

MOBILEYE® SHIELD+ COLLISION AVOIDANCE SYSTEM



OUR VISION. YOUR SAFETY.™



OFFICIAL MOBILEYE PARTNER

MOBILEYE® SHIELD+

OUR SOLUTION FOR PEDESTRIAN & CYCLIST SAFETY

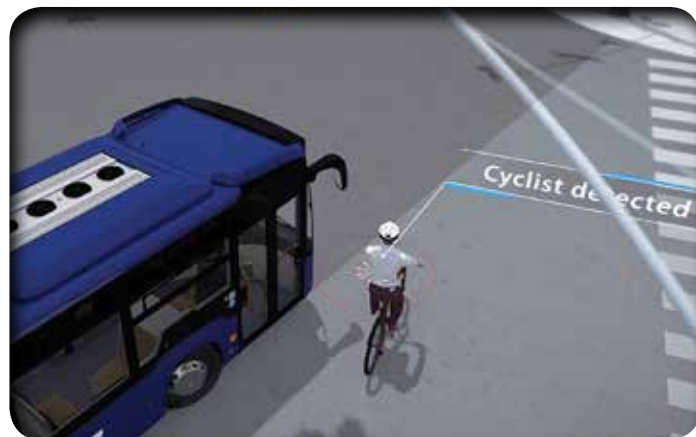
The **Mobileye® Shield+ System** is the latest technological advancement for preventing collisions between vehicles and vulnerable road users (VRUs) including pedestrians and cyclists. The dynamic bus operating conditions on congested urban streets demand the highest level of visibility when operating the bus and especially when approaching VRUs in complex bus turning patterns. Pedestrians and cyclists often are not seen by the driver due to large blind spots around the bus when making turns on tight, busy city streets.

BLIND ZONES AROUND LARGE VEHICLE



REDUCE PEDESTRIAN COLLISIONS, SAVE LIVES...

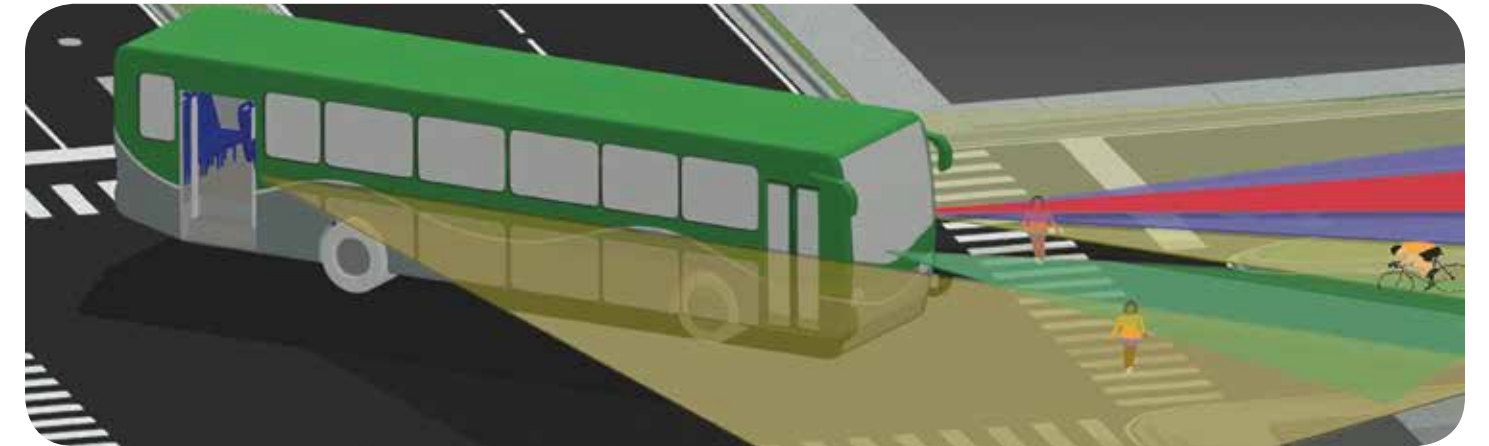
In addition to all the benefits of the original Mobileye® Collision Avoidance System, this unique, smart vision multi-sensor system provides drivers with alerts when pedestrians and cyclists are in the danger zones on the side of the bus. The addition of the pedestrian and cycle side-sensing makes the driver aware of pedestrians and cyclists in the bus path, before an incident occurs, giving the driver time to react and take corrective action. These alerts can help save lives and improve your organization's safety record.



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-sensor system is tuned with sophisticated algorithms and years of Mobileye® experience to filter out VRU proximity that is not at risk, while locking in and following VRU proximity and course if deemed to be collision-likely. Utilizing an intelligent vision sensor that works 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 of these objects are continuously measured to calculate the risk of the driver colliding with them. Even lane markings and traffic signs are detected. When danger is imminent, visual and audible alerts warn the driver to make necessary corrections in sufficient time to avoid potential collisions or mitigate their severity.

- Assists large vehicle operators to prevent collisions with vulnerable road users.
- Assists decision makers by providing invaluable real-time big data on dangerous intersections.
- Provides constant update of near crashes with pedestrians and cyclists.
- Identify exact geo -ocation of incidents.
- Real-time big data on dangerous intersections.

INTERSECTION COMPLEXITY ON "WARP SPEED"



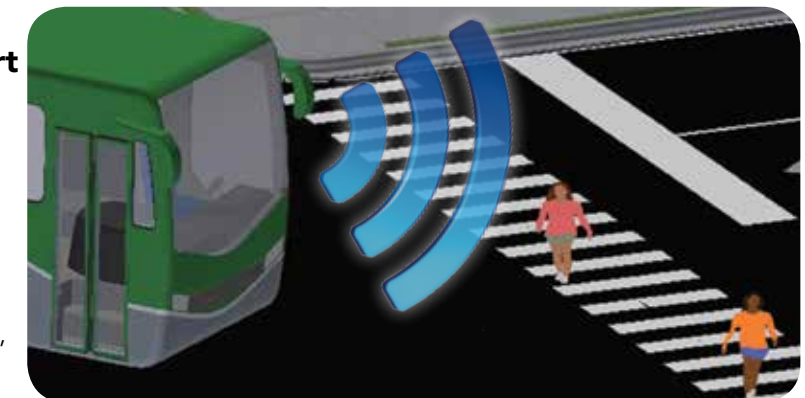
Pictured above is an example of one turn of likely thousands this bus will make over the course of a week in a big, bustling city. Smart vision sensors on the front and sides of the bus (shown in the color codes to the right) track possible collision courses and alert the driver in time to avoid or lessen incident severity.

Fleet managers have installed the Mobileye® Collision Avoidance System in some of the world's best-run fleets including cars, trucks, service vehicles and taxis, in both rural and urban environments. These global organizations have experienced significant reductions in incidents, collisions and associated costs. Your fleet can accomplish the same.

- RED ZONE INDICATES THE BLIND SPOT CREATED BY THE A-PILLAR DURING LEFT HAND TURNS.
- GOLD ZONE INDICATES THE AREA COVERED BY THE REAR, LEFT AND RIGHT SIDE VISION SENSORS.
- PURPLE ZONE INDICATES THE AREA COVERED BY THE FRONT, LEFT SIDE VISION SENSOR.
- GREEN ZONE INDICATES THE AREA COVERED BY THE FRONT, CENTER VISION SENSOR.

Optional: "Intelligent" Pedestrian Audio Alert

The "intelligent", external alert system will send an audible alert to VRUs around the bus to ensure they are aware that the bus is within the vicinity and maneuvering around them. The alert will ONLY sound when 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.



INTERIOR COMPONENTS



(3) Driver Alert Displays

- Injection molded display housings
- Amber & red LED boards for caution & alarm status
- Integrated Eyewatch interface in center display
- Piezo speaker system for audible alerts
- Universal Mounting Features



(2) Windshield Mounted Smart Sensor Cameras

- Smart vision sensor camera
- Multi core chip
- Processing platform for all Mobileye® functions
- Leading automotive application chip
- Mobileye® algorithms for vehicle and pedestrian detection

EXTERIOR COMPONENTS

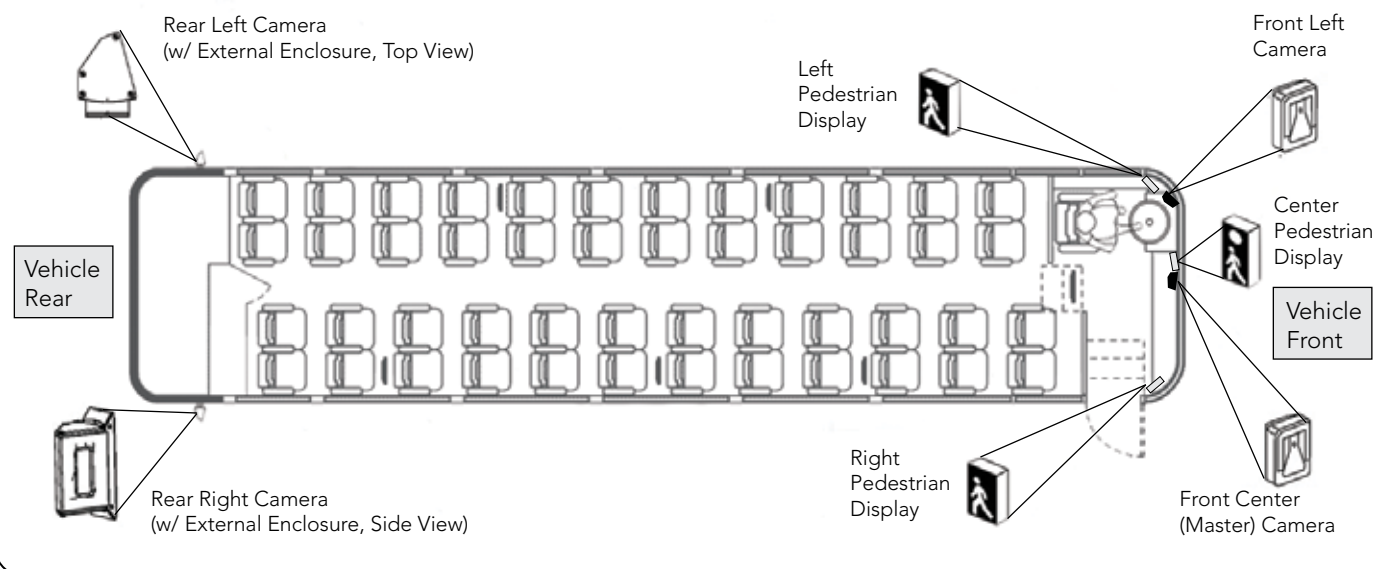


(2) Exterior Camera Housings With Smart Sensor Cameras

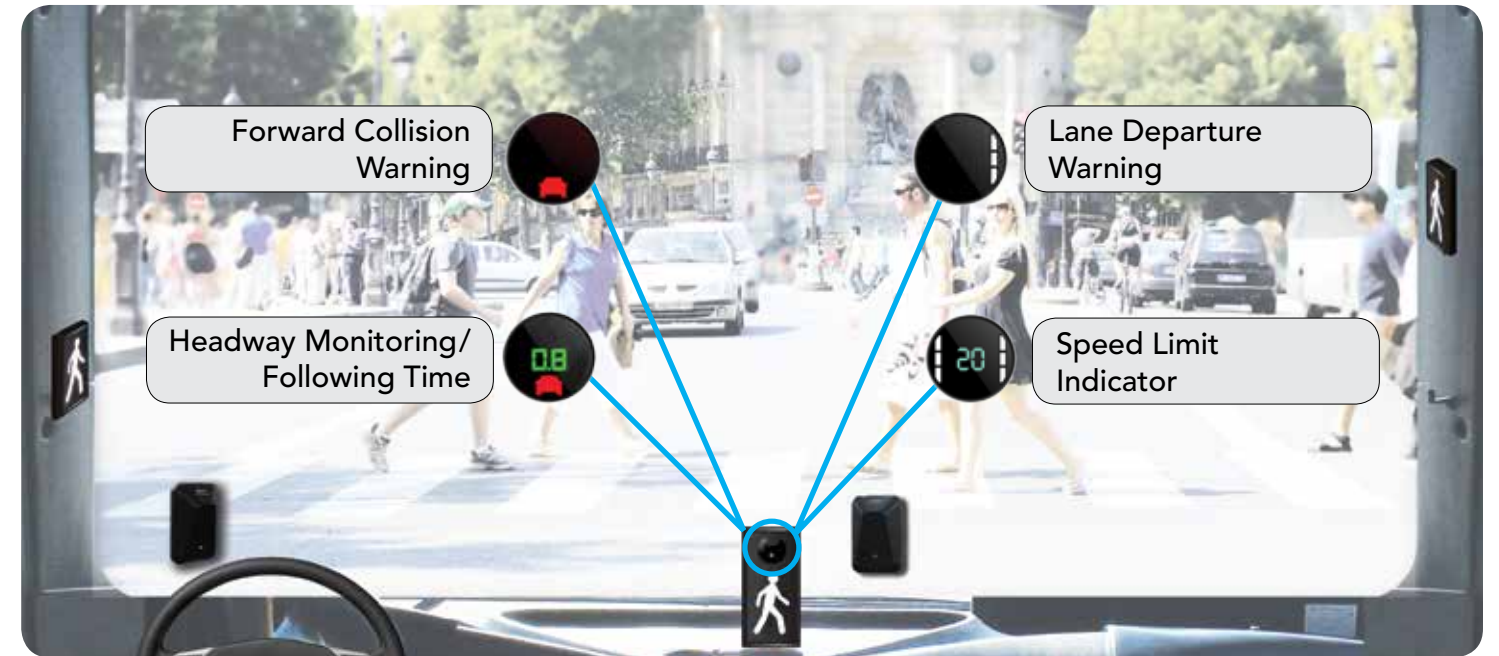
Adjustable, extruded aluminum housings withstand the rigors of the bus and truck marketplace and hold up to bus washes and high pressure cleaning.

- Concealed wiring
- Hydrophilic glass
- Heated interior chamber
- IP 67 Rated

Shield+ Components on Large Vehicle from Top View



VIEW OF SMART SENSORS AND DRIVER DISPLAYS



The Collision Avoidance 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.

DRIVER ALERT DISPLAY READOUTS

	FEATURE	DESCRIPTION
Center Display Only	Speed Limit Indicator	Alerts when the vehicle exceeds the posted speed limit. Notes the amount exceeding the posted limit. Active at any speed.
	Lane Departure Warning	Alerts when vehicle departs from driving lane without turn signals. Right/left lane icon as appropriate. Active above 34 MPH
	Forward Collision Warning	Red vehicle icon warns of up to 2.7 seconds before an imminent rear-end collision. Active at any speed. Same red vehicle icon warns of a possible low speed collision, under 19 MPH.
	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.
	Solid Amber	Solid yellow display alerts the driver that a pedestrian or cyclist is detected around the bus, but is in a safe area. The driver may continue operating the bus. Active under 31mph.
	Blinking Red Alert	Blinking red display and audible beeping alerts the driver of a pedestrian or cyclist that is in the bus collision trajectory. Driver should stop the bus immediately. Active under 31mph.

IDENTIFYING POTENTIAL DANGER ZONES AND 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 proved to be preventable with the right technology.

Mobileye Shield+ Map



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

Vision Zero View Map



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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.



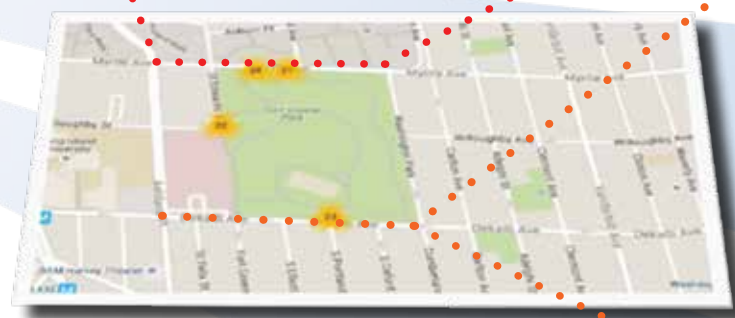
MYRTLE AVE
No protection for cyclists in bike lane from street traffic

Myrtle Avenue in Brooklyn



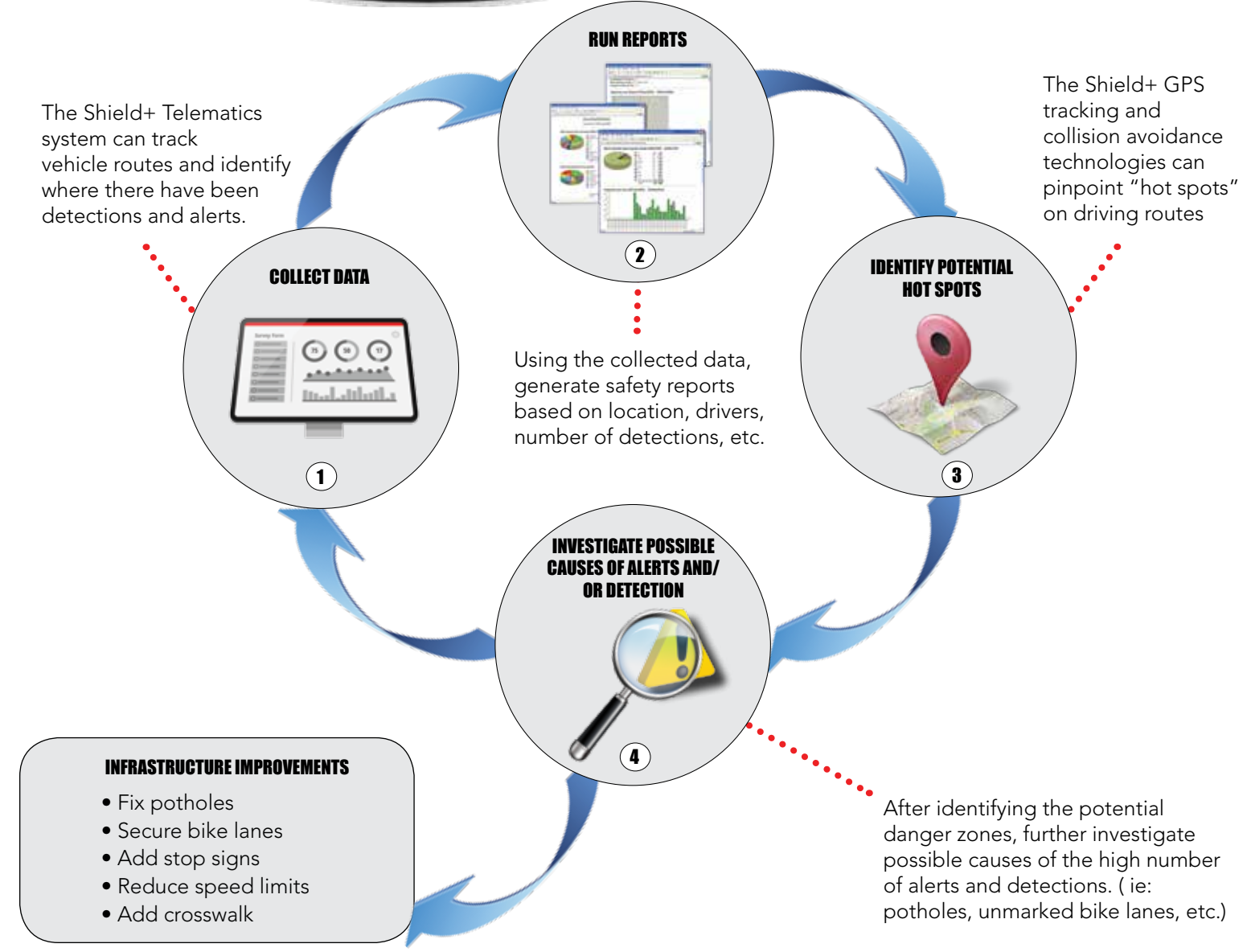
DEKALB AVE
No protection in bike lane, bike lane paint is worn off, a lot of potholes

Dekalb Avenue in Brooklyn



Identified "hotspot" on driving route

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





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Mobileye® is the technological leader in the area of advanced image sensing and processing technology for automotive applications. With over a decade invested in extensive R&D, Mobileye has gained an unprecedented understanding of the diverse challenges that face drivers on the road and how to keep them safe. This unequaled expertise has made Mobileye the recognized global pioneer in collision avoidance systems. As evidence, Mobileye is the OEM (Original Equipment Manufacturer) supplier of such systems to many of the world's leading automobile manufacturers.



Rosco's integration of the Mobileye Collision Avoidance with Pedestrian Side-Sensing is an example of how the unique safety requirements of transit, school, and other bus operations can be addressed with proper application of evolving technology. Applications beyond bus such as in Refuse Vehicles, Walk-In Vans, Trucks, and other vehicle types are possible as well.

Rosco is the largest supplier of automotive vision safety products to the bus and truck marketplace. For over a century, Rosco's goals have remained the same: Commitment to producing the highest quality automotive products and providing the superior service customers have grown to expect. Today, while Rosco products are on all school buses manufactured in North America, Rosco supplies mirrors, visors, and digital vision products to nearly every commercial bus, truck, military, and specialty vehicle manufacturer as well.



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A CENTURY OF AUTOMOTIVE VISION SAFETY

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