

The background of the slide features the LA Metro logo, which consists of a stylized 'M' made of white, 3D-looking rectangular blocks. The 'M' is set against a green circular background, which is itself set against a larger orange circular background. The bottom left corner of the slide is black.

LA Metro Bus Sensor Technology

June 2023



Metro

Introduction

Metro Board approved Item 14, Bus Sensor Technology Motion. The motion requested Metro Staff to report recommendations on safety features such as pedestrian detection by June 2023. Specifically, the following responses were requested:

1. Determine feasibility of incorporating additional safety features into new procurement.
2. Determine feasibility of installing additional safety features on our existing bus fleets.
3. Explore other emerging collision avoidance technologies.

Further, Metro is in the process of concluding two separate passenger collision avoidance studies.

Background | MobileEye

FTA Grant Funded study to evaluate commercially available collision avoidance systems. Study evaluated several technologies available in 2017.

1. Selected Mobileye Shield + to test in partnership with NF, CTE, and the FTA on 50 LA Metro buses. Final Report expected to be available July 2023.
2. Preliminary findings are inconclusive, lacking sufficient evidence to demonstrate safety improvements over transit buses without active collision avoidance systems.

“MOBILEYE® SHIELD+™ V4 w/ APAS” OPERATOR REFERENCE



LEFT SIDE DISPLAY w/ APAS*

- No illumination.
- No pedestrian or cyclist threat on left side of moving bus.
- With pedestrian / bicyclist in proximity of moving bus the external audio message is 'Caution Bys Approaching'.

OFF

- Yellow solid illumination with no sound.
- Informs the operator a pedestrian or cyclist has been detected near the left front or left side of bus.
- Operator should exercise additional caution until verifying that the danger of collision has passed.

DETECTION

- Red flashing with beeping sound.
- Informs the operator a pedestrian or cyclist has been detected in the left front or left side of bus and collision is imminent.
- Operator should take action to carefully stop bus to avoid collision.

ALERT

*Advanced Pedestrian Alert System

CENTER DISPLAY & EYEWATCH

- Contains the Pedestrian Display and EyeWatch.
- The EyeWatch readouts and explanations can be found below on this document.
- No pedestrian or cyclist threat in front of moving bus.
- Illuminated green LED indicates system operational.

DETECTION

- Yellow illumination with no sound.
- Indicates a pedestrian or cyclist is in front of the moving bus or coming towards the moving bus.
- Operator should exercise additional caution until verifying that the danger of collision has passed.
- Illuminated green LED indicates system operational.

ALERT

- Red flashing with beeping sound.
- Indicates a pedestrian or cyclist is in front of the moving bus or coming towards the moving bus and collision is imminent.
- Operator should take action to carefully stop bus to avoid collision.
- Illuminated green LED indicates system operational.

RIGHT SIDE DISPLAY w/ APAS*

- No illumination.
- No pedestrian or cyclist threat on right side of moving bus.
- With pedestrian / bicyclist in proximity of moving bus the external audio message is 'Caution Bus Approaching'.

OFF

- Yellow illumination with no sound.
- Informs the operator a pedestrian or cyclist has been detected near the right side of bus.
- Operator should exercise additional caution until verifying that the danger of collision has passed.

DETECTION

- Red flash with beeping sound and external audio message of 'Danger Step Back'.
- Informs the operator a pedestrian or cyclist has been detected on the right side of bus and collision is imminent.
- Operator should take action to carefully stop bus to avoid collision.

ALERT

*Advanced Pedestrian Alert System

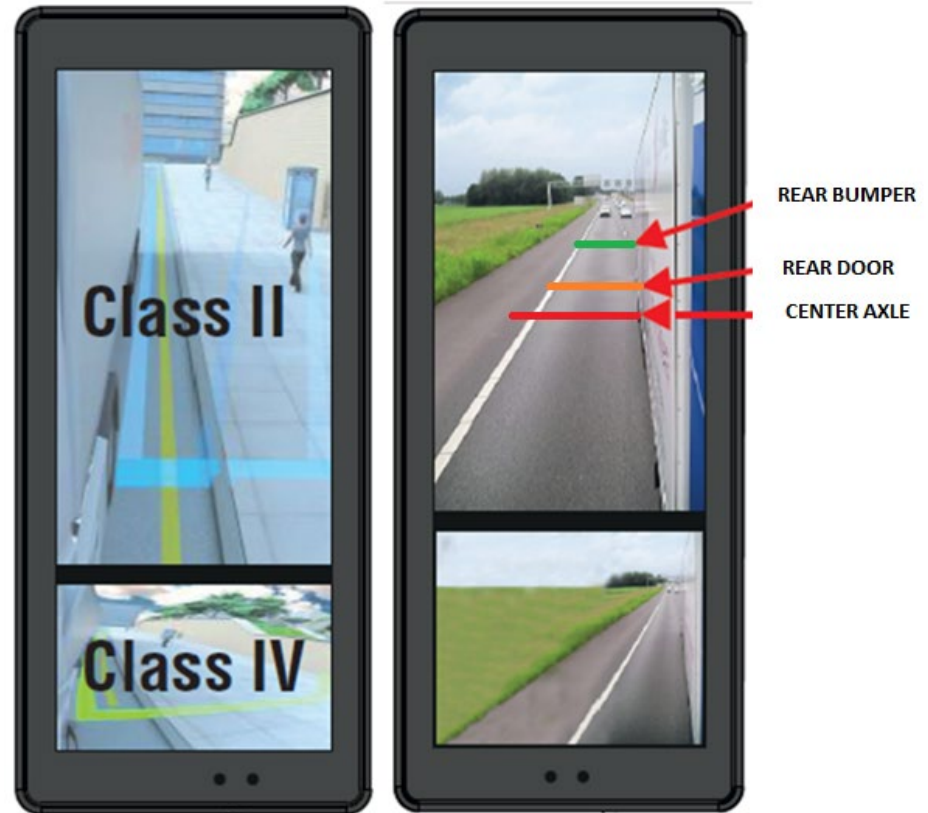


Metro

Background – MirrorEye

MirrorEye Study with BYD

1. Discussions with BYD and MirrorEye began in June 2019.
2. Electronic rear/side view monitors were tested on 5 BYD 60-foot buses and 5 BYD 40-foot buses. Features include night vision & lane marking.
3. Study ongoing, results expected to be published Summer of 2024.



Recommendations to Board Motion Responses (1-3)

1. *Determine feasibility of incorporating additional safety features into new procurement.* Staff has included language in the Technical Specification for new bus procurements to include vehicle safety technologies such as pedestrian detection, lane departure warnings, and Advanced Driver Assistance features.
2. *Determine feasibility of installing additional safety features on our existing bus fleets.* Staff is not recommending the retrofit with MobileEye as benefits were inconclusive, but staff will continue to assess technologies for the existing bus fleet as technologies mature.
3. *Explore other emerging collision avoidance technologies.* Staff will continue to explore new technologies as they emerge and merit additional evaluation.





Thank you.

