Automotive and 5G Industry Integration Development Report, 2020

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STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

ResearchInChina has recently released Automotive and 5G Industry Integration Development Report, 2020, demonstrating the status quo and trends of the automotive 5G industry, the 5G promotion by industry alliances, operators, and OEMs, as well as 8 application scenarios of 5G cars, etc.

Report Highlights
◆ Industry alliances promote automotive 5G demonstration projects
◆ Operators take the lead in promoting 5G infrastructure construction
◆ OEMs scramble to launch 5G models
◆ 5G in 8 typical automotive application scenarios

5G is an important condition for the realization of autonomous driving, during which the shorter the time it takes for the sensor from monitoring road conditions to commanding the vehicle's "brain" to respond, the higher the safety of autonomous driving. Therefore, it poses requirement of high reliability and low latency on the communication network.

The 5G network will promote the rapid development of the connected collaborative autonomous driving technology in China. In November 2020, the General Office of the State Council issued New Energy Vehicle Industry Development Plan (2021-2035), proposing to boost the synergy of electrification, interconnection and intelligent technology. Local governments are aggressively accelerating the deployment of 5G communication base stations and C-V2X roadside equipment, propelling the upgrading of intelligent roads, encouraging and guiding the assembly of vehicular wireless communication terminals, and fueling the coordinated development of intelligence and connection.

The development of 5G in the automotive industry requires coordination and cooperation among governments, operators, automakers, Tier1 suppliers, and Internet companies. At present, all parties (mainly industry alliances, operators, and OEMs) are pushing 5G automotive testing, demonstration and application projects to prepare for the large-scale application of 5G in the automotive industry.

Industry alliances promote automotive 5G demonstration projects

Industry organizations/alliances that promote automotive 5G projects include: 5G Automotive Association (5GAA), 5G Infrastructure Public Private Partnership (5G PPP), and China 5G Autonomous Driving Alliance (5GADA), etc.

5G Automotive Associations and the 5G Projects They Promote

	Established	Enterprises	5G Projects
5GAA	September 2016	**Automobile:** Audi, BMW, Daimler, Ford, Geely, BAIC, SAIC, Volkswagen, Volvo, Honda, Hyundai, Nissan, Jaguar, Land Rover, etc. **Telecommunications:** Ericsson, Huawei, Intel, Nokia, Qualcomm, ZTE, Samsung, etc.	**5G-V2X Project:** 5GAA members Telefónica, Ericsson, Ficosa and Seat show 5G connected car use cases supported by C-V2X direct communication for safer driving in a city. **5G Edge Computing Project:** Vodafone and Continental have joined forces. They are already working on application scenarios at Vodafone's 5G Mobility Lab. A digital shield for pedestrians and a traffic jam warning system are two of the focal projects. They will be implemented with 5G, cellular vehicle-to-everything (cellular V2X) and mobile edge computing. **5G Smart Transportation Demonstration Project:** In September 2019, Shanghai Jiading teamed up with SAIC, Huawei, China Mobile, etc. to launch a 5G smart transportation demonstration project of 5GAA.
5GPPP	February 2013	Ericsson, Bosch, Automotive Technology Centre of Galicia, Chalmers University of Technology, Huawei, King's College London, Marben, Nokia, Orange, PSA, Sequans, Viscoda, Volvo, etc.	5G PPP's collaborative research in three phases PHASE 1: Basic research on 5G network communications. PHASE 2: These technologies are used for the digitization and integration of European vertical industries. The "5GCAR project" led by Ericsson has been selected as part of phase 2 of the 5G PPP. PHASE 3: It is divided into three parts, one of which is the "automobile project" including cross-border corridor projects such as 5G CroCo, 5G-CARMEN, 5G-MOBIX, etc.
5GADA	September 2018	FAW, GAC, Dongfeng, Geely, Changan, BYD, BAIC, Chery, SAIC, Tsinghua University, China Automotive Engineering Research Institute Co., Ltd. (CAERI), Huabei Expressway, Datang Telecom, Huawei, China Academy of Information and Communications Technology, Nokia, etc.	**Beijing Fangshan Open Road Test Site:** There are 11 open roads with a total length of 18 kilometers. Tests for 5G network required by 5G autonomous driving, 5G edge computing platform, 5G-V2X capability, and 5G advanced positioning capability. **Xiangyang Closed Road Test Field:** The base enables smart operations as per actual production in the mining area and 5G remote driving control tests.

Operators take the lead in promoting 5G infrastructure construction

5G operators are vigorously implementing 5G Telematics and autonomous driving. For example, China Mobile is enforcing the 5G+ plan to further prompt the innovative application of 5G in the automotive field. In order to accelerate the development of 5G autonomous driving business, China Mobile has given great attention and support in terms of operating system, R&D and construction efforts, ecological cohesion, etc. China Mobile has formulated a "3+1+N" strategy, namely three advanced networks, a core platform and multiple application scenarios, so as to empower the quick realization of autonomous driving in China and maintain a leading position in the world.

5G Projects of China Mobile

	5G Base	5G Projects	Participators
5G Autonomous Driving Pilot Zone	Suzhou HSR New Town 5G + Smart Intersection Project in Suzhou 5G Internet of Vehicles (IOV) City-level Verification and Application Base	5G + Beidou high-precision positioning system; national 5G new infrastructure CVIS project; regularly operated 5G autonomous bus project	China Mobile, QCraft, Xiandao (Suzhou) New Infrastructure Technology Development Co., Ltd., Beidou etc.
	National Intelligent and Connected Vehicle Quality Supervision and Inspection Center (Xiangyang)	5G autonomous driving and remote driving	China Mobile, Dongfeng Motor, etc.
	IOV Base in Wuxi, Jiangsu	5G-V2X	People's Government of Binhu District, Wuxi City, Traffic Management Research Institute of the Ministry of Public Security, China Mobile Wuxi Branch, etc.
	High-end Manufacturing Base in Fangshan District, Beijing	5G network, 5G edge computing platform, 5G-V2X capability, 5G high-precision positioning capability	CM Intelligent Mobility, People's Government of Fangshan District, Beijing Municipality, China Mobile, Changan Automobile, Uisee Technology, AutoBrain, BWI, Beijing HyperStrong Technology, etc.
5G Smart Park	5G Autonomous Driving Base in Wuhan Economic & Technological Development Zone	5G + Beidou-based autonomous driving, L4 autonomous vehicle (RoboTaxi), autonomous minibus (Sharing-VAN), intelligent autonomous street sweeper, etc.	China Mobile, Dongfeng Motor, FAW, Baidu, Haylion Technologies, DeepBlue Technology, AutoX, etc.
5G Smart Port	China Merchants Port	5G + yard crane remote control, 5G + autonomous driving	China Mobile, Huawei, Beidou, Ping An, China Merchants Holdings (International) Co., Ltd., etc.
	Intelligent Container Truck Platooning Demonstration Base at East Sea Bridge in Yangshan Port	5G + autonomous heavy truck commercialization	China Mobile (Shanghai) ICT Co., Ltd., SAIC, Shanghai International Port (Group) Co., Ltd. (SIPG), China Mobile Shanghai Company, etc.
	Port of Ningbo	5G + remote control, 5G + autonomous container truck	Zhejiang Provincial Seaport Investment & Operation Group, China Mobile Zhejiang Company, Shanghai Zhenhua Heavy Industries Co., Ltd. (ZPMC), Huawei, etc.
	Port of Xiamen	5G + autonomous container truck, port machinery remote control, smart tally, etc.	Xiamen Ocean Gate Container Terminal Co., Ltd., COSCO SHIPPING Technology Co., Ltd., China Mobile Xiamen Branch, etc.

Source: ResearchInChina

OEMs scramble to launch 5G models

With the introduction of commercial and automotive 5G chips, automotive OEMs have launched 5G models successively. In June 2020, BYD launched Han equipped with Huawei's 5G technology. In November 2020, GAC NE unveiled AION V equipped with GAC Aion 5G V2X vehicular intelligent communication system and Huawei Balong 5000 5G communication chip. In November 2020, SAIC R started the pre-sale of the 5G smart electric SUV MARVEL R.

As OEMs scramble to launch 5G models, it is estimated that more than 50% of new cars will be equipped with 5G vehicular terminals.

Mass-produced and Planned 5G Vehicle Models in China

Model	Chip	Features	Start of Production
BYD Han	Huawei MH5000	Smartphone NFC key and DiLink 3.0 IVI system enable distributed non-inductive connection between smartphone and car; smartphone and car to share resources virtually; APP and service to share multiple devices.	2020
AION V	Huawei MH5000	5G + V2X intelligent terminals, the integration of 5G V2X technology and intelligent transportation network	2020
SAIC MARVEL R	Huawei MH5000+Mobileye Eye Q4	Fusion of 5G communication capability and availability of SAIC's latest automated driving technology will enable L3 automated driving.	2020
BAIC ARCFOX αT	Huawei MH5000	Availability of Huawei MH5000 5G chip-based T-BOX enables L2.5 assisted driving.	2021
Weltmeister W6	3rd Generation Qualcomm Snapdragon + 5G Baseband Chip	Availability of 7nm automotive chip, 5G baseband, over 22 sensors, and cloud-based AVP, enables L4 automated driving.	2021
WEY Mocha	Automotive Qualcomm 8155 chip + 5G-V2X	Vehicle 5G + V2X, automotive LiDAR, AR-HUD, L3 automated driving, etc.	2021
NIO ET7	3rd Generation Qualcomm Snapdragon + 5G Chip	Use 3rd generation Qualcomm Snapdragon™ automotive digital cockpit chip and Snapdragon™ automotive 5G chip.	2022

Source: ResearchInChina

5G in 8 typical automotive application scenarios

The report summarizes and analyzes 5G technology and application in 8 scenarios: test area/demonstration area, smart expressways, platooning, valet parking, remote control and remote driving, low-speed autonomous driving in the park, autonomous heavy trucks in the park, and smart buses. This article briefly introduces two of these scenarios.

Application of 5G on smart expressway

Compared with the complex road conditions in urban areas, the traffic environment of expressways is relatively closed and simple, symbolizing one of the typical scenarios where 5G intelligent connectivity technology and solutions are applied first. Smart expressways will gradually establish a complete infrastructure monitoring system and an intelligent road network operation perception system through 5G intelligent networking, Beidou, Internet of Things, cloud computing, big data and other technologies. The construction of smart expressways supporting 5G has become a key part of the new infrastructure.

Application of 5G in low-speed autonomous driving in the park

For example, an automotive smart antenna and a 5G remote driving smart gateway enable a park sweeper to connect 5G network, thereby realizing fully automatic autonomous driving, multi-sensor collaborative cloud management, omni-directional video surveillance, remote takeover, intelligent scheduling, and one-click summon and other functions.

Application of 5G-connected Park Sweeper

Project Name	5G Configuration
The test section of Furong Lake in Xuchang Urban-Rural Integration Demonstration Zone	The self-driving sweeper turns on automatic cleaning mode at a speed of 20km per hour, and successfully passes 14 5G self-driving scenario tests such as obstacle identification, pedestrian and non-motor vehicle avoidance; Construction of 5G network environment system includes 5G base station, roadside sensor system and edge computing system.
Teapark iValley in Nan'an District, Chongqing	The sweeper integrates LiDAR, camera, and ultrasonic radar, which enables fully automatic operation and fulfill cleaning, sprinkling garbage collection, etc on the road. At the same time, it collects data through 5G high bandwidth and transmits them to the background in real time, thus realizing remote monitoring.
5G+ Unmanned driving sweeper in Tiantai Road, Tianyuan District, Zhuzhou	The intelligent driving sweeper developed by Hunan New Encher New Energy Vehicle Co., Ltd. integrates multi-functions such as cleaning, washing and disinfection, and has achieved unmanned driving and can run under 5G network. Through 5G remote control platform, one person can monitor 10-15 such sweepers operations at the same time in the operation room. Tiantai Road has achieved 5G network coverage, and 5G communication with fast transmission speed and low delay has strongly promoted the application of intelligent driving.

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