Artificial Intelligence

Supercharging Knowledge and Decision Making

The Future of Mobility

Mark Platshon
Managing Director
mark@icebreakerventures.com

Icebreaker Ventures

Follow the Money

 $15.3 Billion
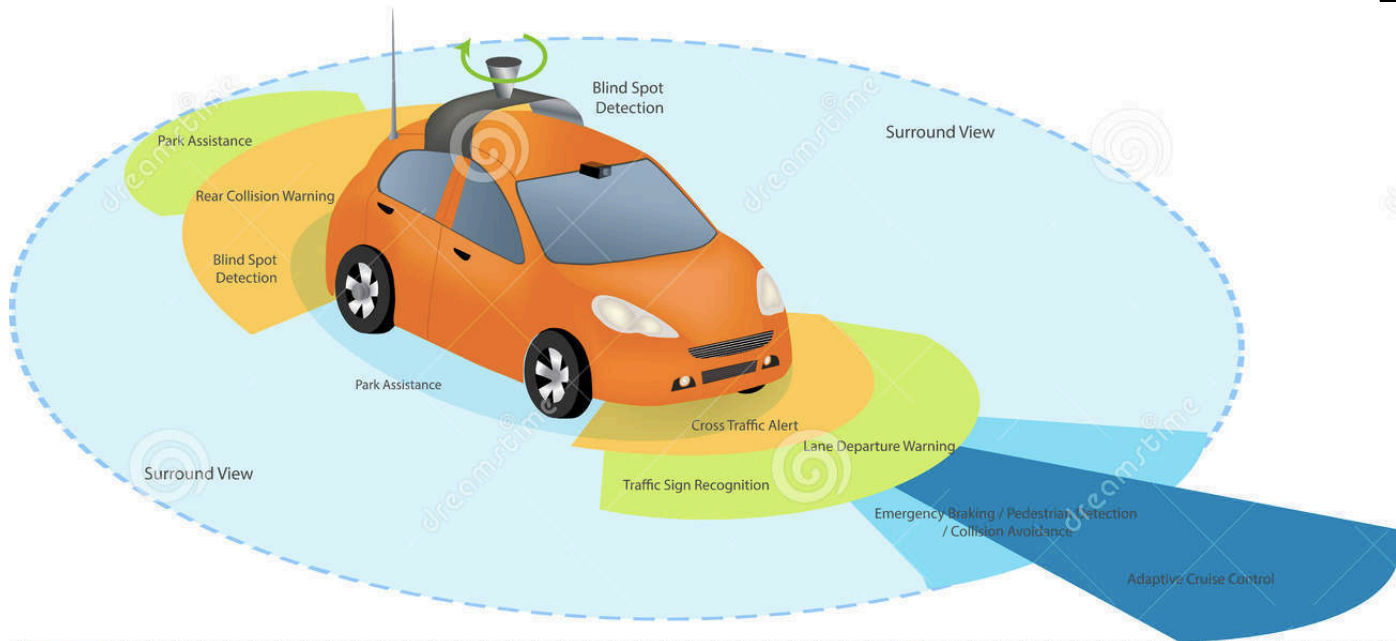
 $8 Billion

 $1 Billion

 $1 Billion

 $581 Million

 $500 Million

 $680 Million

 $300 Million

Blind Spot Detection

Park Assistance

Rear Collision Warning

Blind Spot Detection

Surround View

Park Assistance

Cross Traffic Alert

Lane Departure Warning

Surround View

Traffic Sign Recognition

Emergency Braking / Pedestrian Detection / Collision Avoidance

Adaptive Cruise Control

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1 : 5000 miles

1 : 5000

Miles per Waymo Intervention

1 : 100,000,000 miles

1 : 100,000,000

Miles per Fatal Accident on US Roads
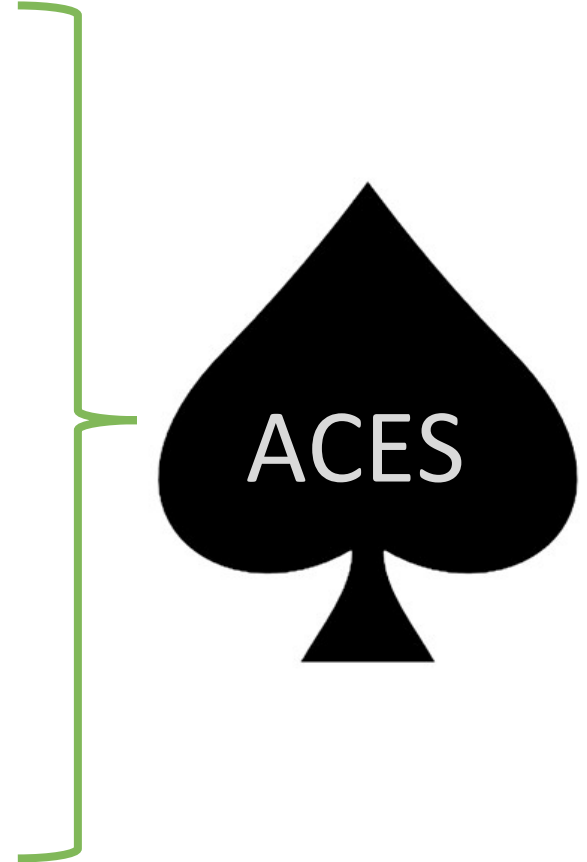
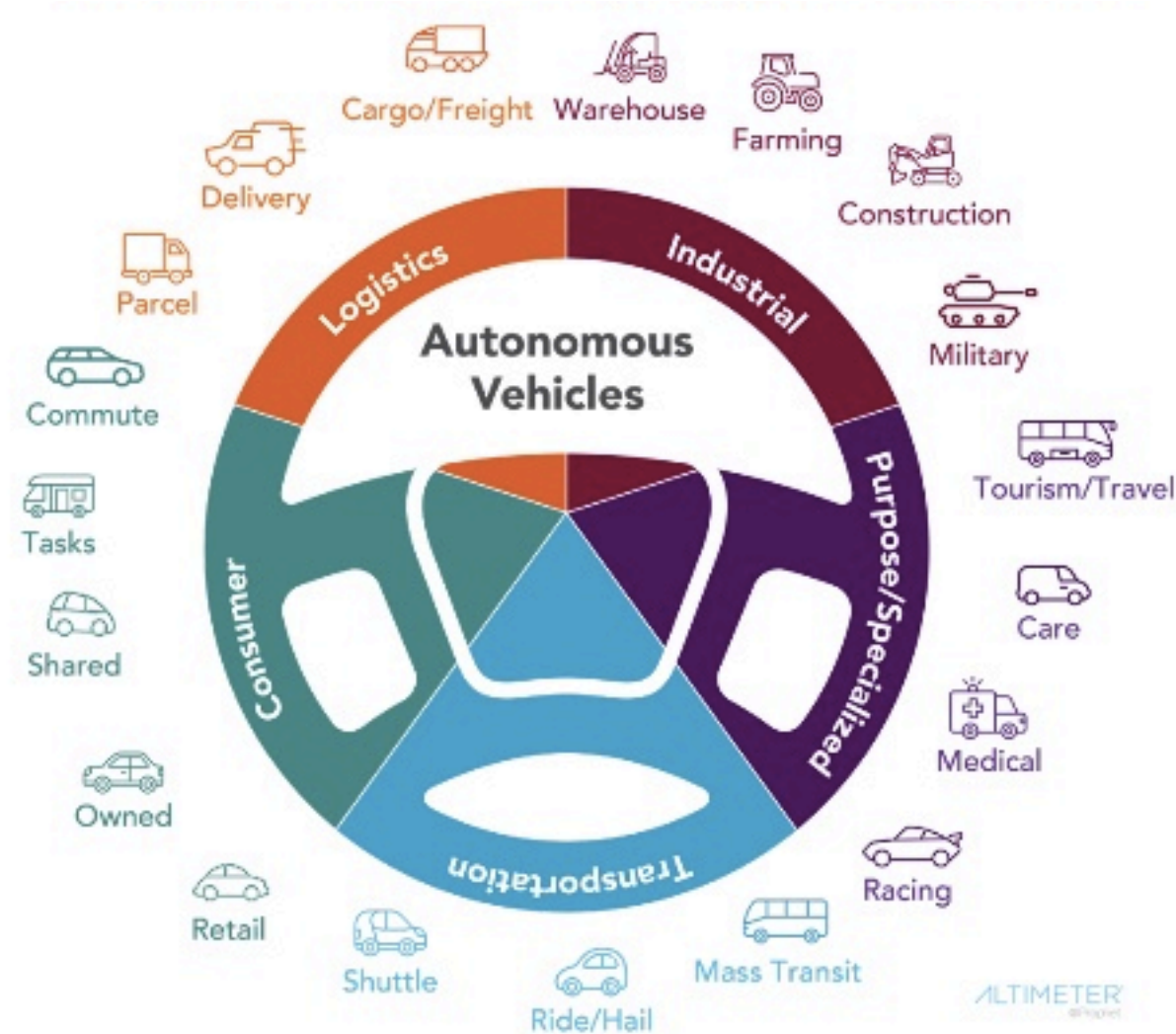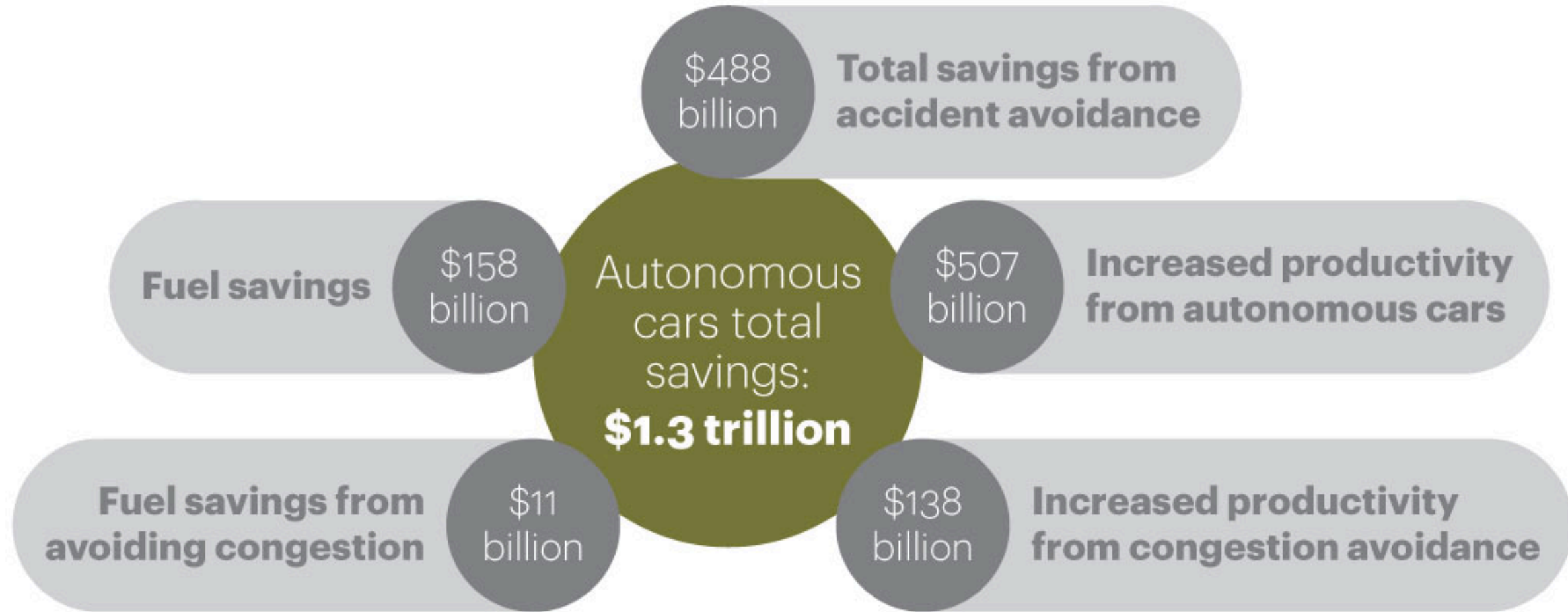# The Next Disruption: Mobility

Autonomous

Connected

Electric

Shared

ACES

HUGE: Applications for Autonomy

Autonomous Vehicles Will Generate Huge Economic Benefits

$488 billion — Total savings from accident avoidance

Fuel savings — $158 billion

Autonomous cars total savings: $1.3 trillion

$507 billion — Increased productivity from autonomous cars

Fuel savings from avoiding congestion — $11 billion

$138 billion — Increased productivity from congestion avoidance

ADAS to Automation

Collision Mitigation
Passive Systems

Collision Avoidance
Reactive Systems

Collision Prediction
Predictive and Warning

Automated
Predictive Actuators

Autonomous
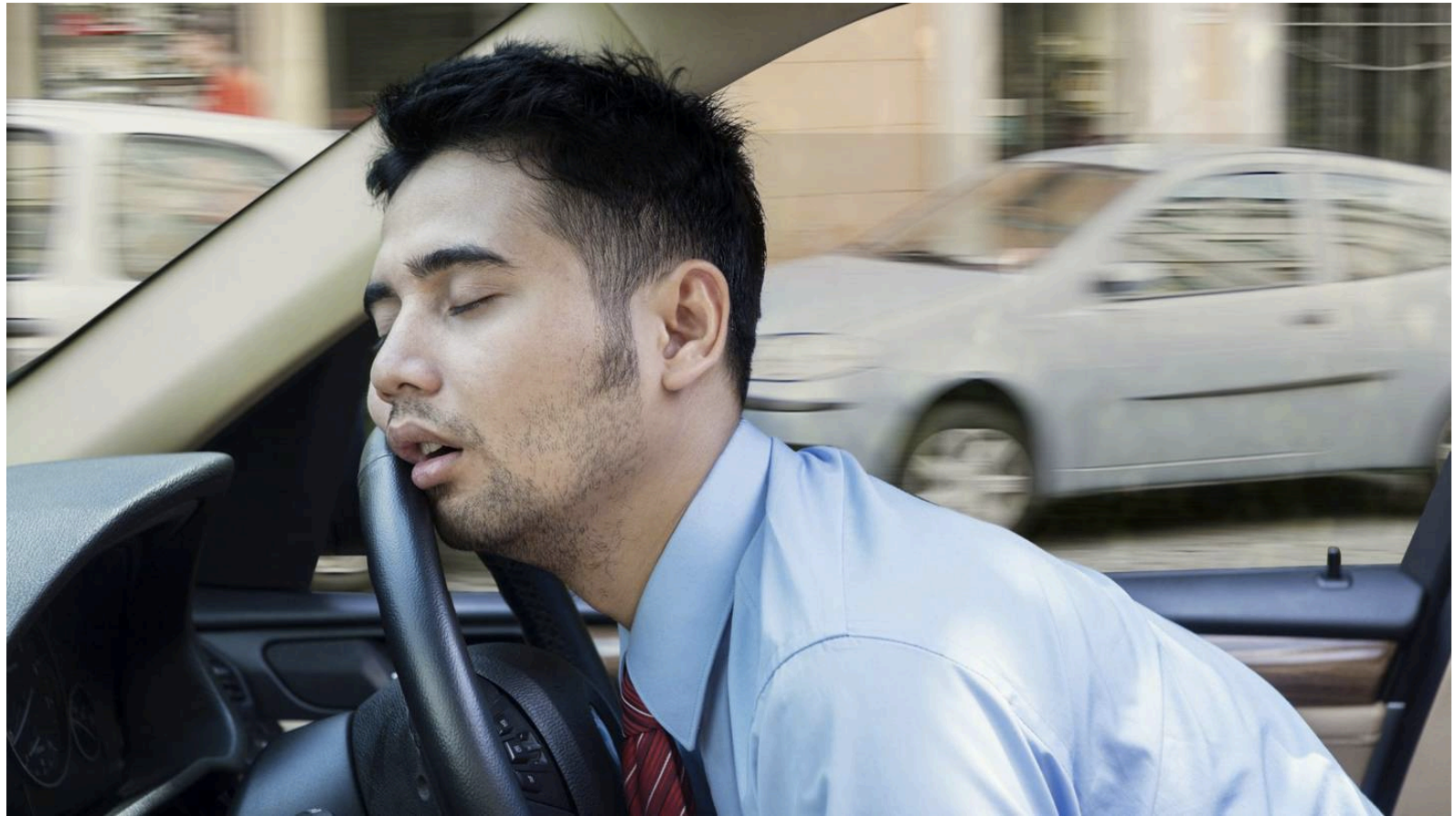Self Driving Cars

source: businessinsider.com

NHTSA and SAE Levels of Automated Driving
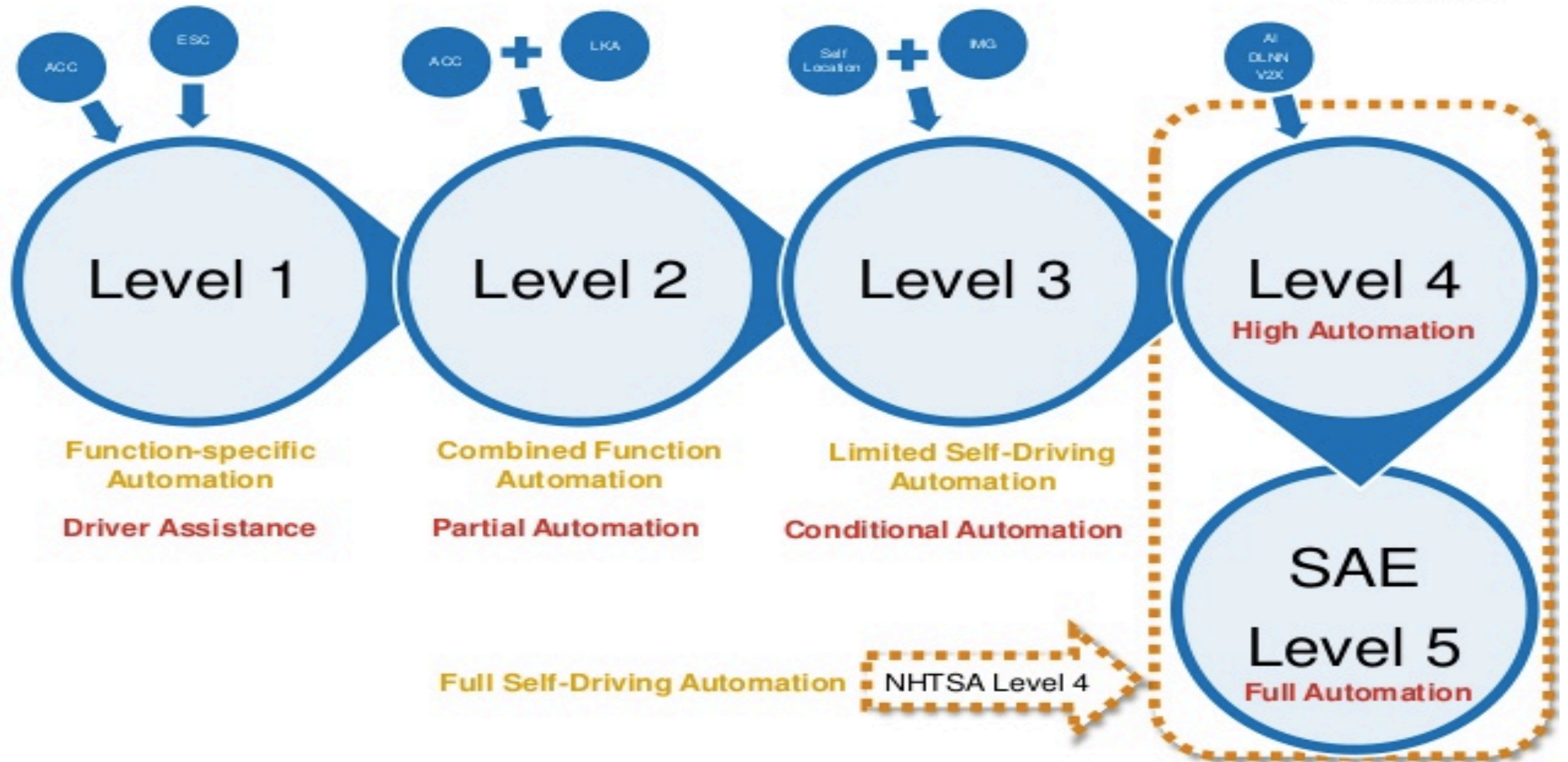
What's Wrong with Level 3 Automation?

"Ford Engineers Are Falling
 Asleep While Monitoring
Self-Driving Cars"
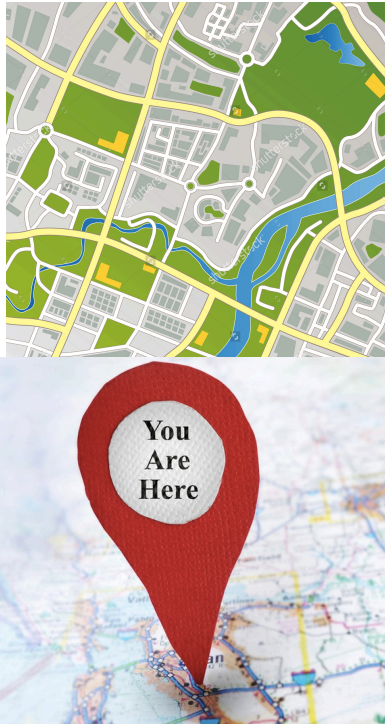
Sensors and Cameras Everywhere

Legend:
- Long-Range Radar
- Lidar
- Camera
- Short/Medium Range Radar
- Ultrasound
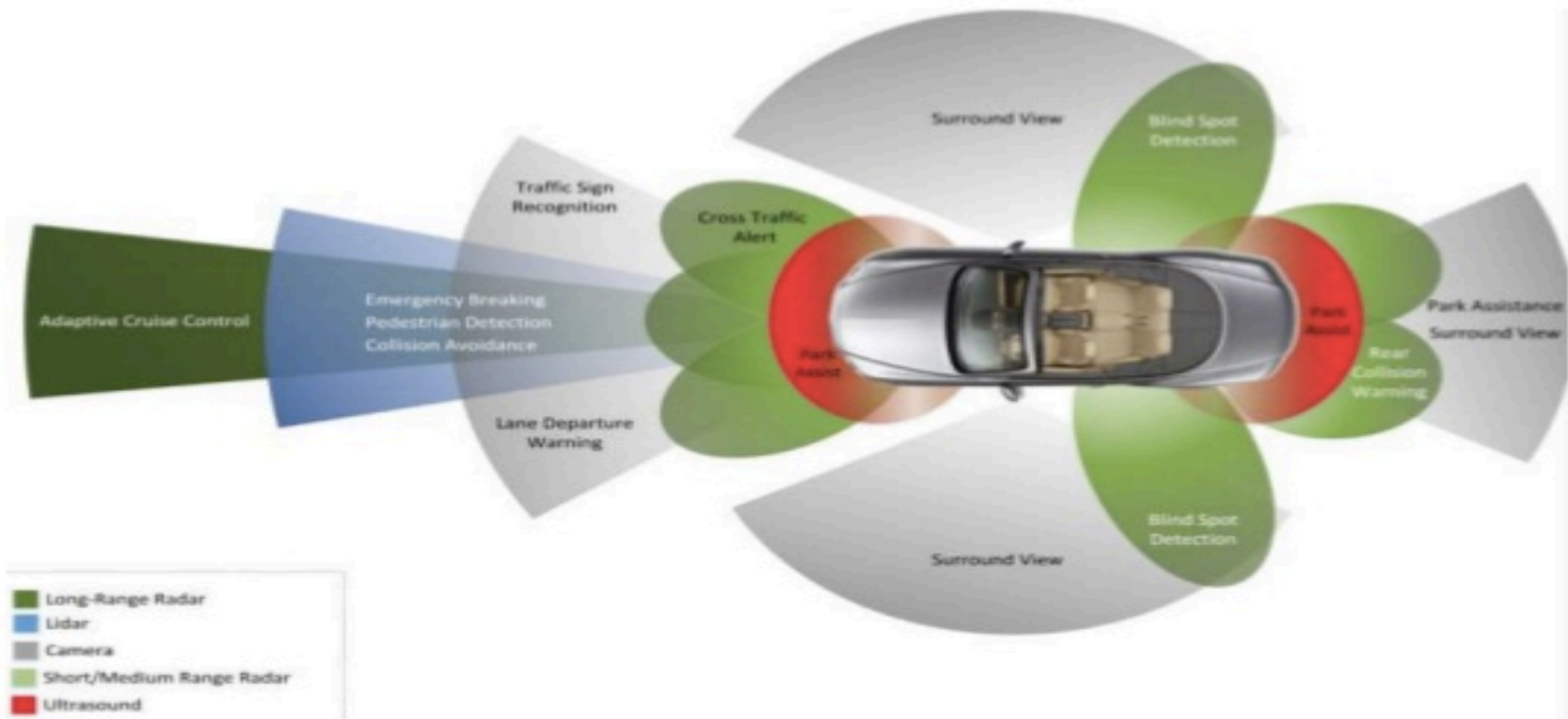
Localization: Where am I, exactly?
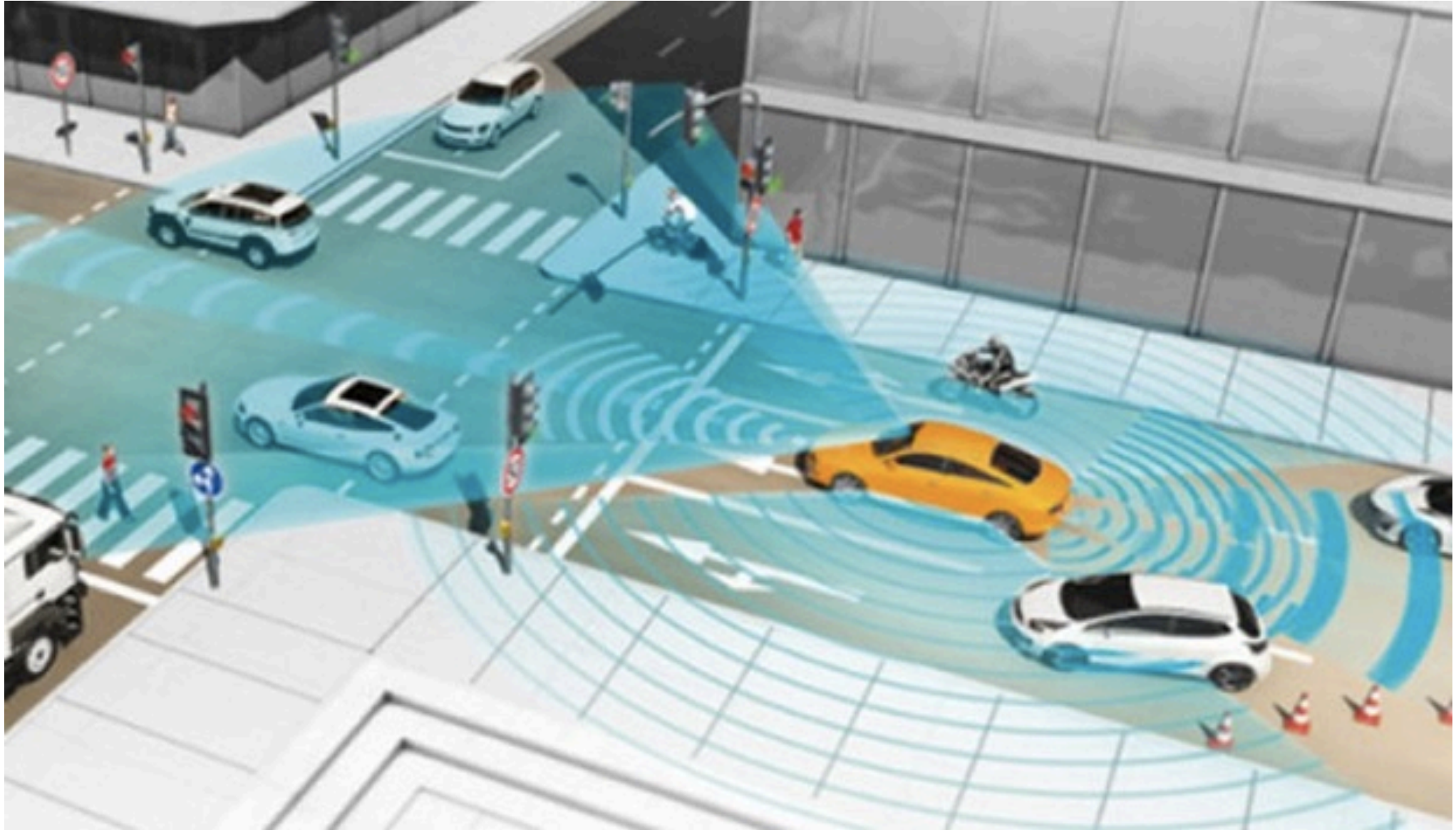
PERCEPTION: LiDAR + Vision + Radar + Infrared
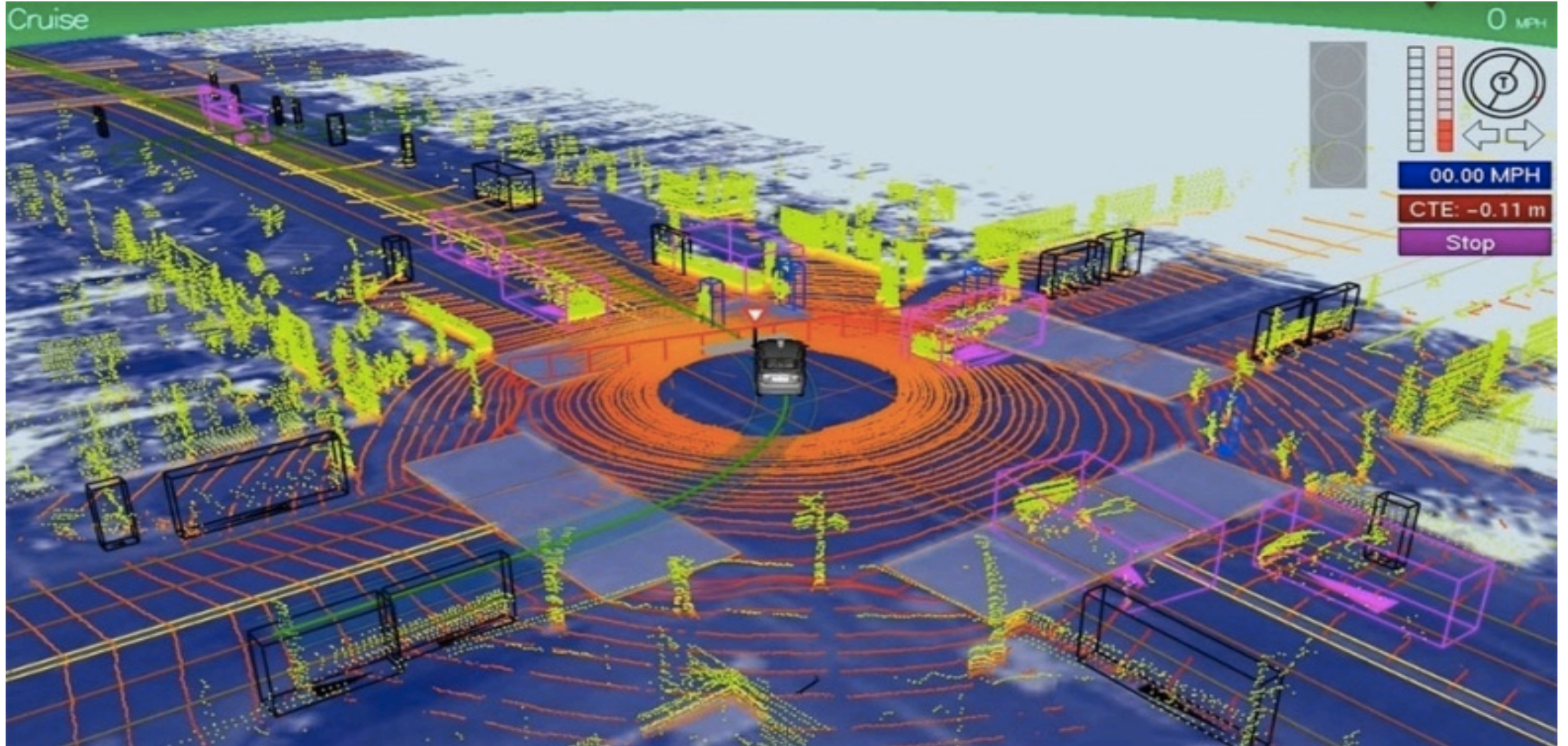
Sensor Fusion Creates Big Data

Machine Readable Maps
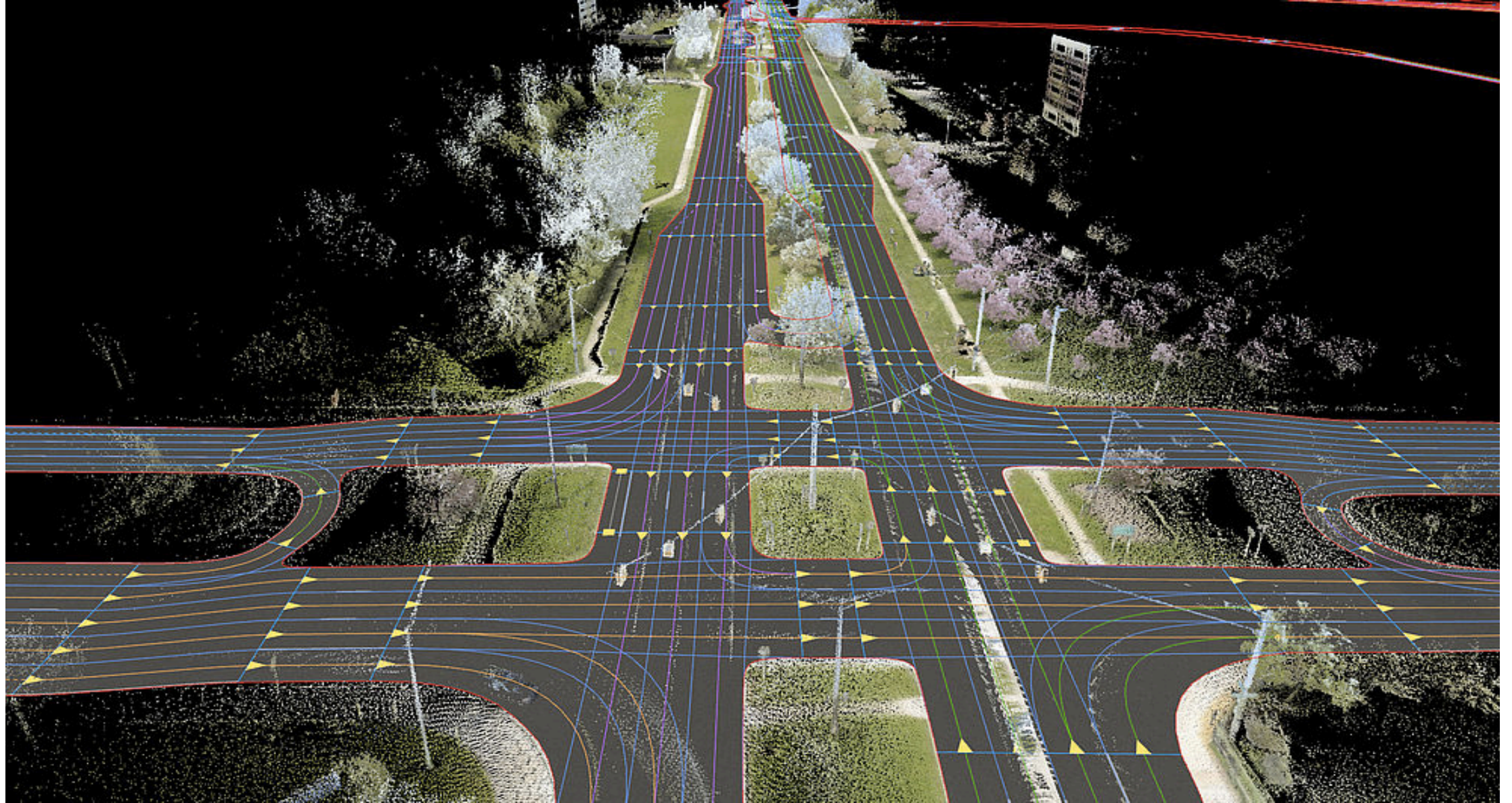
V2V: Seeing around corners, seeing thru cars
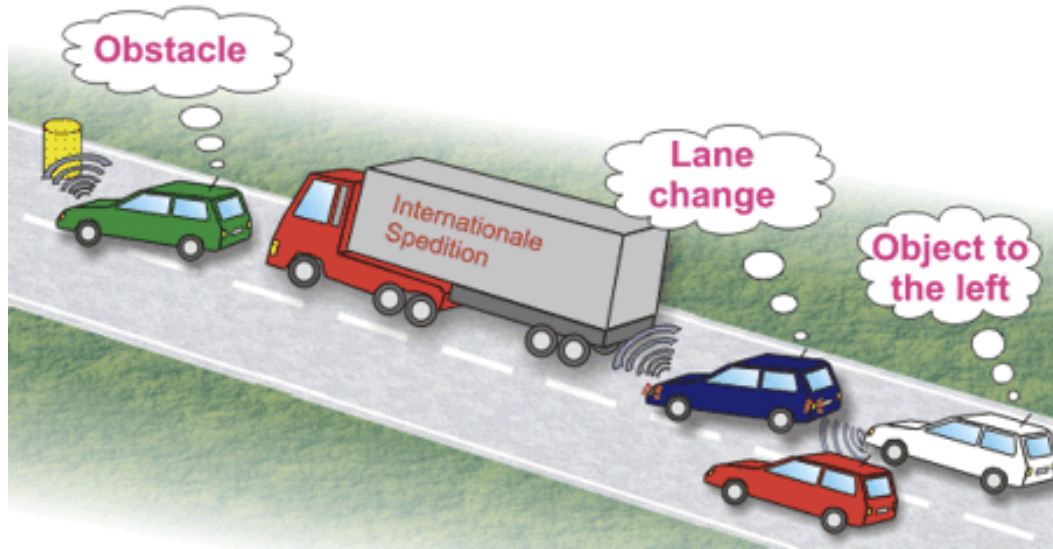
It's all software: So how do we test it... safely?

The Big Secret

It's all software: So how do we test it... safely?

CROWSOURCED FLEET

SHADOW MODE

The Building Blocks of Autonomy

Level of Integration →

AUTONOMOUS SOLUTIONS

TOYOTA · TESLA · Ford · GM · HYUNDAI · KIA MOTORS · Google · UBER · NVIDIA · Continental · navya · ZMP · Audi · BMW · CHANGAN · HONDA · Mercedes-Benz · Apple · Baidu · VisLab · nuTonomy · PSA PEUGEOT CITROËN · NISSAN · BAIC · SAIC · CHERY · DELPHI · BOSCH · RENESAS · OTTO · drive.ai · ZOOX

PROCESSING

RENESAS · NVIDIA · Mobileye · NXP · TOSHIBA Leading Innovation · CEVA · cadence · imagination · ARM · ANALOG DEVICES · intel · XILINX · videantis · ALTERA · TEXAS INSTRUMENTS · QUALCOMM · MARVELL · ST · Movidius

SENSORS

BOSCH · DELPHI · MITSUBISHI ELECTRIC · NXP · Continental · ibeo · Valeo · ZF · TRW · HITACHI · OmniVision · MOBIS · POINT GREY · Pioneer · Autoliv · TOSHIBA Leading Innovation · KOSTAL · DENSO · LG Innotek · Panasonic · MAGNA · HARMAN · FUJITSU TEN · Visteon · QUANERGY · Melexis · Mando Corporation · FLIR SYSTEMS · OSRAM · applanix · Neusoft · Infineon · ON · LeddarTech · SONY · PEPPERL+FUCHS · TRILUMINA · u-blox · Velodyne LiDAR

CONNECTIVITY

HITACHI · RENESAS · Peloton · Continental · NXP · BOSCH · DELPHI · intel · CohdaWireless · QNX · TTTech · DENSO · Infineon · HARMAN · Mentor Graphics

MAPPING

TomTom · G · NAVINFO · mapscape · HARMAN · GeoDigital · Increment P · EXONAV · ZENRIN · applanix · 'AND · Civil Maps

ALGORITHMS

Mobileye · NVIDIA · MITSUBISHI ELECTRIC · Elektrobit · dSPACE · AdasWorks · Neusoft · ETAS · LUXOFT · KPIT · VECTOR

SECURITY/SAFETY

HITACHI · RENESAS · Mentor Graphics · BOSCH · Continental · DELPHI · NXP · WIND · ARGUS · Elektrobit · QNX · intel · DENSO · ETAS · HARMAN · Green Hills SOFTWARE · Infineon · KPIT · VECTOR

DEVELOPMENT TOOLS

BASELABS · IAR SYSTEMS · LDRA · MathWorks · SYNOPSYS · VECTOR software · Elektrobit · KPIT · LUXOFT · Mentor Graphics · HARBRICK · KSHONTI · INTEMPORA · tass international · TTTech · dSPACE · ETAS · VECTOR · QNX

ICEBREAKER VENTURES

The Autonomous World Fund

A corporate ecosystem venture fund for the new age of intelligent mobility

Icebreaker Ventures

February 2017