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Mobileye Shield+

The most advanced collision avoidance warning system for transit buses

Mobileye Shield+

Advanced Driver Assistance System

Mobileye Shield+ is the most advanced collision avoidance system for large vehicles. Transit bus in all environments. Vulnerable Road Users (VRUs) including pedestrians and cyclists often are not seen by operators due to large blind spots around the vehicle, especially when making turns. Mobileye Shield+ increases awareness for drivers, while keeping passengers and VRUs safe on the streets.

Mobileye Shield+ yields amazingly simple left, center, and right alarm interfaces that communicate audio and visual alerts to drivers based on the directional location of the VRU and the potential for collision. Whether a straightaway or turn, the smart vision multi-camera system is tuned with sophisticated algorithms and years of Mobileye experience to assist drivers and avoid potential collisions.

Utilizing intelligent vision sensor cameras that work like a bionic eye, the system identifies a diverse and extensive variety of potential dangers on the road, such as vehicles, cyclists, pedestrians and more. The distance and relative speeds are continuously measured to calculate the risk of collision. The system also detects lane markings and traffic signs, understanding the dynamic landscape of different driving environments. When danger is imminent, visual and audible alerts warn the driver to make the necessary corrections in sufficient time to avoid potential collisions or mitigate their severity.

01 Intersection Complexity For Bus Operators

BLUE CONES

Indicate Mobileye Shield+ coverage. Smart vision sensor cameras on the front and sides of the bus track possible collision courses.

RED CONES

Indicates blind zone created by a pillar. Vision sensor cameras and displays alert the driver in time to avoid or lessen incident severity.

02 Reduce Pedestrian Collisions, Save Lives

MULTI-CAMERA SYSTEM

In addition to the benefits of the Mobileye 8 Connect™ Collision Avoidance System, this smart vision multi-camera system provides drivers with added blind spot protection on the side and front of the veicle.

DRIVER AWARENESS

Pedestrian and cyclist side-sensing make the driver aware of VRUs in the bus' path, before an incident occurs, giving the driver time to react and take corrective action.

03 Blind Zones Around Large Vehicle

Assists large vehicle operators to prevent collisions with vulnerable road users.

Provides coverage of blind zones around the bus.

Provides continual updates of near crashes with pedestrians and cyclists.

Identify exact geo-location of incidents.

Assists decision makers by providing invaluable real-time big data on dangerous intersections.

Mobileye Shield+ Night Vision Capability

The Mobileye Shield+ System is equipped with night vision VRU detection. The smart cameras detect pedestrians and cyclist in low light conditions*, offering crucial assistance to drivers when needed most.

*15 LUX Minimum

Optional Advanced Pedestrian Alert System (APAS)

The optional intelligent, external alert system will send an audible alert to VRUs around the bus to ensure they are aware that the bus only when Mobileye Shield+ detects an imminent collision between the vehicle and a VRU. This “intelligent” or smart technology alert reduces noise pollution and helps prevent VRUs from “tuning out” excessive alerts that sound at every turn.

04 Mobileye Shield+ System Components

Driver Alert Displays

- Yellow & red LED boards for caution & alarm status
- Integrated EyeWatch interface in center display
- Piezo speaker system for audible alerts
- Universal mounting features

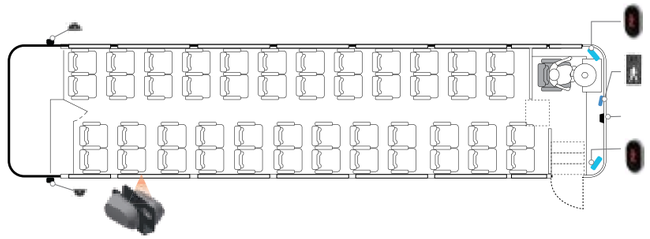
Windshield Mounted Vision Sensor Camera

- Multi-core chip
- Processing platform for all Mobileye functions
- Leading automotive application chip
- Mobileye algorithms for vehicle and pedestrian detection

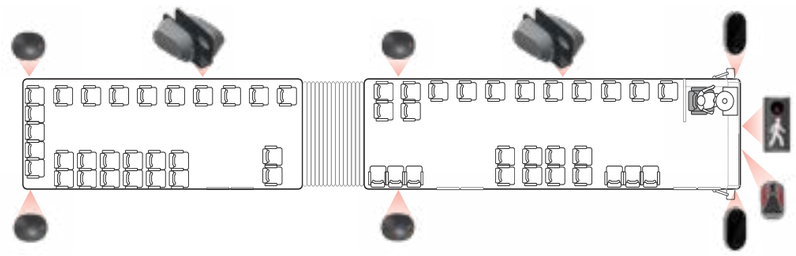
Exterior Vision Sensor Camera

- Concealed wiring
- Heated interior chamber
- IP67 Rated
- Exterior cameras withstand the rigors of the transit environment

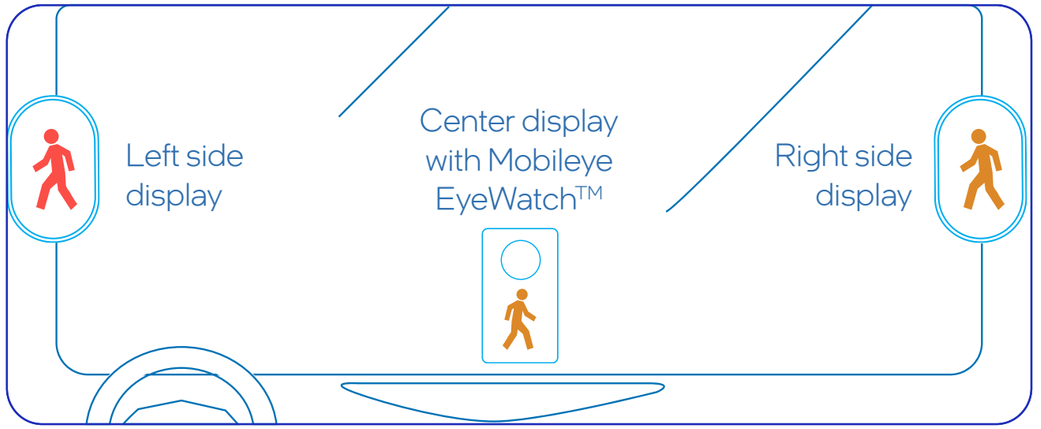
Top View of Shield+ Components



Shield+ Components on Articulating Bus



05 Smart Camera & Driver Display Locations



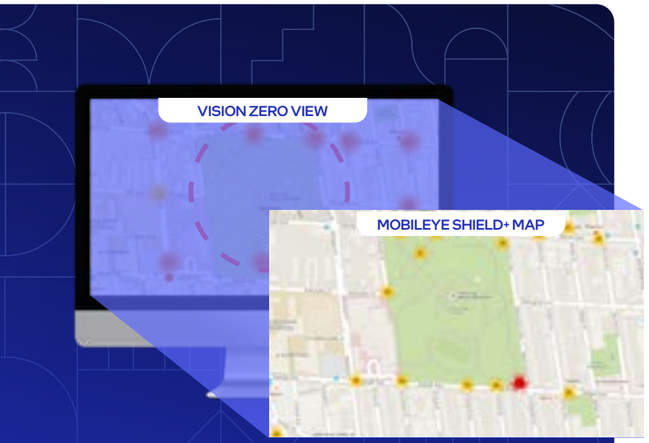
DRIVER ALERT DISPLAY READOUTS

The Mobileye Shield+ System for commercial vehicles includes three (3) display modules that alert the driver, visually and audibly, when the bus is in motion, and a pedestrian and/or cyclist is in one of the danger zones around the bus.

	Feature	Description
CENTER DISPLAY ONLY	LANE DEPARTURE WARNING	Alerts when vehicle departs from driving lane without turn signals. Right/left lane icon as appropriate. Active above 34 mph.
	SPEED LIMIT INDICATOR	Visual verification when the vehicle exceeds the last identified speed limit. Active at any speed.
	HEADWAY MONITORING FOLLOWING	Displays the amount of time in seconds, to the vehicle in front when that time becomes 2.5 seconds or less. Green vehicle icon signifies safe headway; red icon unsafe. Active above 19 mph.
	FORWARD COLLISION WARNING	Red vehicle icon warns of imminent rear-end collision. Active at any speed. Same red vehicle icon warns of a possible low speed collision starting at 0.6 mph up to 124 mph. Three sensitivity level settings.
	YELLOW ALERT	Yellow display alerts the driver that a pedestrian or cyclist is detected around the truck, but is in a safe area. The driver may continue operating with caution. Active from 0.6 mph to 43 mph.
	RED ALERT	Red display and audible beeping alerts the driver of a pedestrian or cyclist that is in the veicle collision path. Driver should stop the veicle immediately. Active from 0.6 mph to 43 mph.

06 Identifying Potential Danger Zones & Hot Spots Using Shield+ Telematics

The Shield+ Telematics System can locate and pinpoint potential "hot spots" on driving routes. A vast majority of collisions involving pedestrians and cyclists prove to be preventable with the right technology.



The hot spots identified by the Mobileye Shield+ Telematics System correspond to the data of cyclist injuries found on the Vision Zero View map.

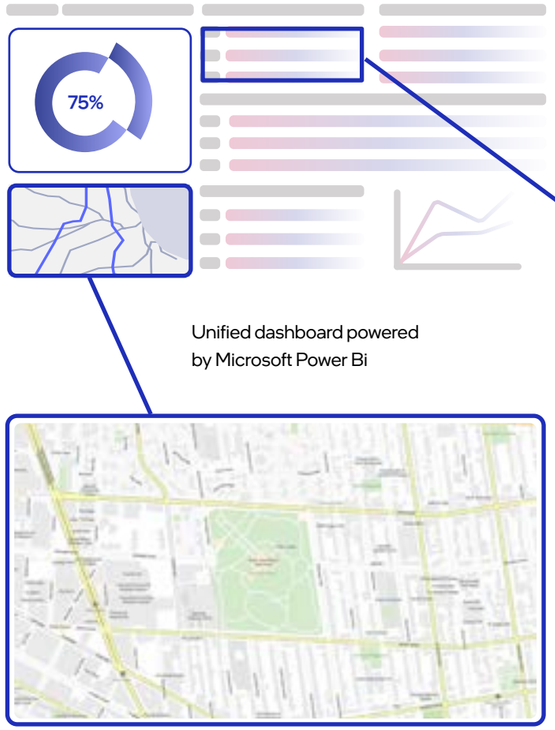
MYRTLE AVENUE IN BROOKLYN

No protection for cyclists in bike lane from street traffic

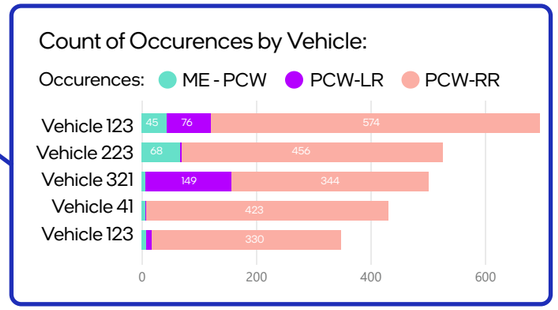
Numbers indicate how many alerts and/or detections the collision avoidance system detected in the marked location.

Pinpointing potential "hot spots" allows us to focus on the location and what could be causing the high incident rate.

07 Let us help you bridge the gap between data & decision making



Unified dashboard powered by Microsoft Power Bi



ME-PCW: Forward Pedestrian Collision Warning
PCW-LR: Left Rear Pedestrian Collision Warning
PCW-RR: Right Rear Pedestrian Collision Warning

Utilizing Microsoft's latest business intelligence analytics tool, Power Bi-Rosco can you help your team paint a bigger picture*

Collect

The Shield+ Telematics System can track vehicle routes and identify where there have been detections and alerts.

Report

Using the collected data, generate safety reports based on location, drivers, number of detections, etc.

Identify

The Shield+ GPS tracking and collision avoidance technologies can pinpoint "hot spots" on driving routes.

Investigate

After identifying the potential danger zones, further investigate possible causes of the high number of alerts and detections.

INFRASTRUCTURE IMPROVEMENTS

✓ Fix potholes ✓ Reduce speed limits ✓ Add stop signs ✓ Secure bike lanes ✓ Add crosswalk

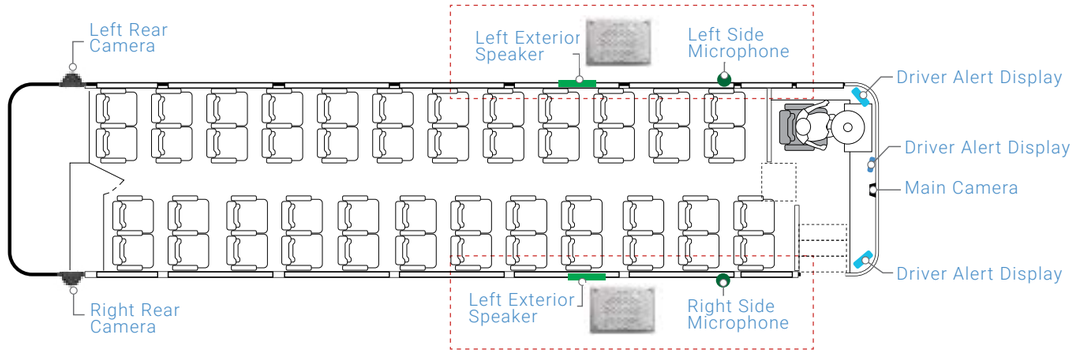
*Rosco's PowerBI business analytics program is available as an augmented service to clients - contact sales for more info

08

Enhanced Safety With Rosco's Advanced Pedestrian Alert System™ (APAS)

The Rosco® Advanced Pedestrian Alert System integrates with the Mobileye Shield+ Collision Avoidance System to provide an external warning to Vulnerable Road Users (VRUs) in the path of a moving vehicle when there is a risk for collision. Rosco's APAS solves the issue of noise pollution that other exterior warning systems create with an intelligent system that will only alert when a VRU is in danger of a collision with the vehicle.

Top View of APAS Components



Left and right speakers are mounted flush on each side of the bus.
Speakers can be loudly heard up to 100 ft away, but self-regulate based on ambient noise conditions..

APAS Features

Broadcasts exterior audible alerts to pedestrians and cyclists to prevent collisions
- Integrates to Mobileye Shield+ System
- 2 exterior speakers: audible in loud traffic
- Multiple levels of detection based on proximity and risk to collision
- Produces warnings/alerts based on the following conditions:
  - VRU detection
  - Turning rate (Yaw)
  - Speed
  - Programmable alert

Intelligent volume control w/ ambient noise detection
- Designed to adjust output volume depending on noise in external environments
- System will be louder in noisier environments, quieter in suburban environments
- System volume can be manually adjusted

Outputs:
- 2 Speaker outputs to Rosco provided speakers: left & right
- 2 additional outputs for integration into existing speaker systems

Add on Feature: Broadcasts exterior visual alerts to pedestrians
- Synchronized to audible alerts
- Designed to alert hearing impaired or distracted pedestrians (Headphones/ cellphone use, etc)

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Mobileye is a global leader in collision avoidance and computer-vision artificial intelligence. With technology trusted by dozens of OEMs and transit fleets, Mobileye's safety solutions aim to reduce collisions and improve driver performance through real-time, proactive alerts.

The Mobileye suite of products includes collision avoidance systems for nearly all classes of vehicles, including standard-compliant enhanced blind spot detection for large vehicles and buses.

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About Rosco Collision Avoidance, Inc.: Rosco Collision Avoidance (RCA) is a proud affiliate of Rosco, Inc., a leader in automotive safety solutions for the commercial vehicle market. Our commitment to enhancing road safety is driven by continuous innovations in automotive technology, particularly in Advanced Driver Assistance Systems (ADAS).

Since 2015, RCA has been the exclusive North American partner to Mobileye for the Mobileye Shield+ Collision Avoidance System – the most powerful ADAS solution for fleet vehicles, effectively mitigating vehicle-to-person collisions. At RCA, we recognize that every mile driven is an opportunity to make our roads safer. We are dedicated to pioneering advancements that safeguard drivers, passengers, and pedestrians alike. RCA is a solutions provider to major North American transit bus OEMs including New Flyer, Nova, Gillig, Proterra, RIDE, and ElDorado National Coach.

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Cat No. Shield+09282023