



**Global and China Automated Parking and
Autonomous Parking Industry Report,
2018-2019**

Feb. 2019

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

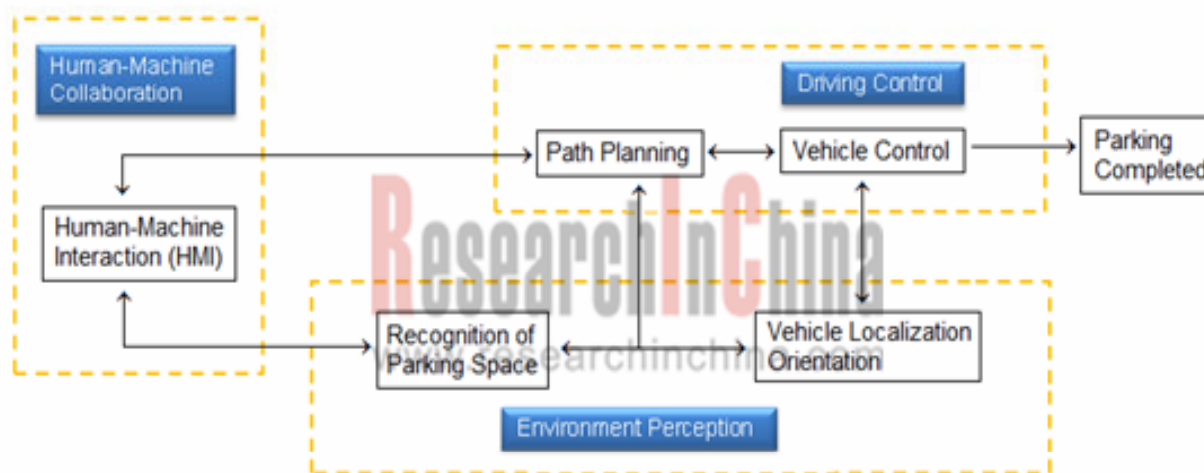
Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional 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

Automated parking system (APS) or automated parking assistant (APA) can measure the distance and angle between vehicle body and surroundings, collect sensor data to work out operation flow whilst automatically tuning the steering wheel, brake and throttle to pull into the parking space. Automated parking system can be divided by technical grades into semi-automatic parking (automatic steering only), fully automated parking (inclusive of automatic steering and automatic forwarding & reversing), autonomous valet parking (AVP), among others.



Automated parking system is generally composed of environment perception system, central control system (path planning system) and execution system (vehicle control system). Taking the diversity of automated parking systems into account, ResearchInChina recently rolled out the Global and China Automated Parking and Autonomous Parking Industry Report, 2018-2019 where all automated parking systems are classified into nine levels including APL1, APL1.5, APL2, APL2.5, APL3, APL3.5, APL4, APL5 and APL6. (See the table below)

Automated Parking Levels Classified by ResearchInChina

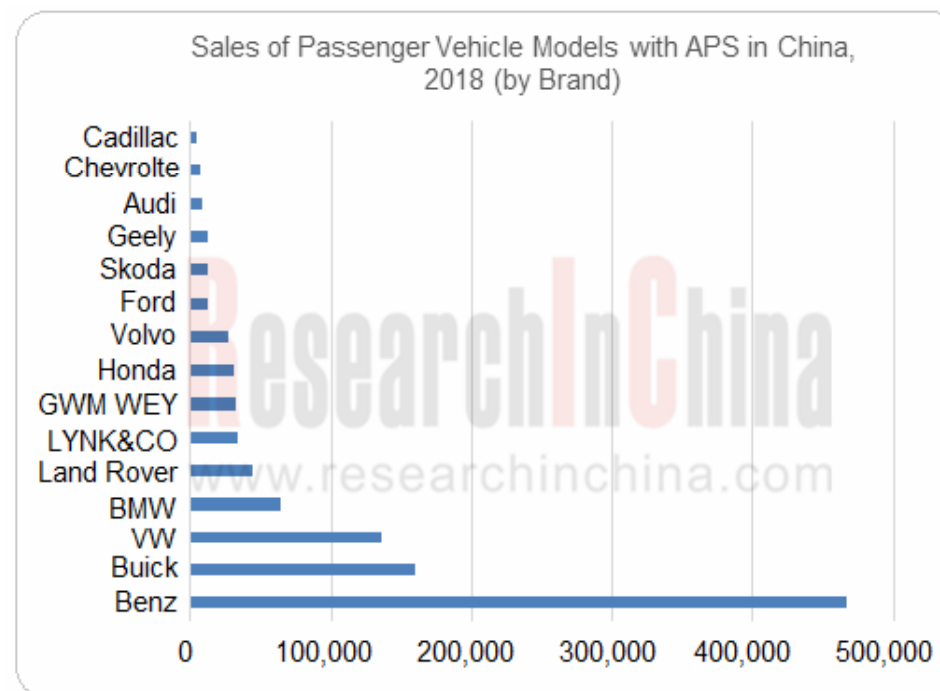
Level	Name	Features	Typical Model
APL1	Automated Steering Parking	Automated steering only. Ultrasonic technical solutions.	Early models with auto parking assist (APA)
APL1.5	Automated Steering Parking +Reversing Image	Automated steering only. Visual reversing. Ultrasonic + reversing camera technical solutions.	Most semi-automated parking models
APL2	Automated Steering Parking + 360° panorama	Automated steering only. 360° view. Ultrasonic + 360° surround view camera technical solutions.	Geely Lynk & Co 01
APL2.5	Automated Steering and Brake Parking (with reference)	Automated steering and braking. Manual throttle and shifting. Other vehicles or steric obstacles are required as a reference during automated parking space searching. Ultrasonic technical solutions.	
APL3	Automated Steering and Brake Parking (without reference)	Automated steering and braking. Manual throttle and shifting. Other vehicles or steric obstacles are not required as a reference during automated parking space searching. Ultrasonic + camera technical solutions.	
APL3.5	One-button Parking Inside the Car	Steering, braking, and throttle dispense with manual control. The driver only needs to press the parking button in the car.	Geely Binyue
APL4	One-button Parking Outside the Car	Steering, braking, and throttle dispense with manual control. The driver only needs to press the smart key or mobile APP outside the car in the field of view	Tesla Model 3/S/X, New Changan CS75, BMW 7 Series, Audi Q7
APL5	Intelligent AVP	Manual control unneeded in the whole process, the field of view unrequired, being eligible for functional safety. Autonomous parking done by the vehicle's own sensors, as well as signs and lines in the parking lot. Suitable for some parking lots, or for some scenarios.	Xpeng G3, Power Dream E200 AVP test vehicles
hAPL6	Vehicle-Parking Lot Coordinative AVP (Public Parking Lots)	Manual control unneeded in the whole process, the field of view unrequired, being eligible for functional safety. Autonomous valet parking achieved by Vehicle-Parking Lot Coordination via parking lot perception, positioning and network as well as the vehicle's own sensors. Suitable for most parking lots, or for most scenarios.	Some concept cars and test vehicles

According to ResearchInChina, the APS configuration rate of passenger vehicles in Chinese market was 5.3% in 2018, a not high figure due to technical immaturity shown as follows:
In the mass-produced vehicle models with APS, the automated parking system still desires to be improved in real experience and is faced with system recognition error and the occurrence of scratches.

Most APS renders ultrasonic sensors for monitoring parking spaces, but ultrasonic sensors are vulnerable to surface stains & defects, raindrops, ice, snow, etc., and thus fail to be brought into full play.

Recognition of parking space and the process of automated parking are subject to environmental factors. The currently mass-produced APS system, for example, usually cannot recognize well lids, pits or loose kerbs, tiny objects on the parking space, among others.

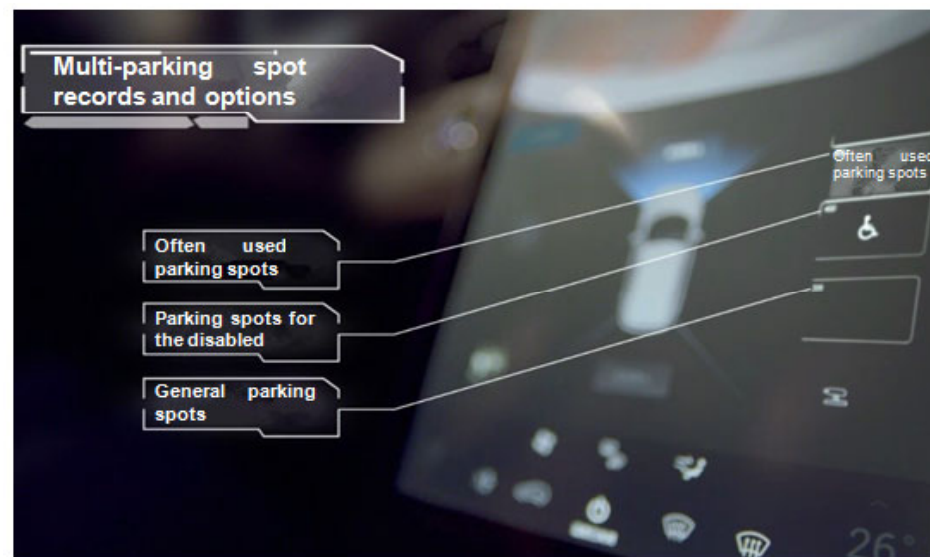
The current best-selling models with APS function are primarily from foreign automakers like Benz, Buick, Volkswagen, BMW and Land Rover as well as China-made premium brands LYNK&CO, Great Wall Motor's WEY, etc.



As automotive intelligence technologies and sensor technologies in particular are developing apace, OEMs are beginning to apply more sensors in the automated parking system, facilitating maturity of the APS technologies. Automated parking has already been a highlight of new car sales.

Geely SUV Binyue is one of the five most successful new cars in Chinese market in 2018. It debuted on October 31, 2018, with the sales outnumbering ten thousand units and reaching 10,100 units in the first month of launch, 13,222 units in December 2018 and 14,627 units in January 2019. Binyue is provided with fully automated parking system that enables horizontal pull-in, vertical pull-in as well as horizontal pull-out by only a key-touch whilst the driver does not have any control on steering wheel, throttle and brake. Binyue has the automated parking level APL3.5.

CS75 (the hit model of Changan Automobile) has the APA4.0 parking system which enable a man standing outside the car to realize one-key parking. Only a touch on the automated parking button is needed, the car can search the tailgate automatically, and performs operations such as forwarding, reversing and wheel steering. The entire parking process needs no driver engagement. CS75 has an automated parking level at APL4. BAIC plans to have the majority of its vehicle models be equipped with the automated parking technologies from July 2019.



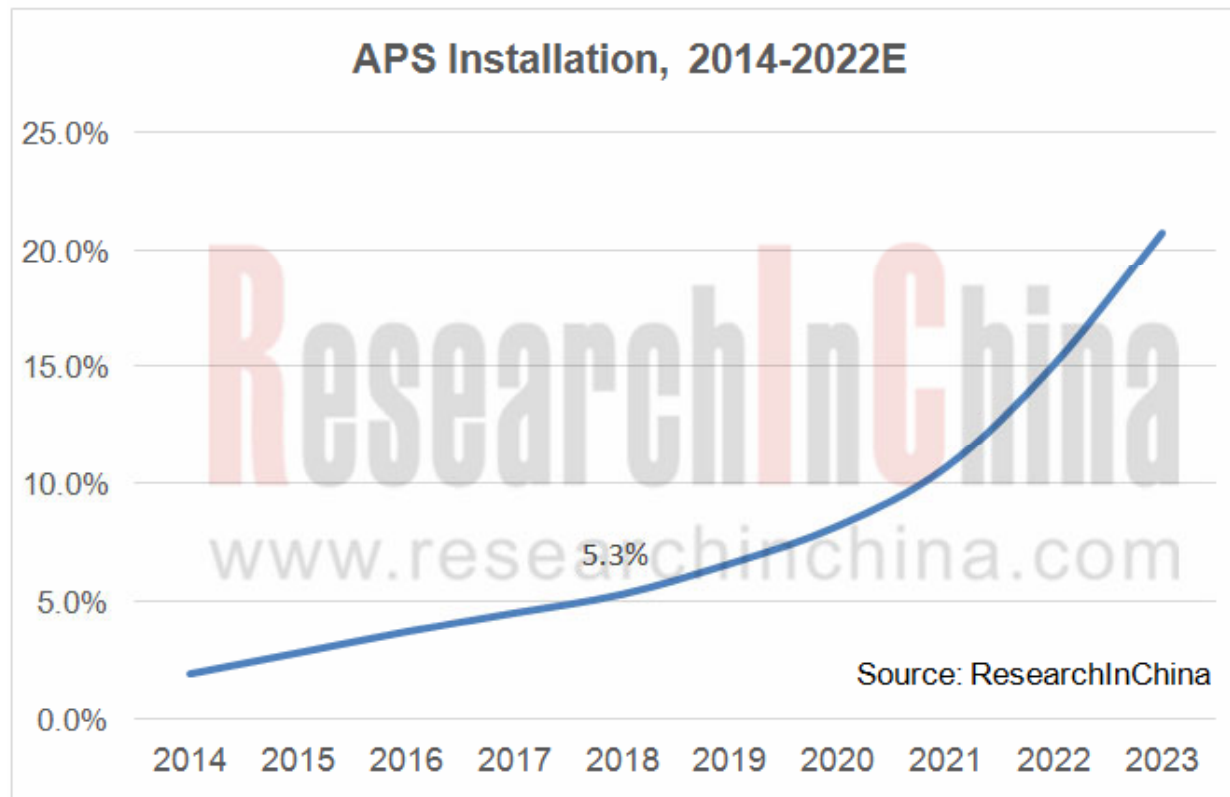
Source: Xiaopeng Motors

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Among emerging car manufacturers, Xiaopeng Motors focuses on automatic parking. Xpeng G3 carries 20 environmental sensors including 12 ultrasonic sensors, 5 vision sensors and 3 radars. That XPENG uses numerous sensor systems to make parking spaces recognized more accurately and lift probability of success in parking is an effective solution to the problems of low parking space recognition and many unsuccessful parking cases, adding more automatic parking capabilities. Xiaopeng says that success rate of its car automatic parking system exceeds 70% compared with less than 5% in general automatic parking and Tesla's 13%.

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As automatic parking technology grows mature and OEMs invest more in APS, installation of such a system will soar from 2020 after years of slow increase, expectedly outstripping 20% in 2023.



Traditional automakers follow an upgrading automated parking technology roadmap in ToC market, while Tier1 suppliers, technology firms and start-ups also have made an attempt to deploy automated valet parking (AVP) pilot projects at one go in ToB market.

Developments of AVP Vendors in 2018

Time	Vendor(s)	Developments
Jan	Hyundai Mobis	It released its AVP solution at CES, and announced to complete research and development this year.
Feb	Bosch	It announced that new Mercedes-Benz S series sedans would use its L5 AVP technology.
Apr	Volkswagen	It tested its AVP technology at Germany's Hamburg Airport, which is planned to be available to VW, Porsche and Audi mass-produced models in 2020.
Apr	Xiaopeng Motors	It launched GS panoramic automatic parking technology.
May	SITECH, Bosch	They signed a strategic cooperation agreement on the project for the application of AVP technology, in Gui'an New Area. They would work together to develop and upgrade SITECH DEV1 whose mass-production version is to be marketed in the second half of 2019.
Jun	Xiaopeng Motors, Desay SV	They signed a strategic cooperation agreement on automated driving systems like AVP system.
Sept	Daimler, Bosch	They announced the successful premiere of their joint automated valet parking pilot in Beijing.
Sept	Alibaba, Bosch	Alibaba Cloud announced cooperation with Bosch on launch of AVP solutions in China.
Sept	SAIC, O-film Tech	It announced SAIC Roewe MARVEL X with O-film Tech's AVP technology would be launched in the year.
Nov	Baidu Apollo	It released Baidu Valet Parking Program at Baidu World Conference. 9 companies such as Pandauto and Shuoqi GoFun were the first partners.
Nov	Wuling, Uisee Technologies	Uisee AVP systems for Wuling Baojun E200 began to be delivered, with total delivery of 100 units.
Nov	GAC NE	It rolled out Aion S, a BEV integrated with AVP capability (GAC adopts an uncommon concept—valet parking pilot (VPP)).
Nov	Horizon Robotics	It tested its AVP system on Chery eQ1 in Shanghai.
Nov	HoloMatic	It unveiled its Holoparking AVP product which is expected to be commercialized in 2020.

Source: Jazzyear

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