Mobileye

REM, an innovation map for autonomous driving

Lior Sethon

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Human Error Is The Cause Of Most Collisions

- 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

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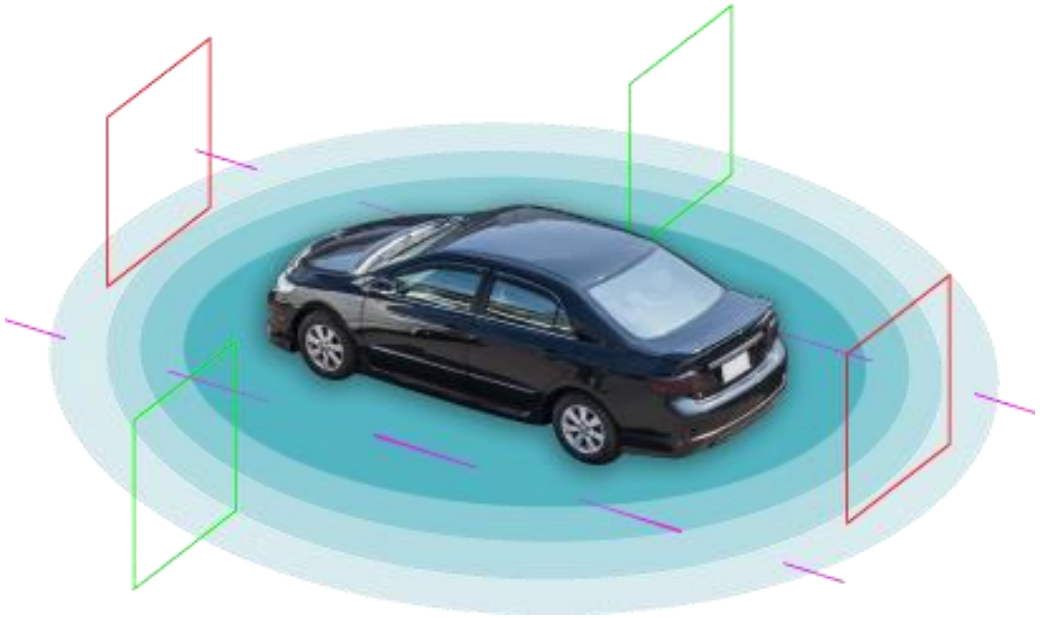
What if we took human error out of the "driving equation”?

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



Source:
Boston Consulting Group, “A Roadmap to Safer Driving Through Advanced Driver Assistance Systems”, 2015. https://goo.gl/QiupQn

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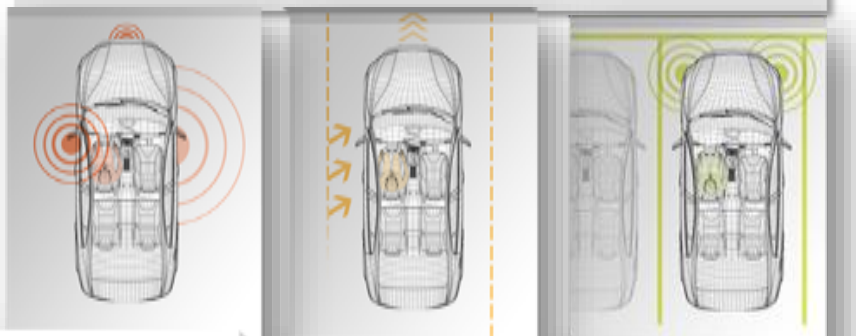
The ADAS Road to AD Reality

ADAS

Human driver monitors environment

UP TO LEVEL 02



NO AUTOMATION

DRIVER ASSISTANCE

PARTIAL AUTOMATION

AUTOMATED

Vehicle system monitors environment

LEVEL 03

LEVEL 04

LEVEL 05

CONDITIONAL AUTOMATION

HIGH AUTOMATION

FULL AUTOMATION

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Early Warning Saves Lives

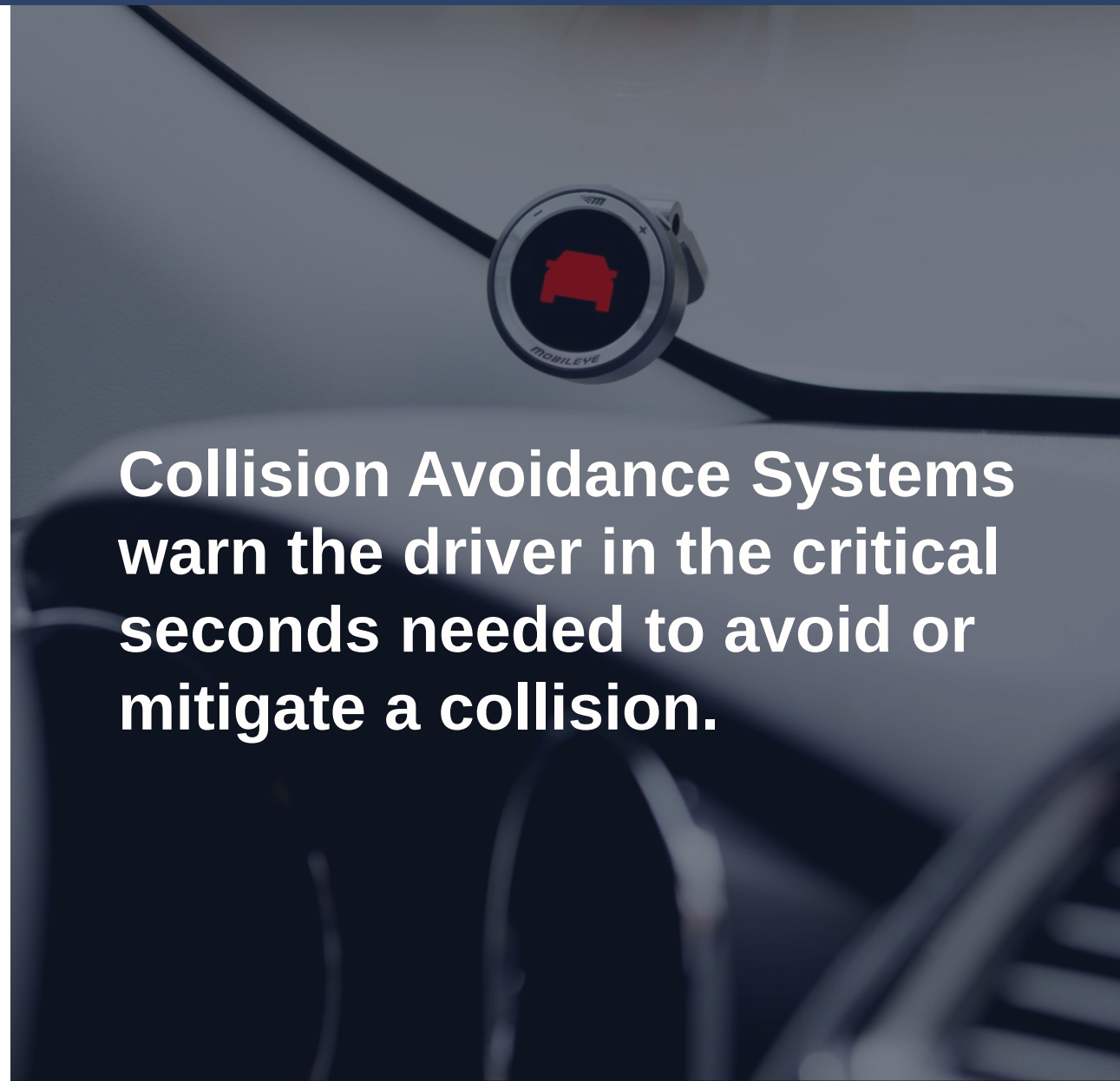
Why are collision avoidance systems effective?

- **80%** of crashes involve driver inattention within 3 seconds before the event.
- **2 second** warning can prevent nearly all collisions.

Improves 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

Insurance Institute for Highway Safety
Highway Loss Data Institute



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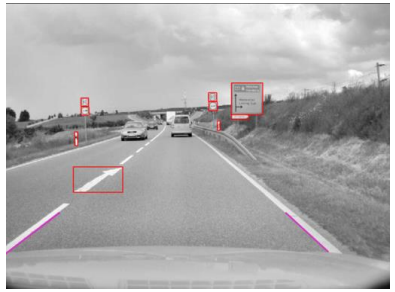
Safety Today
For The Autonomous
Tomorrow

The Three Pillars of Autonomous Driving

Camera-Centric Sensing

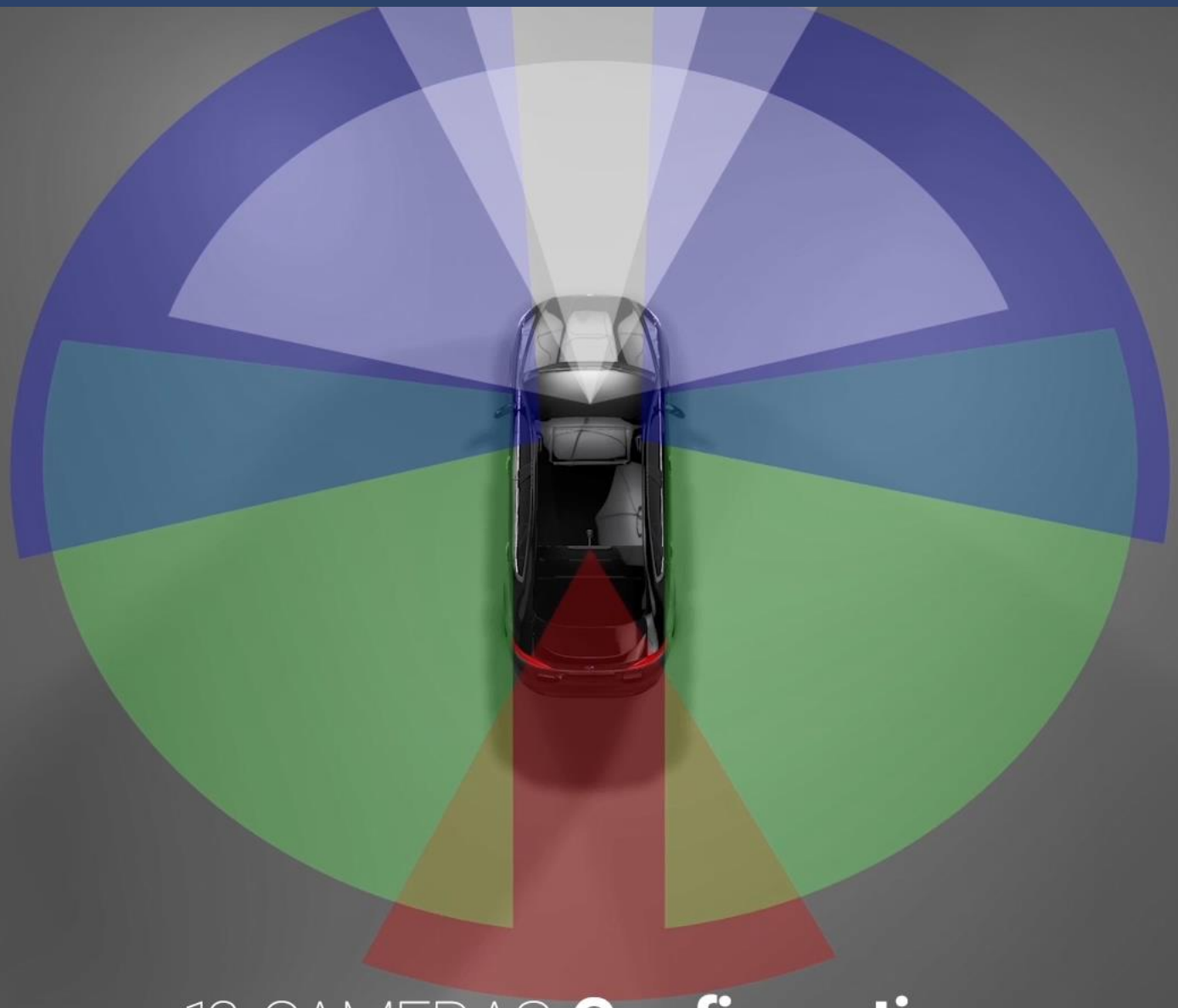


Crowd-Sourced Mapping

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

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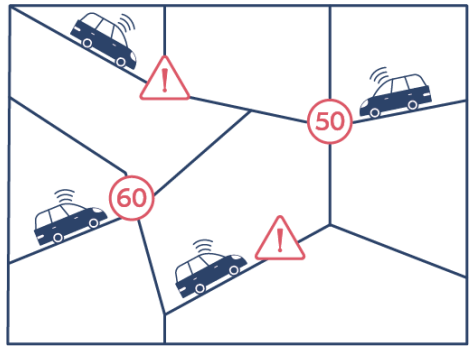
Road Experience Managment: REM™

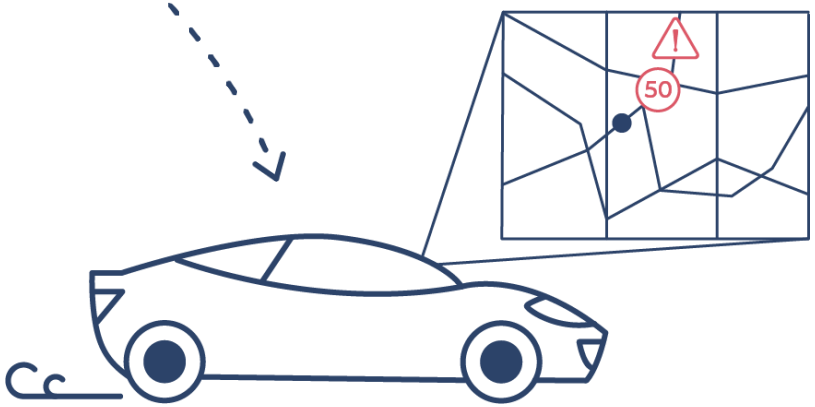
3. AGGREGATING

Generating HD crowdsourced road-book for the autonomous vehicle

2. Anonymizing
& encrypting
roadscape data

4. Map tiles
distributed to AVs





1.HARVESTING

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

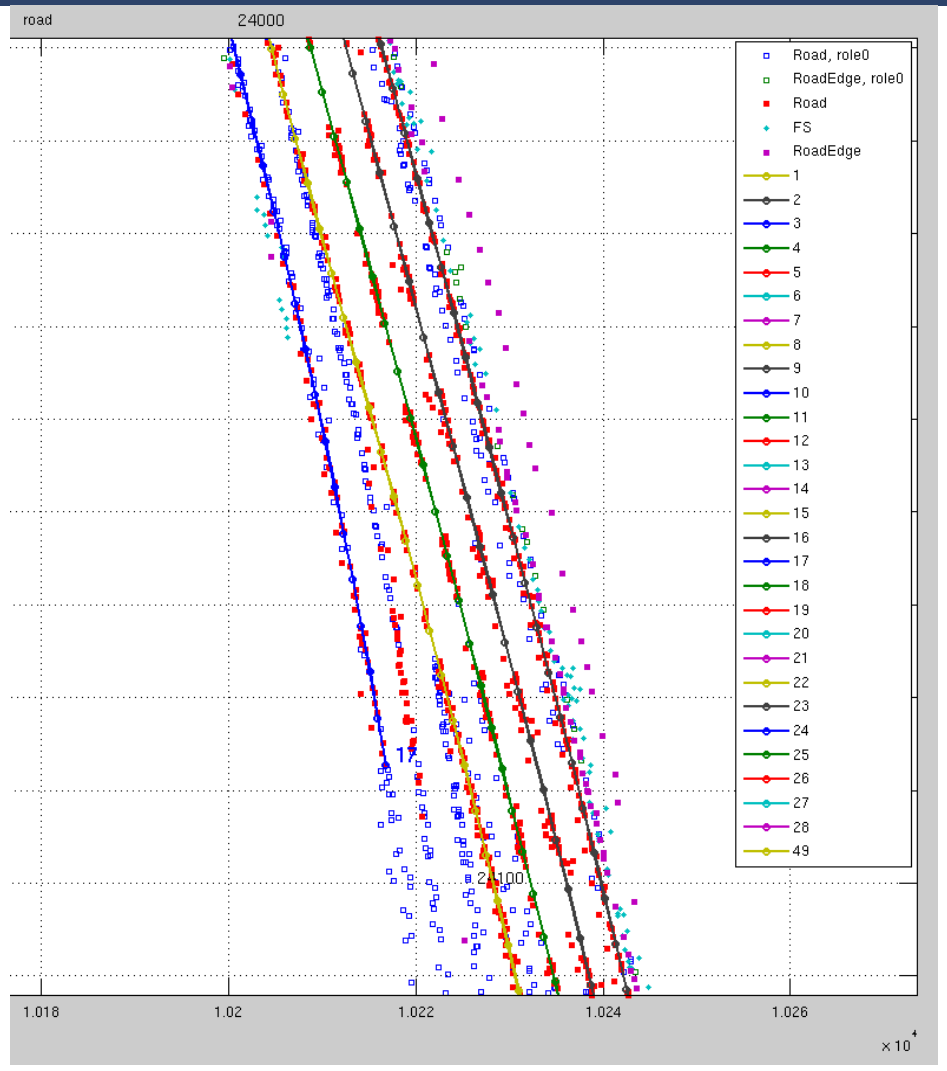
5. LOCALIZATION

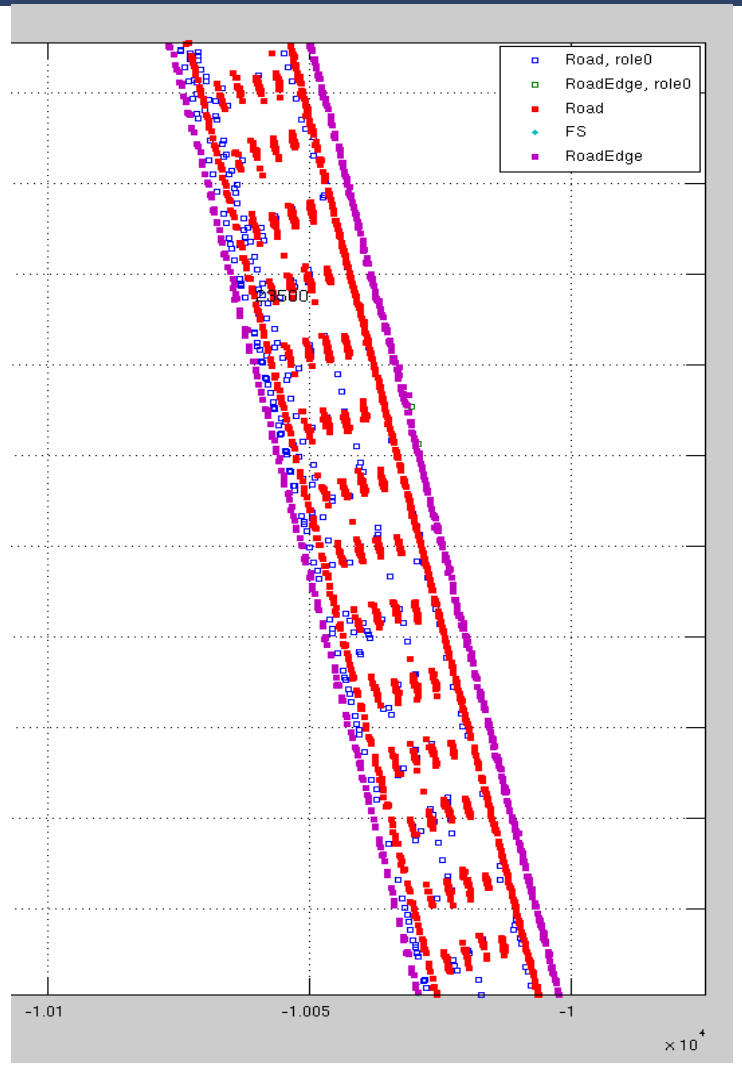
Localizing the car within 5cm accuracy in the road book.

REM™ Harvesting

REM™ Aggregation

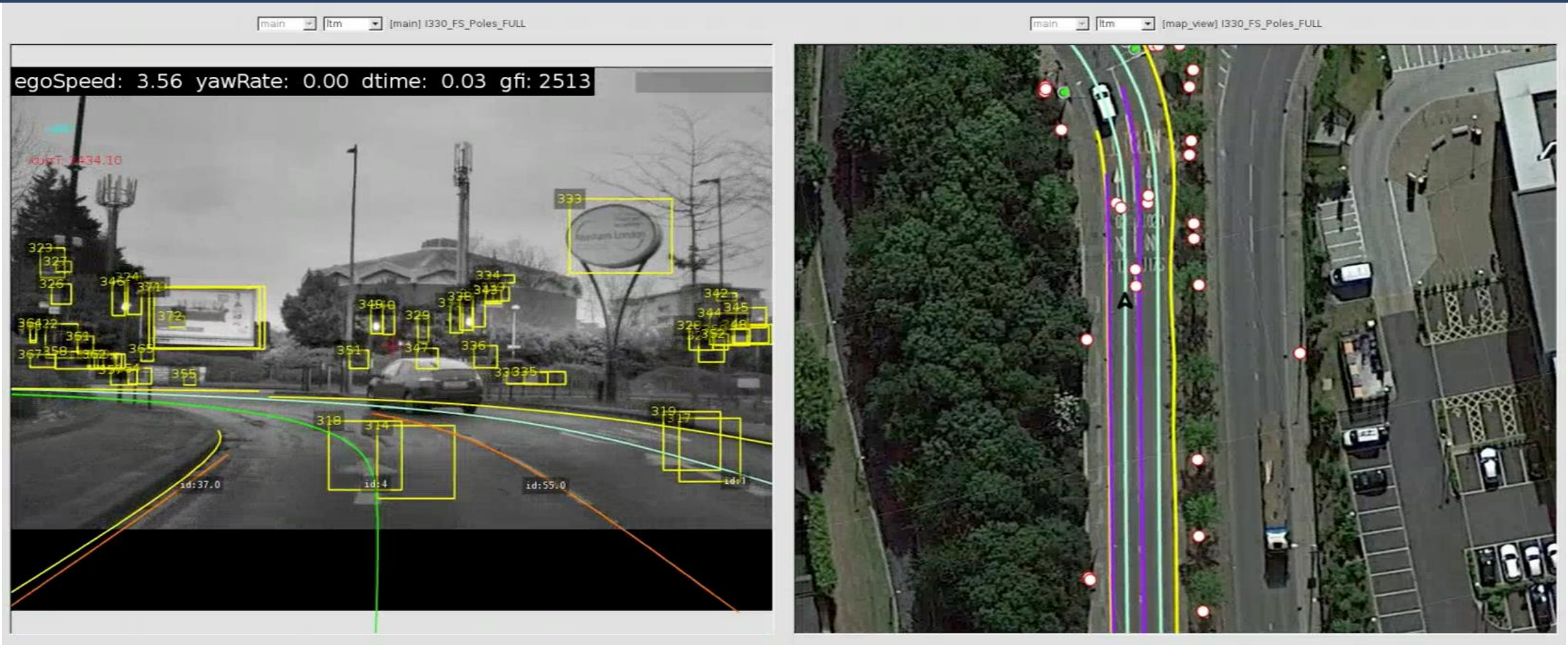
Roadscape data is aggregated to create HD roadbooks distributed to autonomous vehicles in map tiles





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

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Data for the Road Ahead
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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

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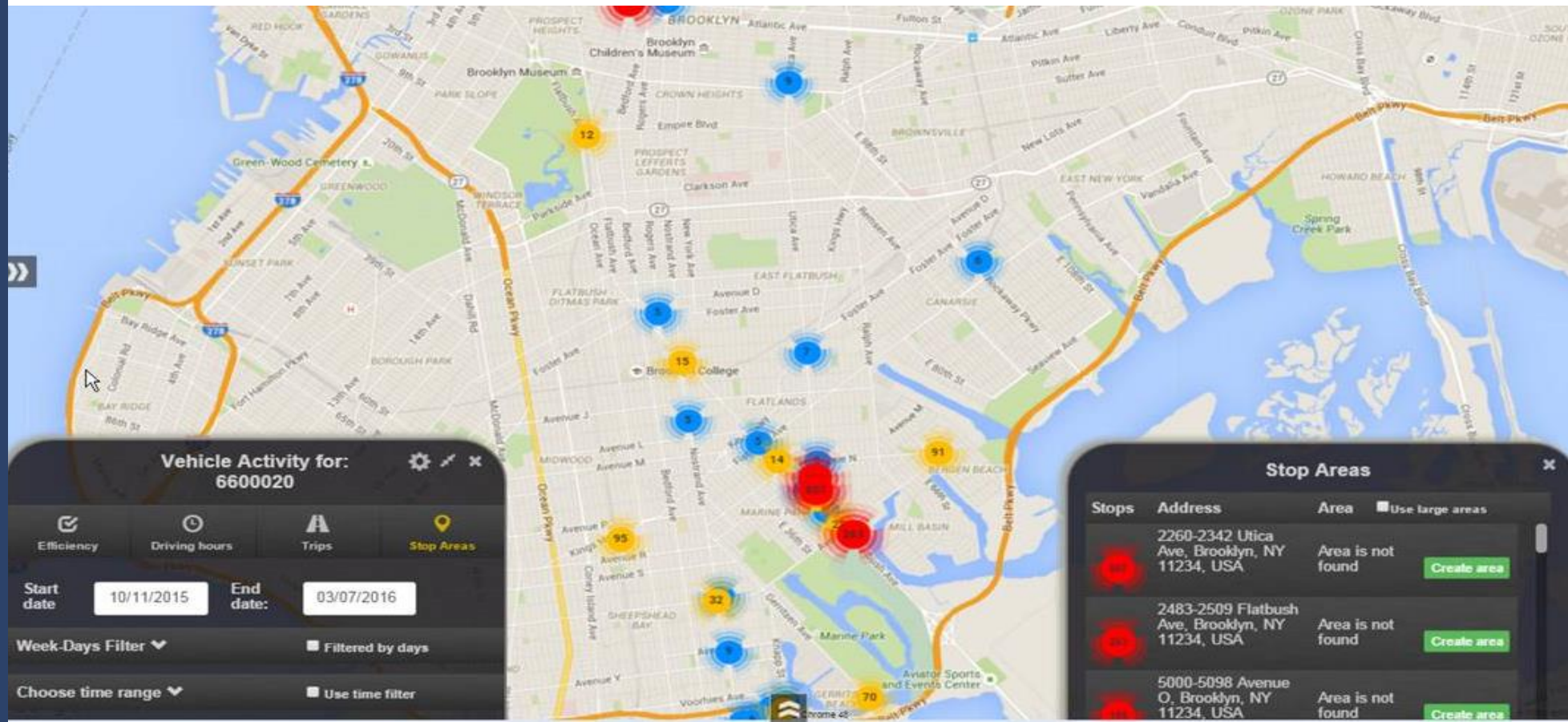
SAFER - Hotspot Mapping

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



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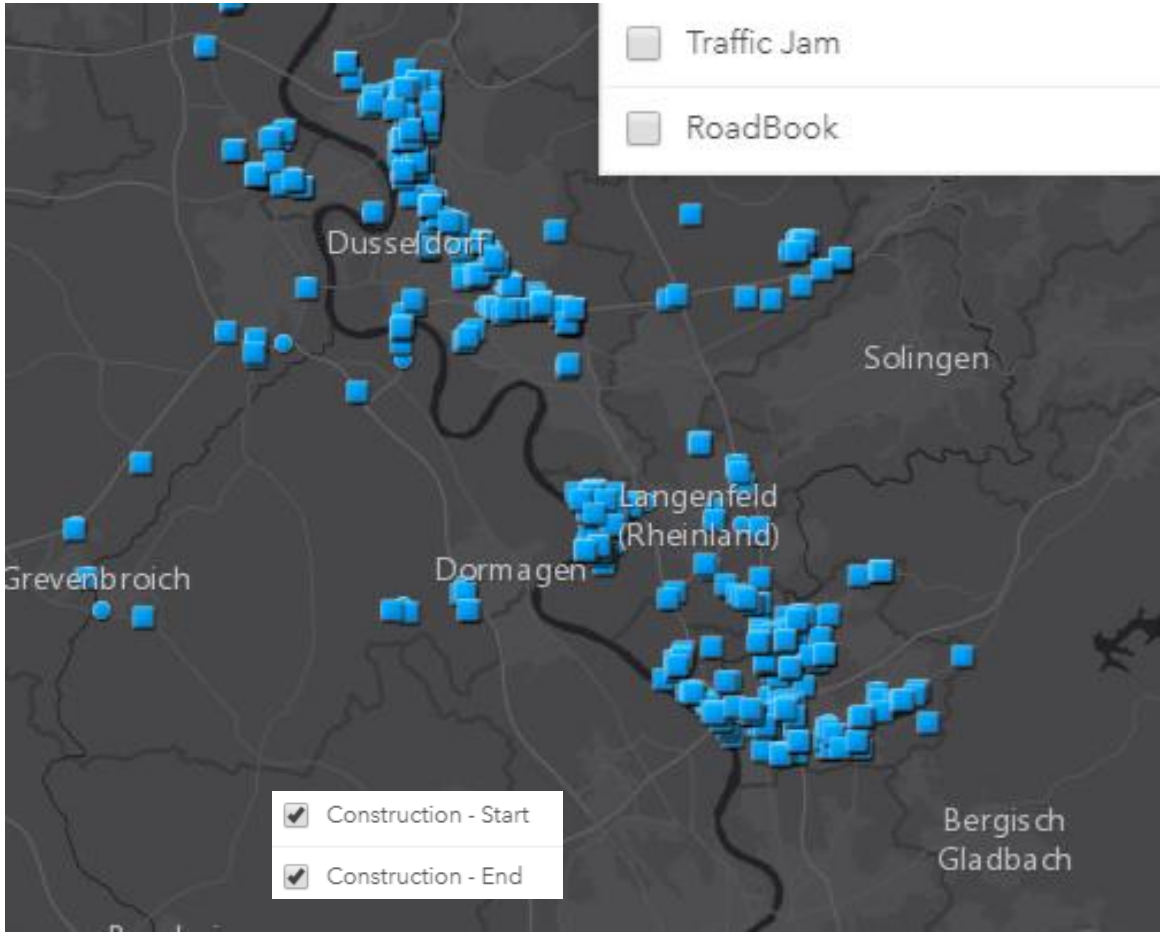
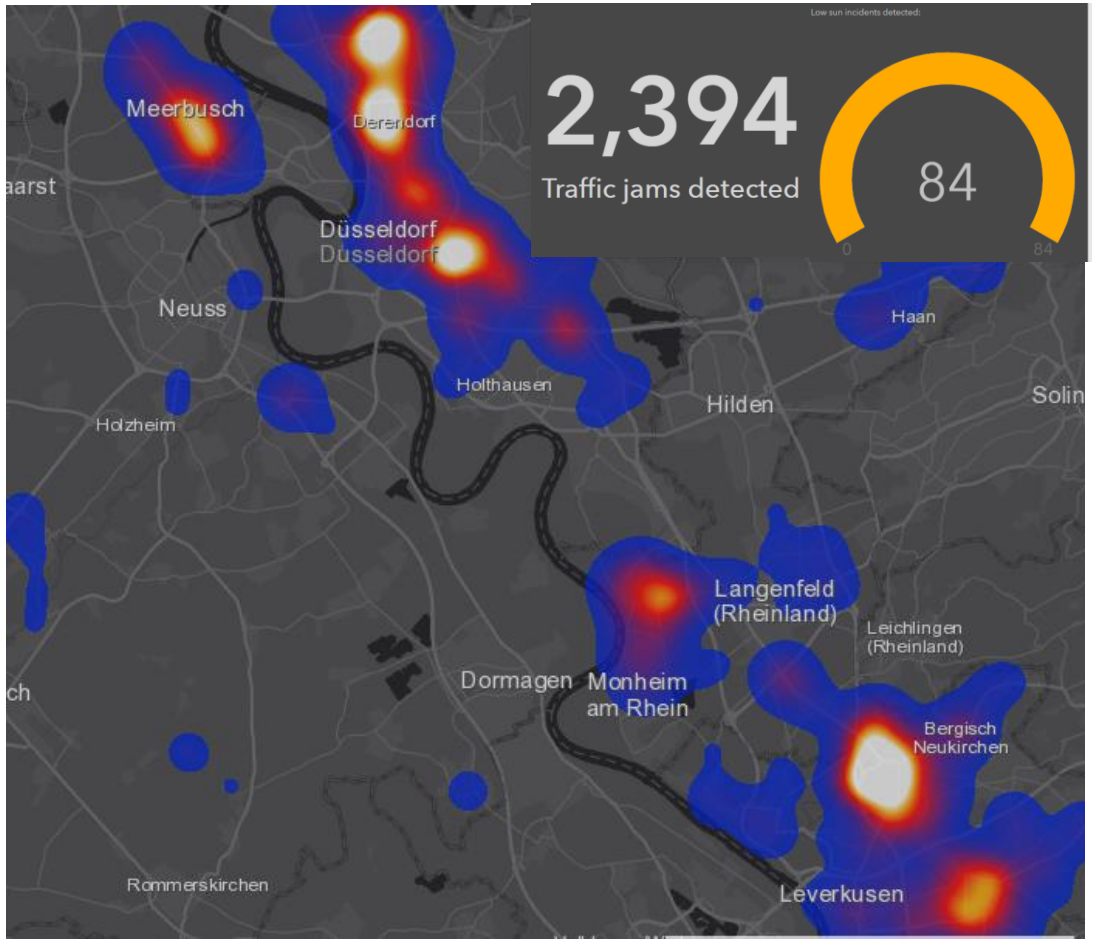
Smarter – Data Insights for Cities

First Deployment Snapshots – Dusseldorf Komod Project

RSD streams of data received (August 2018)



Construction Area Heat Map



Traffic Jam Heat Map

Partnered With esri

Road Segment Data (RSD) Applications

Now With REM

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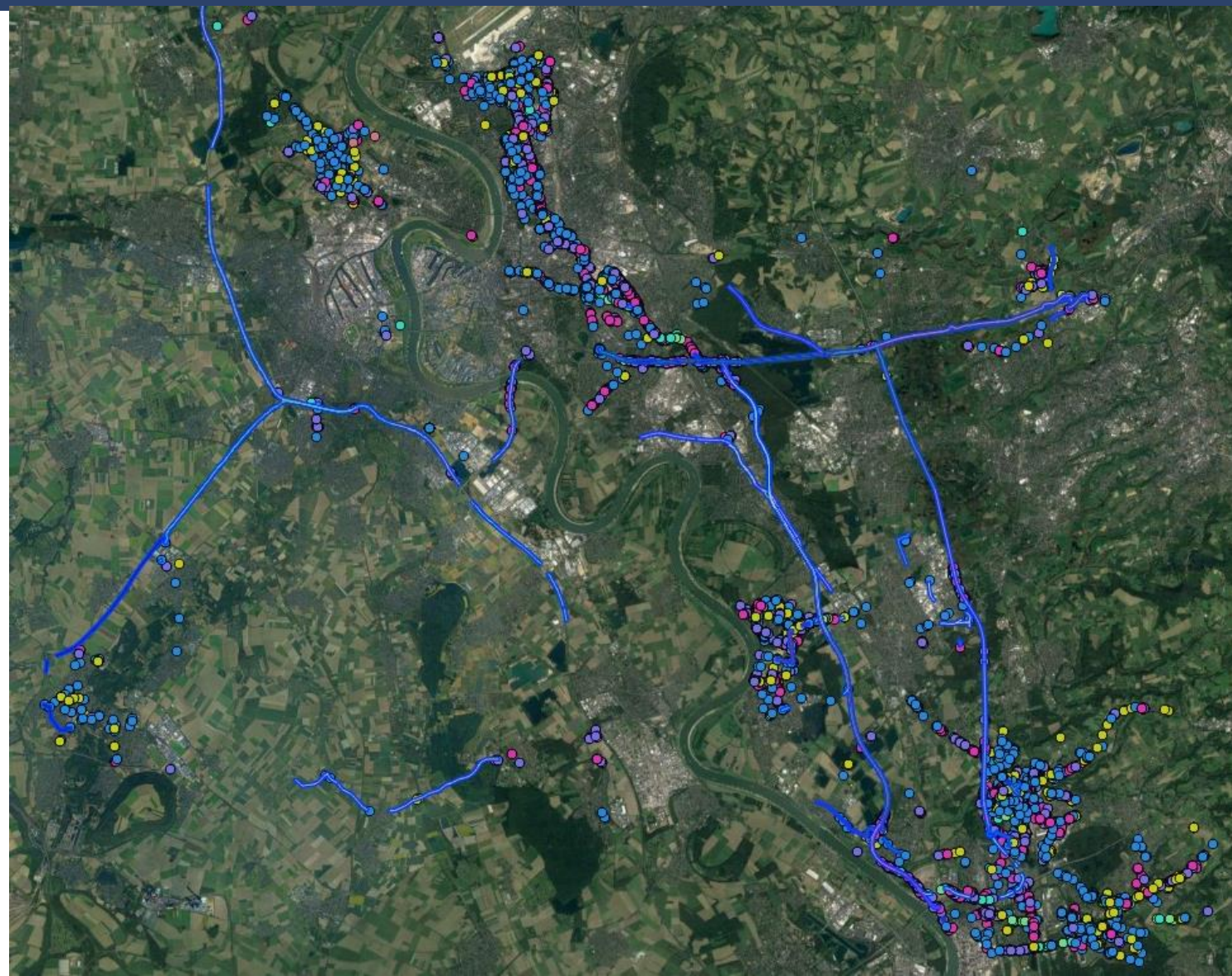
Static Layer

- ✓ 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

Partnered With esri



Make Your City Autonomous Ready

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!