



# BUSPATROL

February 2022

SAFER BUSES, SAFER KIDS

## Making Communities Safer With AI-Powered Technology

**NYS Presentation**



# Transforming Pupil Transportation



We are a **safety focused tech company** powered by **AI and machine learning** that emerged from tackling a serious issue in the school bus safety space.

Our journey has led us to reinvent how school districts and communities can **modernize their fleets and leverage cloud-based technology** to transform their operations and safeguard all student riders.



# 1

## THE PROBLEM



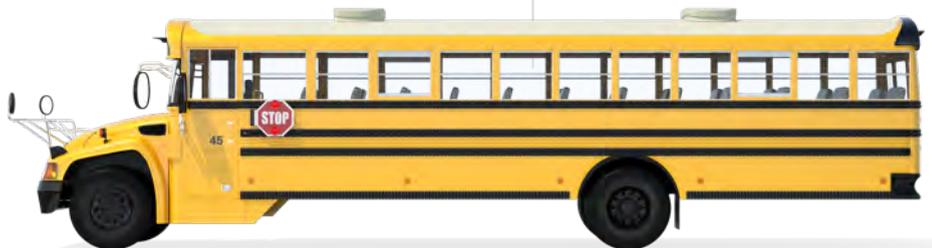
# Children and Parents Trust the Yellow Bus

**~550,000**<sup>(1)</sup>  
School Buses

**18.8B**<sup>(2)</sup>  
Trips Per Year

**26M**<sup>(2)</sup>  
Student Riders

Transporting  
**55%**<sup>(2)</sup>  
of Students



**Source:**

(1) Figures sourced from School Bus Fleet and School Transportation News (US & Canada Figures)

(2) Figures sourced from American School Bus Council (3) 2010 - 2019 figures sourced from NSC and NHTSA

## THE PROBLEM

While the school bus is the safest vehicle on the road, critical problems impact student safety every day.

**~136,000**<sup>(3)</sup>



**1,000+**<sup>(3)</sup>

School Bus  
Related Injuries

Fatalities in  
Past Decade

School and municipal-driven efforts to address the inherent dangers that exist as children get on and off the school bus on their daily trips.

# Addressing a Pervasive Problem Across North America

**17 MILLION**<sup>(1)</sup>

**ESTIMATE NUMBER OF STOP-ARM VIOLATIONS PER YEAR IN AMERICA**

**95K**

Violations Observed in One-Day Survey<sup>(1)</sup>

**0.73**

Violation Rate (Per Bus / Day)<sup>(1)</sup>



**130,963**<sup>(1)</sup>

Bus Drivers Participated



Source:

(1) Motorists that ran school bus stop arms, based on a survey conducted by National Association of State Directors of Pupil Transportation Services in 2019.

# Tackling the Problem Through New and Proven Solutions

## OPERATION SAFE STOP

When readily available,  
police presence deters violators

Source:

(1) Figures sourced from SBF and School Transportation News (US & CAN Figures). (2) Figures sourced from American School Bus Council

## Enforcement Constraints

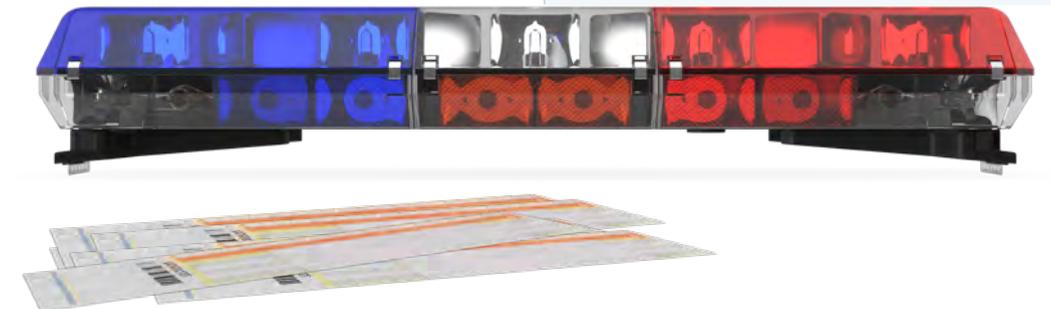
**550,000**<sup>(1)</sup>  
School Buses

**260M**<sup>(2)</sup>  
Daily Trip Miles

**2.75M**<sup>(2)</sup>  
Stops Per Day



**LACK**  
of Required  
Police Resources



ALLENTOWN PA PILOT PROGRAM HIGHLIGHTS THE NEED FOR SUPPORTING TECHNOLOGY

## Traditional Enforcement

2018 CITATION DATA

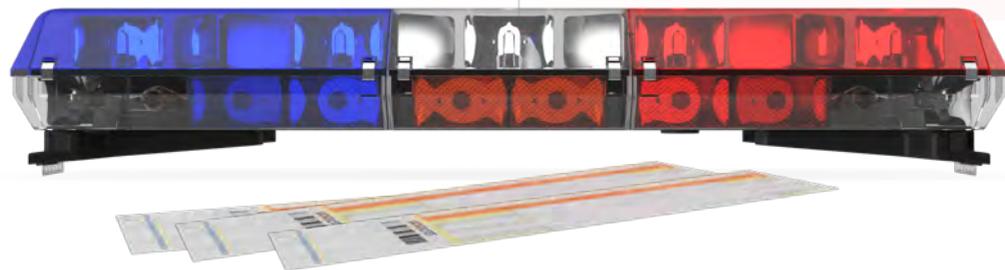
**All**  
School Days



**21,596**  
PA School Buses

**667**  
Tickets

**0.00017**  
Citations / Bus / Day



## Automated Enforcement

2019-2020 PILOT PROGRAM

**47**  
School Days



**2**  
School Buses

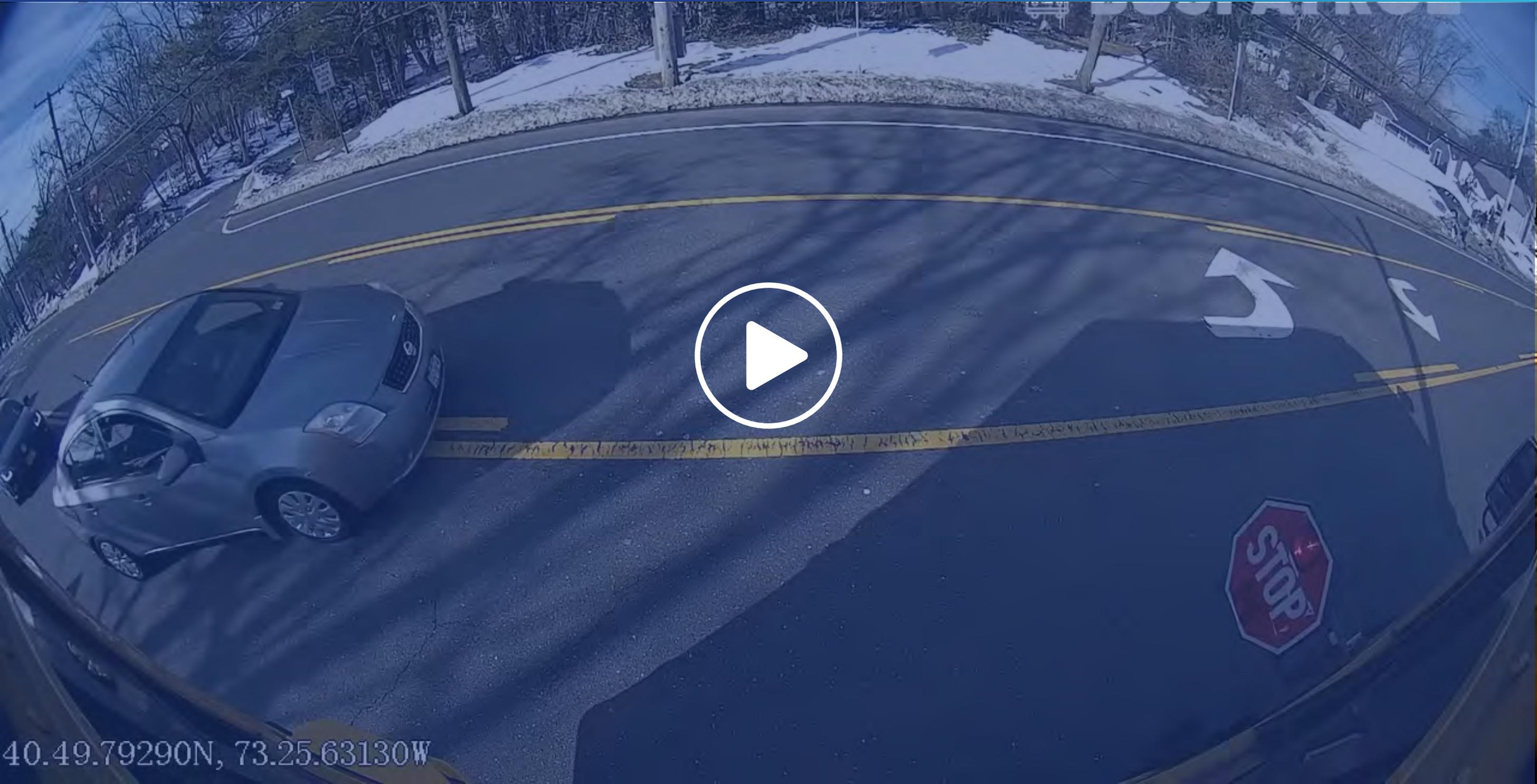
**205**  
Violations

**2.18**  
Violations / Bus / Day



# Visualizing the Problem

# Stop-Arm Camera Footage



40.49.79290N, 73.25.63130W



“

TO AMPLIFY THE SHOCKING RESULTS FROM THIS SCHOOL YEAR WAS **THE FACT THAT OVER A SIX DAY PERIOD, SIX STUDENTS WERE KILLED, AND EIGHT STUDENTS AND TWO ADULTS WERE INJURED BY VEHICLES** EITHER VIOLATING SCHOOL BUS STOP ARMS OR HITTING STUDENTS AND ADULTS WHILE THEY WERE WAITING AT A BUS STOP.”

---

– MIKE LAROCCO  
PRESIDENT NASDPTS



**NASDPTS**

National Association of  
State Directors  
of Pupil Transportation Services



# U.S. Transportation Safety Agency to States: Enact Lifesaving Law to Permit Stop-Arm Cameras on School Buses to Issue Citations to Negligent Drivers

BusPatrol applauds the NTSB's Latest Safety Recommendations for Improved School Bus Safety Enforcement Measures.

NEWS PROVIDED BY

[BusPatrol](#) →

Apr 07, 2020, 17:30 ET

SHARE THIS ARTICLE



LORTON, Va., April 7, 2020 /PRNewswire/ -- [BusPatrol](#), a leading school bus safety technology company, applauds the National Transportation Safety Board's (NTSB) recommendations encouraging the adoption of stop-arm cameras to deter drivers from illegally passing stopped school buses.

The National Transportation Safety Board (NTSB) today called on states to combat school bus stop-arm violations by enacting laws enabling local jurisdictions to install automated enforcement cameras on stop-arms and to issue citations to violators caught on camera.

On April 7, 2020, the NTSB released the abstract for its investigative report on the fatal collision involving four students who were crossing a road to board a stopped school bus in Rochester, Indiana, on October 30, 2018. Three of the student pedestrians, all of the same family, were killed.



# 2

## THE SOLUTION



# Introducing Safety as a Service (SAAS)

We are a safety technology company entirely focused on improving school bus safety through our innovations and services.

- Leading stop-arm enforcement program provider
  - Deployed on the *most buses*
  - Protects the *most student riders*
  - Issued *more school bus citations* than all competitors
- Core business and dedication
  - Products, services and solutions built for pupil transportation



Footage from our school bus safety programs and pilots

# School Bus Safety Programs

## Changing Motorist Behavior, One Citation at a Time



1 BP develops partnerships with school districts or municipalities



2 Deploys AI-powered technology and cloud-connectivity on entire school bus fleet



3 Active buses capture events, identify incidents and help develop evidence packages to issue citations

4 **School districts receive new available funding through cost savings and program**

SAMSUNG

ZONAR

FIRSTNET  
Built with AT&T

transfinder

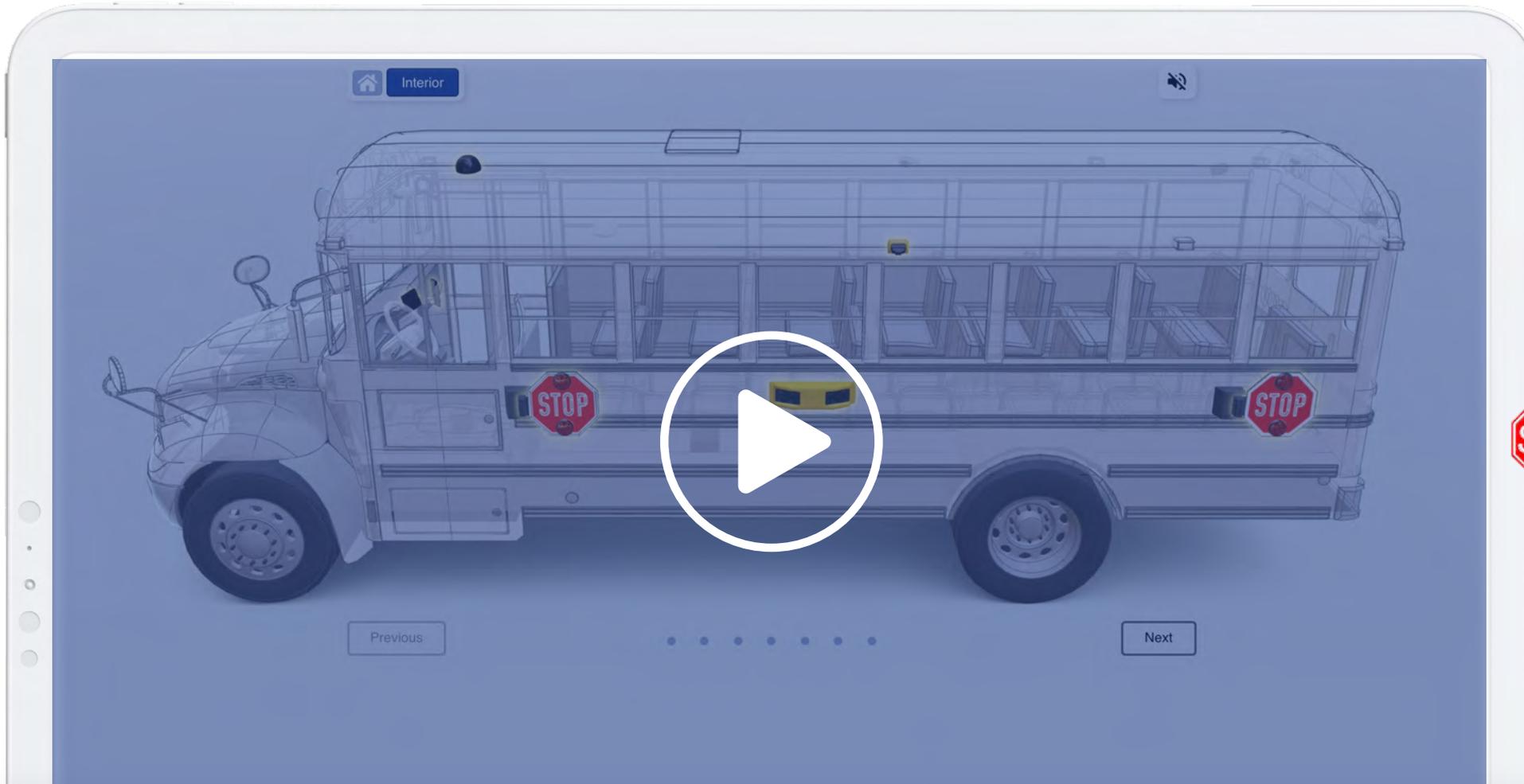
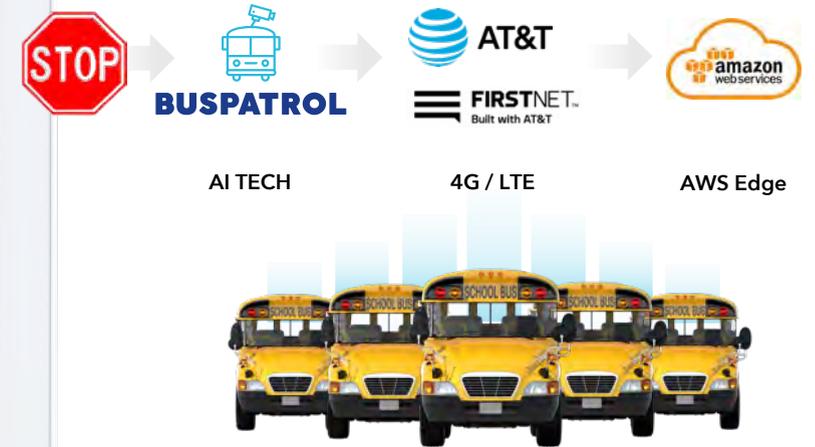
BusPlanner  
by geotab



Fleet modernization options available at \$0 to improve safety and operations

# SCALING ENFORCEMENT

Leveraging Full-Fleet Automated AI Technology

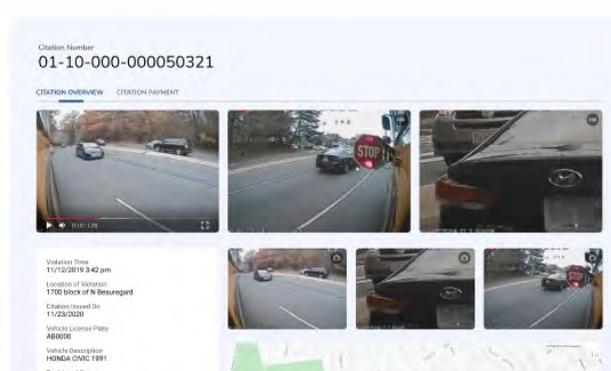


BusPatrol Student Safety Platform

Powering Community Enforcement Programs

## AlertBus

Secure Cloud Interface  
Built for Law Enforcement



- Capture stop-arm events
- Identify and isolate infraction events
- Streamline delivery of evidence packages

# Managing Seamless AI-Powered Automated Enforcement Programs

## SCHOOL BUS ROUTES



School bus stops, stop-arm and lights are deployed and IoT devices activated



Automated Violation Analysis (AVA AI) cameras capture stop-arm events and identify violations



Video, GPS, and other supporting data sent to processing center via secure network

**SECURE  
NETWORK & DATA  
TRANSMISSION**



## QA & REVIEW PROCESS



AVA AI filters footage to help prepare evidence package for reviewers



BusPatrol reviewers QA compiled video and evidence package



Video and supporting evidence package sent to law enforcement



**ALERTBUS PORTAL**

**SECURE ACCESS PROVIDED  
TO LAW ENFORCEMENT**

# Managing Seamless AI-Powered Automated Enforcement Programs

ENFORCEMENT  
& EDUCATION



Law Enforcement use AlertBus platform to review evidence packages and issue citations or disapprove them



Citations are autogenerated and mailed to offender with web link providing access to video evidence

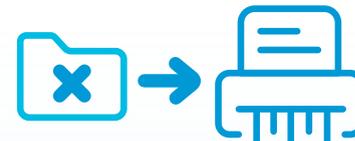


Motorist makes payment online or at a designated municipal office

ENFORCEMENT  
& EDUCATION

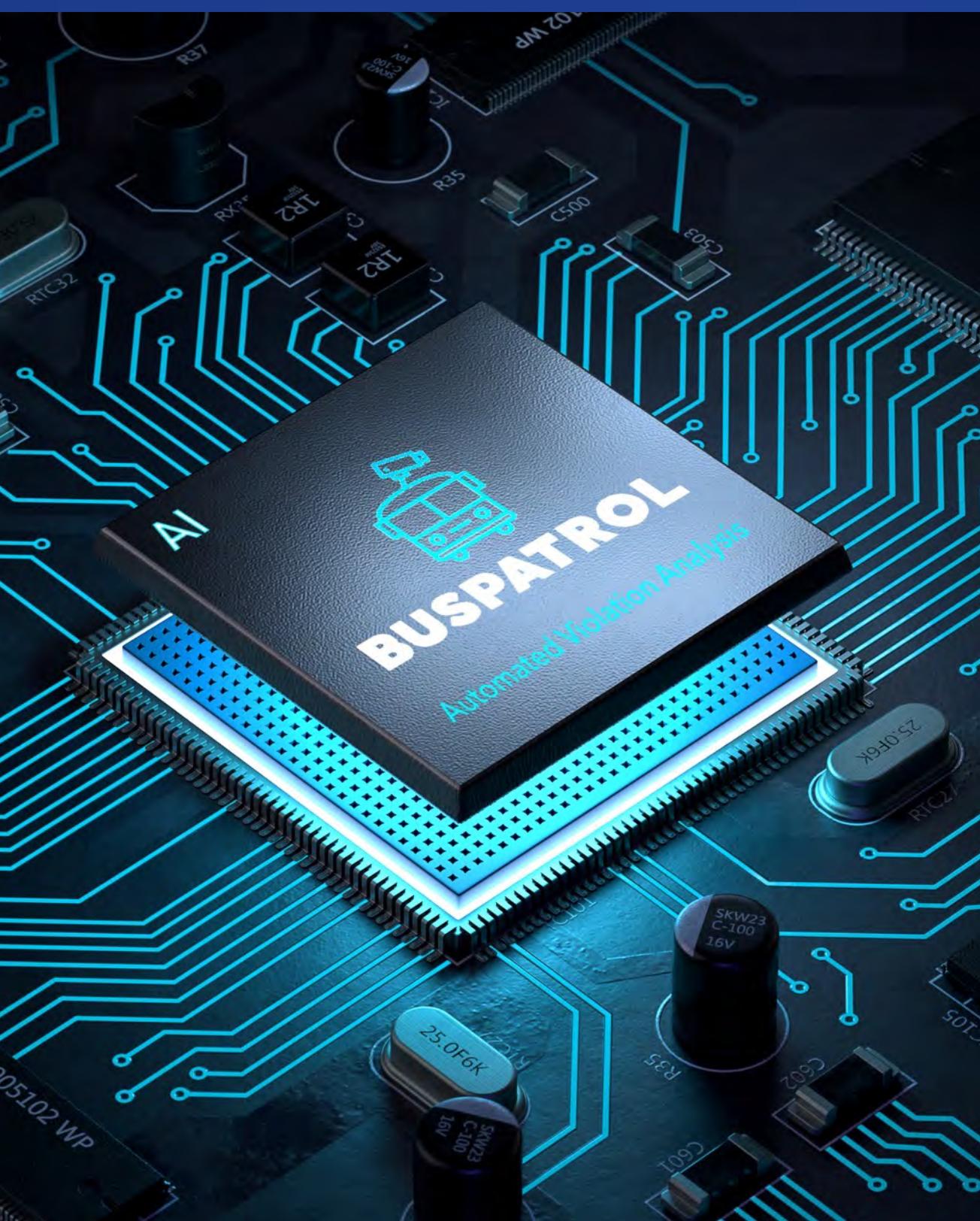


Call center available to educate drivers on how to change behavior



All citation data is purged from DVR, cloud, and servers, according to state law.





## Why AI Technology?

AVA AI TECH

- Most effective automated enforcement technology solution in the industry
- **Efficiency benefits:**  
Capture and process **ALL** stop-arm events across entire school bus fleet
  - *Scalable solution for efficient citation management*



**MORE VIOLATIONS IDENTIFIED**



**A LOT MORE TICKETS ISSUED**

**AI-POWERED ENFORCEMENT PROVIDES**

- **GREATER BEHAVIORAL CHANGES**
- **EDUCATION & SAFETY**



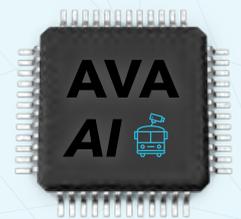
## AUTOMATED VIOLATION ANALYSIS (AVA AI)

# Introducing Pupil Transportation's Only AI-Powered Platform



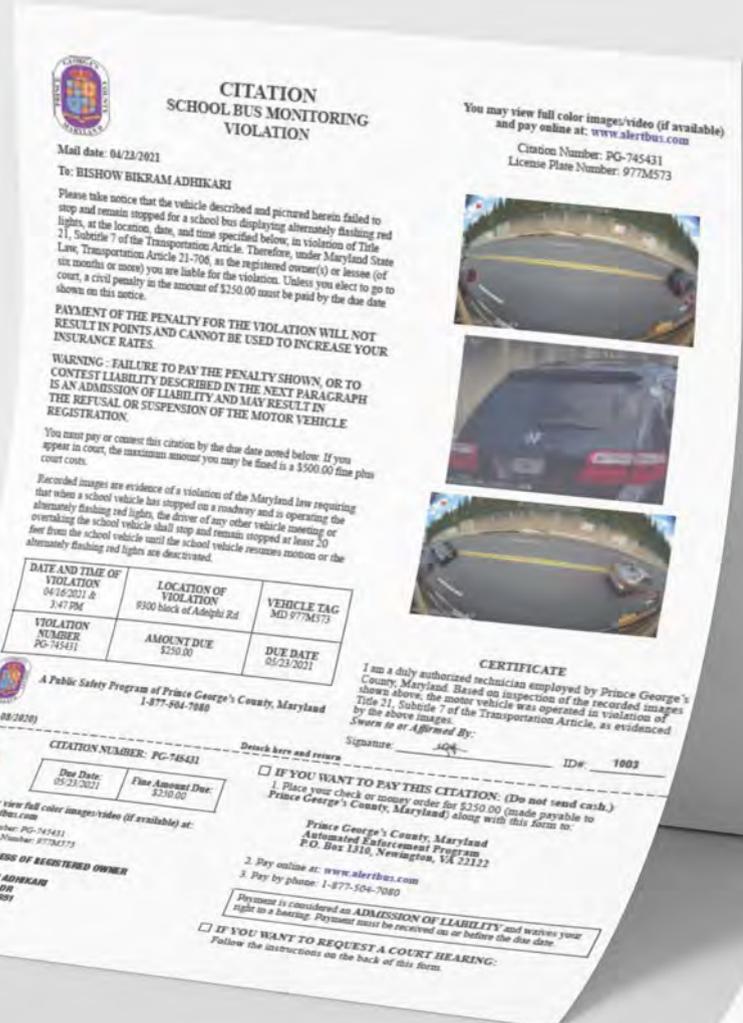
### ENABLING FULL-FLEET ENFORCEMENT

Developed to help process volume of millions of stop-arm events across entire school bus fleets



## CHANGING MOTORIST BEHAVIOR

# Sample of Citation Issued by Law Enforcement



**CITATION SCHOOL BUS MONITORING VIOLATION**

Mail date: 04/23/2021  
To: EISHOW BIKRAM ADHIKARI

Please take notice that the vehicle described and pictured herein failed to stop and remain stopped for a school bus displaying alternately flashing red lights, at the location, date, and time specified below, in violation of Title 21, Subtitle 7 of the Transportation Article. Therefore, under Maryland State Law, Transportation Article 21-706, as the registered owner(s) or lessee (of six months or more) you are liable for the violation. Unless you elect to go to court, a civil penalty in the amount of \$250.00 must be paid by the due date shown on this notice.

**PAYMENT OF THE PENALTY FOR THE VIOLATION WILL NOT RESULT IN POINTS AND CANNOT BE USED TO INCREASE YOUR INSURANCE RATES.**

**WARNING - FAILURE TO PAY THE PENALTY SHOWN, OR TO CONTEST LIABILITY DESCRIBED IN THE NEXT PARAGRAPH IS AN ADMISSION OF LIABILITY AND MAY RESULT IN THE REFUSAL OR SUSPENSION OF THE MOTOR VEHICLE REGISTRATION.**

You must pay or contest this citation by the due date noted below. If you appear in court, the maximum amount you may be fined is a \$500.00 fine plus court costs.

Recorded images are evidence of a violation of the Maryland law requiring that when a school vehicle has stopped on a roadway and is operating the alternately flashing red lights, the driver of any other vehicle meeting or overtaking the school vehicle shall stop and remain stopped at least 20 feet from the school vehicle until the school vehicle remains motionless or the alternately flashing red lights are deactivated.

DATE AND TIME OF VIOLATION	LOCATION OF VIOLATION	VEHICLE TAG
04/16/2021 @ 1:47 PM	9300 block of Adelphi Rd	MD 97734573

VIOLATION NUMBER	AMOUNT DUE	DUE DATE
PG-745431	\$250.00	05/23/2021

**CERTIFICATE**

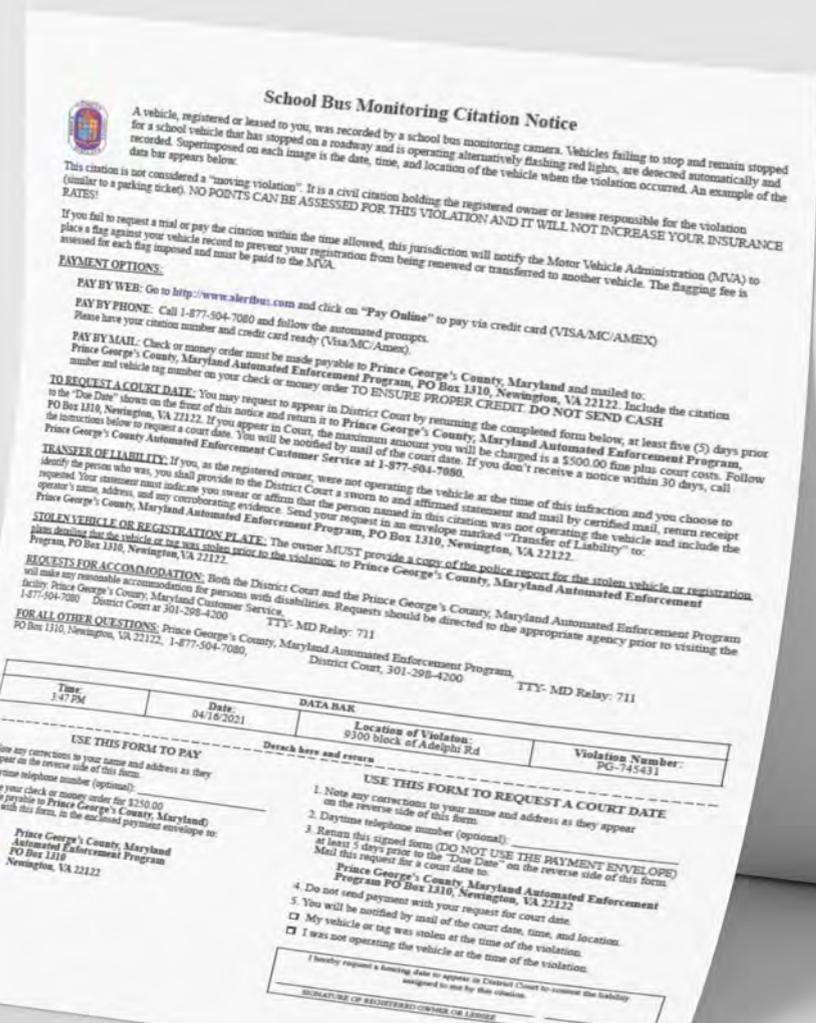
I am a duly authorized technician employed by Prince George's County, Maryland. Based on inspection of the recorded images shown above, the motor vehicle was operated in violation of Title 21, Subtitle 7 of the Transportation Article, as evidenced by the above images.

Sworn to and *affirmed* By: \_\_\_\_\_  
Signature: *ADH* ID#: 1003

**IF YOU WANT TO PAY THIS CITATION:** (Do not send cash.)  
1. Place your check or money order for \$250.00 (made payable to Prince George's County, Maryland) along with this form to:  
Prince George's County, Maryland Automated Enforcement Program  
P.O. Box 1310, Newington, VA 22122

2. Pay online at: [www.alertbus.com](http://www.alertbus.com)  
3. Pay by phone: 1-877-504-7080

**IF YOU WANT TO REQUEST A COURT HEARING:**  
Follow the instructions on the back of this form.



**School Bus Monitoring Citation Notice**

A vehicle, registered or leased to you, was recorded by a school bus monitoring camera. Vehicles failing to stop and remain stopped for a school vehicle that has stopped on a roadway and is operating alternately flashing red lights, are detected automatically and recorded. Superimposed on each image is the date, time, and location of the vehicle when the violation occurred. An example of the data bar appears below:

This citation is not considered a "moving violation". It is a civil citation holding the registered owner or lessee responsible for the violation (similar to a parking ticket). NO POINTS CAN BE ASSESSED FOR THIS VIOLATION AND IT WILL NOT INCREASE YOUR INSURANCE RATES!

If you fail to request a trial or pay the citation within the time allowed, this jurisdiction will notify the Motor Vehicle Administration (MVA) to place a flag against your vehicle record to prevent your registration from being renewed or transferred to another vehicle. The flagging fee is assessed for each flag imposed and must be paid to the MVA.

**PAYMENT OPTIONS:**

**PAY BY WEB:** Go to <http://www.alertbus.com> and click on "Pay Online" to pay via credit card (VISA/MC/AMEX). Please have your citation number and credit card ready (VISA/MC/AMEX).

**PAY BY PHONE:** Call 1-877-504-7080 and follow the automated prompts.

**PAY BY MAIL:** Check or money order must be made payable to Prince George's County, Maryland and mailed to: Prince George's County, Maryland Automated Enforcement Program, PO Box 1310, Newington, VA 22122. Include the citation number and vehicle tag number on your check or money order TO ENSURE PROPER CREDIT. DO NOT SEND CASH.

**TO REQUEST A COURT DATE:** You may request to appear in District Court by returning the completed form below, at least five (5) days prior to the "Due Date" shown on the front of this notice and return it to Prince George's County, Maryland Automated Enforcement Program, PO Box 1310, Newington, VA 22122. If you appear in Court, the maximum amount you will be charged is a \$500.00 fine plus court costs. Follow the instructions below to request a court date. You will be notified by mail of the court date. If you don't receive a notice within 30 days, call Prince George's County Automated Enforcement Customer Service at 1-877-504-7080.

**TRANSFER OF LIABILITY:** If you, as the registered owner, were not operating the vehicle at the time of this infraction and you choose to identify the person who was, you shall provide to the District Court a sworn to and affirmed statement and mail by certified mail, return receipt requested. Your statement must indicate you swear or affirm that the person named in this citation, was not operating the vehicle and include the operator's name, address, and any corroborating evidence. Send your request in an envelope marked "Transfer of Liability" to: Prince George's County, Maryland Automated Enforcement Program, PO Box 1310, Newington, VA 22122.

**STOLEN VEHICLE OR REGISTRATION FEE:** The owner MUST provide a copy of the police report for the stolen vehicle or registration plate stating that the vehicle at tag was stolen prior to the violation, to Prince George's County, Maryland Automated Enforcement Program, PO Box 1310, Newington, VA 22122.

**REQUESTS FOR ACCOMMODATION:** Both the District Court and the Prince George's County, Maryland Automated Enforcement Program will make any reasonable accommodation for persons with disabilities. Requests should be directed to the appropriate agency prior to visiting the facility: Prince George's County, Maryland Customer Service, 1-877-504-7080. District Court at 301-298-4200.

**FOR ALL OTHER QUESTIONS:** Prince George's County, Maryland Automated Enforcement Program, District Court, 301-298-4200. TTY: MD Relay: 711

Time	Date	DATA BAR	Location of Violation	Violation Number
1:47 PM	04/16/2021		9300 block of Adelphi Rd	PG-745431

**USE THIS FORM TO PAY:**

- Note any corrections to your name and address as they appear on the reverse side of this form.
- Daytime telephone number (optional).
- Place your check or money order for \$250.00 (made payable to Prince George's County, Maryland) along with this form, in the enclosed payment envelope to: Prince George's County, Maryland Automated Enforcement Program, PO Box 1310, Newington, VA 22122

**USE THIS FORM TO REQUEST A COURT DATE:**

- Note any corrections to your name and address as they appear on the reverse side of this form.
- Daytime telephone number (optional).
- Return this signed form (DO NOT USE THE PAYMENT ENVELOPE) at least 5 days prior to the "Due Date" on the reverse side of this form. Mail this request for a court date to: Prince George's County, Maryland Automated Enforcement Program, PO Box 1310, Newington, VA 22122
- Do not send payment with your request for court date.
- You will be notified by mail of the court date, time, and location.

My vehicle or tag was stolen at the time of the violation.  
 I was not operating the vehicle at the time of the violation.

I hereby request a hearing date to appear in District Court to contest the liability assigned to me by this citation.

SIGNATURE OF REGISTERED OWNER OR LESSEE \_\_\_\_\_ DATE \_\_\_\_\_

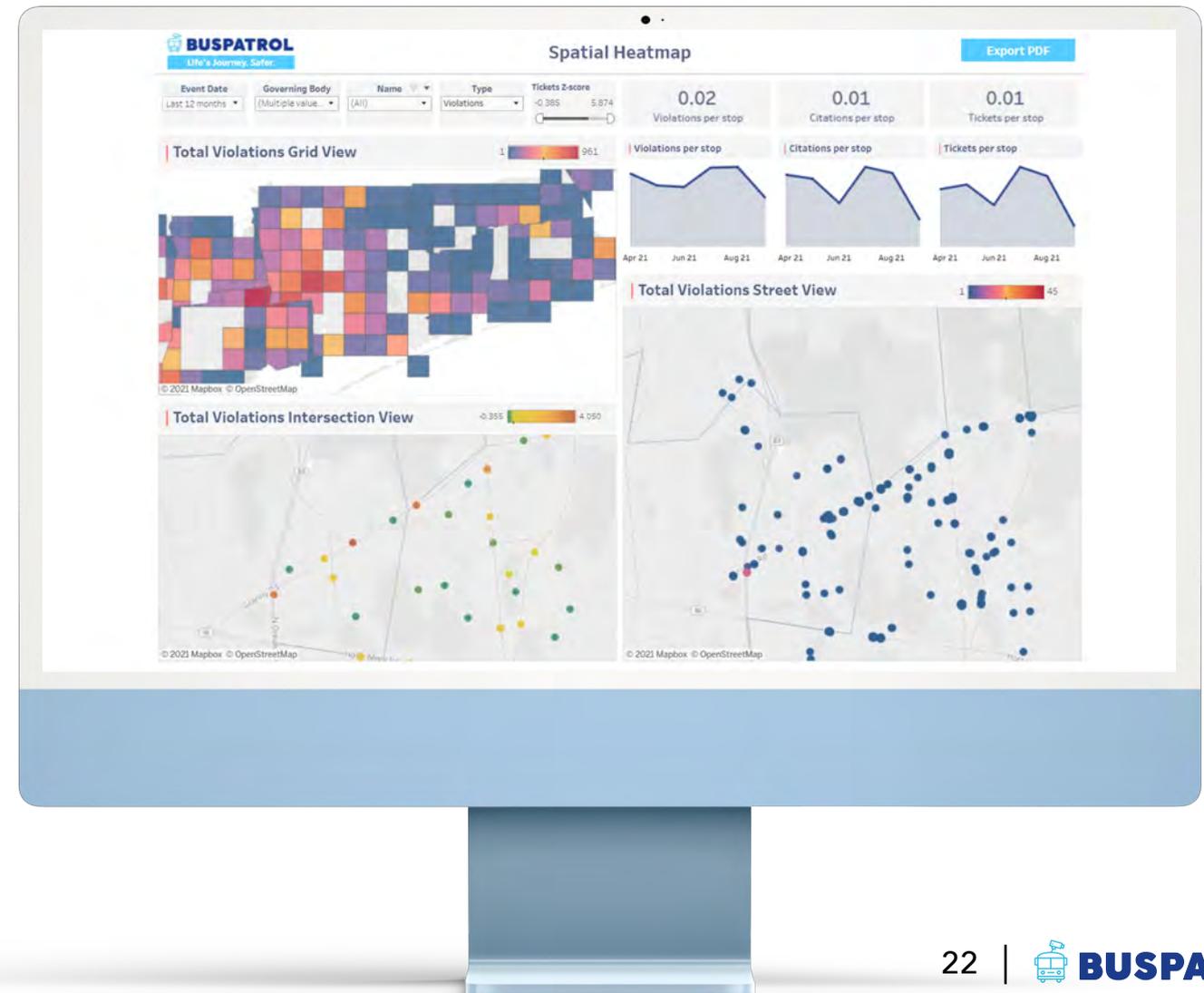
# Performance Tracking | Program Management

## Leveraging Data to Improve Safety and Pupil Transportation

At one recent partner, we were able to identify **70+ hotspots** - outlier locations with significantly higher violation rates.



Proactively installed road signs at each hotspot over the summer. Continuous monitoring for safety improvements.



# 3

## BEYOND ENFORCEMENT







## IMPROVING STUDENT SAFETY & SECURITY

### BENEFITS FOR SCHOOL DISTRICTS

- Full-fleet oversight for authorized officials
- Reduces costs to retrieve footage
- Emergency response management
- COVID-19 mitigation (contact tracing)

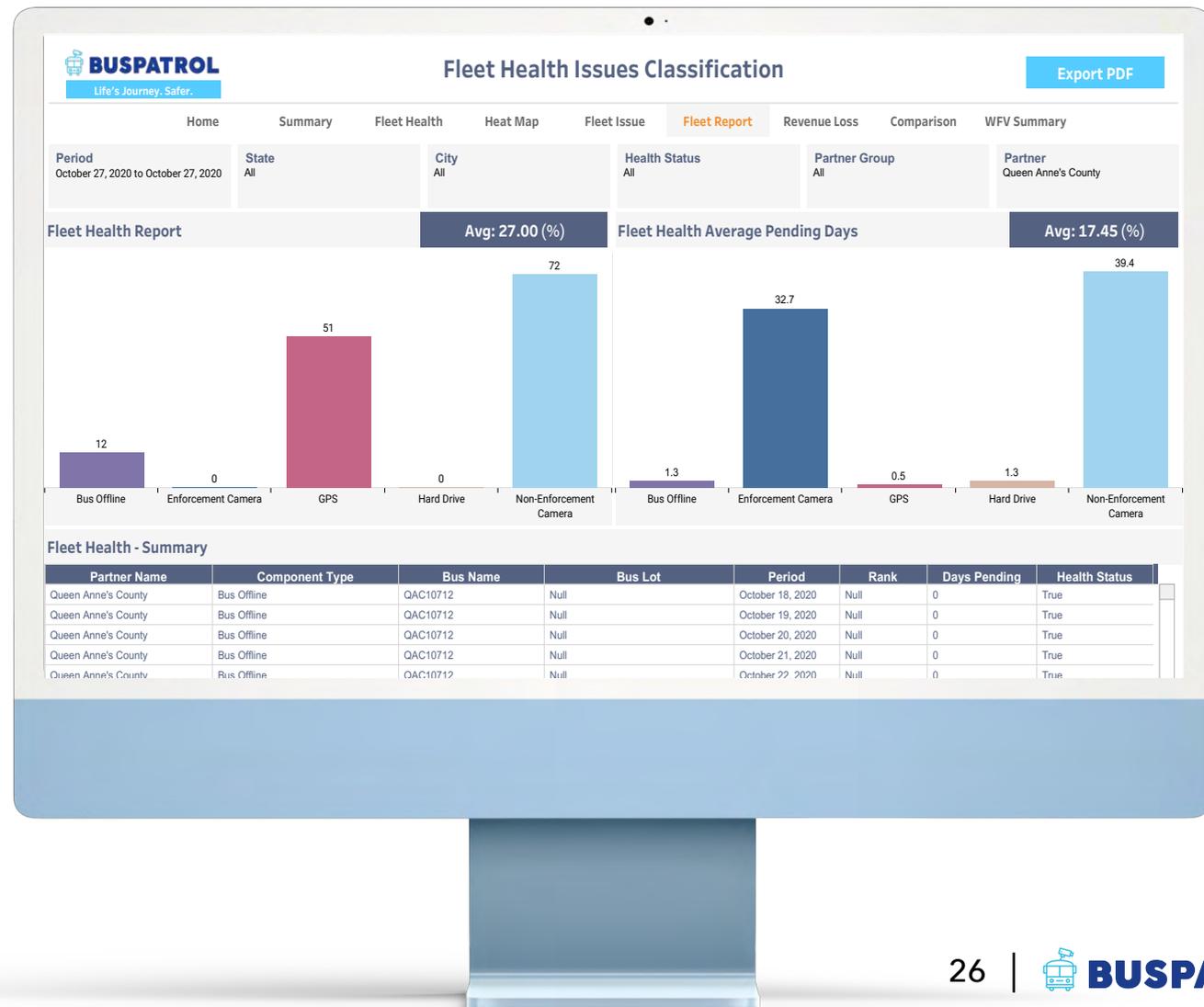


REPORTING INSIGHTS

# Performance Tracking | Fleet Health Check

## Manage and Track the Health of All Cloud-Connected Assets

Our PMs actively monitor fleet health metrics to ensure IoT devices are functional and connected.



## Equitable Access to Technology for Partners



Safety-first methodology means **every bus, every kid, every route & every neighborhood** are safeguarded.

**A CHILD'S LEVEL OF SAFETY SHOULD NOT BE DETERMINED BY THEIR ZIP CODE.**

# Certified Training to Support Full-Fleet Deployments of All Sizes



## **BUSPATROL ACADEMY**

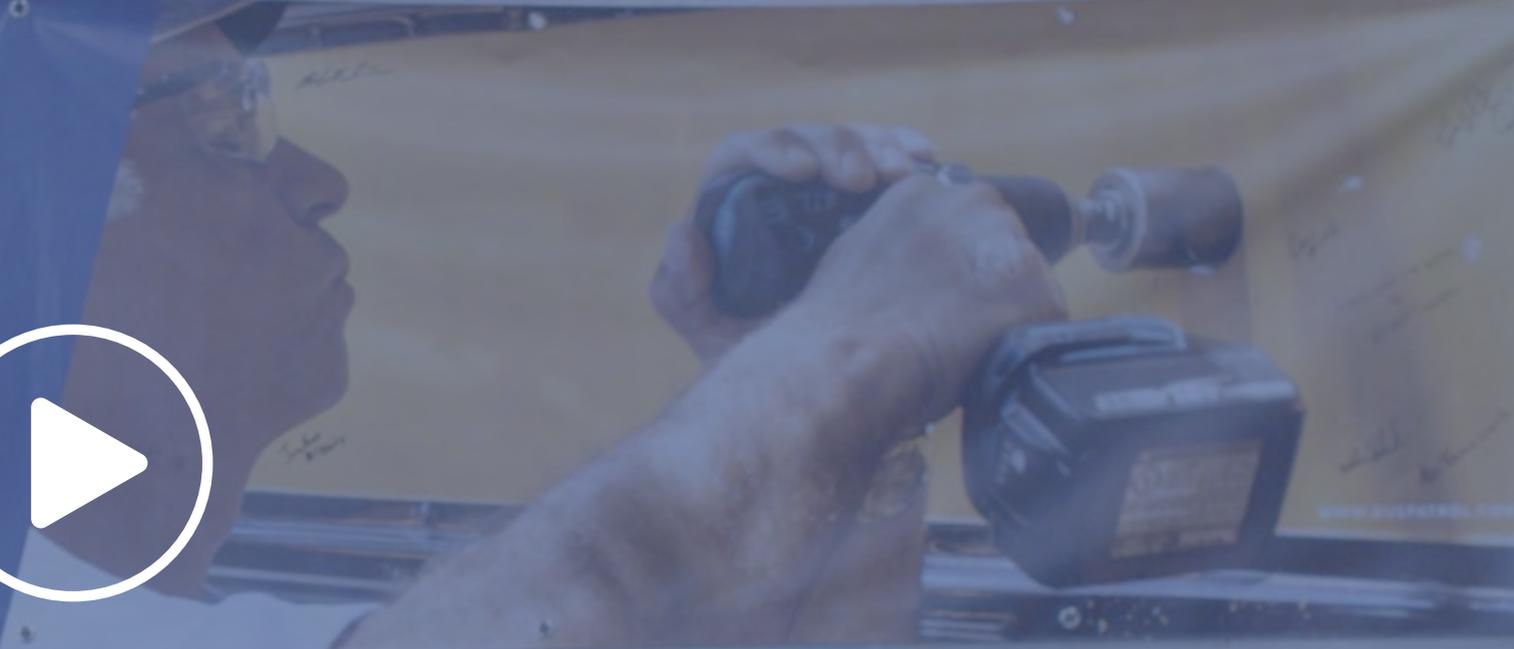
- Competitive advantage to get equipment on buses **more efficiently, more rapidly, with greater quality** than any other provider.
- Technicians must complete a **rigorous 7-day training program**.
  - Includes one-on-one training by a member of our Advanced Technician group.
  - Technicians receive certification levels based on their ability to meet installation standards.





# BUSPATROL ACADEMY

QUALITY IS NOT AN ACT, IT IS A HABIT





# SUFFOLK COUNTY SCHOOL BUS SAFETY PROGRAM



**5000**  
School Buses



**71**  
School Districts



**12**  
Enforcement Jurisdictions



**150 Day**  
Deployment During Pandemic



**INSTALLATIONS**



**EDUCATION**

## FULL-FLEET COMMUNITY PARTNERSHIPS



## PROGRAMS & PILOTS IN 11+ STATES/PROVINCES



# 4

# COMMUNITY EDUCATION



# Educating Communities Through PR and PSAs

BusPatrol School Bus Safety Programs educate drivers and school children so that communities can improve safety.

## Robust community education programs to improve safety

- We aim to correct motorist behavior **even before the 1st ticket is ever issued.**
- A dedicated advocacy team that has **educated millions of drivers across North America.**







# Educating Communities Through PR and PSAs

BusPatrol School Bus Safety Programs educate motorists through traditional and digital public relations efforts

## Media Days & Earned Media

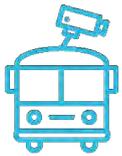
- **Inform motorists** about the presence of automated enforcement technology
- **Re-educate communities** about school bus stopping laws engaging the community for program launch
- **Positive PR** for partners highlighting the safety benefits to the community



# Educating Motorists Through Targeted Digital Campaigns



**STOP-ARM VIDEO  
ENFORCEMENT IS COMING  
TO SUFFOLK COUNTY**



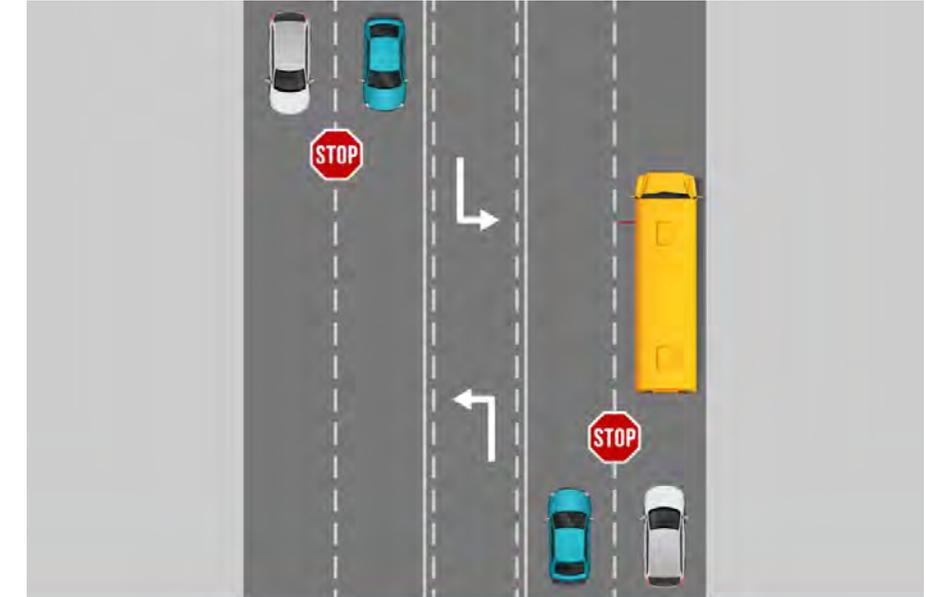
**BUSPATROL**



**REMINDE YOURSELF  
OF THE SCHOOL BUS  
STOPPING LAW  
TO PROTECT OUR KIDS!**

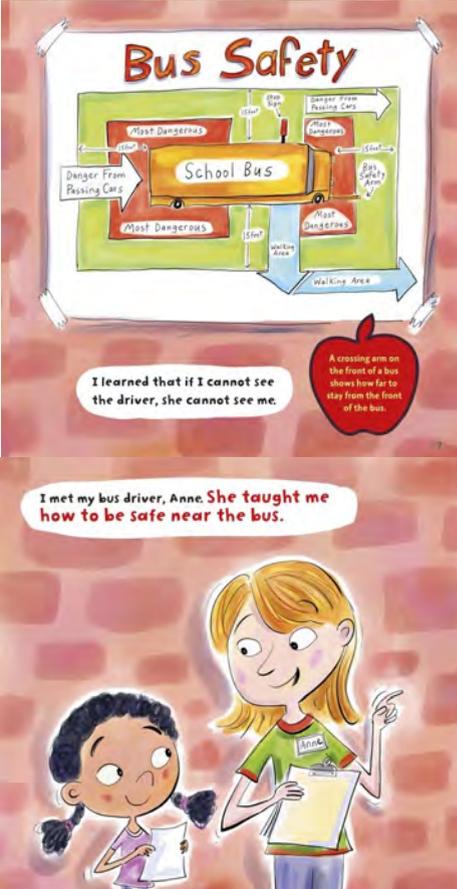
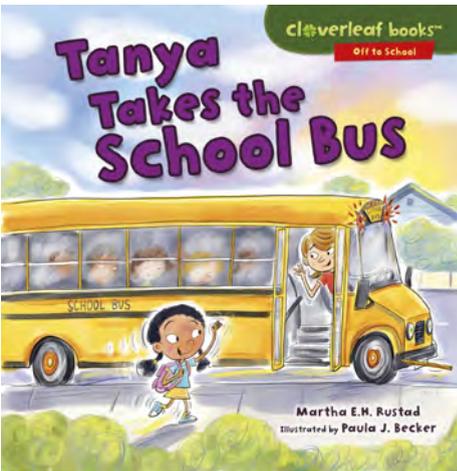


**TWO-LANE:**  
Vehicles traveling in both  
directions **MUST** stop.



**MULTI-LANE PAVED ACROSS:**  
Vehicles traveling in both  
directions **MUST** stop.

Optimized for FB, Instagram and other social media channels.



## Teaching Students About the Danger Zone



Audience	Channels	PSA Material Produced
<p>Parents with Preschoolers (2-5 Years)</p>	<ul style="list-style-type: none"> <li>• YouTube and online video and audio platforms</li> <li>• Social media targeting young parents with children</li> <li>• Digital media platforms</li> </ul>	<ul style="list-style-type: none"> <li>• 3D animated children’s music video addressing the “danger zone” with catchy standalone song for audio platforms.</li> <li>• Exercise and coloring book (printable) to highlight the risks associated with the “danger zone” and how to cross safely.</li> </ul>
<p>Parents with Early School-Age Children (6-8), Preteens (9-12), Teenagers (13-17)</p>	<ul style="list-style-type: none"> <li>• Social media platforms</li> <li>• Schools as a distribution channel</li> <li>• Drivers Ed and DMV (for student drivers)</li> </ul>	<ul style="list-style-type: none"> <li>• Material for school districts to educate:                         <ul style="list-style-type: none"> <li>- Presentations, videos, exercise handouts for teachers to use in classrooms.</li> <li>- Handouts for parents and PTAs.</li> <li>- Email and social content for schools to share</li> </ul> </li> <li>• Social media video campaigns to educate</li> <li>• Website with additional info and downloads</li> </ul>



# 5

## SAFETY PROGRAM MANAGEMENT



# SAAS | Safety as a Service

## End-to-end program management and services



Supply & Installation  
of all Hardware



Issuance of  
Citations



Secure Cloud  
Software



Payment Processing



Requests for  
Court Hearings



Evidence Packages



Expert Testimony



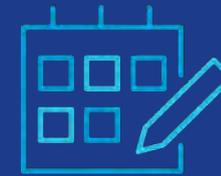
Call Center



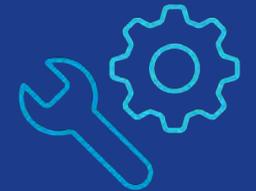
Media Campaign



Training



Monthly Reporting



Ongoing Support  
& Maintenance



**NO CAPITAL NEEDED TO  
DEPLOY & MANAGE THE PROGRAM**

**100%  
Violator-Funded**

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**RISK FREE - ZERO COST**



**98%** OF THE VIOLATORS  
WHO GET A TICKET

VIA STOP-ARM SAFETY PROGRAMS

**DON'T ILLEGALLY PASS A  
SCHOOL BUS A SECOND TIME.**

**ONCE THEY KNOW THE LAW  
IS BEING ENFORCED, THEY STOP.**





# BUSPATROL

FOLLOW OUR SAFETY MISSION



**SAFER BUSES, SAFER KIDS.**

We make the journey to and from school safer for children.

**BUSPATROL.COM**