

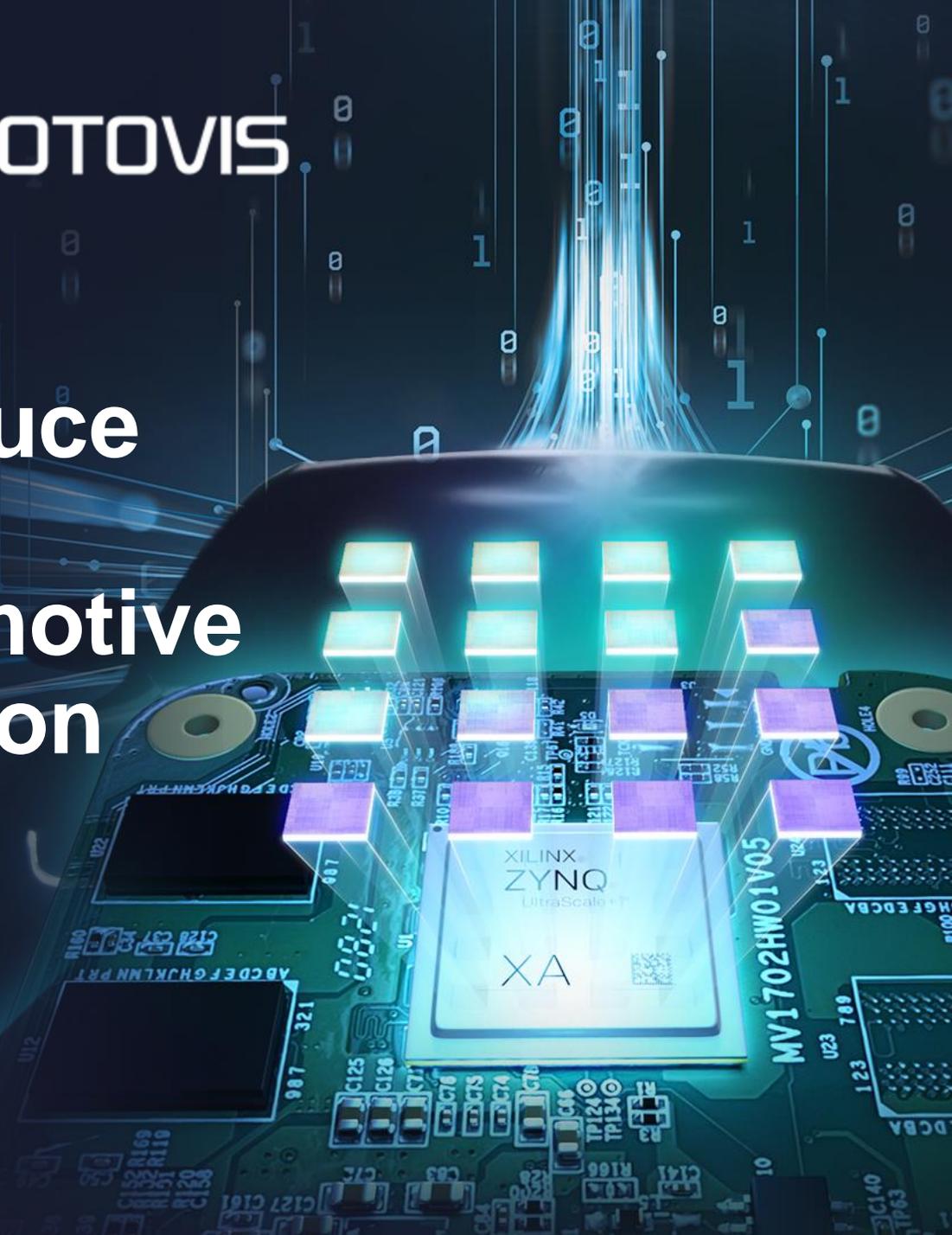


AUTOMOTIVE



# Xilinx and MotoVis Introduce Hardware and Software Solution to Further Automotive Forward Camera Innovation

August 2021

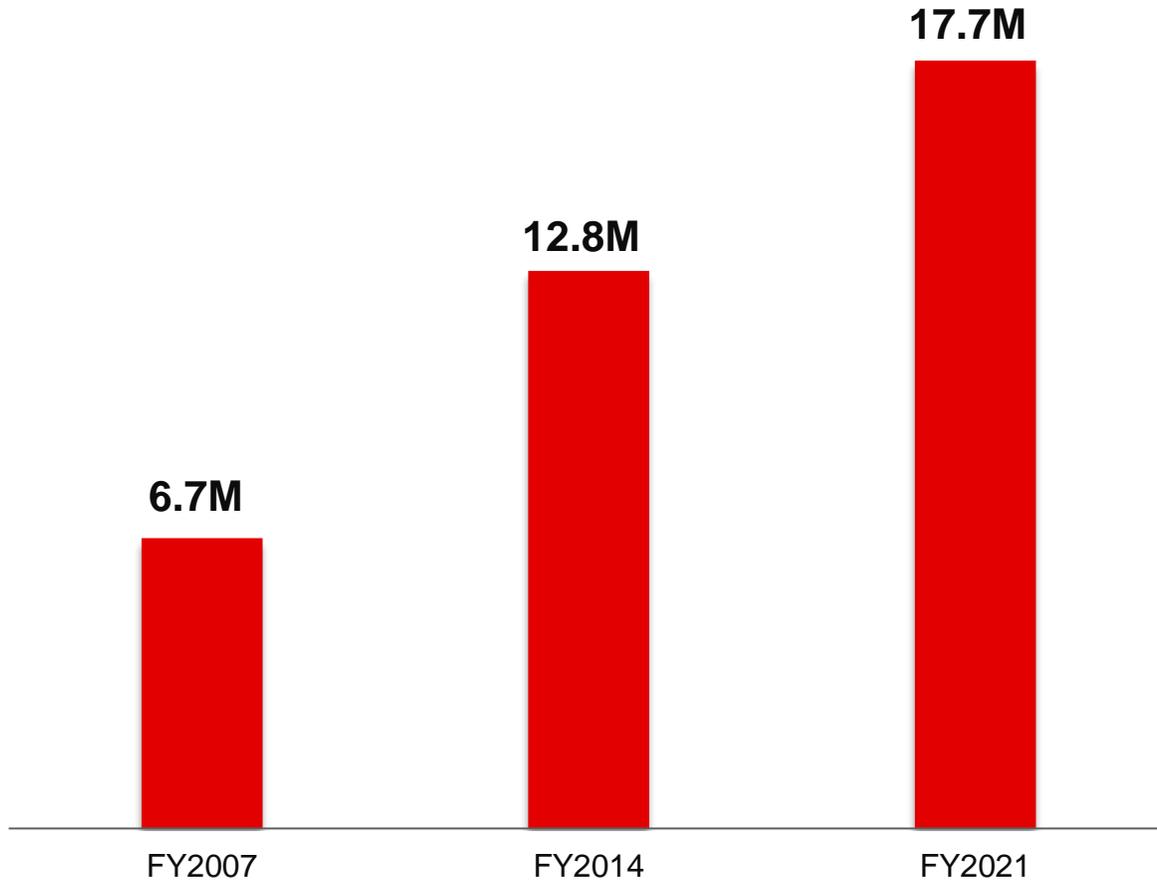


# Overview of News

- ▶ Xilinx and Motovis are collaborating on a joint solution that pairs the Xilinx Automotive (XA) Zynq<sup>®</sup> system-on-chip (SoC) platform and Motovis' convolutional neural network (CNN) IP to the automotive market, specifically for forward camera systems.
- ▶ The forward camera solution scales across the 28nm and 16nm XA Zynq SoC families using Motovis' CNN IP, resulting in a unique combination of optimized hardware and software partitioning capabilities with customizable CNN-specific engines that host Motovis' deep learning networks
- ▶ The solution, which is available now, supports a range of parameters necessary for the European New Car Assessment Program (NCAP) 2022 requirements by utilizing convolutional neural networks to achieve a cost-effective combination of low latency image processing, flexibility and scalability.

# Xilinx Steady Growth in Automotive

## Unit Shipments



## Consistent Growth

- ▶ Double-digit unit shipment growth over **15** years
- ▶ More than **209M** devices shipped
- ▶ More than **85M** devices shipped into ADAS

### Tier-1s



### OEMs



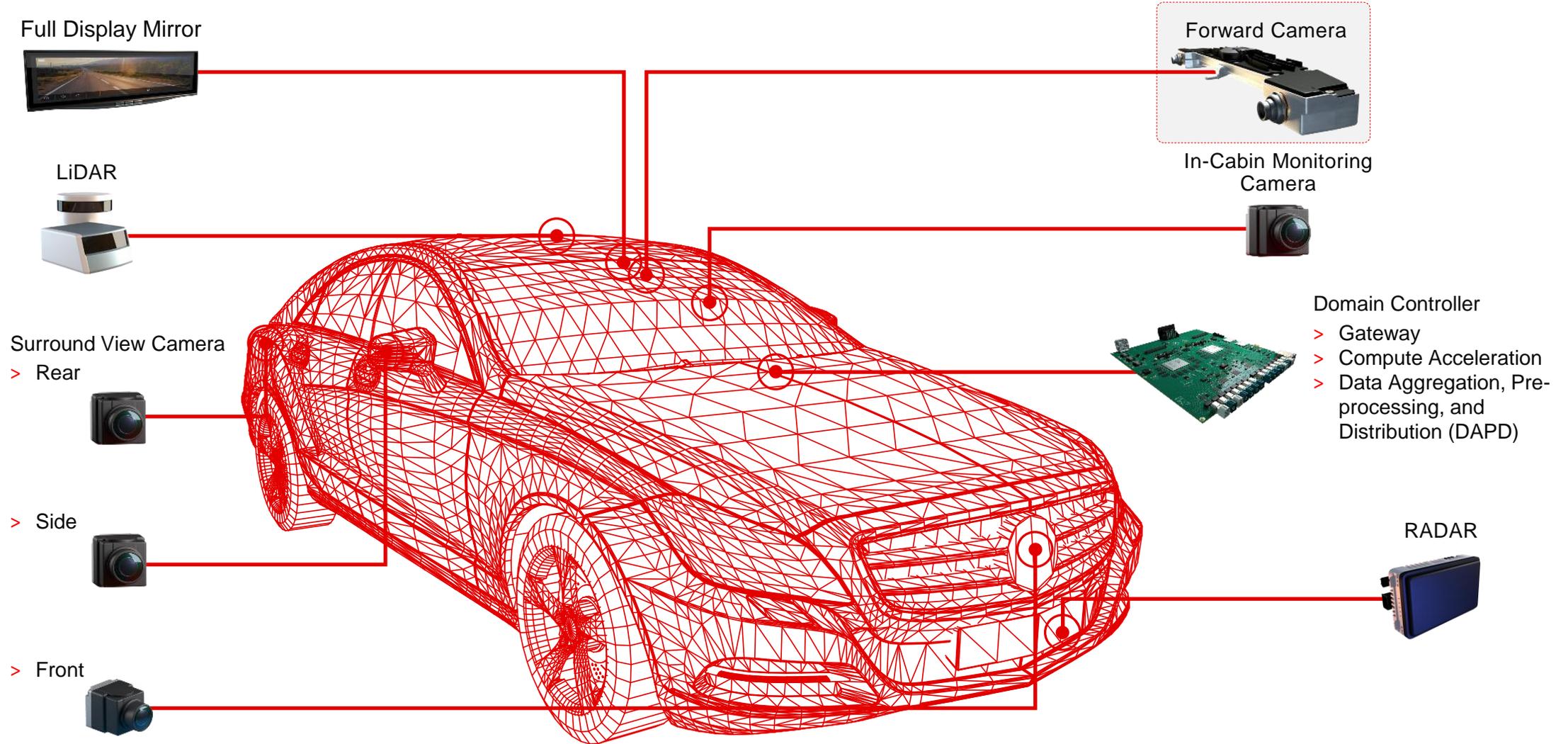
### Startups



Note: Only showing publicly-announced customer collaborations

Production deployments with our 28nm and 16nm families to fuel continued growth

# Xilinx Automotive ADAS & AD Focus Areas

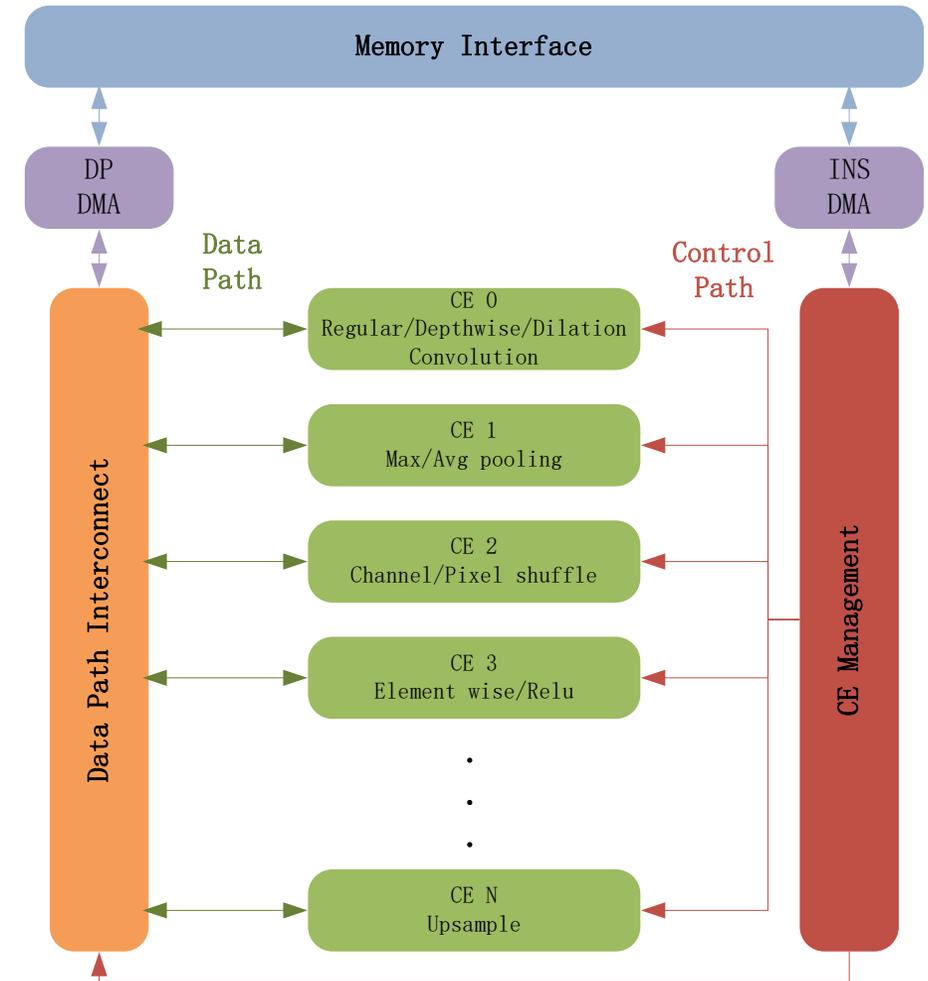


Note: Not representing actual vehicle architecture;  
Sensors are for illustrative purposes



# Motovis Design Methodology and Why FPGA is Integral

- ▶ Adaptable architecture
  - Flexible interconnection
  - Configurable granularity of Computing Engine (building block of CNN Engine)
  - Customizable architecture for optimized CNN to achieve high efficiency
- ▶ Programmable operation types
  - Non-regular convolutions
  - Configurable mode of Pooling/Shuffle/Upsample
  - Ever evolving CNN operations to suit current and future deep learning networks
  - Hardware over the Air reconfigurability to adapt and improve networks over time.



Motovis CNN Engine



# Motovis Product Suite



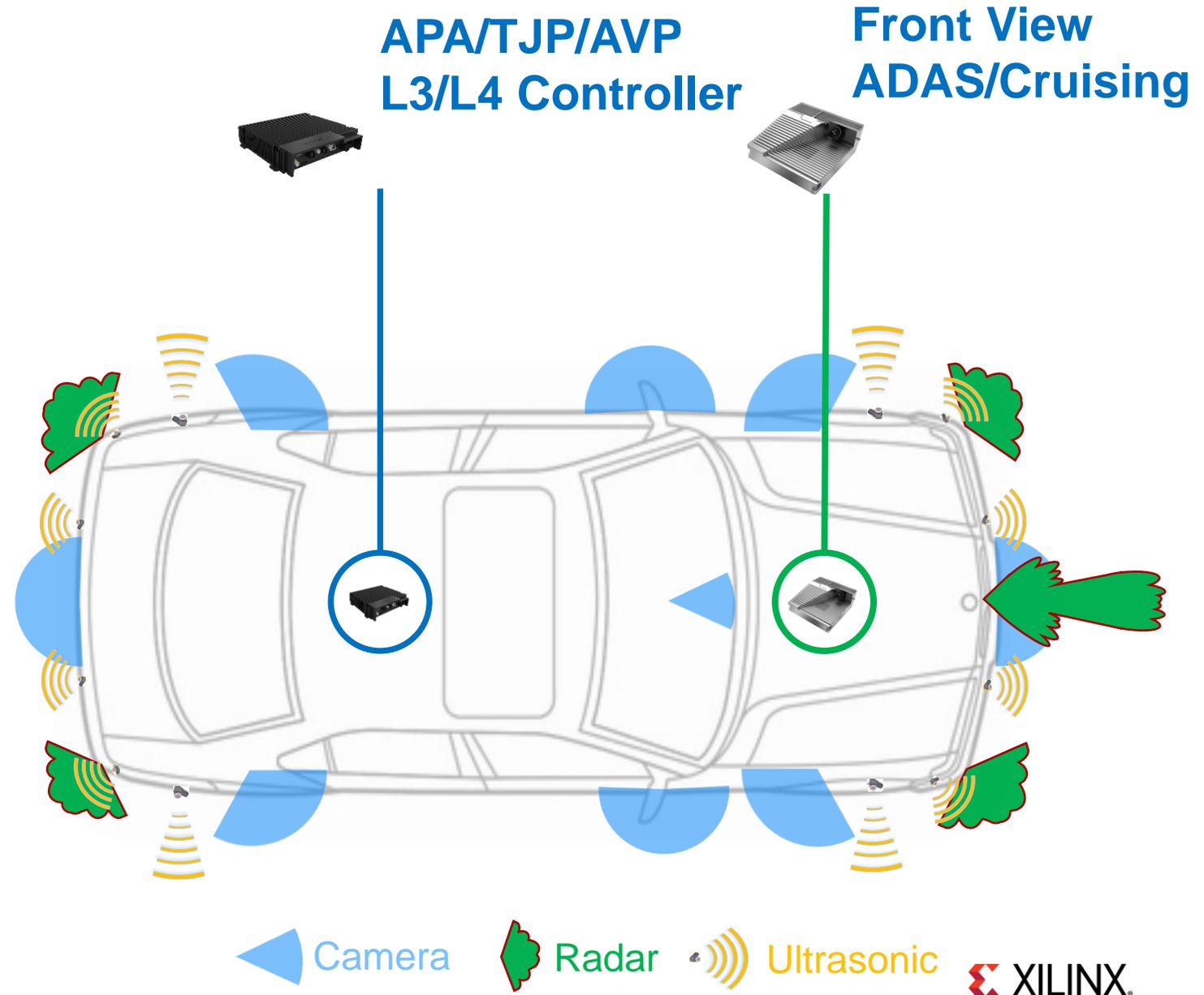
## IP Cores

- ▶ Visual perception for front camera, surround camera and L3/L4
- ▶ VSLAM-based localization for AVP and L3/L4



## System

- ▶ LDW/PCW/FCW
- ▶ AEB/ACC/LKA/Cruising
- ▶ APA/TJP
- ▶ AVP



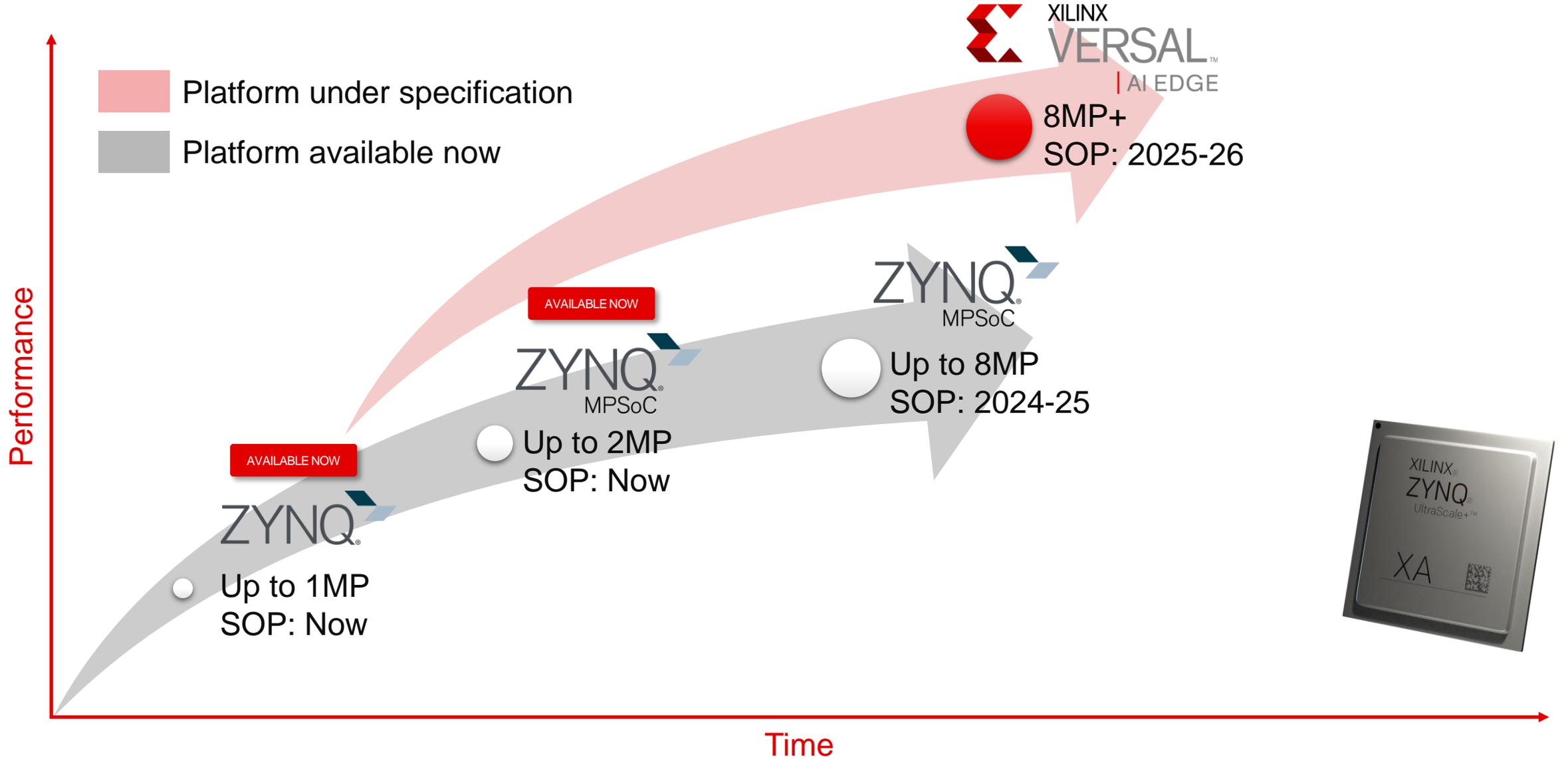
# Forward Camera Demonstration



## ► Features:

- FCW, PCW, LDW, IHBC, SLI
- AEB, ACC, LKA (1 camera, 1 radar)

# Xilinx & Motovis Forward Camera Platform Solutions



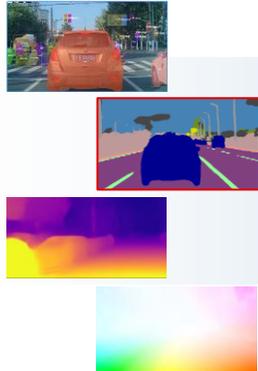
# Forward Camera Platform Function List

Function	
Object	Pedestrian, bicycle, car, motorcycle, truck, bus
Lane and road marking classification	Multiple line types: straight line, dashed line, dotted line
Road shoulder detection	Curbs
Free space detection	Drivable area
Light source detection	Oncoming vehicles
Road sign detection	Regulatory, speed limits, direction, assistance, LED flicker
Traffic signal detection	Traffic sign color and recognition
Distance measurement	Mono-ranging

# Solution Selling Model

## Customer Engagement

- ▶ Motovis engages with customers to understand system requirements and optimize the design



## Device Selection & Ordering

- ▶ Customer orders the SoC directly through Xilinx



## Deployment

- ▶ Xilinx supplies an SoC specifically designed to unlock the Motovis IP
- ▶ Customer can layer their own features and algorithms on top of the Motovis perception stack to further differentiate and future-proof their design



Xilinx adaptive SoC allows Tier-1 & OEM customers to unlock Motovis' IP



AUTOMOTIVE



- ▶ Scalable, Production-Ready Platforms Across Zynq-7000 and Zynq UltraScale+ MPSoC
- ▶ Powerful CNN IP Optimized Specifically for Forward Camera Perception
- ▶ Enables OEMs to Innovate Faster and Future-Proof Their Forward Camera Designs

AVAILABLE NOW

