

Chinese Independent OEMs' ADAS and Autonomous Driving Report, 2024 Nov. 2024 In recent years, China's intelligent driving market has experienced escalating technological competition in driving-parking integration, highway NOA, urban NOA, and map-free NOA. Small and medium-sized ADAS Tier1s are gradually slow to keep up with the pace of technological evolution.

Since 2024, China's ADAS and autonomous driving markets have entered an end-to-end competition. End-toend autonomous driving requires OEMs to change their previous R&D model and invest a lot of R&D, computing power and data resources. However, multi-brand and multi-technology routes make it difficult for OEMs to pool resources to win the battle of intelligent driving. Organizational structure adjustment and team integration have become compulsory courses for domestic OEMs in 2024.



# To compete in intelligent driving, OEMs keep adjusting their structure and integrating their teams

**NIO** continues to dynamically adjust its organizational structure to adapt to different development stages. In June 2024, NIO adjusted the organizational structure of its intelligent driving team from original perception-planning & control-execution to end-toend autonomous driving. NIO's Intelligent Driving R&D Department has newly established the Foundation Model Department (responsible for R&D of end-to-end models), Deployment Architecture and Solution Department (responsible for vehicle-related overall algorithm development, architecture design and function delivery), and Spatiotemporal Information Department (responsible for algorithm/model development and services related to the map information on vehicle and cloud), and canceled the original Perception Department, Planning & Control Department, Environmental Information Department and Solution Delivery Department.

Around August 2024, **Xiaomi** Auto's intelligent driving team also completed a new round of organizational structure adjustments, mainly combining the two secondary departments of "Perception" and "Planning & Control" and reorganizing them into the "End-to-End Algorithm and Function Department."

Not only are emerging OEMs constantly adjusting their organizational structures, but also traditional OEMs are making a rapid change.

In June 2024, **BYD** set up the Tianxuan Development Department for developing intelligent driving in house. It is positioned to self-develop high-level intelligent driving solutions. BYD also established the Tianlang Development Department, positioned to develop low-level intelligent driving solutions. In the second half of 2024, BYD deeply integrated its organizational structure. The core members of the original "Tianxuan" team have been incorporated into the "Tianlang" self-development team.



### Xpeng's autonomous driving department adjusts its organizational structure

Xpeng has also adjusted its technology development department in 2024. Its technology development department covers R&D of algorithms for perception, planning, control, and positioning. After the adjustment, the technology development department was split into three departments: AI End-to-End, AI Application, and AI Energy Efficiency.

#### Xpeng's autonomous driving department adjusts its organizational structure: three new functional sectors are established to accelerate AI transformation



Source: ResearchInChina



## "Parking space to parking space" (D2D) will become the focus of competition among OEMs in 2025

Following **Huawei** that introduced parking space to parking space intelligent driving in August this year, **Li Auto**, **Xpeng** and **Xiaomi** among others will also implement high-level intelligent driving from parking space to parking space.

**Xpeng** Motors says: Based on the Xpeng Turing AI Intelligent Driving System, Xpeng has become a company that can enable the parking space to parking space function using a set of intelligent driving software and end-to-end foundation models. The solution adopts a set of software logics to connect scenarios such as underground garages, gates, and urban roads. It also lays less stress on maps and radars, and can generate routes unconsciously. Xpeng Motors announced the launch of the first full network test at the Auto Guangzhou, and will push it in full on AI Dimensity 5.5.0 in the future.

As well at the Auto Beijing, Fan Haoyu, Senior Vice President of **Li Auto's** Product Department, said that the parking space to parking space function based on end-to-end + VLM has been pushed to 10,000 beta test users, and test drive cars of outlets, across the country. In late November, all AD Max users can enjoy D2D supervised intelligent driving.

Some OEMs' D2D function development and release plans		
Li Auto	OTA 6.5 IVI system will be officially pushed at the end of November, adding parking space to parking space intelligent driving.	
Xiaomi Auto	In November 2024, Xiaomi Auto started beta test of D2D intelligent driving.	
Xpeng Motors	In November 2024, the parking space to parking space intelligent driving solution, enabled by a set of software, officially started the first test on the whole network.	
ZEEKR	The system will be pushed nationwide in batches starting from January 2025.	
Huawei	The parking space to parking space intelligent driving function was released in August 2024, and will be first available on STELATO S9.	

Source: ResearchInChina



On November 16, Xiaomi Auto announced on its WeChat official account: the official name of its parking space to parking space function is All-scenario Intelligent Driving. This function enables parking space to parking space driving assistance as the user gets in the car. All-scenario Intelligent Driving will be installed in Xiaomi HAD (Hyper Autonomous Driving). In the future, Xiaomi SU7 Pro, Xiaomi SU7 Max, and Xiaomi SU7 Ultra models can all be upgraded with this function.

In November 2024, Zeekr released the Haohan Intelligent Driving 2.0, which will soon enable D2D intelligent driving. The D2D function launched by Zeekr has three core highlights: full-speed activation, all-gate access, and all-scenario intelligent parking not limiting parking spaces. It is the industry's first to realize automated parking without memorizing the road in advance, creating a caring parking space-to-parking space service for users. This function is expected to be pushed in batches in January 2025, and will be fully pushed nationwide to all Zeekr products equipped with Haohan Intelligent Driving 2.0 in Q2 2025.





Looking at OEMs' development course of intelligent driving in past few years, emerging OEMs are undoubtedly successful and have always been the leaders. However, Huawei, DJI, MOMENTA and other leading Tier1s do not lag behind. The state-of-the-art all-scenario parking space-to-parking space intelligent driving function in 2024 is first launched on BAIC STELATO S9.

Li Auto has made great progress in intelligent driving in 2024 by relying on its huge user base and rapid entry into endto-end. Chinese OEMs such as BYD, Chery, SAIC, and Geely, with much more sales, are also expected to change the pattern in 2025 with the support of leading intelligent driving Tier1s.

In addition to traditional Chinese OEMs, there are also foreign OEMs. On November 14, at its 2024 Technology Innovation Day event, **Mercedes-Benz** introduced a new "map-free L2++ all-scenario high-level intelligent driving function based on vision-only solution". This high-level intelligent driving system adopts a vision-only solution and NVIDIA DRIVE Orin chip, does not rely on HD maps, uses end-to-end foundation models, and can achieve perception-decision integration. In the future, it will have point-to-point all-scenario intelligent driving capabilities (i.e. parking space to parking space intelligent driving capabilities) from pulling out of the starting parking space to pulling in the destination parking space.

This intelligent driving system of Mercedes-Benz was developed with the support of MOMENTA, a leading intelligent driving Tier1. As multinational OEMs such as Mercedes-Benz, Toyota, and Volkswagen learn to introduce Chinese intelligent supply chains, they also equip their cars with cutting-edge intelligent driving and cockpit functions. Market competition will become fiercer in 2025. A former leader may not always be the leader.



#### 1 Status Quo of Chinese Independent Brand OEMs' ADAS Market

1.1 ADAS Installations and Installation Rate of Independent and Joint Venture Brands: by Level

1.2 ADAS Installations and Installation Rate of Independent Brands: by Function

1.3 L2/L2+ ADAS Installations and Installation Rate of Independent Brands

- 1.3.1 L2/L2+ ADAS Installations: by Brand
- 1.3.2 L2/L2+ ADAS Installation Rate: by Brand
- 1.4 L2/2.5/2.9 ADAS Installations: by Brand
- 1.5 L2/2.5/2.9 ADAS Installations: by Model
- 1.6 L2/L2+/2.5/2.9 ADAS Installations: by Price Range
- 1.7 L2/L2+/2.5/2.9 ADAS Installation Rate: by Price Range
- 1.8 L2.5/L2.9 ADAS Installations: by Price Range + Model (2023)
- 1.9 L2.5/L2.9 ADAS Installations: by Price Range + Model (Jan-Aug 2024)
- 1.10 L2.5/L2.9 ADAS Installations and Installation Rate: by Price
- 1.11 Comparison between L2, L2.5 and L2.9 ADAS Solutions

#### 2 ADAS/Autonomous Driving Layout and Trends of Chinese Independent Brand OEMs

- 2.1 ADAS/AD Implementation Plan and Supply Chain
- 2.1.1 ADAS/AD Implementation Plan of Traditional Brands
- 2.1.2 NOA and End-to-End Implementation Timetable of Main Sub-brands of Changan, GWM, BYD
- 2.1.3 NOA and End-to-End Implementation Timetable of Main Sub-brands of FAW, Geely and GAC
- 2.1.4 NOA and End-to-End Implementation Timetable of Main Sub-brands of BAIC, SAIC, Chery and Dongfeng
- 2.1.5 ADAS Implementation Plan of Emerging Brands
- 2.1.6 NOA and End-to-End Implementation Timetable of NIO, Xpeng Motors, Li Auto, Xiaomi and Leapmotor

2.1.7 ADAS Supply Chain of Traditional Brands 2.1.8 ADAS Supply Chain of Emerging Brands

2.2 Autonomous Driving Industry Trends of Traditional Brands
2.2.1 Trend 1
2.2.2 Trend 2
2.2.3 Trend 3
2.2.4 Trend 4
2.2.5 Trend 5
2.2.6 Trend 6
2.2.7 Trend 7
2.2.8 Trend 8

2.2.9 Trend 9 2.2.10 Trend 10

2.3 Autonomous Driving Technology Trends of Traditional Brands

- 2.3.1 Trend 1 2.3.2 Trend 2 2.3.3 Trend 3 2.3.4 Trend 4
- 2.3.5 Trend 5

2.4 Intelligent Driving Development Trends of Emerging Brands

- 2.4.1 Trend 1
- 2.4.2 Trend 2
- 2.4.3 Trend 3
- 2.4.4 Trend 4
- 2.4.5 Trend 5 2.4.6 Trend 6



## Table of Content (2)

## 3 ADAS/Autonomous Driving Layout of Chinese Traditional Independent Brand OEMs

3.1 Changan

- 3.1.1 ADAS Strategic Planning
- 3.1.2 ADAS Strategy
- 3.1.3 123 Strategy Business Model
- 3.1.4 123 Strategy Ark Architecture
- 3.1.5 123 Strategy SDA Architecture
- 3.1.6 123 Strategy SDA Architecture L5 Layer Autonomous Driving
- 3.1.7 123 Strategy SDA Architecture L6 Cloud Platform and Intelligent Computing Center
- 3.1.8 ADAS Function Development History
- 3.1.9 ADAS Development Roadmap
- 3.1.10 Automatic Parking Development Roadmap
- 3.1.11 Typical ADAS/AD Functions (1)
- 3.1.12 Typical ADAS/AD Functions (2)
- 3.1.13 Typical ADAS/AD Functions (3)
- 3.1.14 Typical ADAS Models (4)
- 3.1.15 L4 Autonomous Driving Test
- 3.1.16 Investment and Cooperation in ADAS

3.2 Great Wall Motor
3.2.1 Overall ADAS Layout
3.2.2 ADAS Strategy - Coffee Intelligence
3.2.3 ADAS Strategy - Coffee Intelligent Driving
3.2.4 Development History of ADAS
3.2.5 ADAS System: HPilot
3.2.6 ADAS System: HPilot 3.0
3.2.7 NOH System

3.2.8 Typical Models with ADAS System
3.2.9 Haomo.ai Self-developed ADAS Technology Layout (1)
3.2.10 Haomo.ai Self-developed ADAS Technology Layout (2)
3.2.11 Haomo.ai Self-developed ADAS Technology Layout (3)
3.2.12 Haomo.ai Self-developed ADAS Technology Layout (4)
3.2.13 Haomo.ai Self-developed ADAS Technology Layout (5)
3.2.14 Haomo.ai Self-developed ADAS Technology Layout (6)
3.2.15 Intelligent Driving Highlights of the 2025 WEY Blue Mountain
3.2.16 ADAS Development Dynamics

#### 3.3 BYD

3.3.1 Development History of ADAS 3.3.2 Overall ADAS Layout 3.3.3 ADAS Responsible Team 3.3.4 ADAS Roadmap 3.3.5 ADAS System: DiPilot & DNP 3.3.6 ADAS System: Eyes of God 3.3.7 Models with Eyes of God 3.3.8 ADAS Hardware Layout (1) 3.3.9 ADAS Hardware Layout (2) 3.3.10 ADAS Software Layout 3.3.11 ADAS Technology Layout (1) 3.3.12 ADAS Technology Layout (2) 3.3.13 ADAS Algorithm Layout (3) 3.3.14 ADAS Algorithm Layout (4) 3.3.15 Autonomous Driving Test 3.3.16 ADAS Cooperative Ecosystem Layout

3.4 FAW Hongqi3.4.1 ADAS Development Roadmap



## Table of Content (3)

3.4.2 Development Strategy
3.4.3 R&D Layout
3.4.4 Electronic and Electrical Architecture
3.4.5 ADAS Technology Layout: Software
3.4.6 Typical ADAS Models (1)
3.4.7 Typical ADAS Models (2)
3.4.8 ADAS Road Test: Demonstration Bases
3.4.9 ADAS Road Test: Public Road
3.4.10 Intelligent Driving Simulation Test
3.4.11 Sinan Intelligent Driving
3.4.12 ADAS Investment and Cooperation

3.5 Geelv 3.5.1 Smart Geely 2025 Strategy 3.5.2 Taizhou Declaration 3.5.3 Integration of Intelligent Driving R&D System 3.5.4 ADAS Self-development (1) 3.5.5 ADAS Self-development (2) 3.5.6 ADAS Technology Layout (1) 3.5.7 ADAS Technology Layout (2) 3.5.8 ADAS Technology Layout (3) 3.5.9 ADAS Technology Layout (4) 3.5.10 ADAS Technology Layout (5) 3.5.11 ADAS Technology Layout (6) 3.5.12 ADAS Technology Layout (7) 3.5.13 ADAS Development Roadmap 3.5.14 Autonomous Driving Test: Simulation Test 3.5.15 Autonomous Driving Test: Closed Road Test 3.5.16 Autonomous Driving Test: Public Road Test

3.5.17 Commercial Vehicle Intelligent Driving Layout3.5.18 ADAS Partners3.5.19 ADAS Investment and Cooperation

3.6 GAC 3.6.1 ADAS Development Path 3.6.2 1615 Strategy 3.6.3 Intelligent Mobility 2027 Action Plan 3.6.4 ADAS Responsible Team 3.6.5 ADAS Technology Layout (1) 3.6.6 ADAS Technology Layout (2) 3.6.7 ADAS Technology Layout (3) 3.6.8 ADAS Solution Evolution Roadmap 3.6.9 ADAS System: ADiGO 2.0 3.6.10 ADAS System: ADiGO 3.0 (1) 3.6.11 ADAS System: ADiGO 3.0 (2) 3.6.12 ADAS System: ADiGO 4.0 (1) 3.6.13 ADAS System: ADiGO 4.0 (2) 3.6.14 Aion Hyper Opened Urban NOA 3.6.15 Intelligent Driving Highlights of the Second Generation AION V 3.6.16 L4/L5 Autonomous Driving Layout 3.6.17 L4/L5 Commercialization Progress 3.6.18 Autonomous Driving Test: Test Field 3.6.19 Autonomous Driving Test: Test License 3.6.20 ADAS Investment and Cooperation 3.7 BAIC 3.7.1 Development History of Autonomous Driving

- 3.7.2 ADAS Strategy: Dolphin+
- 3.7.3 ADAS Technology Layout: Single-vehicle Intelligence



report@researchinchina.com

## Table of Content (4)

- 3.7.4 ADAS Technology Layout: Combination of Single-vehicle Intelligence and Connectivity Technologies
- 3.7.5 ADAS Roadmap 3.7.6 Typical ADAS Models (1)
- 3.7.7 Typical ADAS Models (2)
- 3.7.8 Autonomous Driving Test
- 3.7.9 Cooperation in Autonomous Driving
- 3.7.10 Dynamic Layout of Autonomous Driving

#### 3.8 SAIC

3.8.1 Development History of Intelligent Driving Self-developed Team
3.8.2 Technology Layout: Hardware
3.8.3 Technology Layout: Chip
3.8.4 Technology Layout: Software
3.8.5 Technology Layout: Algorithms & Foundation Model
3.8.6 Technology Layout: HD Map
3.8.7 ADAS Roadmap
3.8.8 Advanced Intelligent Driving System of IM Motors
3.8.9 Technology Advantages of IM AD
3.8.10 Cooperation between IM Motors and Momenta in Intelligent Driving
3.8.11 L4 Autonomous Driving Operation Platform
3.8.12 Autonomous Driving Commercial Vehicle
3.8.13 ADAS Partners
3.8.14 ADAS Development Trends

3.9 Chery3.9.1 Intelligent Strategy: LION3.9.2 Intelligent Strategy: 2025 Yaoguang Strategy3.9.3 2025 Yaoguang Strategy: Intelligent Driving

3.9.4 Autonomous Driving Development History
3.9.5 ADAS Self-developed Layout: ZDrive.ai
3.9.6 Dual-Track Strategy of ZDrive.ai
3.9.7 ADAS Cooperation Layout (1)
3.9.8 ADAS Cooperation Layout (2)
3.9.9 ADAS Cooperation Layout (3)
3.9.10 ADAS Roadmap
3.9.11 Typical ADAS Models
3.9.12 ADAS Development Trends

3.10 Dongfeng
3.10.1 Strategy: "14th Five-Year Plan" Strategic Plan
3.10.2 ADAS Technology Planning: Develop Commercial and Passenger Vehicles Simultaneously
3.10.3 ADAS Technology Planning: "Two Series and One Platform" Technology Products
3.10.4 ADAS Development Roadmap
3.10.5 ADAS Layout (1)
3.10.6 ADAS Layout (2)
3.10.7 ADAS Layout (3)
3.10.8 ADAS Layout (4)
3.10.9 Autonomous Driving Cooperation Layout
3.10.10 Dongfeng Autonomous Driving Partners

#### 4 ADAS/Autonomous Driving of Chinese Independent Emerging Brand OEMs

4.1 NIO

- 4.1.1 Evolution of Autonomous Driving Functions
- 4.1.2 Functions of the First-generation NIO Pilot
- 4.1.3 Functions of the Second-generation NIO NAD
- 4.1.4 Comparison of Hardware Configurations between NIO PILOT and NAD



## Table of Content (5)

4.1.5 Introduction to NOP+	4.2.12 End-to-End Foundation Model (2): AI+XNGP
4.1.6 NOP+ Was Officially Launched	4.2.13 End-to-End Foundation Model (3): Organizational Change
4.1.7 Comparison between NOP and NOP+	4.2.14 Technology Layout (1)
4.1.8 Automated Parking Development Roadmap	4.2.15 Technology Layout (2)
4.1.9 Autonomous Driving World Model	4.2.16 Technology Layout (3)
4.1.10 Swarm Intelligence and Generative Simulation Help Data Closed Loop	4.2.17 Technology Layout (4)
4.1.11 Upgrade of Autonomous Driving Architecture	4.2.18 Autonomous Driving Hardware Configurations and Its Suppliers
4.1.12 Reorganization of Intelligent Driving R&D Team	4.2.19 New Progress of Intelligent Driving
4.1.13 Technology Layout: Autonomous Driving Chip R&D	
4.1.14 Technology Layout: LiDAR Chip	4.3 Li Auto
4.1.15 Self-developed Intelligent Driving SoC: Shenji NX9031	4.3.1 Intelligent Driving Platform Evolution Path
4.1.16 Technology Layout: Foundation Model and Intelligent Computing Center	4.3.2 Hardware Iteration and Suppliers in Intelligent Driving 1.0 Era
4.1.17 Autonomous Driving Cooperation Models and Trends	4.3.3 AD System and Typical Models
4.1.18 Overseas Investments	4.3.4 AD Max System and Typical Models
4.1.19 Major Suppliers of Autonomous Driving	4.3.5 AD Pro System
4.1.20 New Progress of Intelligent Driving	4.3.6 Intelligent Driving 2.0 Era: From AD MAX 2.0 to AD MAX 3.0
	4.3.7 Intelligent Driving 2.0 Era: AD Max 3.0 Architecture
4.2 Xpeng Motors	4.3.8 Intelligent Driving 3.0 Era: End-to-End + VLM Dual System Architecture
4.2.1 Autonomous Driving Evolution	4.3.9 Typical ADAS Functions
4.2.2 Intelligent Driving System in the First Half: Upgrades and Iterations of Xpilot system	4.3.10 Automated Parking System Development Roadmap
4.2.3 Intelligent Driving System in the Second Half: XNGP (1)	4.3.11 Smart Parking and Summoning
4.2.4 Intelligent Driving System in the Second Half: XNGP (2)	4.3.12 Technology Layout: Chips
4.2.5 Intelligent Driving System in the Second Half: XNGP (3)	4.3.13 Technology Layout: Data Closed Loop
4.2.6 Hardware Composition of XNGP	4.3.14 Intelligent Driving Algorithm: NPN
4.2.7 Software Capabilities of XNGP	4.3.15 Intelligent Driving Algorithm: TIN
4.2.8 NGP Function Evolution	4.3.16 Intelligent Driving Algorithm: Occupancy Network Model
4.2.9 VPA-L	4.3.17 Evolution of End-to-End Solution (1)
4.2.10 VPA Function Evolution	4.3.18 Evolution of End-to-End Solution (2)
4.2.11 End-to-End Foundation Model (1): Architecture	4.3.19 Evolution of End-to-End Solution (3)



### Table of Content (6)

4.4 Neta Auto 4.4.1 R&D Layout 4.4.2 Development History of Autonomous Driving 4.4.3 Autonomous Driving Strategy: Hozon Strategy 1.0 4.4.4 Autonomous Driving Strategy: Hozon Strategy 2.0 4.4.5 NETA PILOT 4.4.6 NETA PILOT 3.0/4.0 4.4.7 Advanced Function Release Plan of NETA PILOT 3.0/4.0 4.4.8 NNP & NCP 4.4.9 Parking Functions: NTP & NMS 4.4.10 Suppliers of Intelligent Driving Parts 4.4.11 Important Suppliers 4.4.12 Development Trends of Intelligent Driving 4.5 Leapmotor 4.5.1 Intelligent Driving Evolution 4.5.2 Intelligent Driving Configuration of Models 4.5.3 Leapmotor Pilot 4.5.4 Establishes Intelligent Technology Research Institute 4.5.5 Intelligent Driving Domain Configuration of the Four Leaf Clover EEA 4.5.6 Technology Layout (1) 4.5.7 Technology Layout (2) 4.5.8 Suppliers 4.5.9 Intelligent Driving Highlights of Leapmotor C16

4.6 Xiaomi Auto

4.6.1 Intelligent Driving Development History

4.6.2 Intelligent Driving Achievements of Xiaomi Pilot

4.6.3 Xiaomi Pilot Is Divided into Two Versions



4.6.4 Xiaomi Pilot Self-developed Intelligent Driving Algorithm
4.6.5 Xiaomi SU7: Intelligent Driving Highlights
4.6.6 Xiaomi SU7 Applied End-to-End Foundation Model
4.6.7 Investments in Automotive Field

4.7 HIMA (Harmony Intelligent Mobility Alliance) 4.7.1 ADAS Evolution 4.7.2 Development History of Intelligent Driving Business 4.7.3 ADS1.0 to ADS3.0 4.7.4 Release of ADS2.0 in 2023 4.7.5 ADS2.0, a Generation Ahead in Functional Safety 4.7.6 ADS2.0: Intelligent Parking Capability 4.7.7 ADS 2.0-enabled Models and Price 4.7.8 ADS 2.0-enabled Models (1) 4.7.9 ADS 2.0-enabled Models (2) 4.7.10 ADS 2.0-enabled Models (3) 4.7.11 ADS3.0 to Be Released in 2024 4.7.12 ADS3.0 All-round Active Safety Upgrade 4.7.13 ADS3.0 Smart Parking 4.7.14 Touring Platform Prepares for ADS3.0 Upgrade to L3 Intelligent Driving Compliance on the Road 4.7.15 ADS SE

4.7.16 Collaborative AVP Smart Parking Solution

report@researchinchina.com



#### **Beijing Headquarters**

TEL: 13718845418 Email: report@researchinchina.com Website: ResearchInChina

WeChat: Zuosiqiche



#### Chengdu Branch

TEL: 028-68738514 FAX: 028-86930659



