

Headway Monitoring and Warning



Technology



headway value is 1 second, but the TTC value is infinity since the cars will never collide if the conditions do not change.

Online HMW Reporting

As headway keeping correlates with the general quality of driving, fleet managers can receive reports on their drivers' behavior via Mobileye's data reporting system.

Studies indicate that drivers tend to overestimate the headway to the car in front of them, resulting in insufficient time to react if the car ahead unexpectedly stops or slows down. The British Highway Agency found that keeping insufficient driving distance (tailgating) contributes to 29% of all injury accidents.

Mobileye's Headway Monitoring and Warning (HMW) application assists the driver in keeping a safe driving distance ('headway'). This considerably reduces the chances of an accident by simply allowing the driver more time to react in unexpected situations. The HMW application uses Mobileye's vehicle detection technology for detecting the closest in-path vehicle (CIPV), which is the car ahead, and for continuously calculating the headway to it. This value is then displayed to the driver.

Headway vs. Time to Collision

The simple mathematical definition of headway is:

$$\frac{\text{[range to vehicle ahead]}}{\text{[driving speed]}}$$

The headway value should not be confused with Time to Collision (TTC). TTC is the estimated time to contact with the vehicle ahead, calculated using the relative speed between the two vehicles. When both vehicles are in motion, the TTC is always longer than the headway measurement.

For example, when driving 25 meters behind a moving vehicle and both vehicles are moving at 90 Km/h (25 m/sec), the

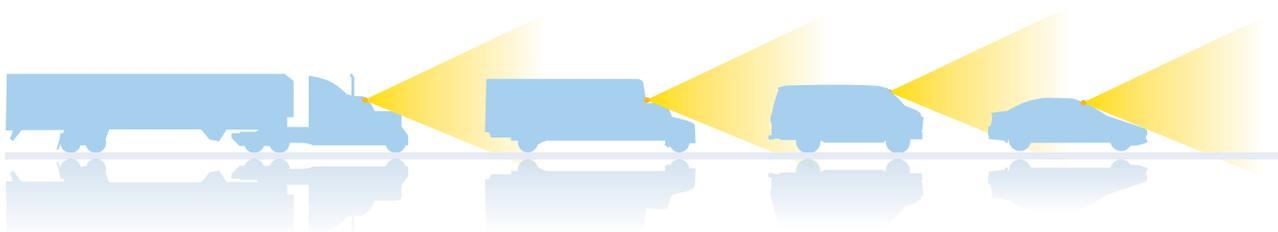
Features:

- Unique single camera-based application
- Real-time audio-visual feedback to the driver regarding distance keeping ('headway')
- Color-coded visual indications for safe, short, and dangerous headway
- Audio alert upon entering an unsafe headway
- Customizable headway warning timing and alert scheme - gradual, multiple and repetitive alerts
- High availability, including night and rain conditions

Add Ons

HMW is a stand-alone application that can be integrated with other Mobileye Driver Assistance applications (such as LDW, FCW).

HMW can be used in fusion with radar/other forward-looking vehicle sensors for driver assistance applications.



Headway Monitoring and Warning



Headway Indications

When driving behind another vehicle, two indications are provided:

- A car icon changing from green, to orange, and red, as the headway decreases
- The headway distance in seconds, displayed on a digital headway gauge

Safe Headway



Short Headway



Dangerous Headway



Processing Platform

The HMW application runs at 10-15 FPS on Mobileye's automotive qualified Mobileye EyeQ™ vision system on a chip. Mobileye EyeQ has an integrated dual channel CAN controller and a glue-less interface to various CMOS image sensors. A complete automotive vision system can consist of a single high-dynamic range CMOS image sensor and a compact electronic board including the Mobileye EyeQ processor, program memory and communication interface to the car's network.

Benefits:

- Reduces chances of accidents by assisting drivers in keeping a safe headway
- Increases driver awareness to keeping a safe driving distance and improves driving habits
- Alerts driver upon entering a pre-defined "Dangerous Headway" zone
- Fits all vehicle types
- Compact size - the application operates on the match-box sized Mobileye SeeQ® board
- Cost-effective with respect to other solutions in the market

The HMW continuously calculates the headway to the CIPV (red rectangle) and presents it to the driver.



The headway value equals the distance to the vehicle ahead divided by the driving speed.



0.8 seconds headway and closing...



Keeping 0.4 seconds headway is dangerous driving.



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