



# Mobileye Shield+

The most advanced collision avoidance warning system for transit buses

WITH FRONT & SIDE PEDESTRIAN DETECTION





# Mobileye Shield+

## Advanced Driver Assistance System

Mobileye Shield+ is the most advanced collision avoidance system for large vehicles. Bus and truck operating conditions demand the highest level of awareness by the driver 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 based on time-to-collision (TTC) 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 Enhance Operator Awareness, Provide Performance Boosting Tools



### THE OPERATOR'S COPILOT

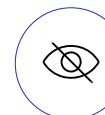
Empowering drivers with real-time alerts to potential hazards while keeping full vehicle control in their hands, enabling swift, confident reactions when it matters most (without taking over the bus).

## 02 Ease Intersection Complexity



### BLUE CONES

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



### RED CONES

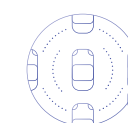
Indicates blind zone created by the A-Pillar. Vision sensor cameras and displays alert the driver in time to avoid or lessen incident severity.

## 03 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 vehicle.



### 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.



# 04 Blind Zones Around Large Vehicles



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



Provides coverage of blind zones around the bus.



Provides continual notifications/alerts of near crashes with pedestrians and cyclists.

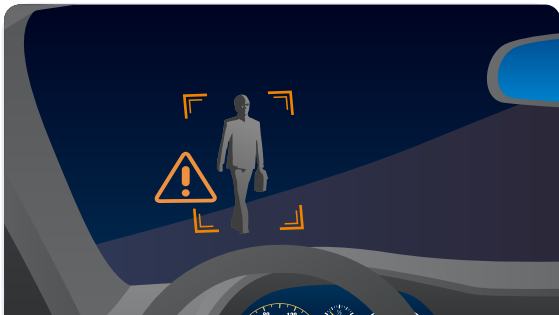


Identify GPS-based geo-location of incidents.



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

# 05 Mobileye Shield+ System Components



## Mobileye Shield+ Night Vision Capability

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

\*15 LUX Minimum



## Driver Alert Displays

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




## Windshield Interior Mounted Vision Sensor Camera

- ✓ Mobileye EyeQ4 SoC chip
- ✓ Processing platform for all Mobileye functions
- ✓ Leading automotive application chip
- ✓ Mobileye algorithms for vehicle and pedestrian detection



## Exterior Vision Sensor Camera

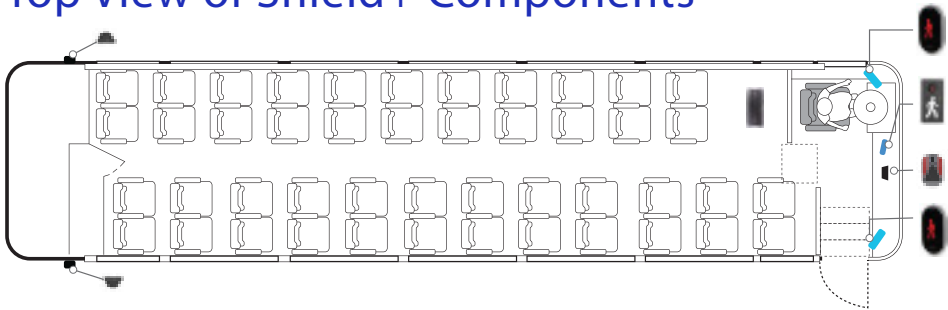
- ✓ Concealed wiring
- ✓ Heated interior chamber
- ✓ IP67 Rated
- ✓ Exterior cameras withstand the rigors of the transit environment



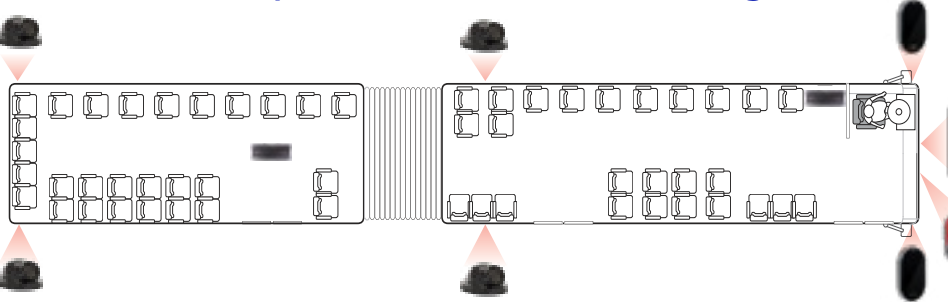
### Optional Advanced Pedestrian Alert System (APAS)

The optional intelligent, external alert system will send an audible alert to VRUs around the bus to ensure they are aware of 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.

## Top View of Shield+ Components



## Shield+ Components on Articulating Bus



Components





06

# Smart Camera & Driver Display Locations



## DRIVER ALERT DISPLAY READOUTS

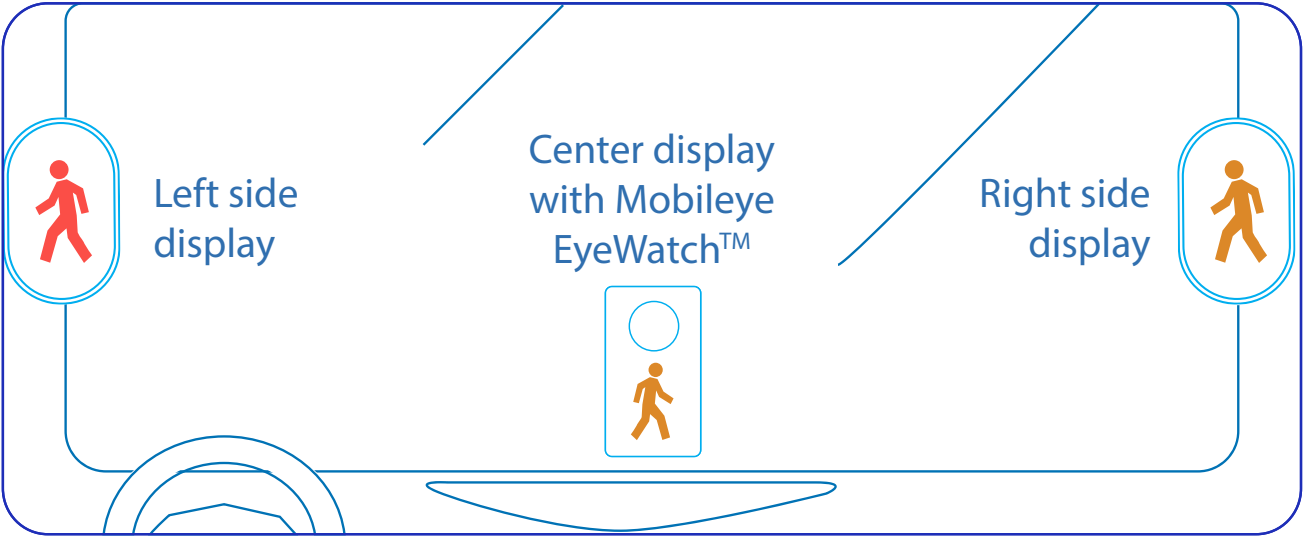
The Mobileye Shield+ System for commercial vehicles includes three (3) display modules that alert the driver, visually and audibly, when the bus is in motion, and a pedestrian and/or cyclist is in one of the danger zones around the bus.











**D•CAMS<sup>+</sup>**



**now available:  
D-CAMS+ upgrade**

Bringing together the power of e-Mirror innovation and collision avoidance technology.



Feature			Description
CENTER DISPLAY ONLY	 <b>LANE DEPARTURE WARNING</b> 		Alerts when vehicle departs from driving lane without turn signals activated. Right/left lane icon appear as appropriate. Active above 34 mph.
	<b>SPEED LIMIT INDICATOR</b> 		Visual verification when the vehicle exceeds the last identified speed limit sign. Active at any speed.
	<b>HEADWAY MONITORING &amp; WARNING</b> 		Displays the following distance 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.
	<b>FORWARD COLLISION WARNING</b> 		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.
	<b>VIRTUAL BUMPER</b> 		The VB provides issues an alert before a possible collision with the vehicle in front in extremely low speeds situations, for example, traffic lights, traffic jams and parking scenarios.
	<b>YELLOW ALERT</b>  		Yellow display alerts the driver that a pedestrian or cyclist is detected around the vehicle. Active from 0.6 mph to 43 mph.
	<b>RED ALERT</b>  		Red display and audible beeping alerts the driver of a pedestrian or cyclist that is in the vehicle collision path. Active from 0.6 mph to 43 mph.

# D•CAMS<sup>+</sup> **NEW**

w/ Mobileye Shield+ Integration

P/N: DCVQ1000

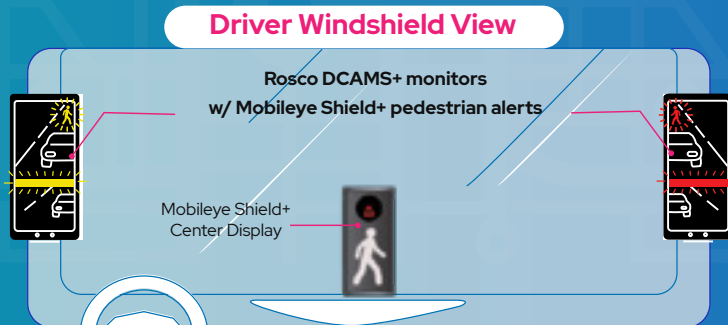
Bringing together the power of e-Mirror innovation and collision avoidance technology.



This enhancement empowers your D•CAMS with the advanced capabilities of Mobileye ADAS. Rosco D•CAMS delivers superior visibility and safety by replacing traditional side-view mirrors with high-definition digital images especially at night and during inclement weather. This solution integrates advanced functionality while complying with key national and regional regulatory standards.

Upgrade kits available for current Mobileye Shield+ users!

DCAMS+ custom kits available for major bus OEMs including Gillig, New Flyer, Nova Bus, ENC, MCI, plus more!



## Mobileye Shield+ System Components



### Exterior Vision Sensor Camera

- Exterior cameras withstand the rigors of harsh environments



### Windshield Mounted Vision Sensor

- Platform for Mobileye's industry-leading algorithms for vehicle and pedestrian detection



### Driver Pedestrian Alerts

- Pedestrian alert overlays on DCAMS monitors



DCAMS+ enhances the user experience by integrating Mobileye's collision avoidance technology into D•CAMS e-mirror monitors.

Mobileye's ADAS (Advanced Driver Assistance System) seamlessly transmits and overlays data to the D•CAMS monitors in real time.

(Alerts enhanced for illustrative purposes)

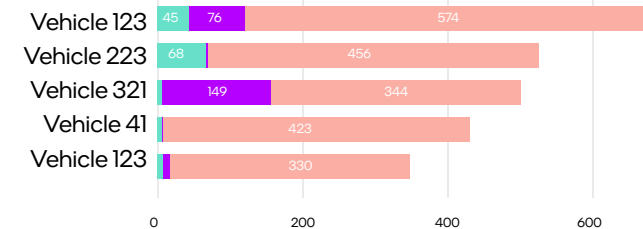
## 07 Identifying Potential Danger Zones & Hot Spots Using Shield+ Telematics



Unified dashboard powered by Microsoft Power Bi

### Count of Occurrences by Vehicle:

Occurrences: ME - PCW (green), PCW-LR (purple), PCW-RR (red)



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 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, vehicle, 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 & OPERATOR TRAINING

- ✓ Fix potholes
- ✓ Reduce speed limits
- ✓ Add stop signs
- ✓ Avoid dangerous intersections
- ✓ Add crosswalks
- ✓ Secure bike lanes

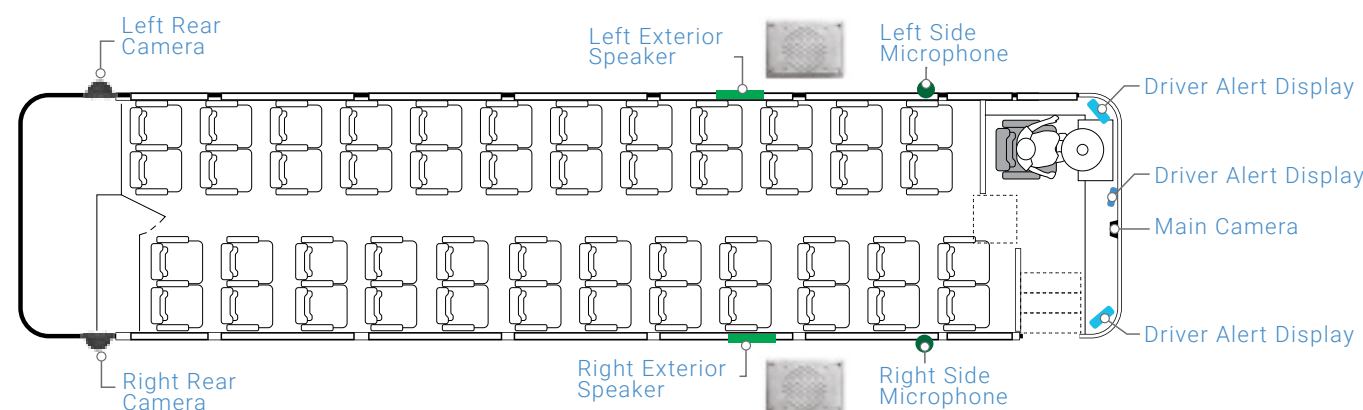
\*Rosco's PowerBI business analytics program is available as an augmented service to clients - contact sales for more info



## 08 Enhanced Safety with Rosco's Intelligent 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 and remain silent otherwise.

### Top View of APAS Components (Rigid Bus)



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 or 4 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
  - Time-to-collision (TTC)
  - 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

Add on Feature:

- LED strobes (may not be legal in all states)
- Broadcasts exterior visual alerts to pedestrians
- Synchronized to audible alerts
- Designed to alert hearing impaired or distracted pedestrians (Headphones/cellphone use, etc)



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.



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, RIDE, and ENC.



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