Mobileye
REM, an innovation map for autonomous driving
Lior Sethon
94% of road accidents are caused by human error.

In China, 260,000 people die in road accidents each year.

That is 700 people per day.

Source: NHTSA, WHO “Global Status Report on Road Safety”, 2015
What if we took human error out of the “driving equation”?

Fully autonomous vehicles could reduce accidents, cutting them by an estimated 90% once AVs become the primary means of transport.

Source:
The ADAS Road to AD Reality

**ADAS**
Human driver monitors environment

- **UP TO LEVEL 02**
  - NO AUTOMATION
  - DRIVER ASSISTANCE
  - PARTIAL AUTOMATION

**AUTOMATED**
Vehicle system monitors environment

- **LEVEL 03**
  - CONDITIONAL AUTOMATION
- **LEVEL 04**
  - HIGH AUTOMATION
- **LEVEL 05**
  - FULL AUTOMATION
Early Warning Saves Lives

Why are collision avoidance systems effective?

- **80%** of crashes involve driver inattention within 3 seconds before the event.

- **2 second** warning can prevent nearly all collisions.

Implements Driver Behavior – Recent IIHS Study

- **30% - 70%** drop in FCW, LDW, and HMW for drivers with a Mobileye-equipped vehicle (IIHS, 2018)

- **62%** of drivers said they felt their driving improved

Collision Avoidance Systems warn the driver in the critical seconds needed to avoid or mitigate a collision.
Safety Today
For The Autonomous Tomorrow
The Three Pillars of Autonomous Driving

- Camera-Centric Sensing
- Crowd-Sourced Mapping
- Semantic Driving Policy

Responsibility-Sensitive Safety
Sensing  360° awareness

12 CAMERAS Configuration
Why HD maps are important for autonomous driving

- Redundancy for sensors
- ‘Memory’ of the vehicle
- Crucial for localization and planning
Road Experience Management: REM™

1. HARVESTING
Collecting Road Segment Data
crowed-sourced via vehicles
equipped with Mobileye

2. Anonymizing
& encrypting roadscape data

3. AGGREGATING
Generating HD crowdsourced road-
book for the autonomous vehicle

4. Map tiles
distributed to AVs

5. LOCALIZATION
Localizing the car within 5cm
accuracy in the road book.
REMTM Aggregation

Rodscape data is aggregated to create HD roadbooks distributed to autonomous vehicles in map tiles.
REM™ LOCALIZATION
Redundancy for sensors
What’s Unique About REM™?

Narrow Bandwidth
Harvested RSD compressed to 10KB/km Roadbook data size similar to SD map, with HD quality.

Implementation Today
Light data means using a 3G link. No need for 5G.

Local accuracy, in real time
within the driving lane, accurate up to 5cm

Privacy
No user identification information passed (complies with GDPR)

Leveraging the collective “memory” of the crowd
Accurate real-time data
Data for the Road Ahead
What Advanced Road Data Will Bring

SAFER
Making the roads safer for everyone with collision avoidance and accident hotspot mapping

SMARTER
Support infrastructure changes in your city with actionable data

AUTONOMOUS READY™
Paving the way to autonomous driving with crowd-sourced RoadBooks
As vehicles equipped with Mobileye (EyeQ4) drive around a city, they can collect data helping to make it safer and smarter

- Identification of hotspots and potentially dangerous areas
- Traffic light and sign surveying,
- Detection of infrastructure deficiencies
Smarter – Data Insights for Cities
First Deployment Snapshots – Dusseldorf Komod Project

RSD streams of data received (August 2018)

Construction Area Heat Map
Traffic Jam Heat Map

Partnersed With
Static Layer

- Traffic Signs
- Directional Signs
- Traffic Lights Position
- Road Markings
- Road Edge
- Lane Marks

Dynamic Data

- Pedestrians, Cyclists, Hazardous Geolocations – Hotspots
- Driving Speed
- Red Light time per Traffic Light
- Standing vehicles, Pedestrians – Side of the Road – HW Scenarios
- Construction areas
A highly accurate map, with an ultra-high refresh rate, is a critical pillar of autonomous driving.

Critical REM™ data will enable AVs to eventually move safely and efficiently in your city.
Mobility-as-a-service

- Volkswagen Group and Mobileye announced plans to commercialize Mobility-as-a-Service (MaaS) with self-driving vehicles in Israel.
- Development to begin early 2019 and roll out in phases in 2022
Thank You.
Drive Safely!