



RESEARCH STUDY

# The Benefits of ADAS for Mass Transit Using Mobileye® Shield+™ Technology



## Introduction

A serious problem is facing the bus industry. Between 2002 – 2014, buses and vanpools in the US were involved in 85,391 collisions, experienced 1,340 fatalities, and 201,382 injuries, and created expenditures for casualty and liability expenses of \$5.7 billion. Sobering statistics such as these have mass transit officials and regulatory bodies seeking new ways to lower the risk of collisions in order to keep their citizens safe and costs down.

## Objective

Seeing the unfolding of collision avoidance technology in cars, this study aimed to see if applying similar technology in transit vehicles could help reduce the most expensive and catastrophic losses such as pedestrian strikes and rear-end collisions. Mobileye Shield+ served as the test system.

## Conclusions

Buses equipped with Shield+ showed a 58.5% potential reduction in vehicular and pedestrian collision claims. In addition, buses with Shield+ were not involved in any collisions with pedestrians or bicyclists, or any rear-end collisions.

## About Mobileye Shield+ Technology

Shield+ is a collision avoidance system designed specifically to address the large blind spots, greater turning radii and unique challenges bus drivers encounter in crowded urban environments.

Powered by sophisticated computer vision algorithms, Shield+ continuously monitors the road ahead and the vehicle's blind spots. When the threat of a collision with another vehicle, pedestrian or cyclist is detected, the system warns with visual and audible alerts – in real time – giving drivers the vital seconds needed to prevent or mitigate a collision.





## Challenges for ADAS Technology and Mass Transit Vehicles

Tailoring this technology for large municipal vehicles, such as buses, is not as simple as adapting the existing forward-facing collision avoidance technology used in cars to fit a larger vehicle. The geometry of a bus is different resulting in driving dynamics that present unique types of dangerous situations. Some of the most perilous situations faced by bus drivers include:

- Pedestrians or cyclists in the blind spots. Buses have large blind spots on both sides of the vehicle and by the A-pillar, which can conceal pedestrians and bicyclists from the driver’s sight.
- Making a left or right turn. Buses have a greater turning radius makes turning one of the most dangerous scenarios.
- Approaching the bus stop. Buses approach a bus stop crowded with people, while also continuing to move, making this situation particularly perilous.
- People running alongside or rushing in front of the bus in order to catch the bus at the bus stop.

## Key Findings

### Potential Reduction in Claims

Buses equipped with Shield+ showed a 58.5% potential reduction in vehicular and pedestrian claims due to collisions for all insured buses.

### Zero Collisions

No buses equipped with Shield+ were involved in any collisions with pedestrians or bicyclists or any rear-end collisions, as compared to 284 events reported for the control group.

### Improved Driving Behavior

Buses with Shield+ triggered fewer collision alerts when compared to the control group suggesting that after having driven with the system for some time, drivers became more aware of their behavior and drove more safely.

71.55% fewer forward collision warnings\*



43.3% fewer pedestrian & cyclist collision and blind spot warnings\*



\*per 1,000 miles

### High Accuracy Rate

Shield+ was found to have an accuracy rate of 96.5%. The System rarely missed the potential conflicts and was found to be robust in adverse weather, low lighting, direct sunlight, and shadows.

### Demonstrated Success

At the completion of the study, several of the participating transit agencies elected to keep the Shield+ systems in their buses. Since the research, dozens of transit systems in North American and around the world have added Shield+ to their buses.

### Reference

[Active Safety-Collision Warning Pilot in Washington State \(2017\)](#)

