

R-CAR SOLUTIONS FOR AD/ADAS

JULY 2024

RENESAS ELECTRONICS CORPORATION

AUTOMOTIVE MARKET MEGA TRENDS

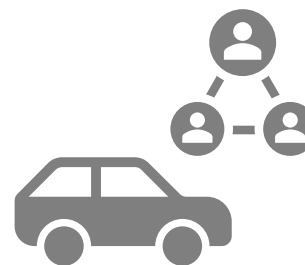
CASE Trend



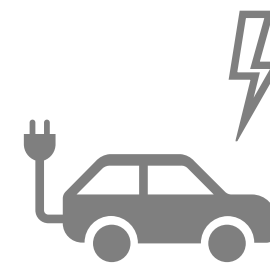
Connected



Autonomous

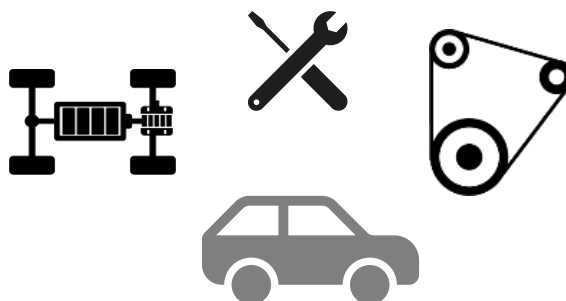


Shared/Service

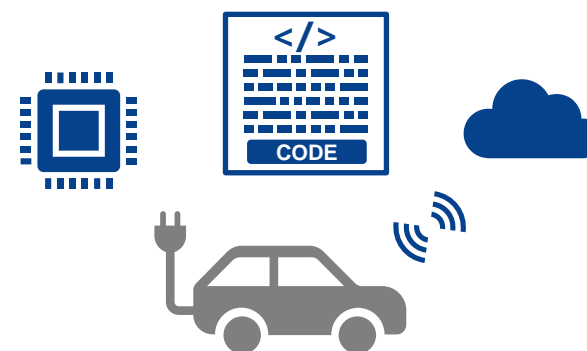


Electrified

Value



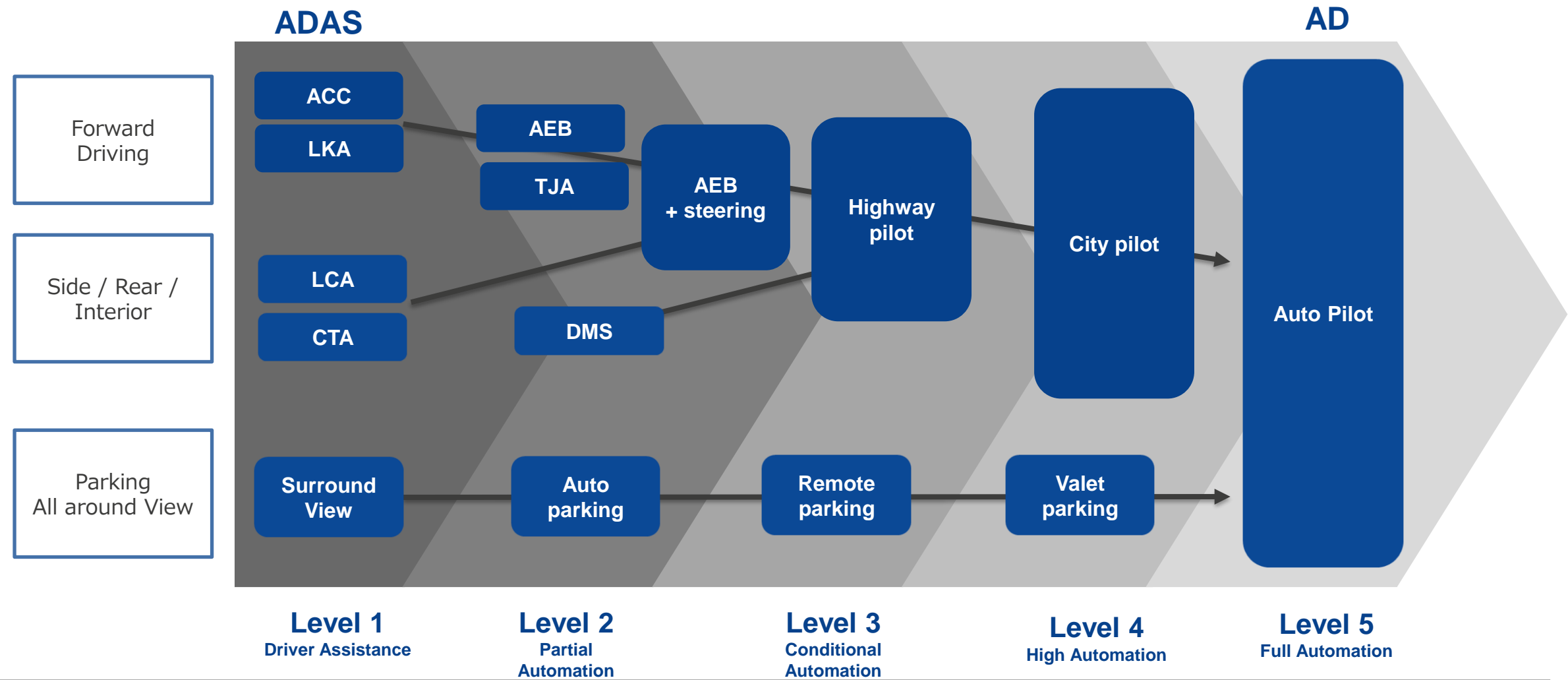
Mechanics oriented



Software defined vehicle

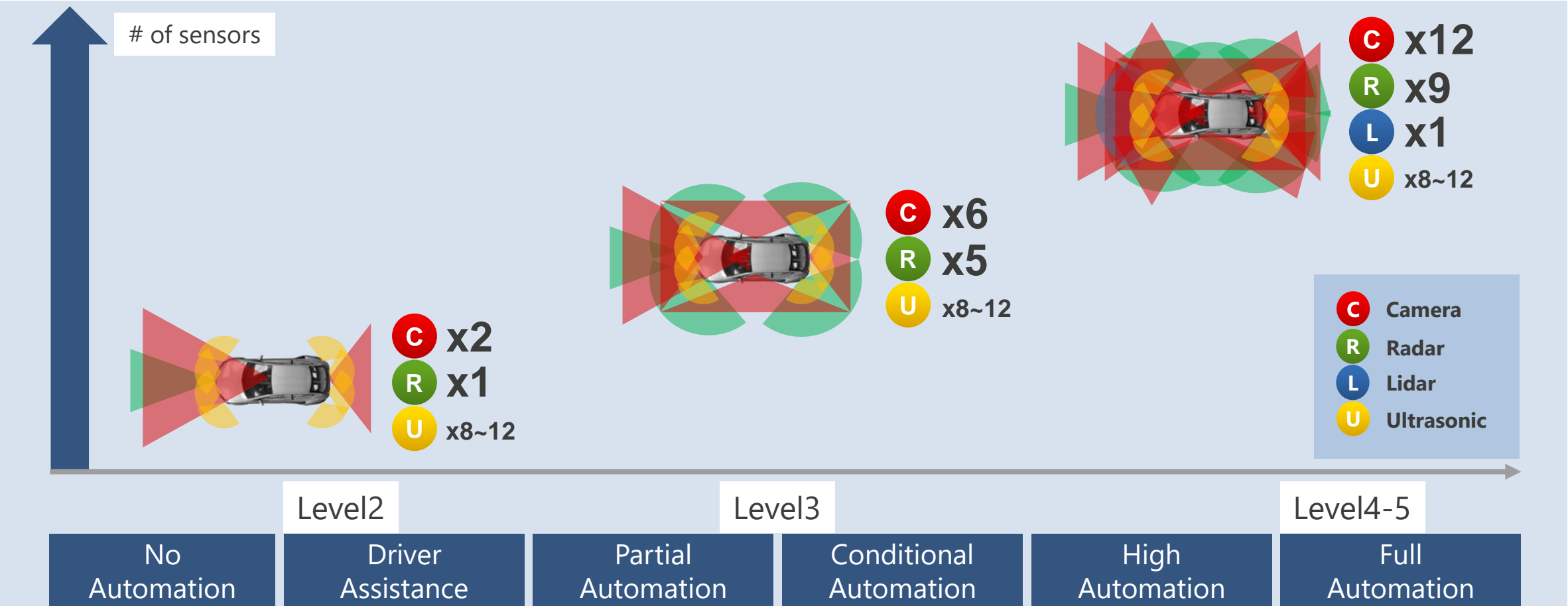
ADAS & AD MARKET TREND

ACC: Automatic Cruise Control
LKA: Lane keep Assist
LCA: Lane Change Assist
CTA: Cross Traffic Alert
AEB: Autonomous Emergency Braking
TJA: Traffic Jam Assist
DMS: Driver Monitoring System



ADAS/AD SYSTEM TREND

The integration of sensors including Camera, Radar, Lidar.
Higher level of autonomous requires more sensors.



ROADMAP

MCU & SOC



V3x – ADAS

Gen4 –ADAS & CoGW

Gen5 – X-domain / Zone architecture

Central ADAS
Smart Camera

Cockpit/IVI
Cluster

Central ECU

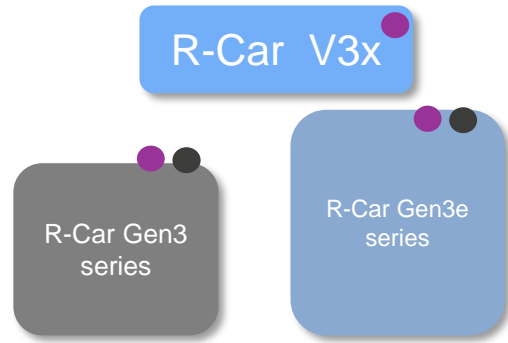
SOC

MCU

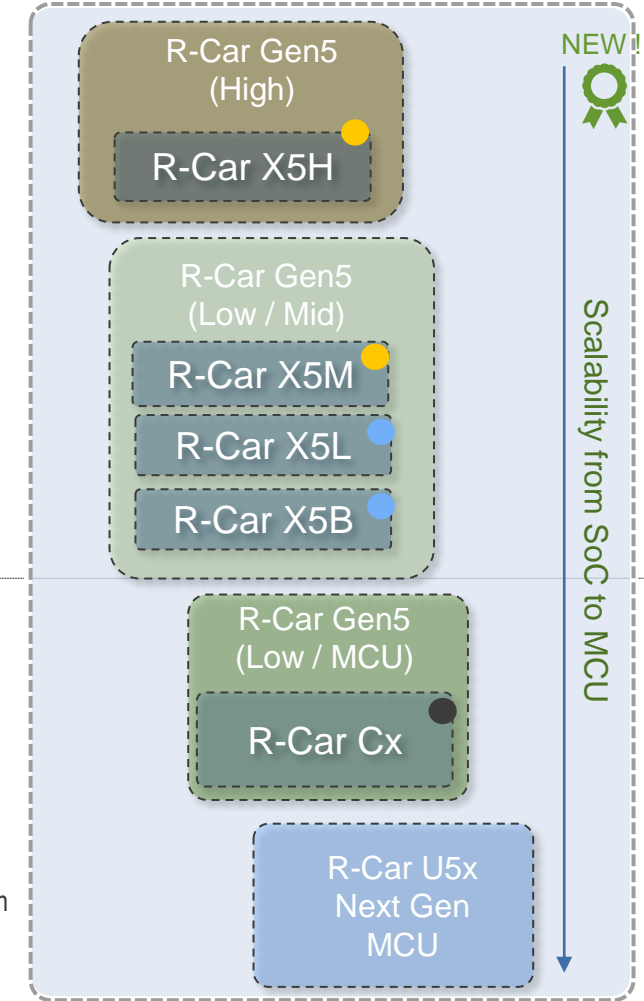
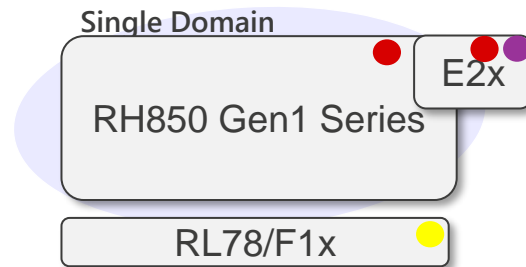
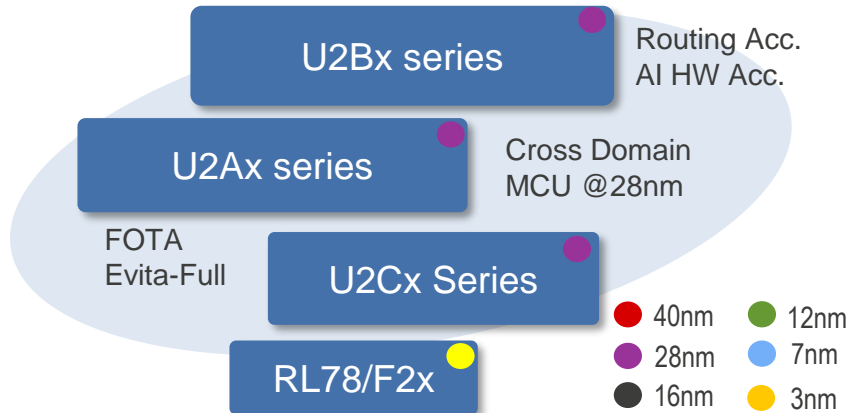
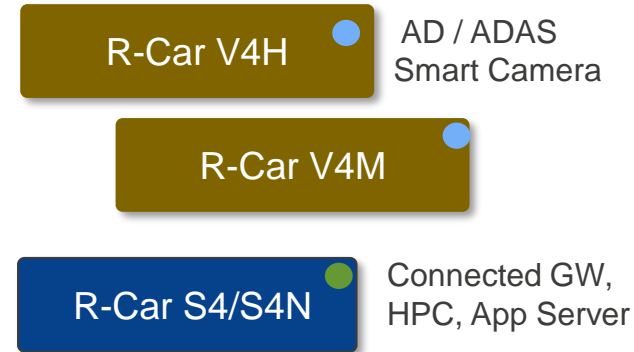
Domain/Zone

Vehicle
Control

Actuator



**Gen3 – In Vehicle Infotainment
Cockpit, Cluster**

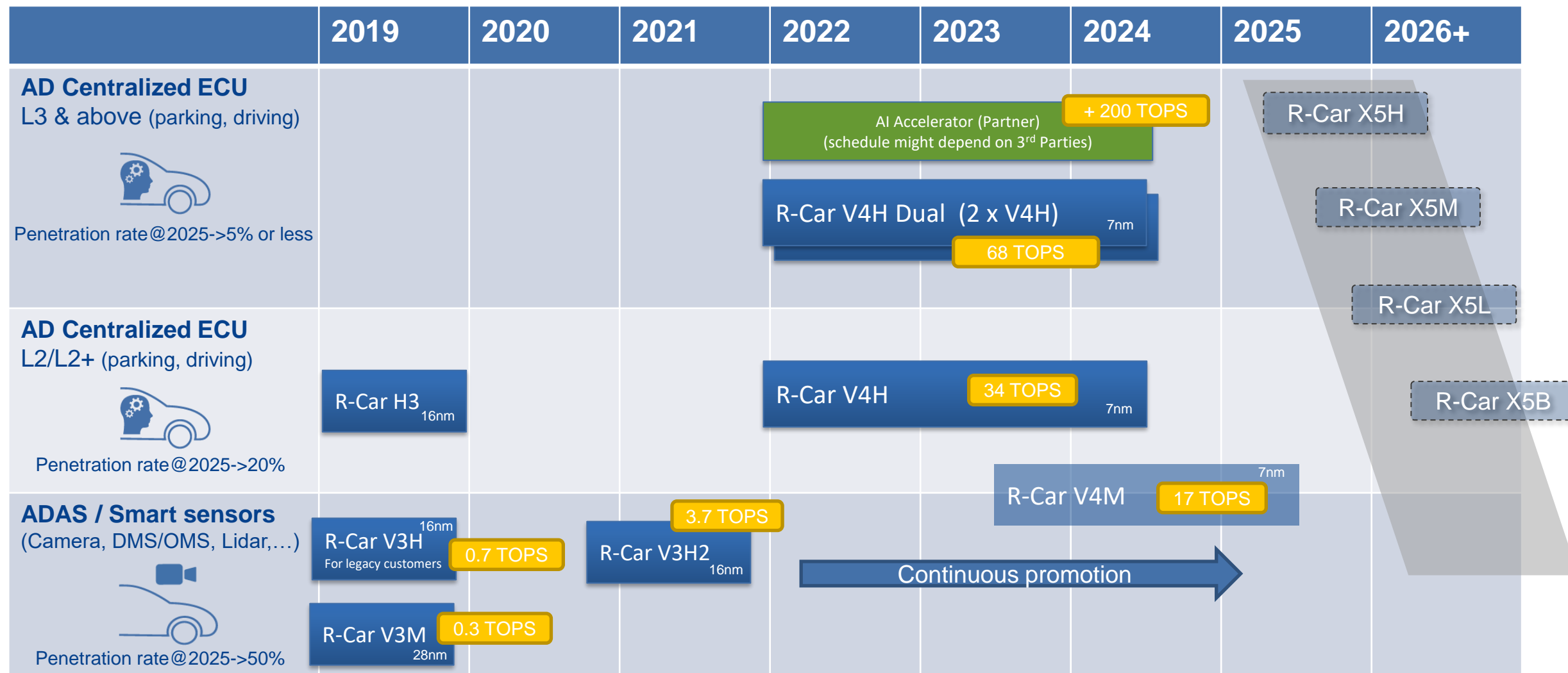


Renesas long term roadmap ensures a sustainable investment in R-Car

R-Car ADAS Roadmap update



CNN TOPS

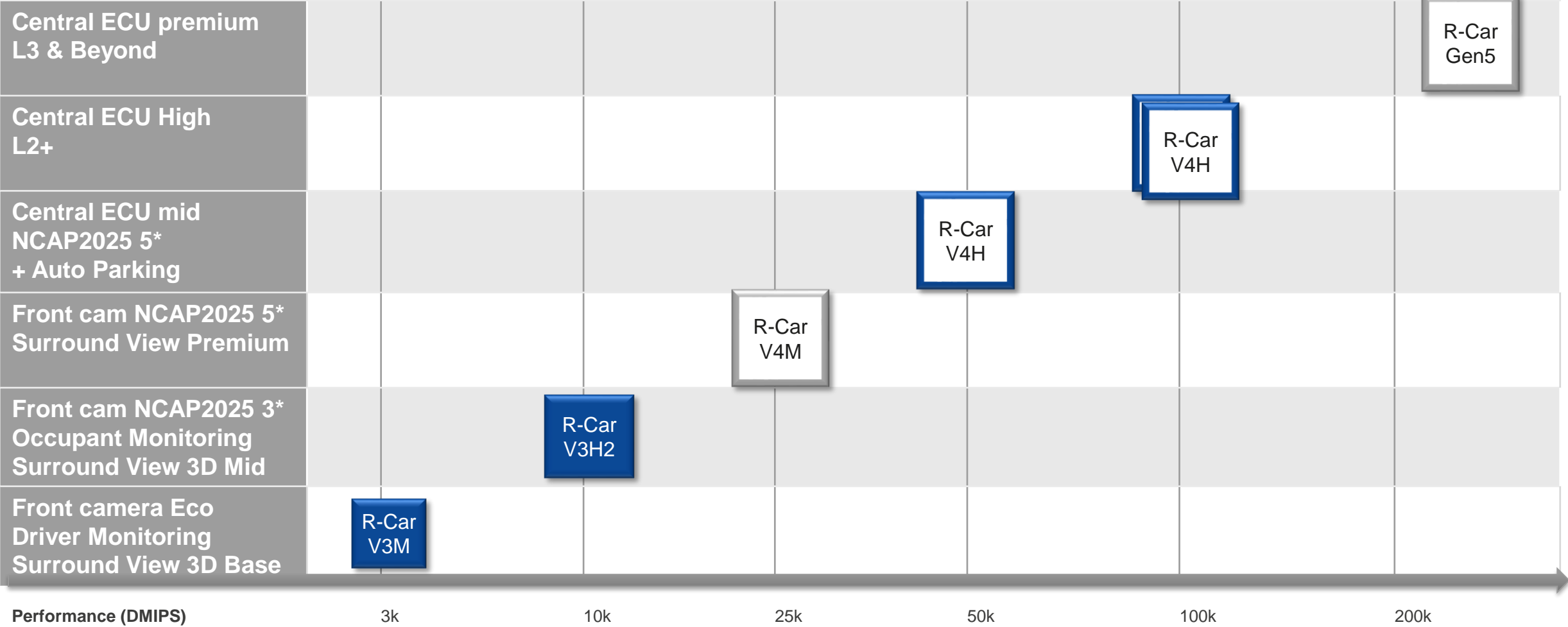


R-CAR : PRODUCT SCALABILITY

SoP ready

In develop-ment

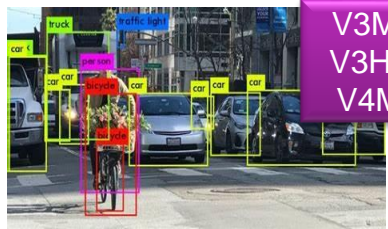
In specification /planning



Renesas Track Record



Smart Camera



V3M/
V3H /
V4M



DMS / OMS



V3M/H



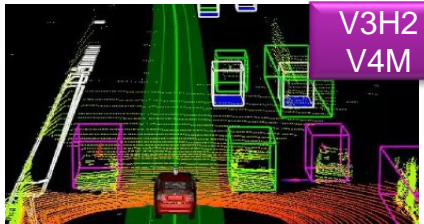
Mirror Replacement



V3H2



Lidar



V3H2
V4M



Parking



M3N+
V3H



Central AD (Passenger Car)



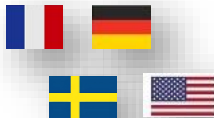
V4H



Central AD (Off Road)



V4H



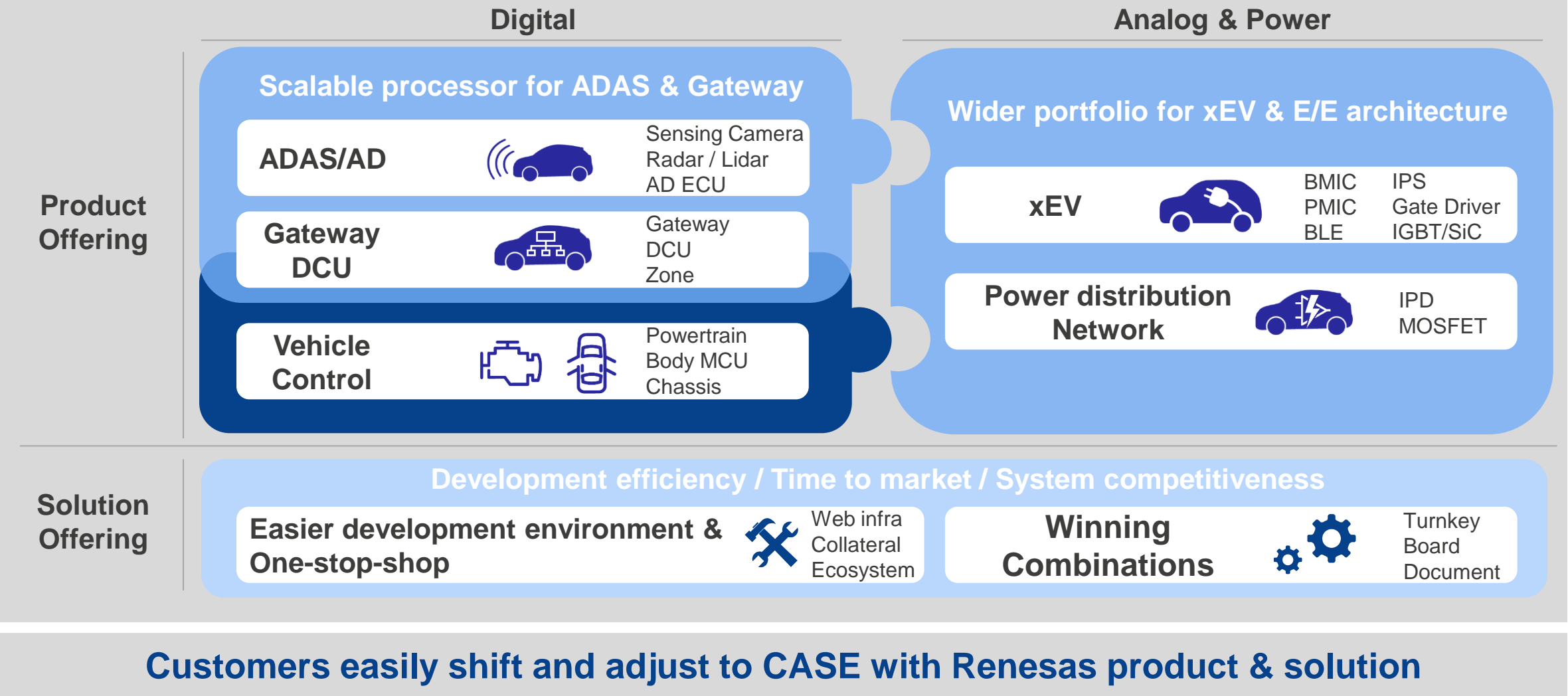
Non auto



V4H



RENESAS VALUE PROPOSITION

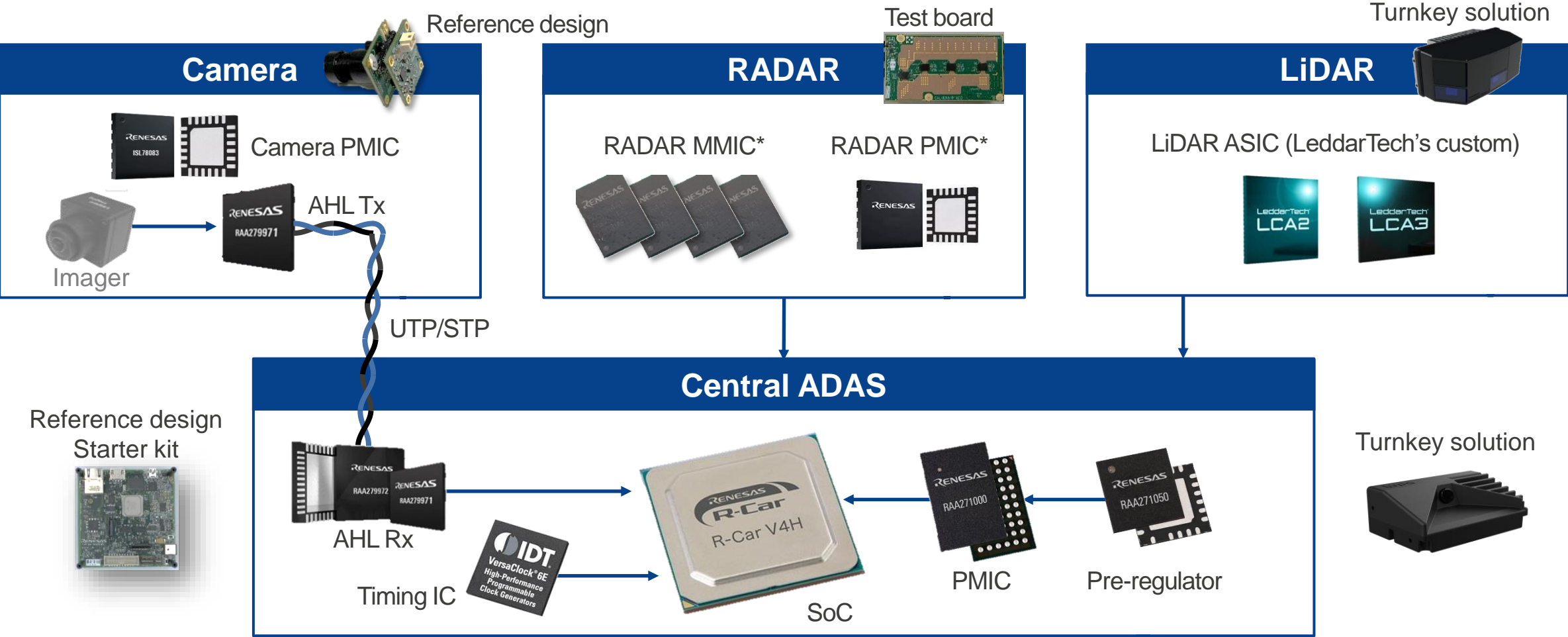


AUTONOMOUS DRIVE SOLUTION



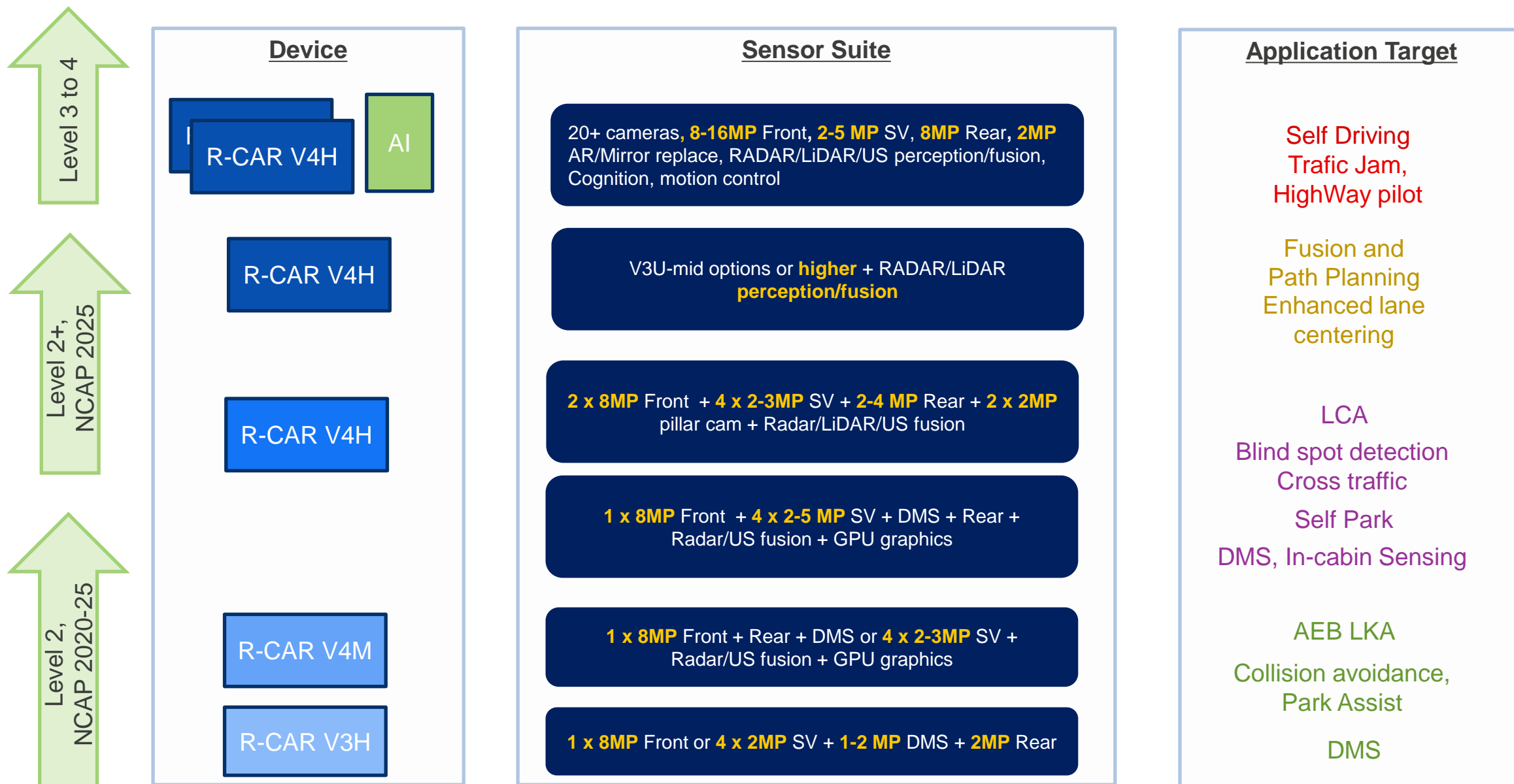
ADAS SYSTEM CONFIGURATION & RENESAS SOLUTION

- Renesas provides total solutions and reference designs for ADAS system



AHL: Automotive HD Link

R-CAR THE PLATFORM FOR SAFE COMPUTE

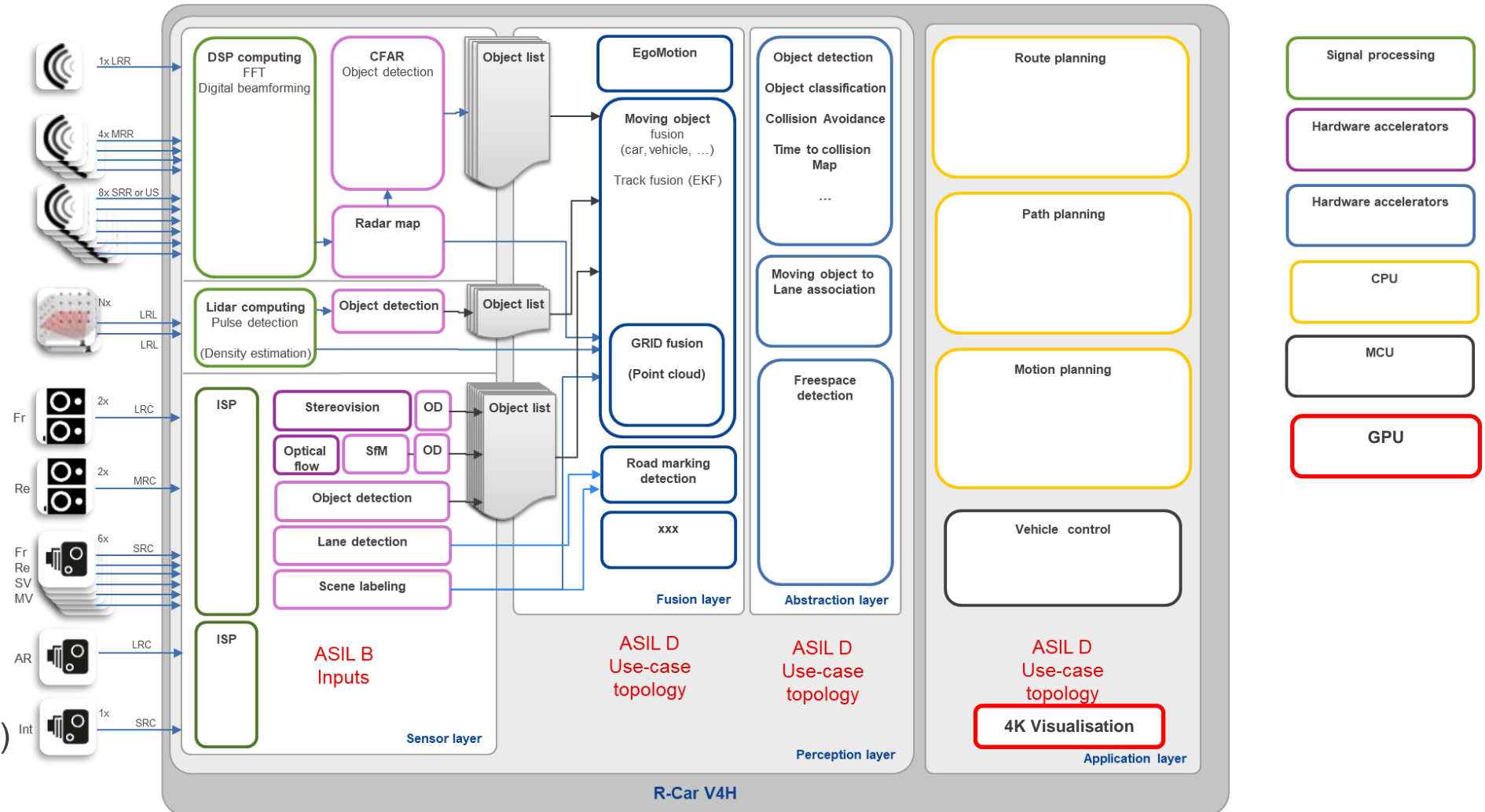


High Computing Platform for AD Application

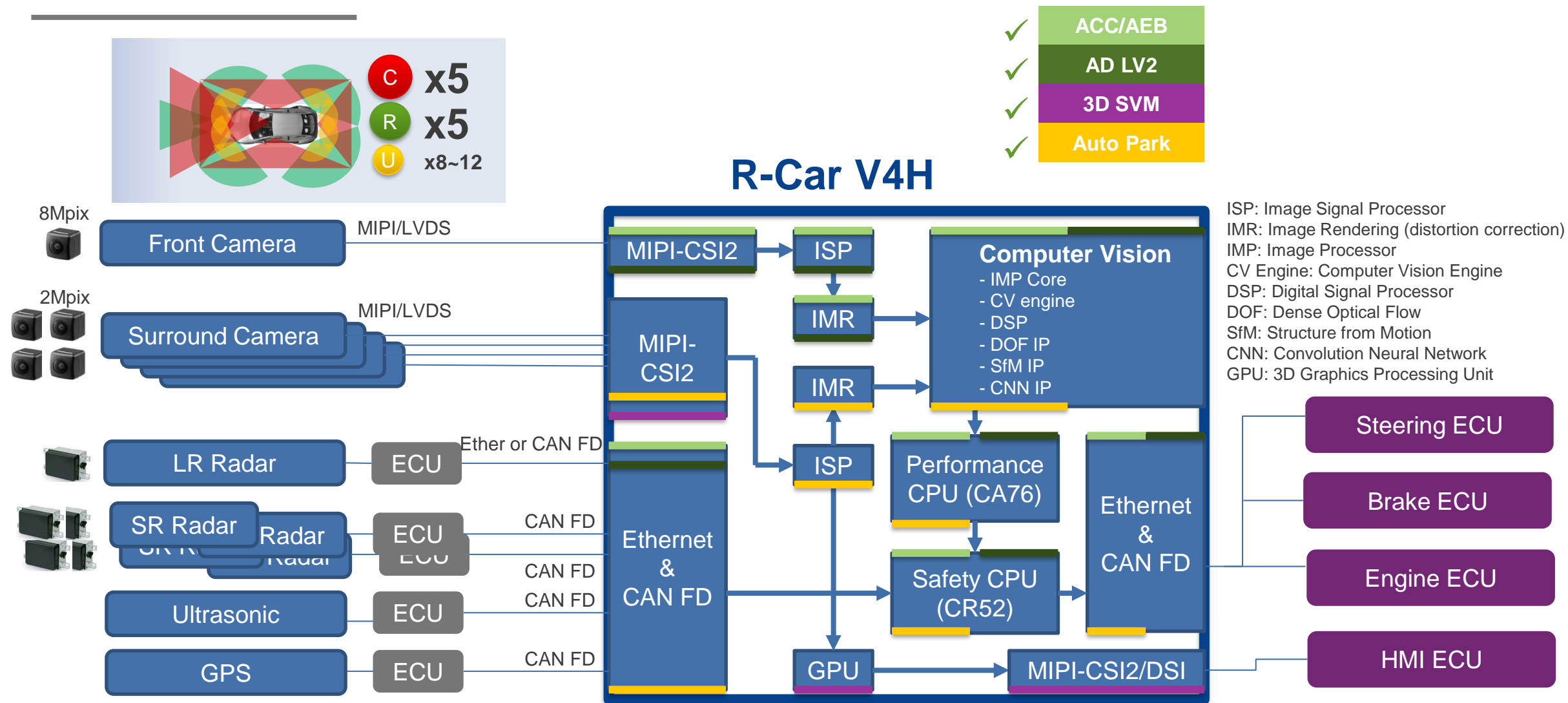
System configuration

One chip solution

- Radar Processing
- Lidar Processing
- Camera processing
- Sensor Fusion
- 360° Perception
- Application
- Vehicle control
- Visualization (4K screens)

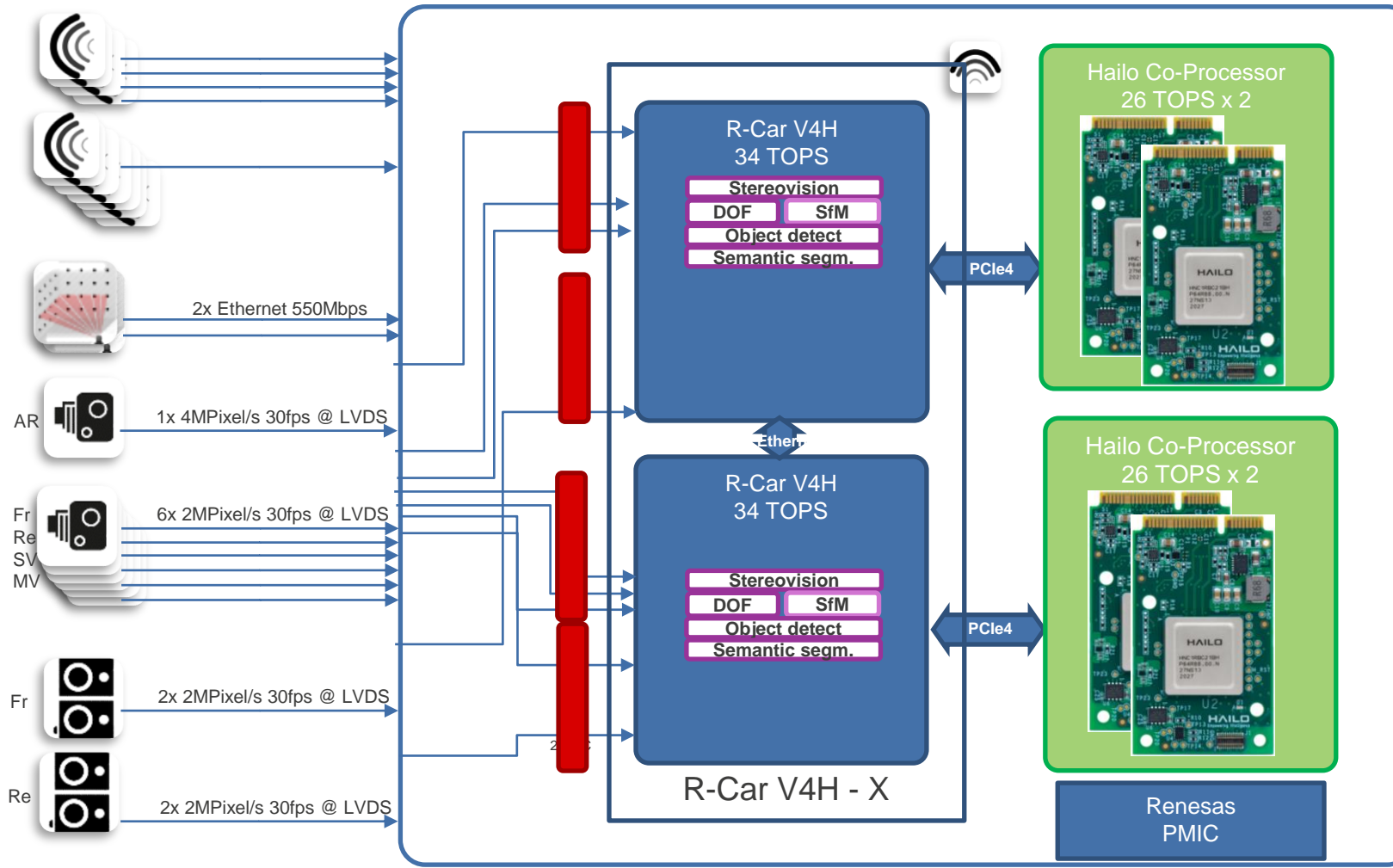


R-CAR V4H USE-CASE FOR LEVEL 2



High Computing Platform for Level 3 With AI Accelerator

HAILO



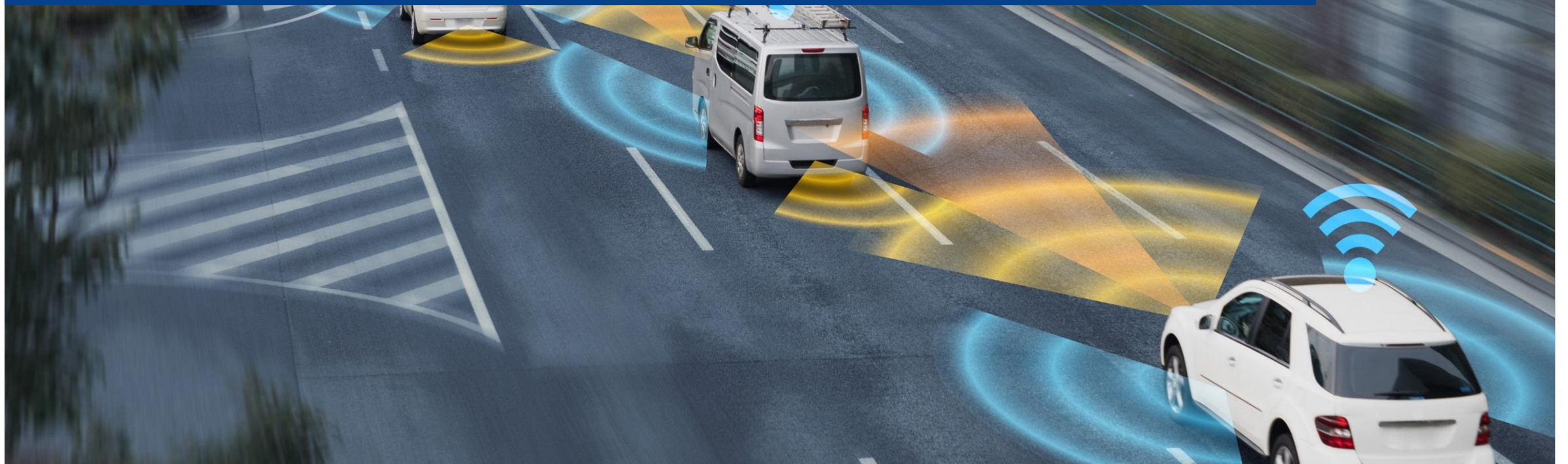
Advantages

- Scalability in AI and compute allowing flexibility for L2-L4
- Proven Chip to Chip Communication (HW & SW)
- Unified SW platform and development
- Best-in-class power efficiency enabling passively cooled ECUs
- Unified SOC power concept by REL PMICs (simplify Power design)
- FuSa concept at System level.
- Open software ecosystem allowing OEMs/Tiers control and innovation
- Reference design for Easy to start
- One Stop Shop @ Renesas

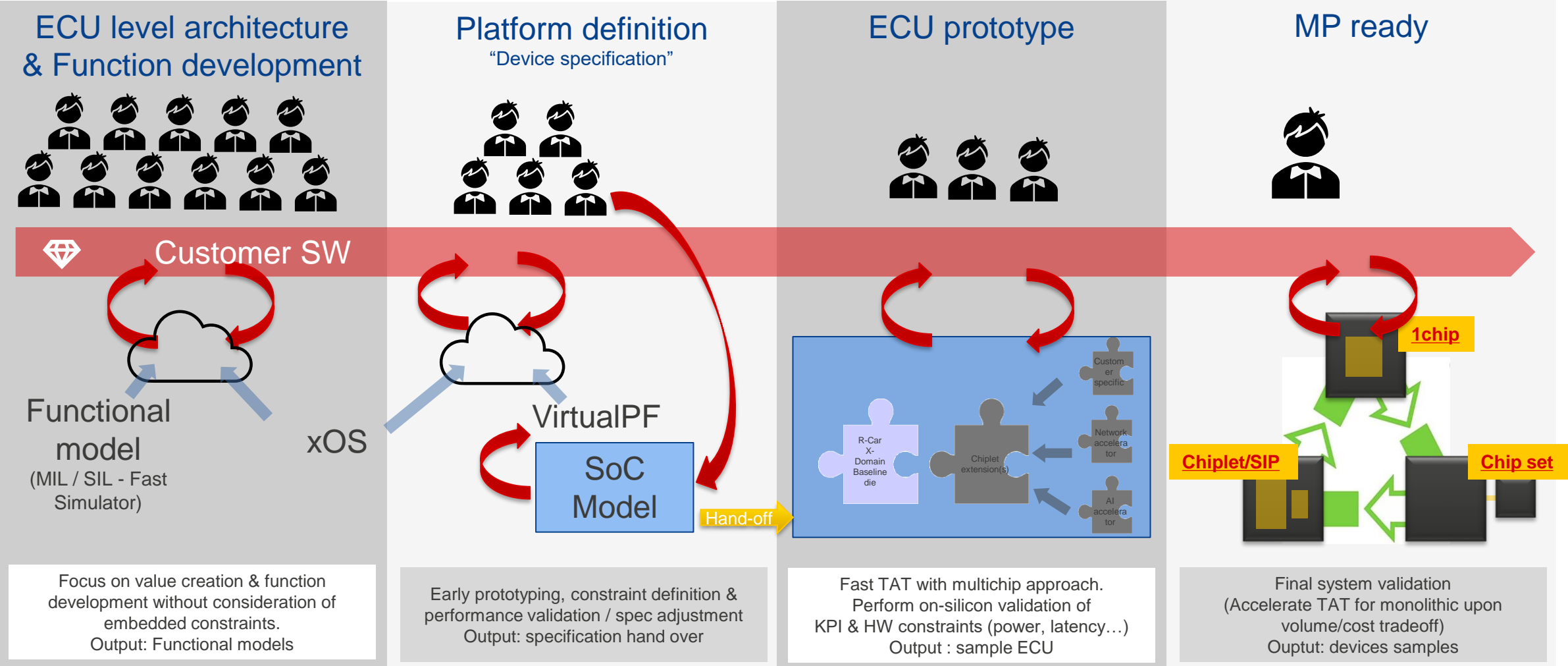
“Easy to Use” and “Easy to develop” with pre-validated HW & SW platform – Shorten TAT to MP

An aerial view of a city street with several cars. Blue wireless communication icons (three concentric arcs) are positioned above some of the cars, indicating connectivity. The scene is slightly blurred to suggest motion.

A NEW PARADIGM – SHIFT LEFT INTRODUCION TO VIRTUAL PLATFORM

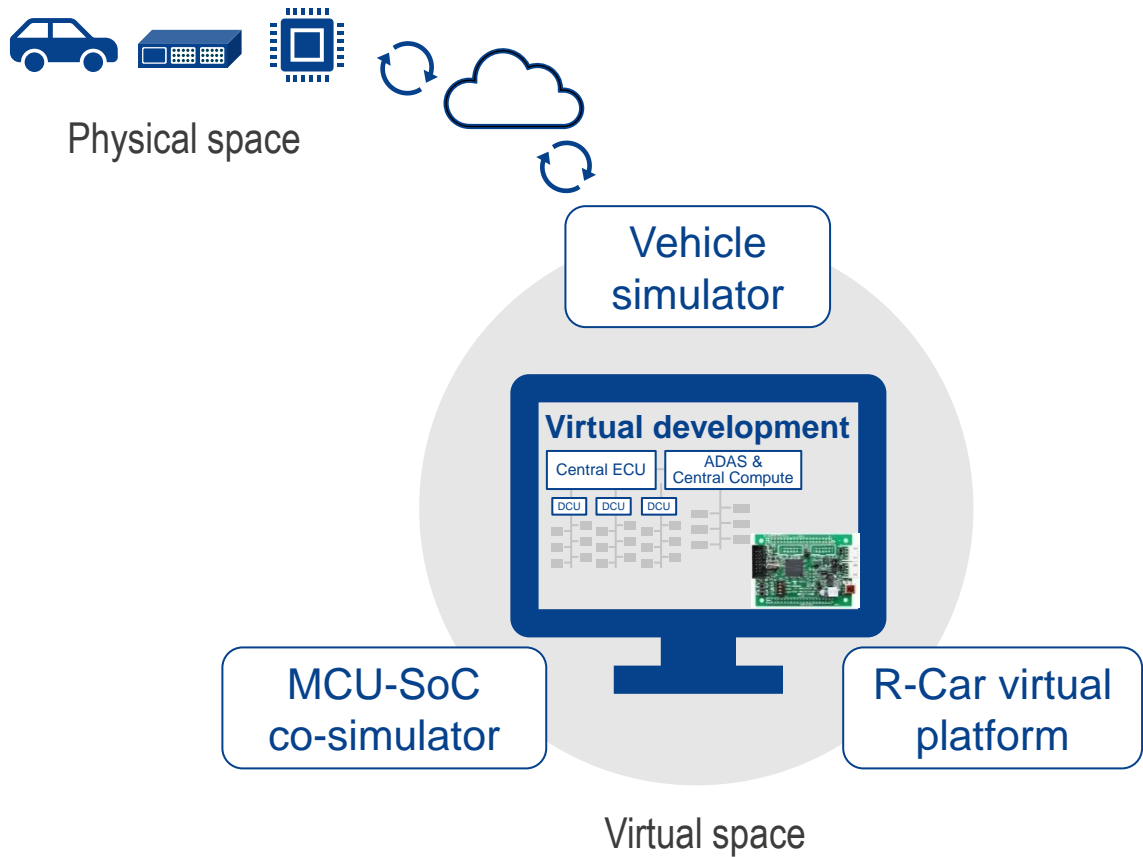


NEW APPROACH TO THE MARKET

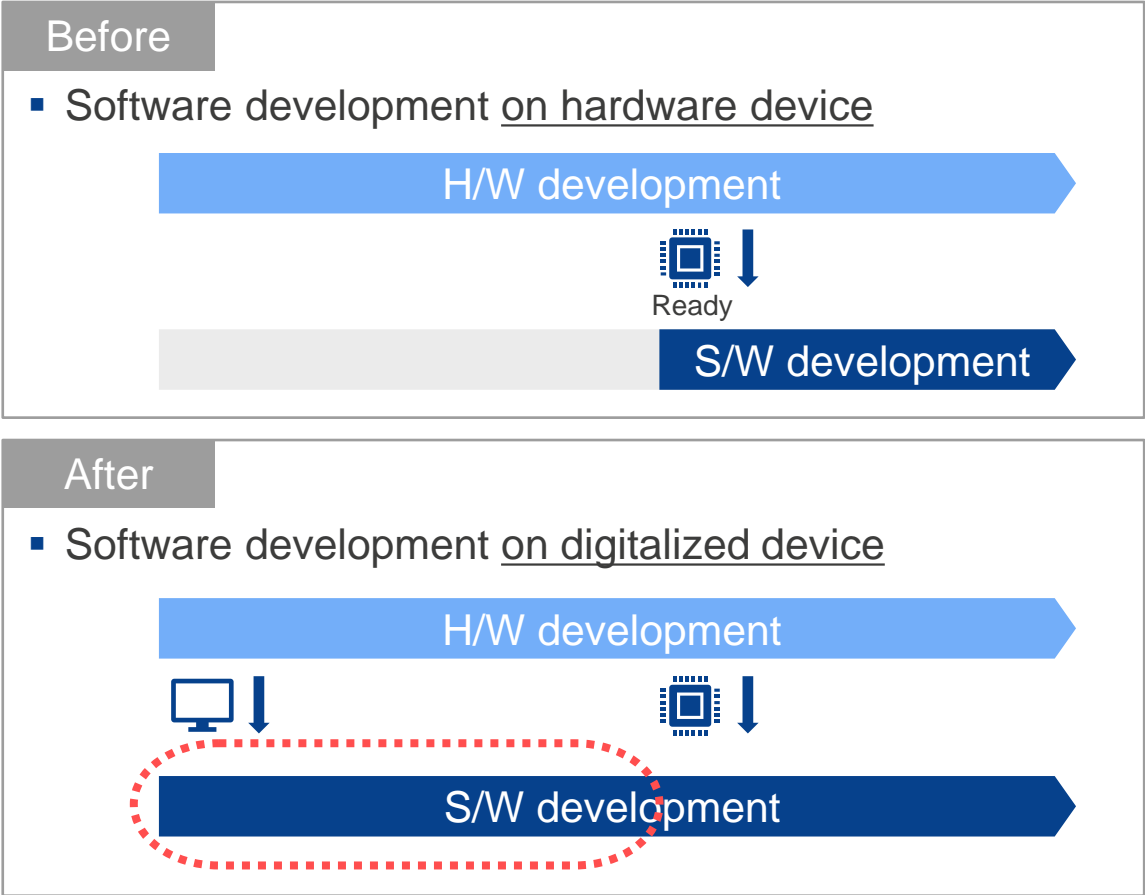


RENESAS TOOLS FOR SHIFT LEFT

Digital twin



Shift left



R-CAR DEVELOPMENT STORYLINE FOR AD/ADAS

■ OEM SW asset developments

L3 SW assets.

L4 SW assets.

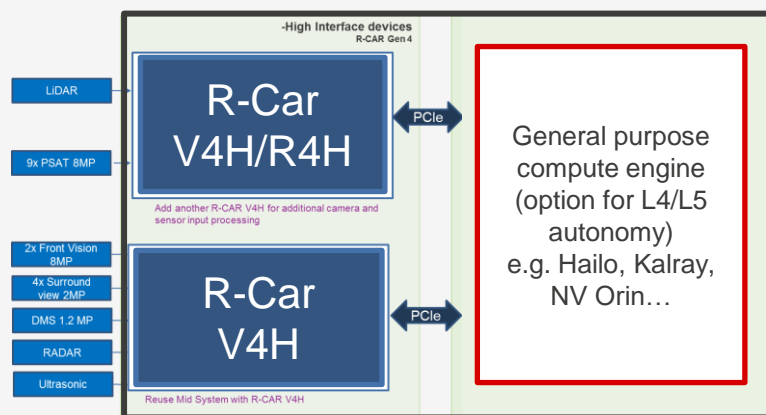
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Base platform + L2 SW assets

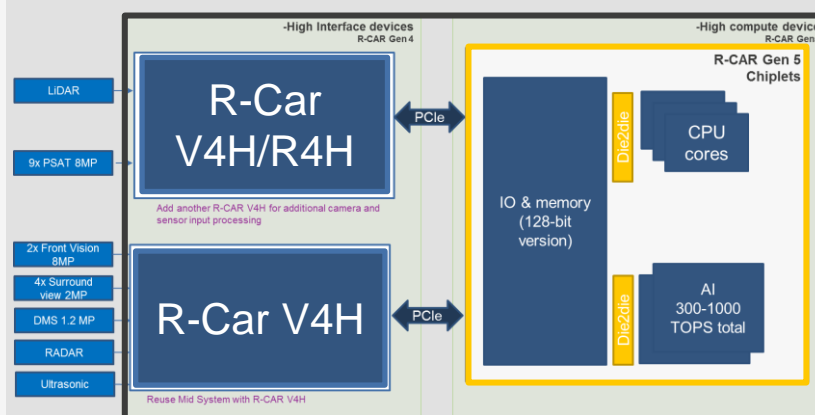
Base platform + L2/L3 SW assets

Base platform + L2/L3/4 SW assets

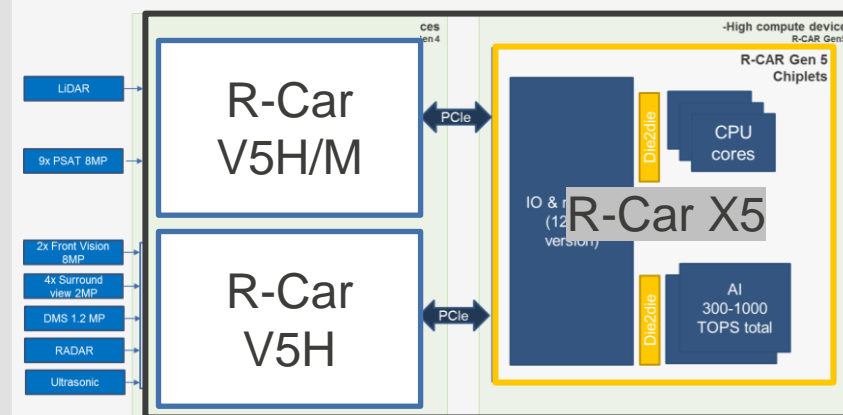
■ OEM HW platform migration path



2025



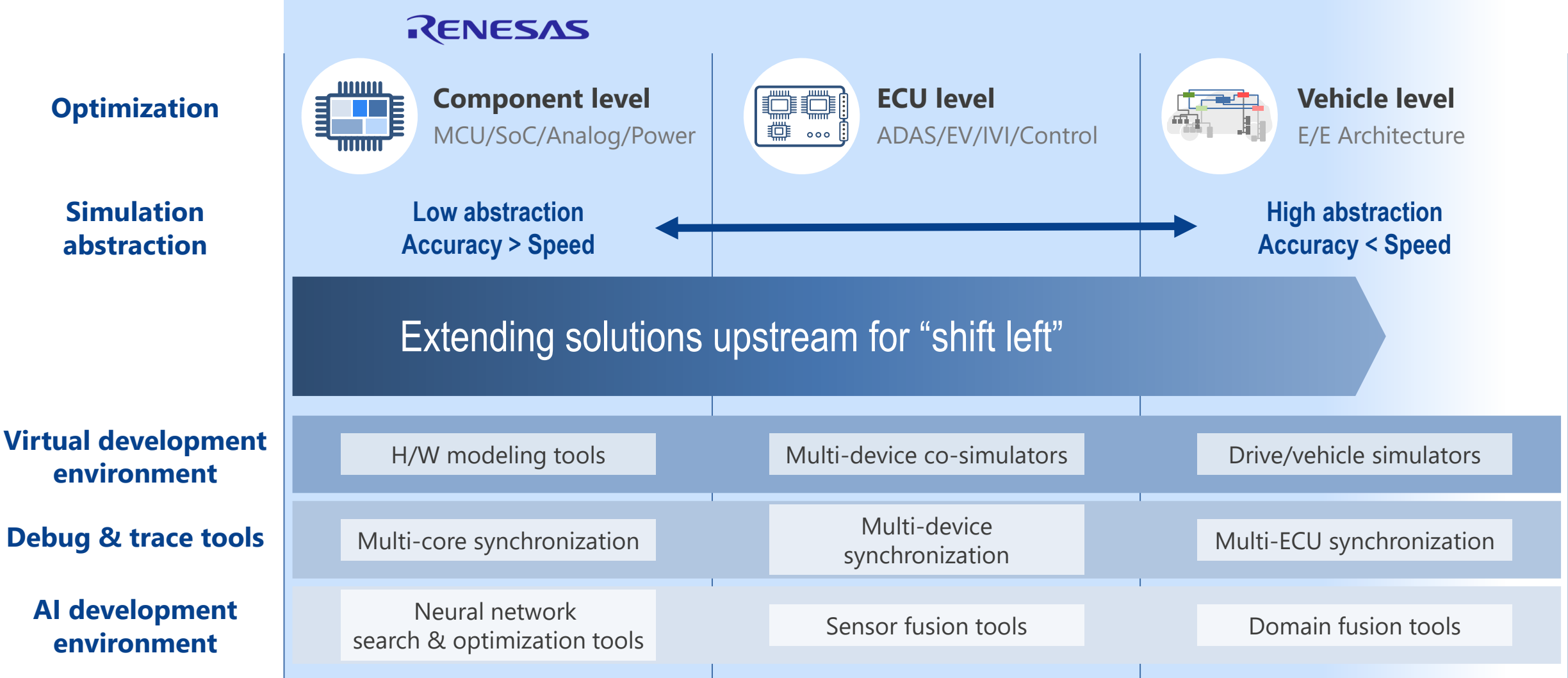
2027



>2028

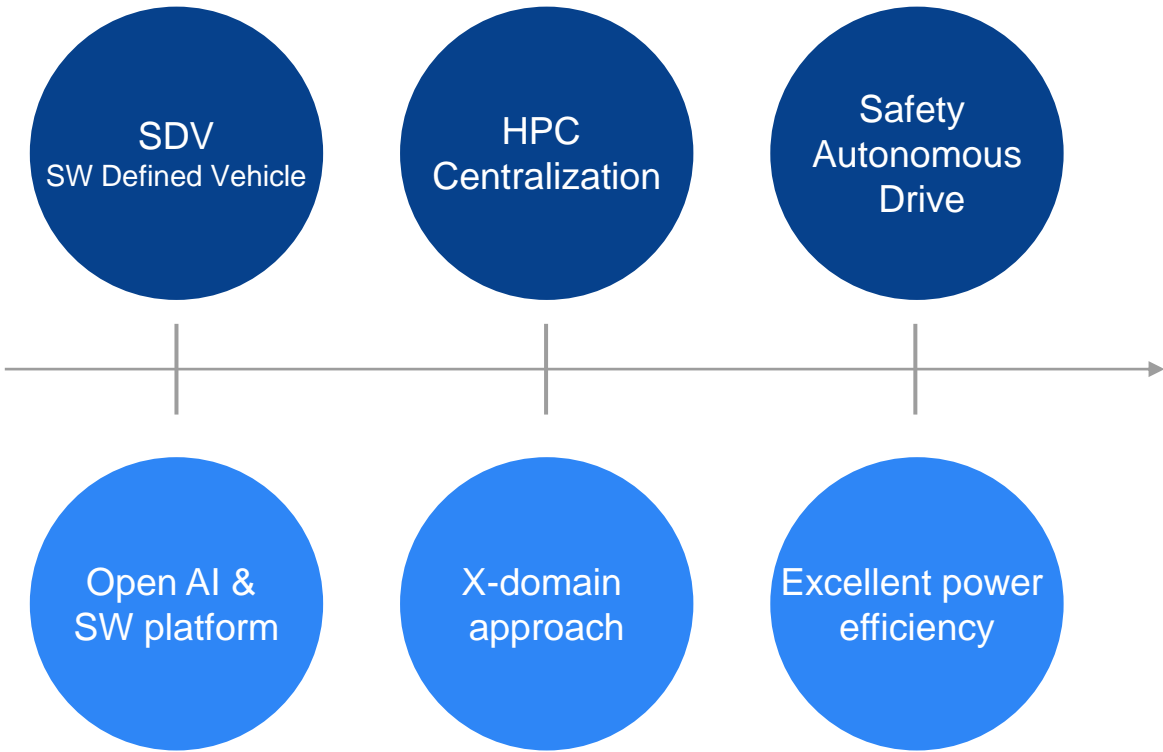
Start with R-Car V4H to translate needs into resource consumption & define next device line together (V5x / X5)

UNIFIED DEVELOPMENT ENVIRONMENT

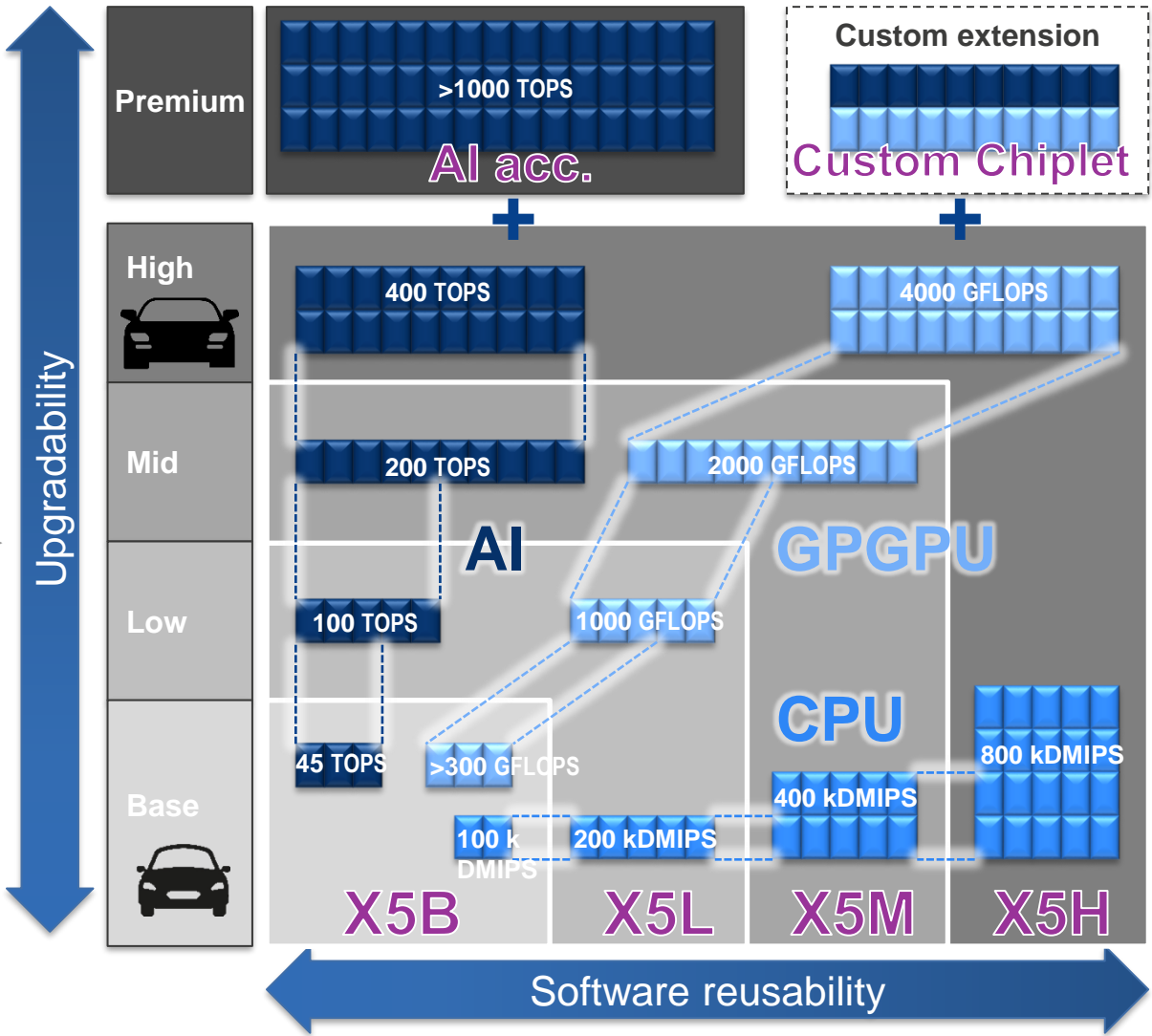


R-CAR GEN5 CONCEPT

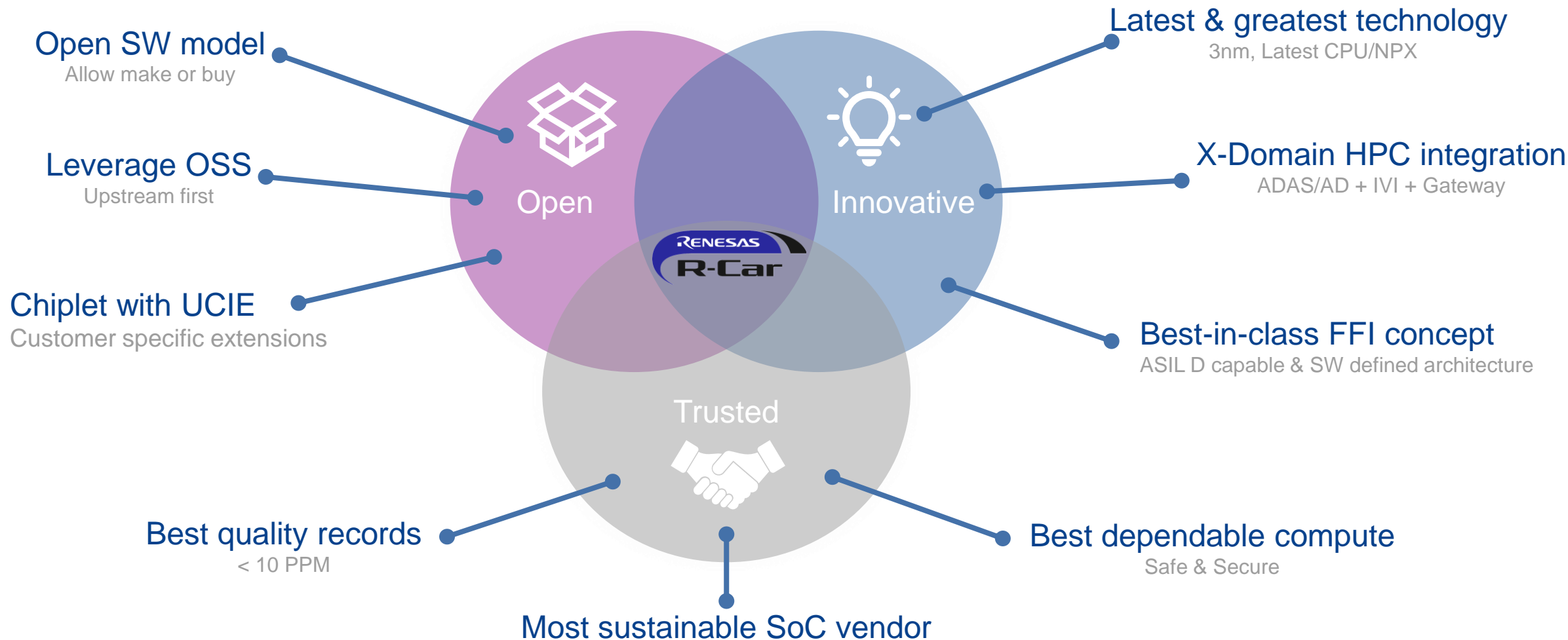
OEM NEEDS and CARE-ABOUTS



Renesas' Solutions



DRIVING THE FUTURE OF AUTOMOTIVE HPC



The image features the Renesas logo in a bold, blue, sans-serif font, centered horizontally. The background is a grayscale, isometric illustration. In the foreground, a detailed circuit board is shown with various components like chips and traces. In the background, a city skyline with several tall skyscrapers is visible, suggesting a connection between technology and urban infrastructure.

RENESAS