



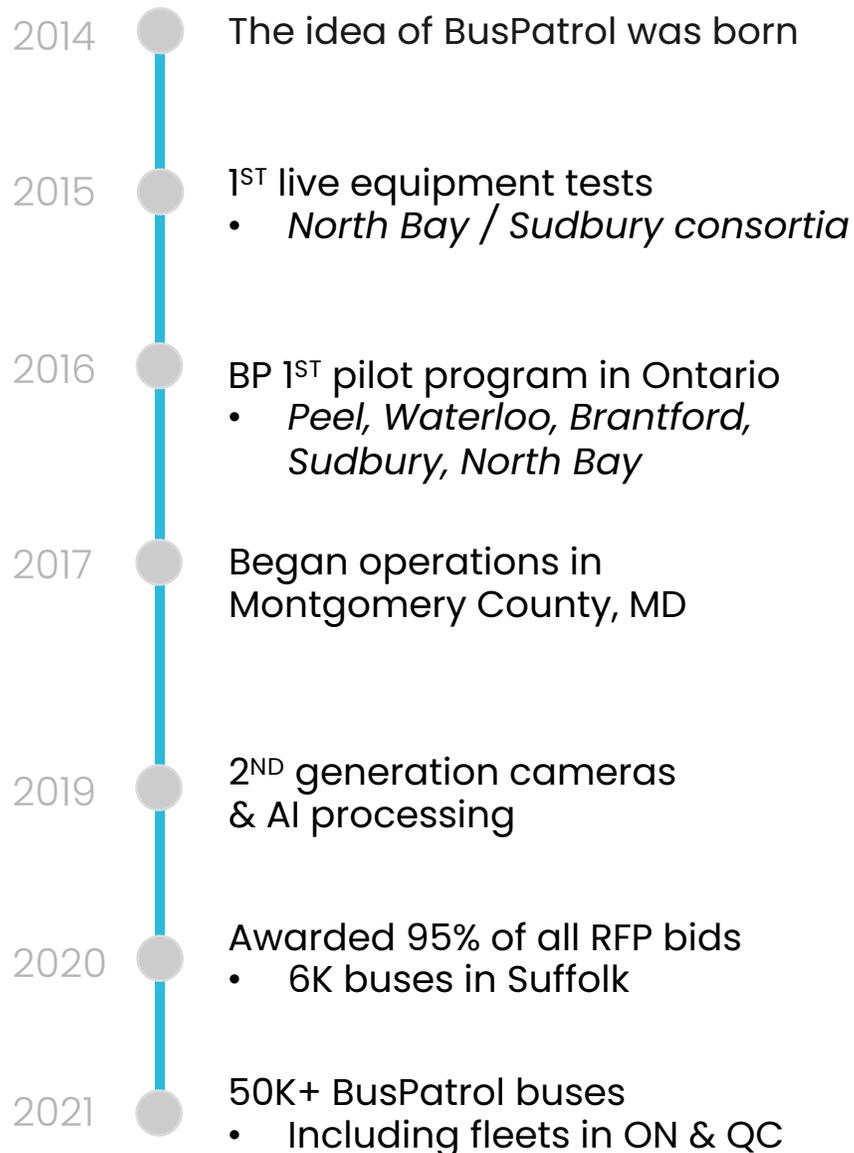
# BUSPATROL

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## BusPatrol Safety Program North Bay Meeting

February 9th, 2021





## SCHOOL 1<sup>ST</sup> PROGRAM APPROACH

Built From Years of Understanding Stakeholder Needs

**6 Years**

Building the most robust school bus safety program

**8.6M**

Hours of live road testing

**5x**

More effective stop-arm enforcement than competitors (AI Assisted)

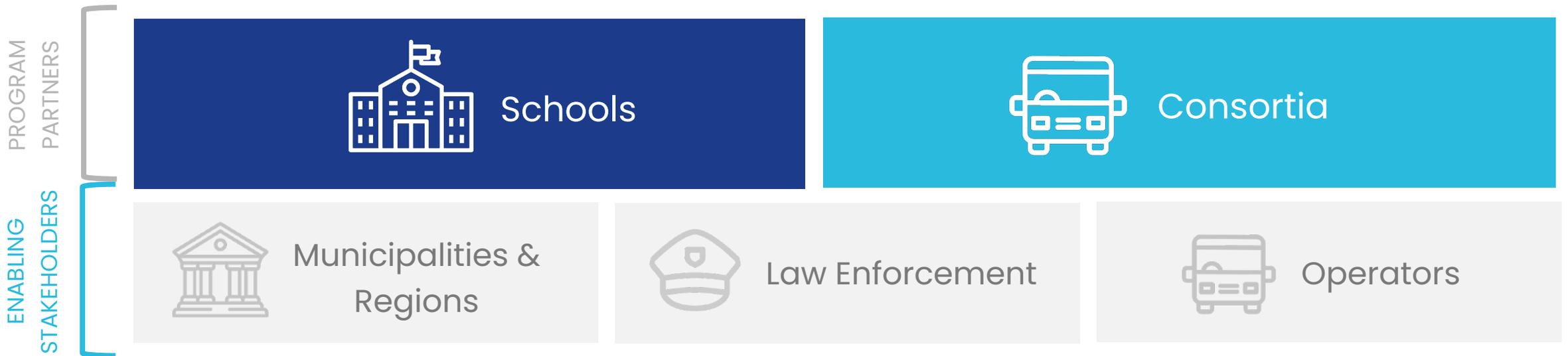
Trusted by State & Provincial legislators in NY, PA, MI, MA, VA, MD, ON, QC to advise on regulation drafting



## SCHOOL 1<sup>ST</sup> PROPOSITION

Because opt-ins are critical to program success

### Our 360° Approach That Delivers All Stakeholder Needs



# PEOPLE FIGHTING FOR CHANGE.

Responsibility to provide  
communities with access to the  
best safety solutions.





Safety technology as a building block for enforcement, awareness and funding of future safety initiatives



Includes Full Fleet Deployment

THE ONLY SOLUTION EFFECTIVELY REDUCING  
STOP-ARM VIOLATIONS AND MAKING COMMUNITIES SAFER.

20%

## PARTIAL FLEET COVERAGE



**PROBLEM:** CAN'T QUANTIFY REDUCTIONS

100%

## FULL-FLEET COVERAGE



**SOLUTION:** COMPREHENSIVE, STABLE DATA



Data Encryption In Transit & At Rest  
Private APN in Telus Network

APPLICATION TECHNOLOGY

### BusPatrol is Powered by Amazon Cloud

- ✓ AWS VPC infrastructure with private subnets, load balancing
- ✓ Serverless application with autoscaling
- ✓ LDAP / SSO
- ✓ AWS S3, Lambda, Batch and Aurora Clusters

ANALYTICS LAYER

AWS API Gateway

AWS Redshift

AWS QuickSight

AWS Glue

Tableau Server

IDENTITY BASED DATA SEGREGATION

Peel Student Technology Stack

Provincial Offences Officers Processing Stack



AI-assisted technology



End-to-end encryption in transit and at rest



AWS Canada infrastructure with redundancy and disaster recovery



Accenture-verified cybersecurity



PCI & SOC 2 compliance



IAM based, physical segregation of data & video



Tableau reporting interface and AWS API gateways

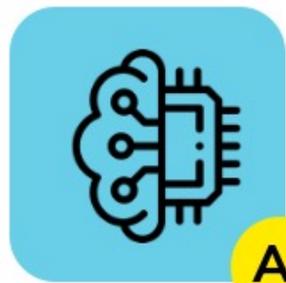


Only company certified for Emergency Responder private network

## STOP-ARM TECHNOLOGY FEATURES



The stop-arm enforcement camera suite contains 3-5 high resolution cameras, optimized for performance in environments with variable weather and light conditions.



AI Assisted  
Technology

Ai



8 Lanes of  
Coverage

8



Variable  
Weather  
Conditions



Variable  
Light Conditions



4K & 180°  
Coverage



Anti Vibration  
Technology



**HIGHEST STOP-ARM  
CAPTURING RATE**



TRAFFIC GOVERNANCE  
MANAGEMENT



**SECURED AWS CLOUD  
TECHNOLOGY WITH  
DATA SEGREGATION**

\*Page 13

SCHOOL GOVERNANCE  
MANAGEMENT



## Citation Management Tools

Evidence Processing  
Vehicle Page  
Citation Issuing

### Provincial Offences Officers

Manage Data and Video at  
Processing Center

External Stop-Arm Cameras Only

## Fleet Management & Routing

### Parent Apps



SAMSUNG



### School & Consortia

Access to Student Safety  
Data & Application

Internal Cameras Only



Cloud-Connected Safety Cameras

Full-service Fleet Management

\$0 Capital Outlay



### BUS ROUTE



Stop-arm camera is activated, while bus is in operation



Overhead lights activated, bus stops & stop-arm deployed

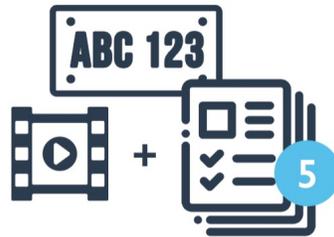


Stop-arm violations are identified and recorded



Video, GPS and data are captured by BusPatrol AI

### PROCESSING & REVIEW



BusPatrol AVA AI compiles video and evidence package

### PEEL REGIONAL PROCESSING CENTRE



Provincial offence officers process stop-arm incidents



Provincial offence officers issue stop-arm citations

\*BusPatrol has already deployed a program with municipal officers overseeing processing / ticketing

ENFORCEMENT  
& EDUCATION

## PEEL REGIONAL PROCESSING CENTRE



Ticket is mailed to offender with website containing link to access video evidence



Driver makes payment online or at designated municipal office



Citation revenue used to cover program expenses & invest in safety initiatives



Call Centre Available to Educate Drivers on Road Safety and Facilitate Citation Management and Collection

**FULL-STOP ENFORCEMENT PROGRAM**

**MORE THAN TECHNOLOGY**

## SCHOOL DISTRICTS & CONSORTIA

### 100% Fleet Deployment Model

- ✓ Critical for consortia opt-in
- ✓ Equitable safety for all constituents



- Next-gen tech for schools that integrates to:
  - ✓ Parent apps
  - ✓ Decision analytics
  - ✓ Route planning
  - ✓ Safety technology
- Millions in new safety technology

## SCHOOL BUS OPERATORS

- Industry-leading hardware
  - 100% free to private operators
- Seamless and automated program
  - Management & processes
  - Deployment & maintenance

**\$0** No Upfront Costs or Capital Outlay

- Integrated with fleet planning software



## INTEGRATED FLEET TECH SOLUTIONS

Accessibility to Technology for Schools

- Route Planning Software Solution
- Transportation Information Portal
- Map & Boundary Administration Software
- GPS Tracking & Analysis Module
- Redistricting Analysis Module
- Route Costing Capabilities
- BusPlanner Turns+
- Chipmunk Parent App
- Implementation, User Training & SAAS



PSAs and Educational Campaigns for Drivers – 30 Day Warning Period



The Best Hardware Demands the Best Software and Bundled Services to Support it.

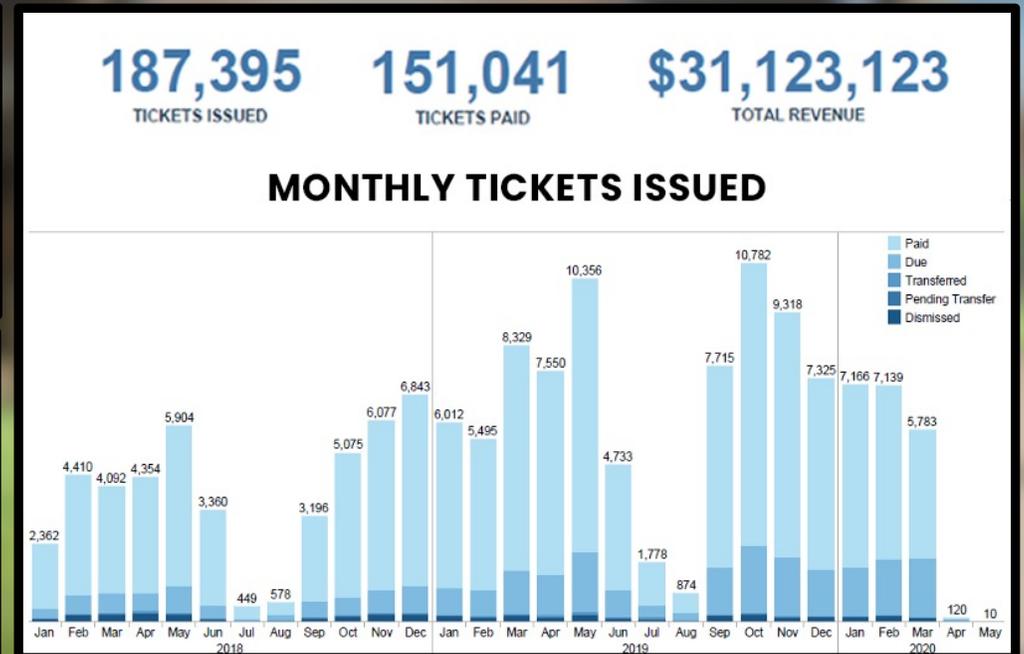
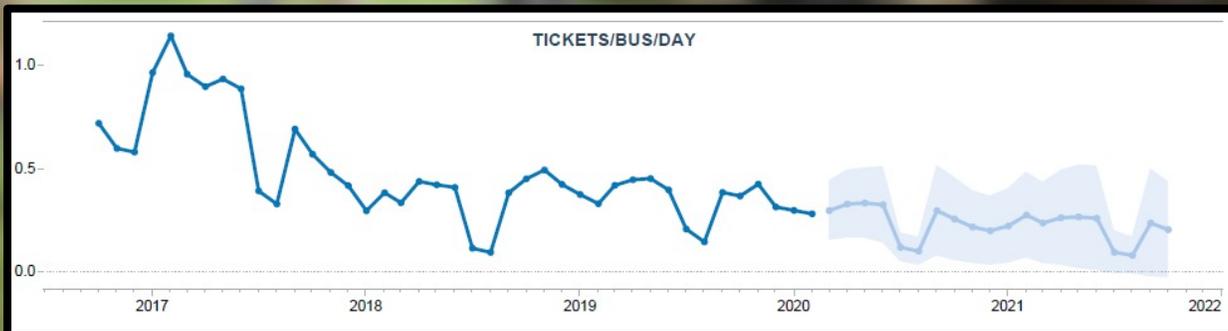
### Partner Portal

### GPS & Reporting Tools

- Real-time GPS
- Historical GPS timestamps

BusPatrol AVL: Automatic vehicle locator GPS and accelerometer system provides real-time telemetry data.

Snail Trail: GPS telemetry data is saved so you can look up the historical location of the bus.



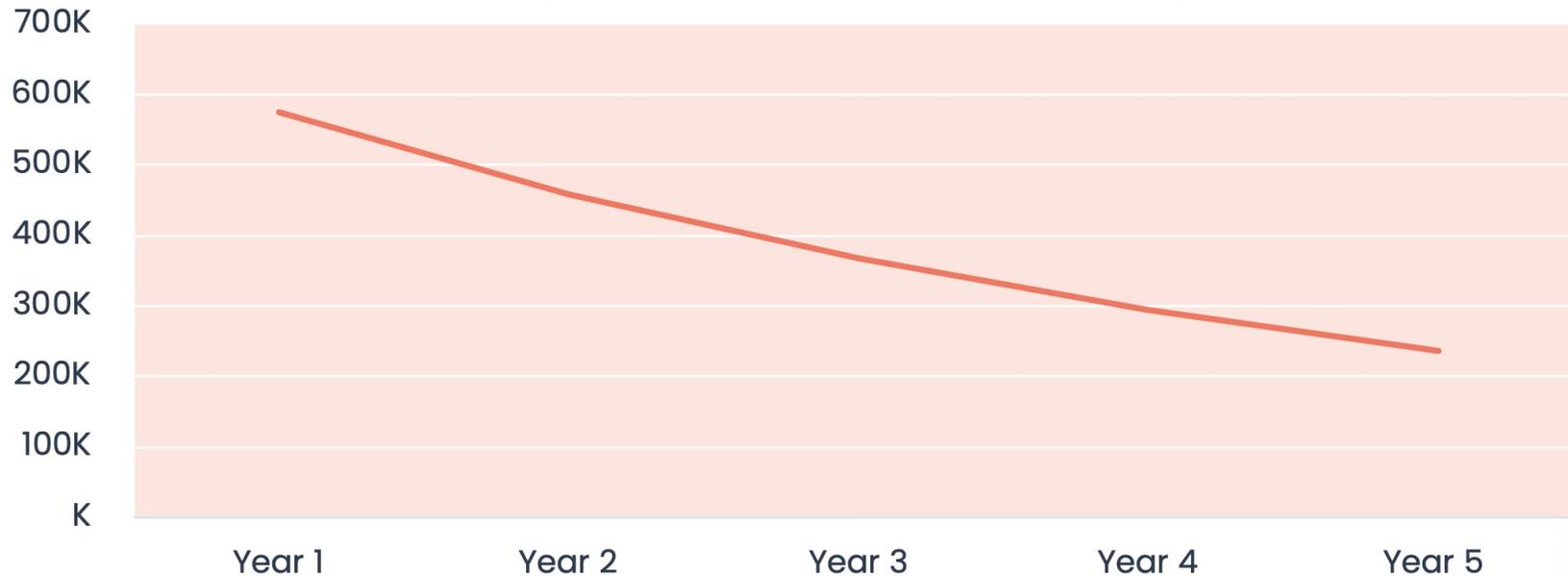
Correcting Motorist Behavior Through Stop-Arm Enforcement Over Time

Suffolk County, NY	Year 1	Year 2	Year 3	Year 4	Year 5
Total Violations	573,937	459,150	367,320	293,856	235,085

## Changing Driver Behavior Around School Buses

Estimated 60% Reduction in Violations

### Stop-Arm Violations (Y1-Y5)



A yellow school bus is the central focus. In the foreground, a young girl in a red dress with a blue backpack is being hugged from behind by a woman in a white top and tan skirt. In the background, a boy with a backpack is standing near the open door of the bus, and a woman is visible inside. The scene is set outdoors on a sunny day.

**STUDENT SAFETY BENEFITS  
BEYOND ENFORCEMENT**

FULL-FLEET MODEL IS INCLUSIVE AND PROVIDES  
SAFETY BENEFITS TO ALL STUDENTS

**MONTGOMERY COUNTY, MD**

100  
%



**FULL-FLEET COVERAGE = 1382 BUSES**

**350** School Buses Have  
Not Issued Tickets

2 ROUTES A DAY | AVG. 50 STUDENTS PER BUS

**35,000 RIDERS BENEFIT FROM**

ROUTING SYSTEM

INTERNAL SAFETY CAMERAS

REMOTE VIDEO ACCESS

REAL-TIME STREAMING

## OPTIONAL SAFETY CAMERA VIEWS



Optional safety cameras available at no cost to school districts and municipalities.

\*Our solution is fully-customizable to meet our partners' needs and their school bus make and models.

**LIVE** STREAMING

Remote Access



Cloud  
Connectivity



\*Locations  
Customizable



4



## ADDITIONAL TECHNOLOGY FEATURES



The same technology that powers our stop-arm enforcement program enables school districts and municipalities to upgrade their fleet with supplementary safety technology:



Windshield  
Camera



Rearview  
Camera



Sideload  
Camera



Interior Cloud  
Connected  
Cameras



Health Check



Real-Time GPS  
& Reporting Tools



On Demand  
Video



Live View  
Streaming

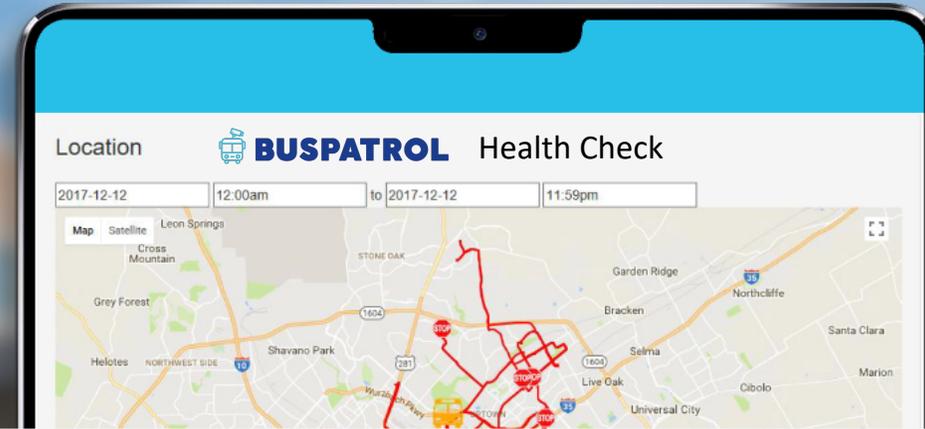


Silent Alarm  
Emergency  
Alert System

The Best Hardware Demands the Best Software and Bundled Services to Support it.

## Partner Portal Health Check

- Real-time overview of BusPatrol's pupil transportation technology and tools.
- Quickly review the status and functionality of cameras across your entire fleet to ensure optimal citation management.



### Health

99% 

100% 



Today at 3:06 PM	SW129	0682005888	10 140 24 11 [vnc] [rdp]	Southwest ISD	Southwest ISD	75%		
Today at 3:06 PM	SW198	0682005767	10 140 24 32 [vnc] [rdp]	Southwest ISD	Southwest ISD	73%		
Today at 3:06 PM	SW106	06820057F0	10 140 25 172 [vnc] [rdp]	Southwest ISD	Southwest ISD	57%		
Today at 3:06 PM	DV68	0682005748	10 140 23 203 [vnc] [rdp]	Del Valle	Del Valle	70%		
Today at 3:06 PM	PF28	0682004EF9	10 140 20 225 [vnc] [rdp]	Pflugerville	Pflugerville	77%		
Today at 3:06 PM	PF42	0682005226	10 140 21 40 [vnc] [rdp]	Pflugerville	Pflugerville	77%		
Today at 3:06 PM	PF126	068200530A	10 140 24 38 [vnc] [rdp]	Pflugerville	Pflugerville	67%		
Today at 3:06 PM	PF226	0682005573	10 140 23 242 [vnc] [rdp]	Pflugerville	Pflugerville	67%		
Today at 3:06 PM	PF45	0682005584	10 140 21 44 [vnc] [rdp]	Pflugerville	Pflugerville	67%		
Today at 3:06 PM	DE69	0682005526	10 140 20 256 [vnc] [rdp]	Pflugerville	Pflugerville	67%		

The Best Hardware Demands the Best Software and Bundled Services to Support it.

## Partner Portal On-Demand Retrieval

- Streamline video retrieval process by requesting video via BusPatrol Secure SmartCloud Ecosystem
- Cost saving allowance possible by decreasing man hours spent pulling video
- Security in knowing who has access to your internal video

### Create a Video Request

[← Back to Video Requests](#)

Search for Vehicle

Search for Vehicle

Request Start Date & Time

MM/DD/YYYY 12:00 PM

Select Cameras

Select Cameras

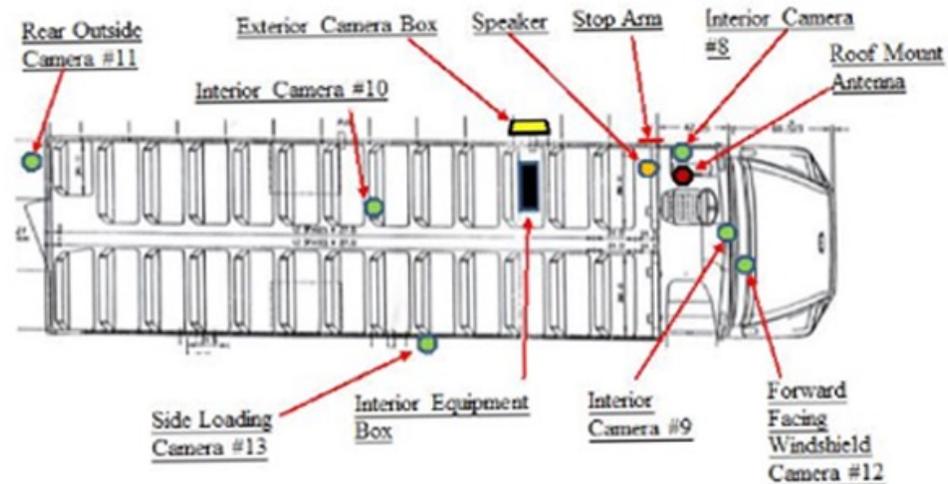
Request Duration ⓘ

1

Description

Please enter a description of your request.  
(e.g. Traffic accident at Smith Rd. and West Rd.)

Submit Request



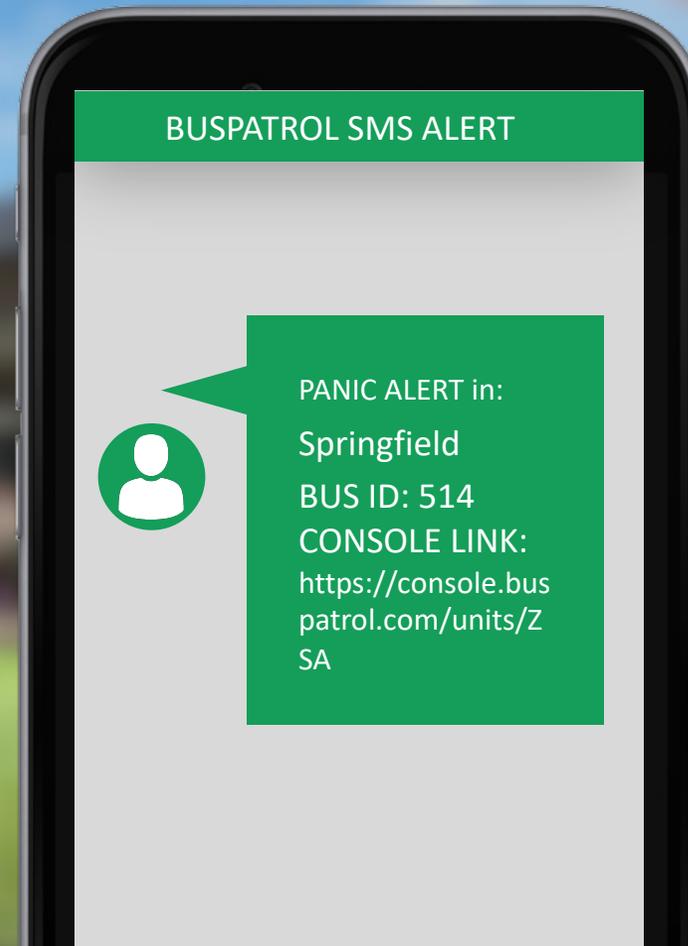
The Best Hardware Demands the Best Software and Bundled Services to Support it.

## Real-Time Emergency Alerts

BusPatrol Silent Alarm triggers a notification link that provides important information including still images, GPS info, and live view.



SILENT ALARM  
SAFETY FEATURE

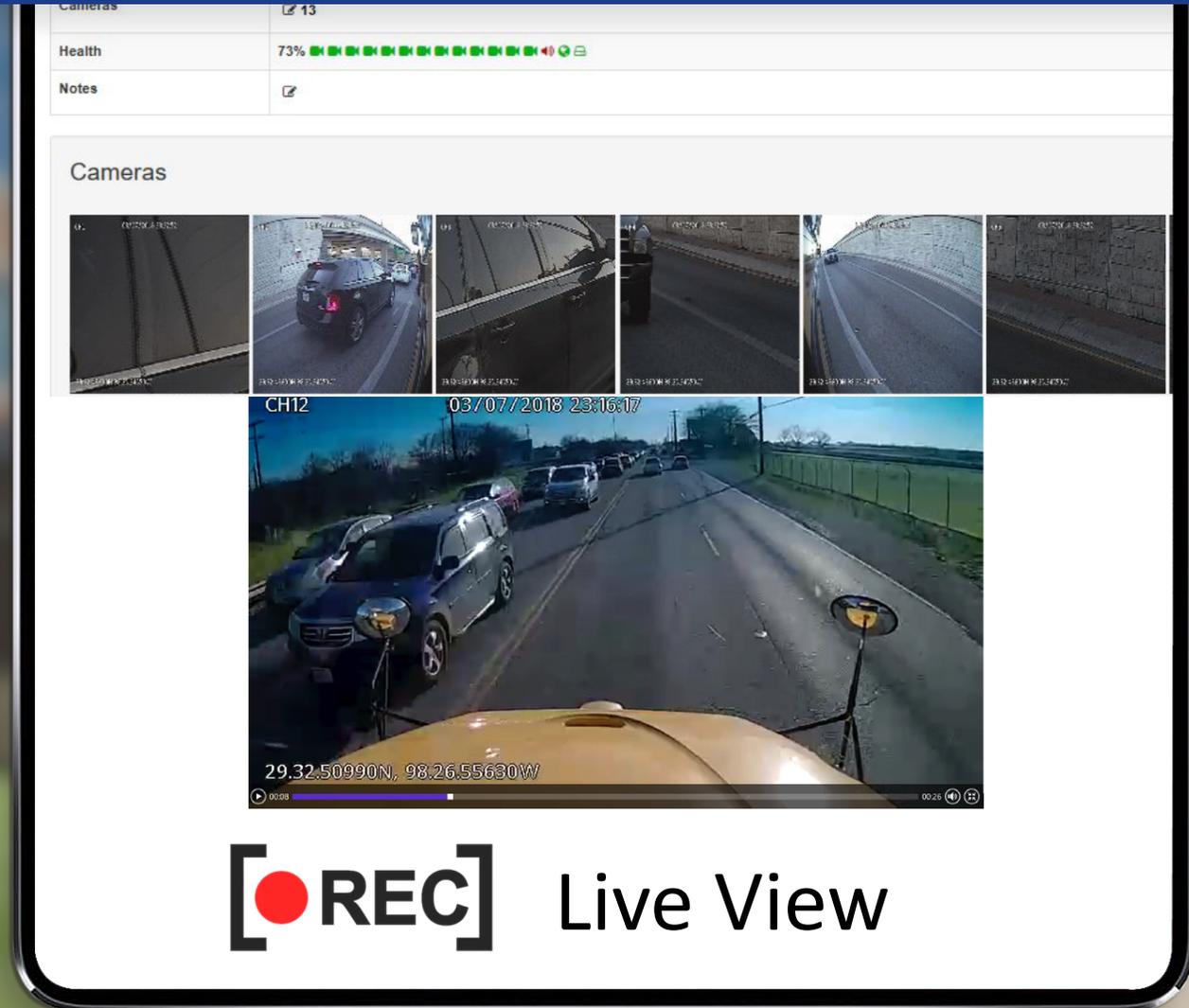


The Best Hardware Demands the Best Software and Bundled Services to Support it.

## Partner Portal Live View Streaming

Our exclusive capability allows school officials to remotely access live audio & video feeds from the school bus when incidents occur.

**SAFETY FEATURE**

A screenshot of the BUSPATROL Partner Portal interface. At the top, there is a status bar with 'Cameras' (13), 'Health' (73%), and 'Notes'. Below this is a 'Cameras' section with a grid of six camera feeds. The largest feed is a live video stream from a bus camera, showing a road with a line of cars. The video player includes a timestamp '03/07/2018 23:16:17', coordinates '29.32.50990N, 98.26.55630W', and a progress bar. At the bottom, the 'REC' logo and 'Live View' text are displayed.

Cameras	13
Health	73%
Notes	

Cameras

CH12 03/07/2018 23:16:17

29.32.50990N, 98.26.55630W

**[REC]** Live View



**SAFEGUARD YOUR**

**ENTIRE FLEET AT NO COST**

**INTEGRATED SAFETY TECHNOLOGY SOLUTIONS**

**\$0**



## Giving Municipalities the Freedom to Develop their own Programs

- BusPatrol's complies with all provincial regulations
  - Developing processing centres to comply with regs and guidelines
- **North Bay can choose from three models to process stop-arm violations**
  - Including joining BusPatrol's existing Peel processing centre

## Provincial Guidelines

	<p>With this new program, municipalities will continue to have the choice as to whether they would like to set up a school bus stop arm camera program in their municipality. Some examples of other evidentiary requirements include:</p> <ul style="list-style-type: none"> <li>▶ State that the system used to take the photograph was an automated school bus stop arm camera system as per the regulation;</li> <li>▶ Set out the manufacturer's name and the model number of the automated school bus stop arm camera system used to take the photograph; and</li> <li>▶ State the name of the municipality in which the school bus was located when the photograph was taken.</li> </ul> <p>For a full list of evidentiary requirements, please consult the HTA and its relevant school bus stop arm camera regulations, along with the Part 1 <i>Provincial Offences Act</i> forms.</p>
Privacy	<p><b>General Operating Considerations</b> Municipalities should comply with existing privacy rules in the <i>Municipal Freedom of Information and Protection of Privacy Act</i> for storing and transferring sensitive information. MTO recommends that municipalities undertake a privacy assessment before launching a school bus stop arm camera program.</p>
Procurement	<p>The camera technology chosen will need to be able to capture all elements of the offence – such as the stop arm being actuated while the bus is passed by a motor vehicle that has a clearly visible number plate, etc. – and comply with all requirements set out in the future school bus stop arm camera regulation. Video at a minimum of 10fps, or an equivalent for a series of photographs that are taken in very quick succession, is a requirement. Please consult the HTA and its relevant school bus stop arm camera regulations, along with the Part 1 <i>Provincial Offences Act</i> forms, prior to setting up your school bus stop arm camera program.</p>
Penalties	<p>Sections 175 (19) and 175 (20) of the HTA set out the penalties for the owner-based offences for passing/overtaking a school bus. Under a school bus stop arm camera program, the penalties for these owner liability offences remain unchanged. The set fine for these offence(s) is \$400 with a maximum penalty of \$2,000.</p> <p>Also, being that these are owner-based offences, demerit points and licence suspensions are not imposed upon conviction. Those drivers convicted of a school bus passing offence may be subject to licence plate denial if they default on the fines.</p>
Signage	<p>Signage will be uniform across the province, signage requirements will be outlined as part of the plate registrant data access agreement.</p>

## Peel Processing Centre



- Deployed using:
  - City infrastructure
  - City employees
  - Regional authorities
  - Centralized provincial offences officers
- Who can join and what are the payment obligations?
  - Any municipality can join Peel's processing centre for seamless deployment of a BusPatrol safety program
  - Payment obligations are limited to and paid exclusively from stop-arm enforcement revenues including the required provincial offences officers.

## 1. JOIN PEEL PROCESSING CENTRE

### Streamlined and Seamless Enforcement

- ✓ Centralized management and implementation of processing centre including required provincial offences officers
- MOU and negotiations required with Peel on fine revenue distribution

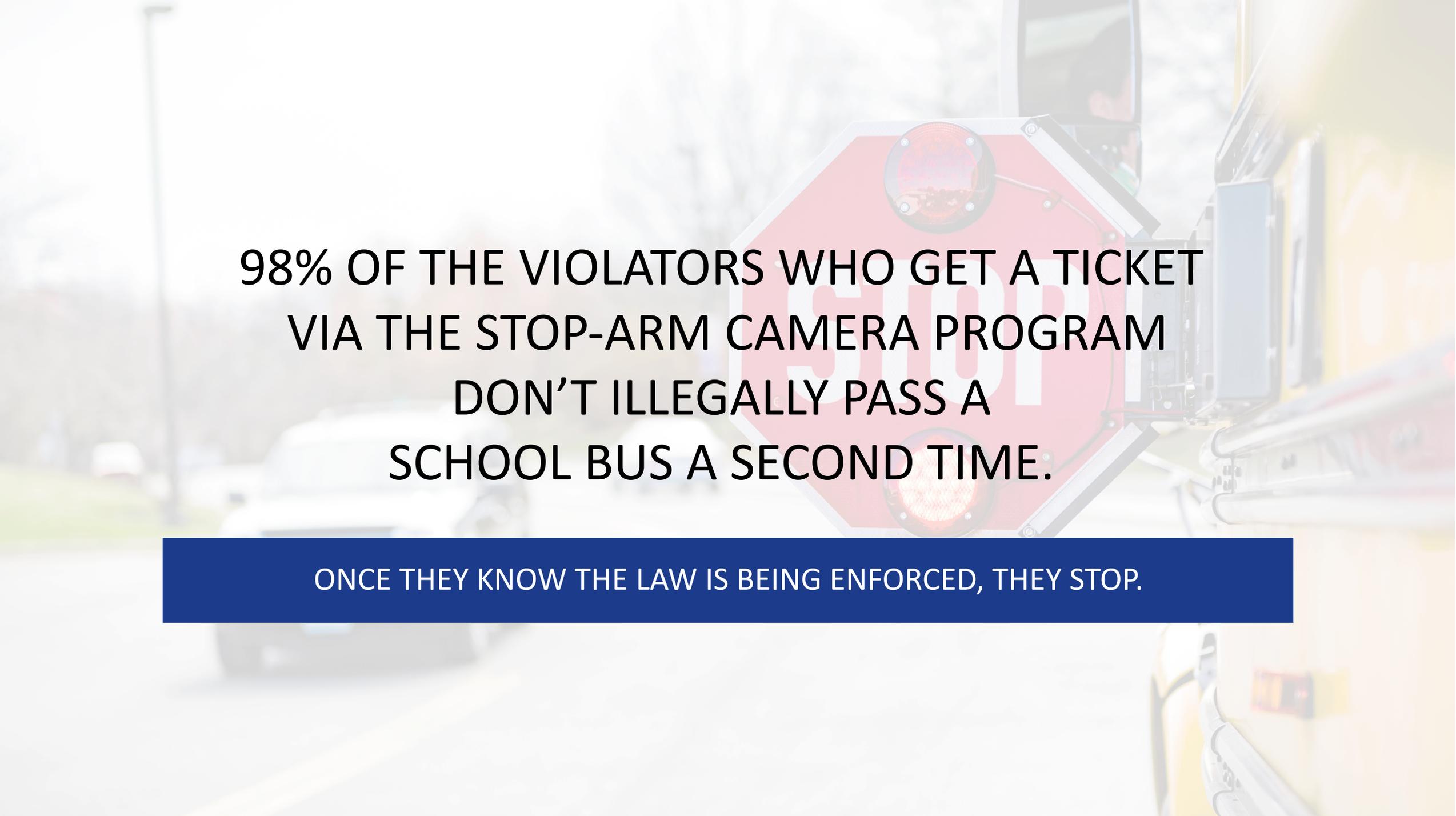
## 2. DEVELOP REGIONAL PROCESSING CENTRE

- ✓ Existing policies already in place for fine revenue sharing and distribution
- Time required to coordinate with municipalities, region and BusPatrol to implement the regional processing centre

## 3. DEVELOP NORTH BAY PROCESSING CENTRE

- ✓ Increased independence from region and other processing centres
- Limited revenues vs. costs for provincial offenses officers
- Time and resources required to coordinate BusPatrol to implement
- Coordination required with MTO to implement local processing centre



A school bus is shown from a side-front perspective, with its stop sign extended and red flashing lights illuminated. The background is a blurred street scene with other vehicles and trees.

**98% OF THE VIOLATORS WHO GET A TICKET  
VIA THE STOP-ARM CAMERA PROGRAM  
DON'T ILLEGALLY PASS A  
SCHOOL BUS A SECOND TIME.**

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

# Thank You!

Contact us:

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**BUSPATROL.COM**

FOLLOW OUR MISSION:     