



# Global and China HD Map Industry Report, 2019-2020

Mar.2020

## 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

**HD map industry study: the HD map market is burgeoning with the roll-out of L3 autonomous vehicles.**

The automakers (except Volvo, Ford and NIO that claimed a leap over L3) have set foot in L3 autonomous vehicle successively, and most of them are scheduled to launch L3 models in 2020.

**L3 Time-to-market of Key Automakers and HD Map Partners**

Automaker	L3 Time to Market (estimated)	L3 Vehicle Model (s)	HD Map Partners
Benz	2020	Benz Class-S	Here
GAC NE	2019	Aion LX	Baidu
BMW	2021	iNext(iX5)	NavInfo, Here
Audi	2019	A8L/Q8	Here
Great Wall Motor	2021	WEY	Baidu
Geely	2020		AutoNavi (amap.com)
Changan Automobile	2020	UNI-T	Baidu
Cadillac	2020	CT5/CT6	AutoNavi (amap.com)
Nissan	2022		DMP
BAIC BJEV	2020		Baidu
Toyota	2020	LEXUS	DMP
Honda	2020	Legend	DMP
Hyundai	2020		Netradyne, Baidu
SAIC	2020	MARVEL X	KOTEI Big Data
Chery	2020	JETOUR X	Baidu
XPENG	2020	P7	AutoNavi (amap.com), eMapgo
FAW	2020		AutoNavi (amap.com), eMapgo

Source: ResearchInChina

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As HD map is indispensable to an L3 self-driving car, the HD map market ushers in a period of rapid growth.

With the advances in HD map, the map providers are turning to the data services and getting data update service charges annually. HD map has a unit price at least five times higher than traditional navigation map (about 200 yuan/vehicle) and subsequent service fee stands at 100 yuan/year or so. In 2019, AutoNavi (amap.com) introduced the standard HD map fee below 100 yuan/year per vehicle, facilitating the prevalence of HD map.

As expected, the Chinese HD map market will be worth more than RMB9 billion in 2025.

The HD map market is now in its infancy and it has not been spawned yet, but the market will be booming after 2021 when more and more intelligent connected vehicles, or ICVs will be packed with HD map with the launch of L3 self-driving vehicle models. It can be seen from use of HD map in automakers' L3 self-driving cars to be soon mass-produced that the map leaders like Amap, Baidu Map, NavInfo and eMapgo stay ahead in HD map application.

In addition to HD map services for third parties, more companies applied in 2019 to be the eligible providers of electronic navigation mapping with class-A qualification, such as DiDi, Huawei and SF Express. JD.com is primarily focused on the maps for unmanned delivery vehicle often running on the non-motorway and JD thus needs to collect the HD map data about the non-motorway.

HD map is used mainly in the three including mobility service market, enclosed areas and parking areas. As concerns mobility service, the map providers like Baidu have tried mobility services such as RoboTaxi in China and beyond. In respect of enclosed area, SAIC has conducted a trial project "5G+L4 self-driving heavy truck" at the Shanghai Yangshan Deepwater Port. What's more, AVP (automated valet parking) remains a hotspot over the past two years, and the map providers like Baidu and eMapgo have already launched the map solutions for automated parking.

HD map is not only for autonomous vehicle but serves as a stimulus to the development of intelligent connected roads. In September 2019, the State Council put forward the importance of smart connected road construction in the Program of Building National Strength in Transportation. At the same time, China Highway and Transportation Society (CHTS) also issued the Levels of Intelligent Connected Roads and Interpretations. It is now at the L1 in China.

### Levels of Intelligent Connected Roads

Level	Definition of Smart Road System
L0	No information/intelligence/autonomy at all
L1	Preliminarily digital/intelligent/autonomous
L2	Partially connected/intelligent/automated
L3	Conditional autonomy and highly connected, based on traffic infrastructure
L4	Highly automated, based on traffic infrastructure
L5	Fully automated, based on traffic infrastructure

Source: China Highway and Transportation Society (CHTS)

In the next three years, a total of about RMB75 billion will be invested to build intelligent road projects in China. HD map will be an integral part of smart road and will be onto the cloud as a platform. Moreover, it offers a unified space benchmark for roads. HD map is also an important carrier of smart road toll collection by service.

HD map is an emerging industry and is still short of unified industrial criteria, and the map vendors still apply de facto standard. An industrial standard will not be developed until the massive use of HD map in self-driving cars. China Autonomous Driving Map Working Group plans to nail down all kinds of autonomous driving map related standards and testing standards in 2022.

### **1 HD Map Industry**

- 1.1 Concept of HD Map and Technologies
  - 1.1.1 Concept of HD Map and Technologies
  - 1.1.2 HD Map Composition
  - 1.1.3 HD Map Format
  - 1.1.4 ADAS MAP
  - 1.1.5 HAD MAP
  - 1.1.6 HD Map for L4
  - 1.1.7 Dynamic Map
  - 1.1.8 Static Map
- 1.2 Role of HD Map
  - 1.2.1 Vehicle Positioning
  - 1.2.2 Path Planning and Perception
  - 1.2.3 Decision Aid
  - 1.2.4 HD Map for Simulation
  - 1.2.5 HD Map for V2X
  - 1.2.6 Difficulties in HD Map Application
- 1.3 Standards on HD Map
  - 1.3.1 Autonomous Driving Data Link and Ecosystem
  - 1.3.2 Map Standards
- 1.4 Production and Maintenance of HD Map
  - 1.4.1 Production Process
  - 1.4.2 Data Production of Static Map
  - 1.4.3 Data Update of Dynamic Map
  - 1.4.4 Tools for Acquisition of Dynamic Map

- 1.4.5 Maintenance of HD Map
- 1.5 HD Map Market Size
- 1.6 Competitive Pattern of HD Map
- 1.7 Challenges for Development of HD Map
  - 1.7.1 Mapping Costs of HD Map
  - 1.7.2 Technical Complexity
  - 1.7.3 Frequency of HD Map Updates
- 1.8 Development Trend of HD Map
  - 1.8.1 From Professional Mapping to Crowdsourcing Update
  - 1.8.2 Elimination of Perceptual Error
  - 1.8.3 Diversified Competition
  - 1.8.4 HD Map Gets Used Increasingly with Mass Production of L3 Autonomous Vehicle
  - 1.8.5 Facilitate the Development of Intelligent Roads

### **2 HD Map Supporting Technologies and Data**

- 2.1 HD Map Supporting Technology
- 2.2 Data Acquisition of HD Map
- 2.3 Mobileye and HD Map
- 2.4 Bosch HD Map Technology
- 2.5 Qianxun SI
- 2.6 Dynamic Map Planning

### **3 Chinese Map Providers**

- 3.1 AutoNavi (amap.com)

3.2 Baidu Map

3.3 NavInfo

3.4 Tencent Map

3.5 Leador

3.6 eMapgo (EMG)

3.7 DiTu (Beijing) Technology

3.8 Momenta

3.9 Wuhan KOTEI Big Data Corporation

3.10 Jiangsu Zhitu Technology

3.11 JD Logistics

3.12 Photool Technology

3.13 Huawei Map

HD Map Development Roadmap of Chinese Map Providers

HD Map Technology Analysis of Three Leading Chinese Map Providers

HD Map Orders of Three Leading Chinese Map Providers

#### **4 Foreign Map Providers**

4.1 Here

4.2 TomTom

4.3 Waymo

4.4 Zenrin

4.5 Increment P

#### **5 HD Map Starups**

5.1 KuanDeng Technology

5.2 Deep Map

5.3 Civil Maps

5.4 Ivi 5

5.5 Carmera

5.6 Wayz.ai

5.7 Ushr

5.8 DeepMotion

5.9 Mapbox

5.10 Dilu Technology

5.11 TrafficData

5.12 Netradyne

#### **6 Standardization Organizations**

6.1 NDS

6.2 ADASIS

6.3 SENSORIS

#### **7 Conclusions**

HD Map Market Players

Comparison between Foreign HD Map Companies

Comparison between Chinese HD Map Companies

HD Map Business Model

Applied Scenarios of HD Map



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