



Trends in the Automotive Industry

Driving Safety



Automated Driving



Electric Mobility



Industry Trends



Digitalization



Connectivity



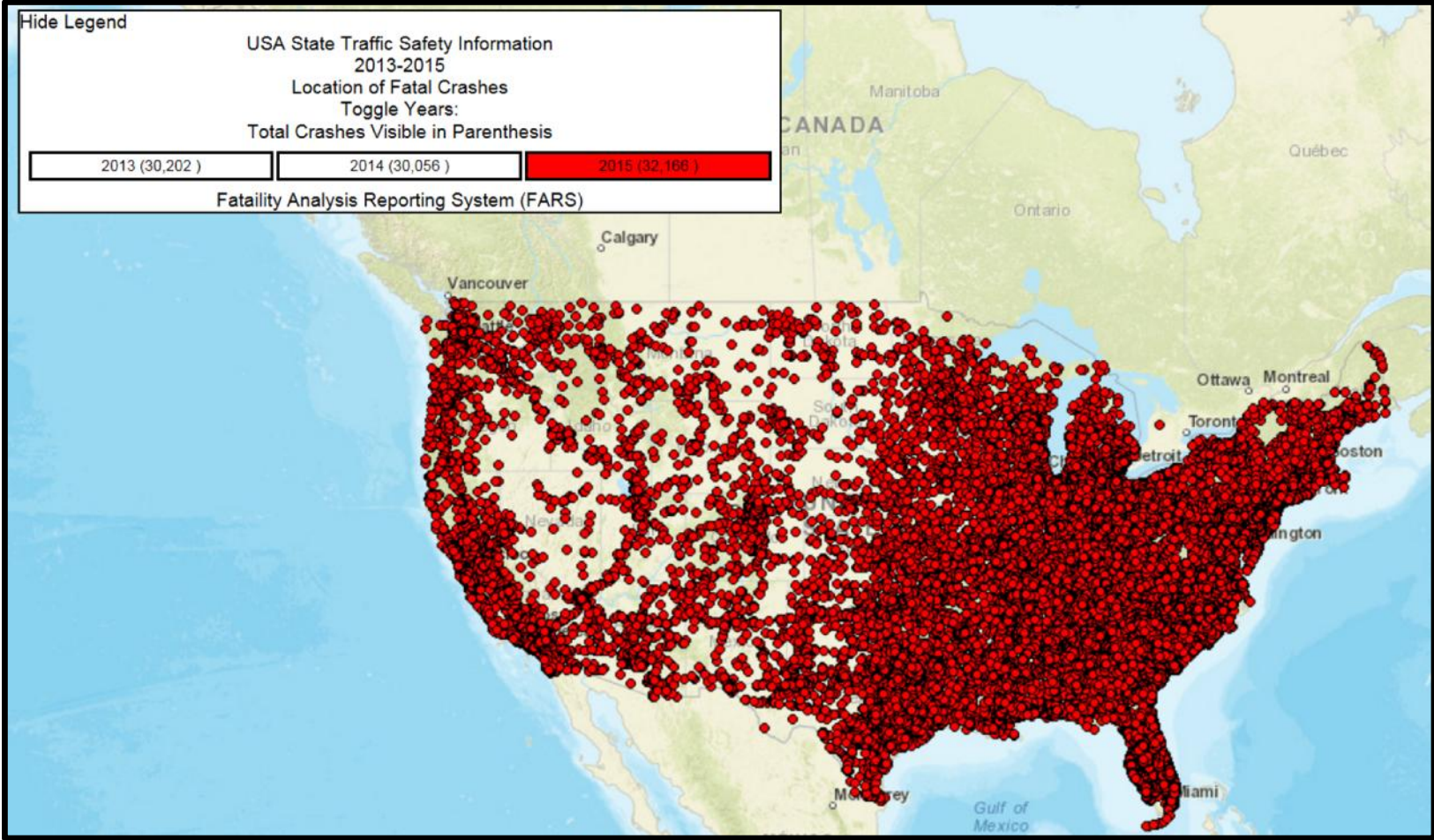
Assisted to Automated Driving: The Safety Story

Traffic Fatalities

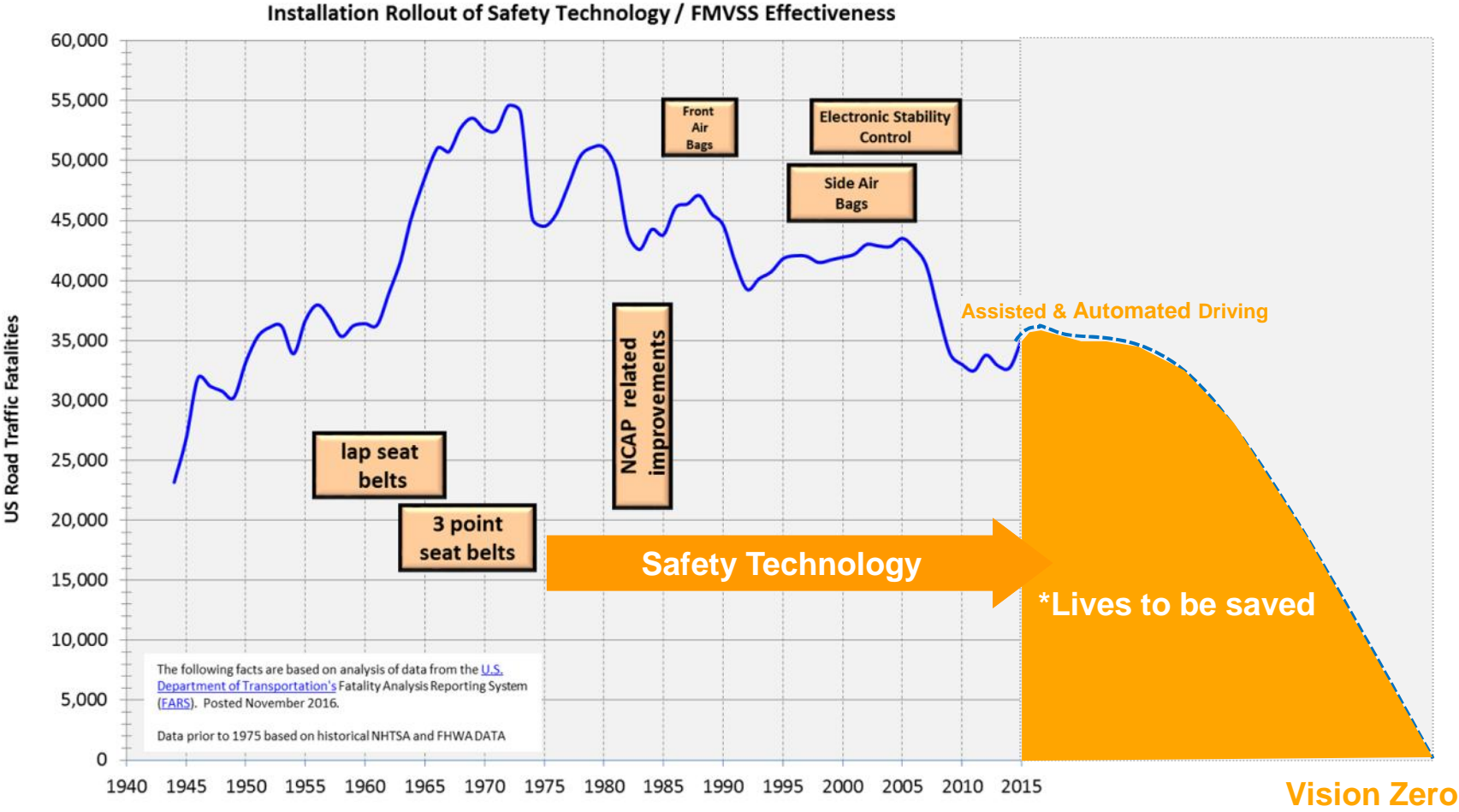


Still more than
1.2 Million
traffic fatalities per year

In 2015, there were over 32,000 crashes and 35,000 fatalities in the United States



Safety Technologies are the Main Drivers in Reducing the Number of Traffic Fatalities



* Fatality data beyond 2015 is hypothetical for illustrative purposes only

The Safety Basics

If a car assists you, or drives you automatically, it must:

SENSE
IDENTIFY & INTERPRET



PLAN
DECIDE & CONTROL



ACT
EXECUTE



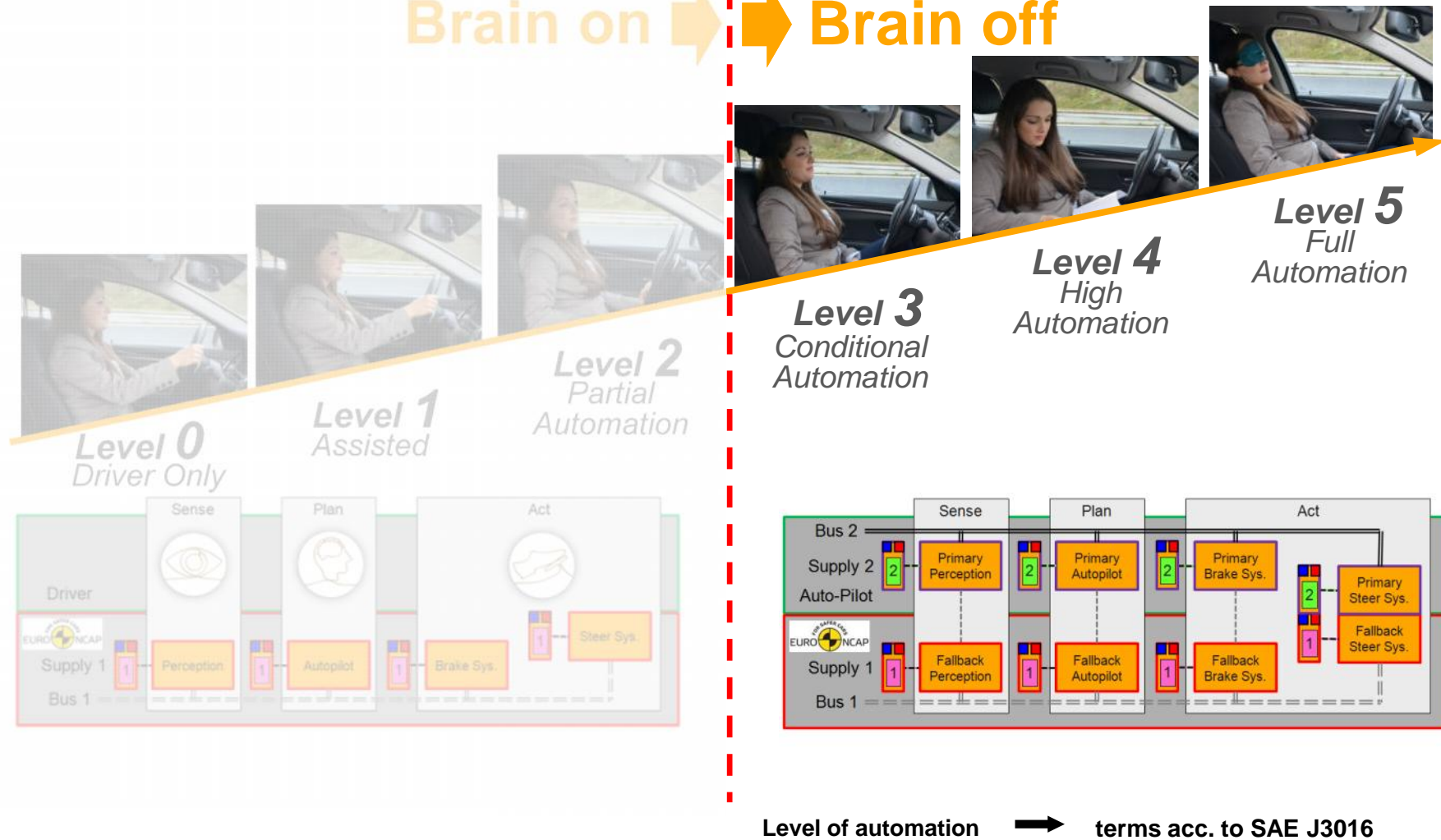
**SURROUND
MODELING**

MOTION PLANNING


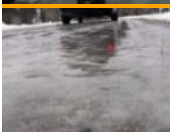


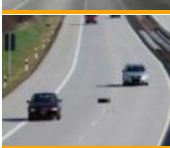
MOTION EXECUTION






Automated Driving Level 2 and beyond

Brain on → Brain off



Automated Driving Challenges..

	Low sight
	Sudden icy road
	Aquaplaning
	Difficult lane markings
	Small stationary objects

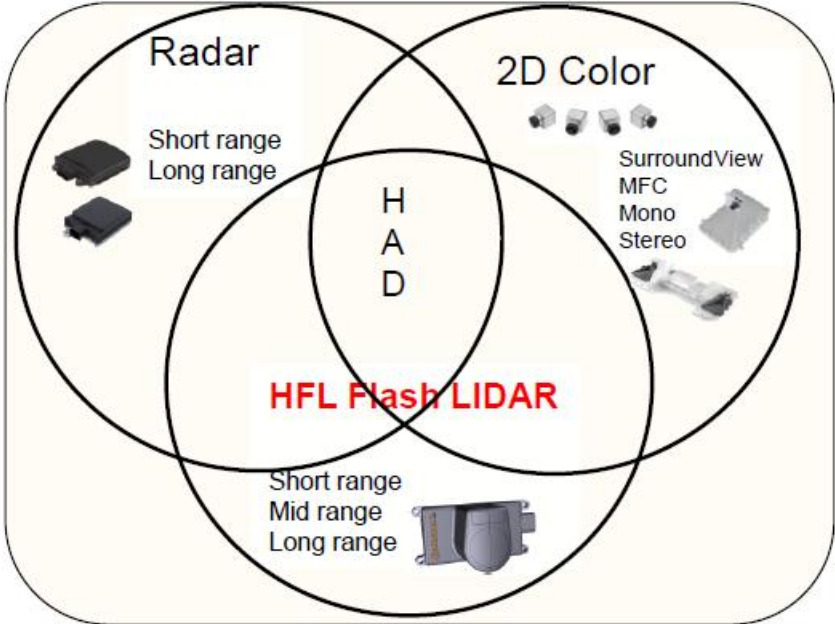
	Pedestrians on the road
	Animals
	Traffic light recognition
	Lane change
	System Failure

	Merging lanes
	Tight lanes
	Toll stations etc.
	Driver Take Over
	End of use case detection (system boundaries)

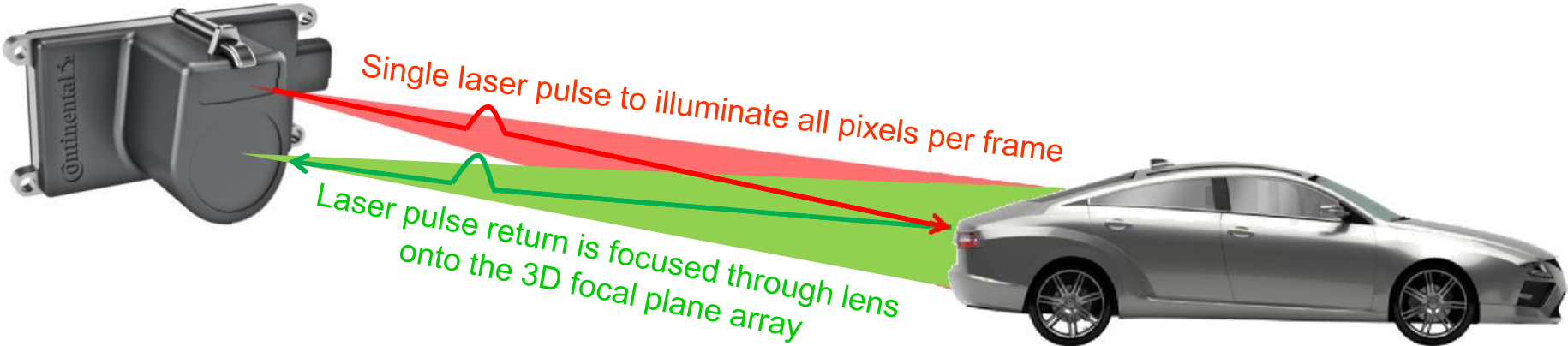
The list goes on...

Redundancy of sensor data will enable safe Highly Automated Driving

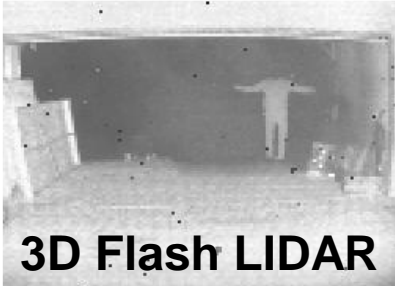
Detection	Camera	RADAR	LiDAR
Color / Light	+	X	X
Weather Robustness	0	+	0
Velocity Accuracy	-	+	0
Angle Resolution	+	-	+
Object Contour	0	-	+
Road Surface	0	-	+
Range Accuracy	-	+	+
Day vs Night	-	+	+
Detection Reliability	-	+	+



High-Resolution 3D Flash LIDAR

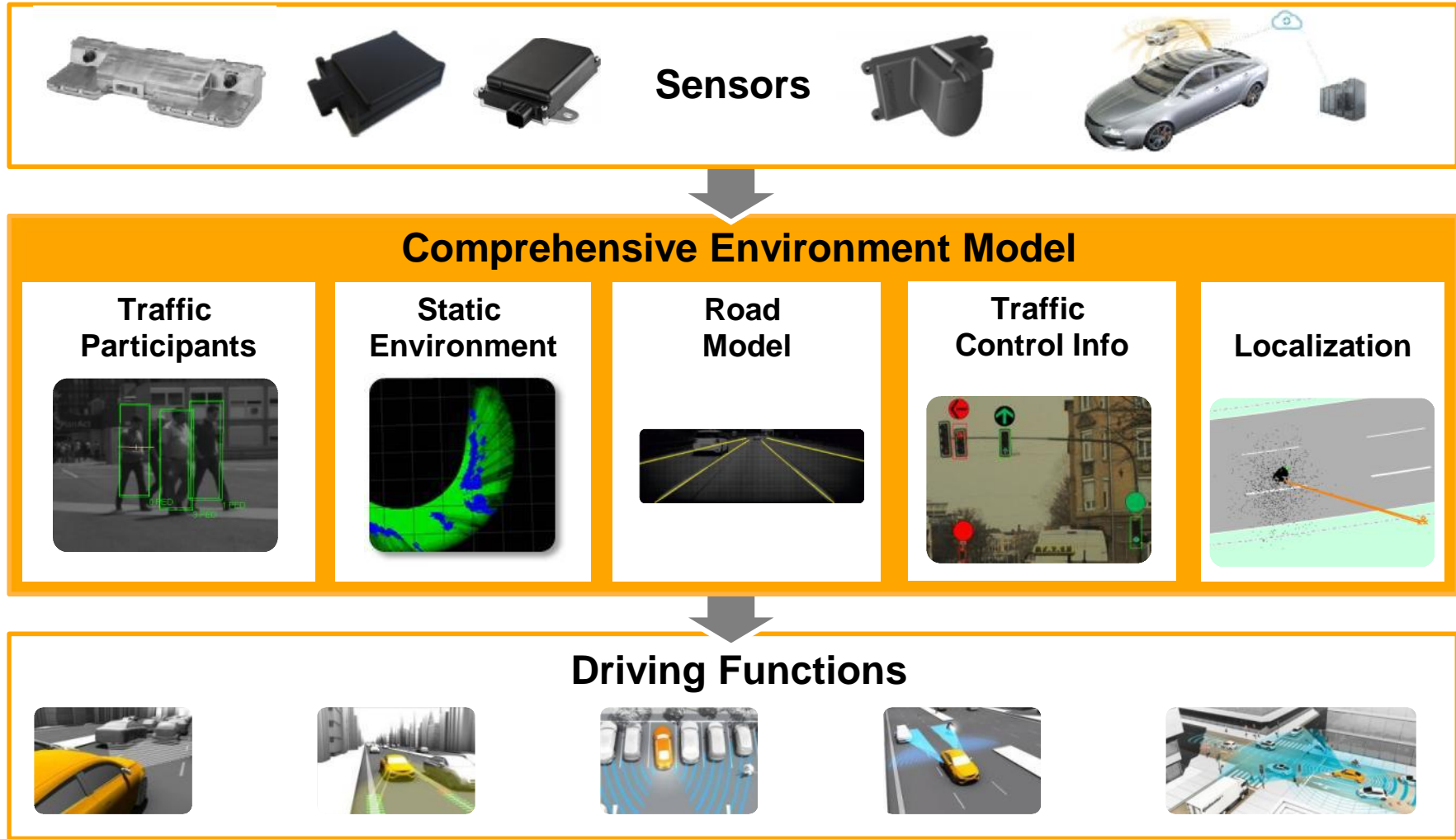


Imaging through obscuration



Comprehensive Environment Model

Entire description of driving environment



Highly Automated Driving @ Continental

On the road since 2011

Nevada License



Cross-country tours



2017 Third Generation



Continental

Worldwide development of automated driving



Current testing regions worldwide



Vision Zero



Thank you
for your attention!