15 AM	Morning	Rochester	IN	9	Elementary		Dark	Road
5	10/30/18	Fall	7:15 AM	Morning	Rochester	IN	6	Elementary		Dark	Road

ID	Bus Present	Community Type	Road Type	Severity	Source	Description
1	No	Suburban	5 lanes	Fatal	https://www.actionnewsjax.com/news/local/jacksonville-fire-rescue-person-hit-by-car-on-university-blvd/818491350/	Struck by passenger car while attempting to cross road with no crosswalk
2	Yes	Rural	2 lanes	Fatal	https://www.news-leader.com/story/news/2018/09/27/joplin-girl-8-dies-after-being-struck-tractor-trailer/1442353002/	Struck by tractor trailer driver when crossing road (no crosswalk available) to board school bus. Bus lights were flashing and door was open.
3	No	Suburban	6 lanes	Severe Injury	https://wtop.com/montgomery-county/2018/10/car-strikes-pedestrians-in-aspen-hill/	Struck while waiting for bus when vehicle swerved onto the sidewalk
3	No	Suburban	6 lanes	Minor Injury	https://wtop.com/montgomery-county/2018/10/car-strikes-pedestrians-in-aspen-hill/	Struck while waiting for bus when vehicle swerved onto the sidewalk
3	No	Suburban	6 lanes	Minor Injury	https://wtop.com/montgomery-county/2018/10/car-strikes-pedestrians-in-aspen-hill/	Struck while waiting for bus when vehicle swerved onto the sidewalk
3	No	Suburban	6 lanes	Minor Injury	https://wtop.com/montgomery-county/2018/10/car-strikes-pedestrians-in-aspen-hill/	Struck while waiting for bus when vehicle swerved onto the sidewalk
3	Yes	Rural	2 lanes	Fatal	https://www.baltimoresun.com/maryland/harford/aegis/bs-md-car-accident-20181009-story.html	Struck while crossing road to flag down school bus. No crosswalk present. Bus yellow lights flashing.
4	Yes	Rural	2 lanes	Fatal	https://www.walb.com/2018/10/25/car-hits-children-they-head-school-bus-colquitt-county/	Struck by driver of passenger vehicle when crossing road (no crosswalk available) to board school bus. Bus stop arm was extended.
4	Yes	Rural	2 lanes	Severe Injury	https://www.walb.com/2018/10/25/car-hits-children-they-head-school-bus-colquitt-county/	Struck by driver of passenger vehicle when crossing road (no crosswalk available) to board school bus. Bus stop arm was extended.
5	Yes	Rural	2 lanes	Fatal	https://www.cbsnews.com/news/indiana-crash-school-bus-stop-today-2018-10-30-live-updates/	Struck when crossing the road (no crosswalk available) to board a stopped school bus, with lights flashing and bus stop arm extended.
5	Yes	Rural	2 lanes	Fatal	https://www.cbsnews.com/news/indiana-crash-school-bus-stop-today-2018-10-30-live-updates/	Struck when crossing the road (no crosswalk available) to board a stopped school bus, with lights flashing and bus stop arm extended.

Appendix A. Media Scan Results

ID	Date of Event	Season	Time	TOD	City	State	Age	Level	Conditions	Lighting	Location
5	10/30/18	Fall	7:15 AM	Morning	Rochester	IN	6	Elementary		Dark	Road
5	10/30/18	Fall	7:15 AM	Morning	Rochester	IN	11	Middle		Dark	Road
6	10/31/18	Fall	6:35 AM	Morning	Pratts	MS	9	Elementary		Dark	Road
7	10/31/18	Fall	7:30 AM	Morning	Tallahassee	FL	5	Elementary		Dark	Road
8	11/1/18	Fall	7:00 AM	Morning	Franklin	PA	7	Elementary		Light	Road
9	11/8/18	Fall	7:26 AM	Morning	Norfolk	AR	13		Intoxication	Light	Driveway
9	11/8/18	Fall	7:26 AM	Morning	Norfolk	AR	15	High	Intoxication	Light	Driveway
10	12/12/18	Fall	7:00 AM	Morning	Rohrsburg	PA	5	Elementary		Dark	Road
11	1/4/19	Winter	4:00 PM	Afternoon	Columbia	MO	5	Elementary		Light	Sidewalk
12	1/14/19	Winter	7:00 AM	Morning	Fort Myers	FL	12	Middle		Dark	Road

ID	Bus Present	Community Type	Road Type	Severity	Source	Description
5	Yes	Rural	2 lanes	Fatal	https://www.cbsnews.com/news/indiana-crash-school-bus-stop-today-2018-10-30-live-updates/	Struck when crossing the road (no crosswalk available) to board a stopped school bus, with lights flashing and bus stop arm extended.
5	Yes	Rural	2 lanes	Severe Injury	https://www.cbsnews.com/news/indiana-crash-school-bus-stop-today-2018-10-30-live-updates/	Struck when crossing the road (no crosswalk available) to board a stopped school bus, with lights flashing and bus stop arm extended.
6	Yes	Rural	2 lanes	Fatal	https://abcnews.go.com/US/child-dies-hit-truck-board-school-bus/story?id=58880202	Struck by driver of pickup truck when crossing the road (no crosswalk available) to board a stopped school bus. Bus lights were flashing and bus stop arm extended.
7	Yes	Rural	2 lanes	Minor Injury	https://www.wctv.tv/content/news/Child-hit-near-school-bus-stop-in-Tallahassee-499145911.html	Struck by driver of passenger vehicle when crossing road (no crosswalk available) to board school bus. Bus stop arm was extended and lights were flashing. Was with adult.
8	No	Rural	2 lanes	Fatal	https://www.altoonamirror.com/news/local-news/2018/11/state-police-delivery-truck-backed-over-boy-at-bus-stop/	Struck by delivery truck driver backing up while waiting at stop. No sidewalk on road. School bus was not present.
9	No	Suburban	2 lanes	Minor Injury	https://www.ktlo.com/2018/11/08/two-students-waiting-for-school-bus-struck-by-car-in-norfork/	Struck in driveway by driver under the influence backing up
9	No	Suburban	2 lanes	Minor Injury	https://www.ktlo.com/2018/11/08/two-students-waiting-for-school-bus-struck-by-car-in-norfork/	Struck in driveway by driver under the influence backing up
10	No	Suburban	2 lanes	Fatal	https://www.wnep.com/article/news/local/columbia-county/child-hit-and-killed-by-pickup-truck-at-school-bus-stop-in-columbia-county/523-ed065590-c014-4803-b13c-e51b20b1a300	Struck by driver of pickup truck when crossing the road (no crosswalk available). No sidewalk on road. School bus was not present. Was with adult.
11	Yes	Rural	3 lanes	Fatal	https://www.kansas.com/news/nation-world/national/article223994775.html#adnr=900000	Struck by police SUV exiting road to park on sidewalk to observe students loading a school bus. Student was in bus loading area.
12	No	Suburban	2 lanes	Fatal	https://www.winknews.com/2019/07/05/driver-who-hit-and-killed-alana-tamplin-will-not-face-criminal-charges/	Struck by van when walking on edge of road back from school bus stop after dropping off sibling. No sidewalk present.

Appendix A. Media Scan Results

ID	Date of Event	Season	Time	TOD	City	State	Age	Level	Conditions	Lighting	Location
13	1/14/19	Winter	8:30 AM	Morning	Summit	PA	11	Elementary	Sun glare	Light	Road
13	1/14/19	Winter	8:30 AM	Morning	Summit	PA	9	Elementary	Sun glare	Light	Road
13	1/14/19	Winter	8:30 AM	Morning	Summit	PA	6	Elementary	Sun glare	Light	Road
14	3/25/19	Spring	6:50 AM	Morning	Cape Coral	FL	8	Elementary		Dark	Roadside
15	4/3/19	Spring	7:15 AM	Morning	Bedford	NH	8	Elementary		Light	Driveway
16	4/4/19	Spring	5:43 PM	Afternoon	Conroe	TX	15	High		Light	Road
17	4/17/19	Spring	3:00 PM	Afternoon	Queens	NY	7	Elementary		Light	Road
18	5/13/19	Spring	7:00 AM	Morning	Franklinville	NC	8	Elementary		Light	Road
19	5/13/19	Spring		Afternoon	Willowick	OH	7	Elementary		Light	Road
19	5/13/19	Spring		Afternoon	Willowick	OH	7	Elementary		Light	Road

ID	Bus Present	Community Type	Road Type	Severity	Source	Description
13	No	Rural	2 lanes	Fatal	https://www.wpxi.com/news/top-stories/11-year-old-boy-dies-after-being-hit-by-car-waiting-for-school-bus-2-other-siblings-injured/904214379/	Struck on roadside by driver of passenger vehicle turning after stopping at stop sign. No sidewalk present. Child may have been sitting.
13	No	Rural	2 lanes	Minor Injury	https://www.wpxi.com/news/top-stories/11-year-old-boy-dies-after-being-hit-by-car-waiting-for-school-bus-2-other-siblings-injured/904214379/	Struck on roadside by driver of passenger vehicle turning after stopping at stop sign. No sidewalk present. Child may have been sitting.
13	No	Rural	2 lanes	Severe Injury	https://www.wpxi.com/news/top-stories/11-year-old-boy-dies-after-being-hit-by-car-waiting-for-school-bus-2-other-siblings-injured/904214379/	Struck on roadside by driver of passenger vehicle turning after stopping at stop sign. No sidewalk present. Child may have been sitting.
14	No	Suburban	2 lanes	Fatal	https://www.fox4now.com/news/local-news/pedestrian-injured-in-hit-and-run-crash-in-ne-cape-coral	Struck by driver of pickup truck while sitting on grass at roadside. No sidewalk present.
15	Yes	Suburban	2 lanes	Severe Injury	https://www.necn.com/news/local/father-son-injured-in-pedestrian-crash-while-walking-toward-school-bus/235071/	Struck in driveway by car backing, while walking to school bus with adult
16	No	Rural	2 lanes	Fatal	https://www.click2houston.com/news/2019/04/06/district-to-review-satellite-bus-stops-after-student-struck-killed-by-vehicle/	Struck when walking on road from satellite bus stop (no sidewalk present).
17	Yes	Urban	2 lanes	Fatal	https://nypost.com/2019/04/17/queens-boy-fatally-struck-by-a-van-after-walking-off-school-bus/	Pinned between back of school bus and van after exiting bus and crossing street.
18	No	Rural	2 lanes	Fatal	https://www.wxii12.com/article/girl-8-waiting-for-school-bus-dies-after-being-hit-by-car-in-randolph-county/27452899	Struck by driver of passenger vehicle when waiting in road for school bus (no sidewalk was present). Police claim child darted into road.
19	Yes	Suburban	2 lanes	Minor Injury	https://abc13.com/elementary-students-hit-by-teen-driver-passing-school-bus/5303109/	Struck in road after exiting the bus when vehicle passed stopped school bus
19	Yes	Suburban	2 lanes	Minor Injury	https://abc13.com/elementary-students-hit-by-teen-driver-passing-school-bus/5303109/	Struck in road after exiting the bus when vehicle passed stopped school bus

Appendix A. Media Scan Results

ID	Date of Event	Season	Time	TOD	City	State	Age	Level	Conditions	Lighting	Location
20	8/15/19	Summer	6:25 AM	Morning	Myakka City	FL	14	High		Dark	Road
21	8/22/19	Summer		Afternoon	Holiday	FL	4	Elementary		Light	Road
22	9/18/19	Fall	7:00 AM	Morning	Greenville	SC	13	Middle		Dark	Sidewalk
23	9/18/19	Fall	6:15 AM	Morning	Columbus	OH	11	Middle		Dark	Road
24	9/20/19	Fall	4:00 PM	Afternoon	Louisville	KY	6	Elementary		Light	Road
25	9/30/19	Fall	8:15 AM	Morning	Farmington	ME	6	Elementary		Light	Road
26	10/16/19	Fall		Morning	Penn Hills	PA	6	Elementary	Rain	Dark	Crosswalk
27	10/22/19	Fall	8:30 AM	Morning	Columbus	OH				Light	Sidewalk
27	10/22/19	Fall	8:30 AM	Morning	Columbus	OH				Light	Sidewalk
28	11/15/19	Fall	6:50 AM	Morning	Cumming	GA	6	Elementary	Intoxication, Drowsiness	Dark	Sidewalk

ID	Bus Present	Community Type	Road Type	Severity	Source	Description
20	Yes	Rural	2 lanes	Severe Injury	https://www.bradenton.com/news/local/article234028752.html	Struck by driver when crossing street (no crosswalk) to board stopped bus with lights flashing and stop arm extended
21	No	Suburban	2 lanes	Severe Injury	https://www.abcactionnews.com/news/region-pasco/driver-wanted-after-hitting-seriously-injuring-4-year-old-let-off-at-wrong-bus-stop-in-pasco-county	Struck in road after getting dropped off at wrong stop. Bus was no longer present.
22	No	Suburban	6 lanes	Severe Injury	https://wlos.com/news/local/update-teen-hit-in-sc-road-rage-incident-in-critical-condition	Struck by driver of passenger car that lost control and drove onto sidewalk. Vehicle was driving 30mph over speedlimit and attempting to cut off other car in road rage incident.
23	No	Suburban	2 lanes	Fatal	https://abc6onyourside.com/news/local/police-looking-for-second-driver-that-hit-and-killed-a-girl-on-her-way-to-school	Struck by vehicle when walking in road to school bus stop, no sidewalks present.
24	Yes	Suburban	2 lanes	Severe Injury	https://www.whas11.com/article/news/local/father-of-child-hit-run-over-by-school-bus-seeking-answers/417-1b3187de-1007-40dc-bcc9-6519b0fbf59e	Struck by school bus driver after exiting bus and crossing in front of it. No crosswalk present.
25	Yes	Rural	2 lanes	Minor Injury	https://www.wmtw.com/article/farmington-boy-hit-by-vehicle-while-waiting-for-school-bus-police-say/29305248	Struck in road while crossing to board school bus. School bus lights were not activated
26	Yes	Suburban	2 lanes	Minor Injury	https://www.wtae.com/article/boy-hit-by-car-while-trying-to-get-on-bus-in-penn-hills-police-say/29491568#	Struck when crossing the road in a crosswalk, with bus lights flashing.
27	No	Urban	2 lanes	Minor Injury	https://www.nbc4i.com/news/local-news/video-crashes-double-at-bus-stop-where-children-hit-by-vehicle/	Struck on sidewalk by t-boned vehicle pushed off road
27	No	Urban	2 lanes	Minor Injury	https://www.nbc4i.com/news/local-news/video-crashes-double-at-bus-stop-where-children-hit-by-vehicle/	Struck on sidewalk by t-boned vehicle pushed off road
28	Yes	Suburban	4 lanes	Severe Injury	https://www.wsbtv.com/news/local/forsyth-county/man-two-kids-hit-by-car-while-waiting-for-school-bus/1008922553/	Struck in driveway before boarding bus by intoxicated, drowsy driver who swerved to the right of a stopped bus

Appendix A. Media Scan Results

ID	Date of Event	Season	Time	TOD	City	State	Age	Level	Conditions	Lighting	Location
28	11/15/19	Fall	6:50 AM	Morning	Cumming	GA	9	Elementary	Intoxication, Drowsiness	Dark	Sidewalk
29	12/11/19	Fall	7:12 AM	Morning	Holland	MI	16	High		Dark	Road
30	12/12/19	Fall	4:00 PM	Afternoon	Bethesda	MD	9	Elementary		Light	Road
31	12/13/19	Fall	7:15 AM	Morning	Rockville	MD	17	High		Dark	Road
32	12/13/19	Fall	7:00 AM	Morning	Lancaster	OH	17	High		Dark	Road
33	12/18/19	Winter	6:30 AM	Morning	West Palm Beach	FL	15	High	Rain	Dark	Crosswalk
34	1/21/20	Winter	7:40 AM	Morning	Umatilla	FL	12	Middle		Light	Roadside
35	1/23/20	Winter	8:10 AM	Morning	Edina	MN	17	High	Intoxication	Light	Boarding
36	1/27/20	Winter	7:30 AM	Morning	Cairo	GA	6	Elementary		Dark	Road
37	2/10/20	Winter	7:15 AM	Morning	Oasis	WI	6	Elementary	Fog	Light	Boarding

ID	Bus Present	Community Type	Road Type	Severity	Source	Description
28	Yes	Suburban	4 lanes	Severe Injury	https://www.wsbtv.com/news/local/forsyth-county/man-two-kids-hit-by-car-while-waiting-for-school-bus/1008922553/	Struck in driveway before boarding bus by intoxicated, drowsy driver who swerved to the right of a stopped bus
29	No	Suburban	2 lanes	Fatal	https://www.wzzm13.com/article/news/local/pedestrian-vehicle-crash-holland-township/69-6e4a847e-e2e0-4c74-8c48-923f366cd83e	Struck in road while walking to bus stop
30	Yes	Suburban	2 lanes	Fatal	https://wtop.com/montgomery-county/2019/12/child-struck-by-school-bus-in-bethesda/	Struck by school bus driver when crossing road after getting dropped off, as bus was making right turn. No crosswalk present.
31	Yes	Suburban	4 lanes	Severe Injury	https://wtop.com/montgomery-county/2019/12/13-year-old-struck-by-suv-in-montgomery-co-injuries-are-life-threatening/	Struck by SUV driver when crossing road to board school bus, stop arm was extended. Unclear if crosswalk was used.
32	No	Suburban	2 lanes	Severe Injury	https://abc6onyourside.com/on-your-side/scoring-our-schools/lancaster-student-suffers-concussion-hit-by-car-while-walking-to-school-bus-stop	Struck in road when crossing to bus stop, no crosswalk present. School bus was not present.
33	Yes	Suburban	5 lanes	Fatal	https://www.wptv.com/news/region-c-palm-beach-county/west-palm-beach/1-hospitalized-from-crash-involving-school-bus-near-west-palm-beach	School bus driver making right turn strikes student passenger in crosswalk.
34	No	Rural	2 lanes	Severe Injury	https://www.clickorlando.com/news/local/2020/01/21/12-year-old-boy-waiting-at-lake-county-bus-stop-dragged-by-hit-and-run-driver-deputies-say/	Struck on grassy shoulder while waiting for school bus. Driver actively wanted for other criminal activity.
35	Yes	Suburban	2 lanes	Injury	https://kstp.com/news/driver-charged-in-edina-hit-and-run-that-injured-high-school-student-march-19-2020/5679044/	Driver under the influence accelerated passenger vehicle between the bus and the sidewalk with the intention of striking an unknown student. Bus lights were flashing and stop sign was extended.
36	No	Suburban	2 lanes	Fatal	https://www.wctv.tv/content/news/New-details-in-crash-that-killed-of-6-year-old-Cairo-boy-567359771.html	Struck in road after running to cross the street after missing school bus.
37	Yes	Rural	2 lanes	Fatal	https://www.nbc15.com/content/news/Waushara-Co-kindergartner-struck-by-car-killed-while-waiting-for-bus-567728191.html	Struck by driver of pickup truck when boarding the bus as vehicle passed bus on righthand shoulder. Bus lights were flashing.

Appendix A. Media Scan Results

ID	Date of Event	Season	Time	TOD	City	State	Age	Level	Conditions	Lighting	Location
37	2/10/20	Winter	7:15 AM	Morning	Oasis	WI	4	Elementary	Fog	Light	Boarding
38	2/16/20	Winter	7:00 AM	Morning	Stone Mountain	GA	8	Elementary		Dark	Crosswalk
39	2/20/20	Winter	4:00 PM	Afternoon	Cleveland	OH	9	Elementary		Light	Road
40	2/20/20	Winter	7:00 AM	Morning	Sevierville	TN	6	Elementary		Dark	Road
40	2/20/20	Winter	7:00 AM	Morning	Sevierville	TN	16	High		Dark	Road
41	2/27/20	Winter	6:30 AM	Morning	St. Paul	MN	7	Elementary		Dark	Crosswalk
42	2/28/20	Winter	6:30 AM	Morning	Pleasant Hill	SC	6	Elementary		Dark	Road
43	2/28/20	Winter	4:25 PM	Afternoon	Shelby	MI	6	Elementary	Backpack hooked on bus	Light	Road
44	3/17/20	Spring	8:25 AM	Morning	Rush	NY	10	Elementary		Light	Boarding

ID	Bus Present	Community Type	Road Type	Severity	Source	Description
37	Yes	Rural	2 lanes	Minor Injury	https://www.nbc15.com/content/news/Waushara-Co-kindergartner-struck-by-car-killed-while-waiting-for-bus-567728191.html	Struck by driver of pickup truck when boarding the bus as vehicle passed bus on righthand shoulder. Bus lights were flashing.
38	Yes	Suburban	2 lanes	Fatal	https://www.ajc.com/news/local-education/driver-charged-after-hitting-killing-dekalb-schools-student/KdhtAcwLj5BVXzJRw7pkdN/	Struck in crosswalk by vehicle that passed bus with stop lights flashing, while behind held by parent
39	Yes	Urban	2 lanes	Minor Injury	https://www.cleveland19.com/2020/02/21/police-have-video-car-suspected-hit-and-run-girl-walking-off-cleveland-school-bus/	Struck in road when crossing after exiting school bus. Bus lights flashing.
40	Yes	Suburban	4 lanes	Severe Injury	https://www.wbir.com/article/news/crime/2-children-hit-by-vehicle-on-west-main-street-possible-suspect-being-interviewed/51-da429c97-4b28-4d2b-b51f-8d9c6dc3e441	Struck by pickup truck when crossing road to board school bus, no crosswalk present
40	Yes	Suburban	4 lanes	Minor Injury	https://www.wbir.com/article/news/crime/2-children-hit-by-vehicle-on-west-main-street-possible-suspect-being-interviewed/51-da429c97-4b28-4d2b-b51f-8d9c6dc3e441	Struck by pickup truck when crossing road to board school bus, no crosswalk present
41	Yes	Urban	5 lanes	Severe Injury	https://minnesota.cbslocal.com/2020/02/27/st-paul-police-boy-7-critically-injured-by-motorist-while-attempting-to-board-school-bus/	Struck by driver pickup truck who drove through intersection. Bus stop arm was extended.
42	No	Suburban	2 lanes	Fatal	https://www.wsocvtv.com/news/local/troopers-7-year-old-girl-hit-by-car-while-waiting-school-bus-lancaster-county/AD4VKNL2PZD6XH4E3EOD43H4J4/	Struck by driver of pickup truck. Police claim child darted in road, alternate claim that she was on the sidewalk/shoulder. Was with an adult.
43	Yes	Suburban	2 lanes	Minor Injury	https://www.fox2detroit.com/news/5-year-old-hit-by-utica-school-district-bus-witnesses-say	Struck by school bus driver after exiting bus and crossing in front of it. No crosswalk present.
44	Yes	Suburban	2 lanes	Minor Injury	https://13wham.com/news/local/police-10-year-old-hit-by-car-while-boarding-school-bus-in-rush	Struck while boarding bus by driver who swerved to the right of the stopped bus with lights flashing and stop arm extended



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