



让理想飞扬

Reflection on High Way Pilot for Series Production Vehicles



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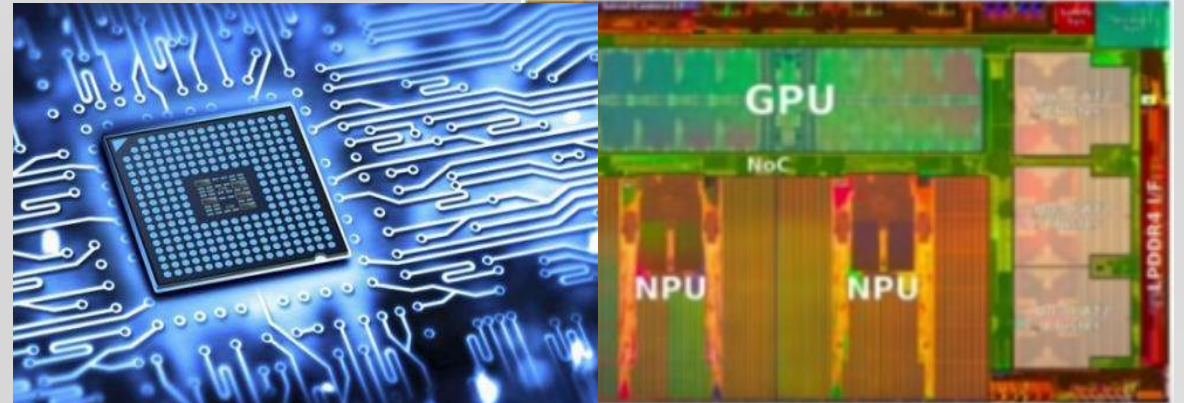
01 Evolution Trends

- ❑ Large scale production of L1-L2 level automatic driving begins, and the era of L3 and L4 is coming
- ❑ 5G has come, people—vehicle—road—cloud cooperation, intelligent transportation is expected in the future



01 Evolution Trends

- ❑ **Software:** the rapid development of big data and AI technology enables automatic driving
- ❑ **Hardware:** tackling key high performance chips, sensors, computing platforms to accelerate automatic landing



01 Evolution Trends

- ❑ Traditional OEM: walking on two legs, product development of to C end and application demonstration of to B end
- ❑ Internet technology companies: relying on their own software development advantages, leap forward development route



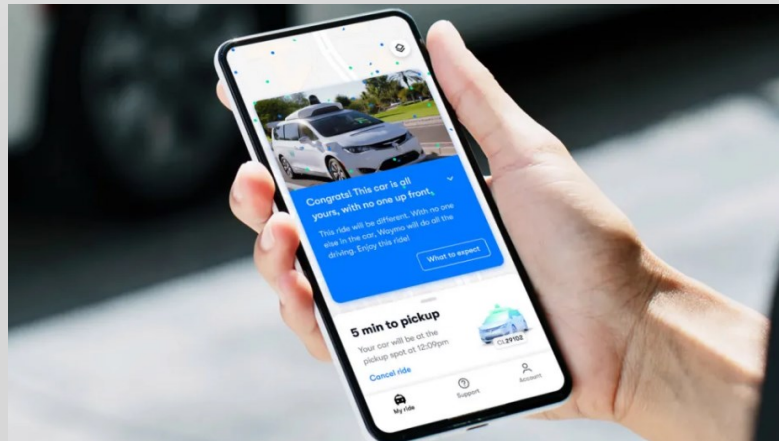
01 Evolution Trends

□ Market segmentation

- Low speed scenario: AVP (Automated Valet Parking) is approaching, and is expected to take the lead in commercialization
- Medium speed scenario: the next goal for robotaxi is to remove the security driver in the regional demonstration
- High speed scenario: TJP (Traffic Jam Pilot)/HWP(High Way Pilot) mass production development, waiting for regulatory approval



AVP



Robotaxi



HWP/TJP

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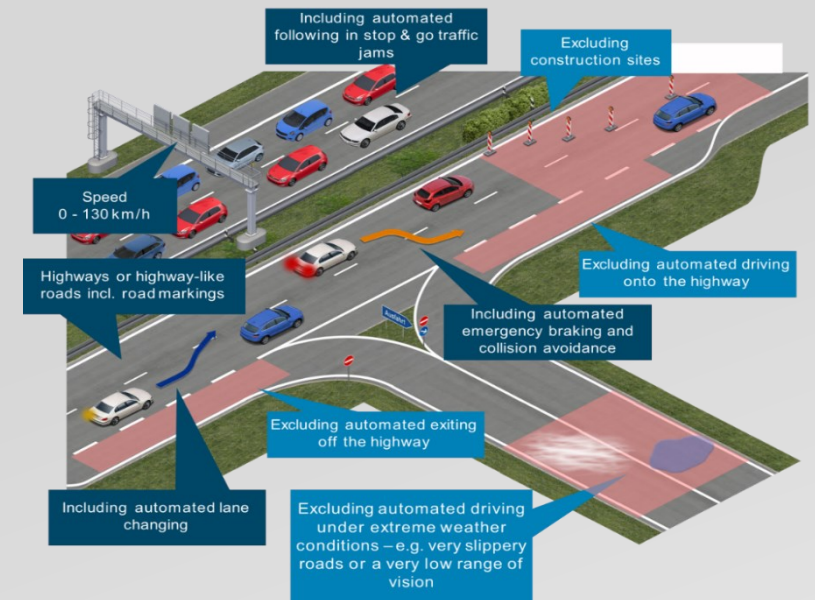
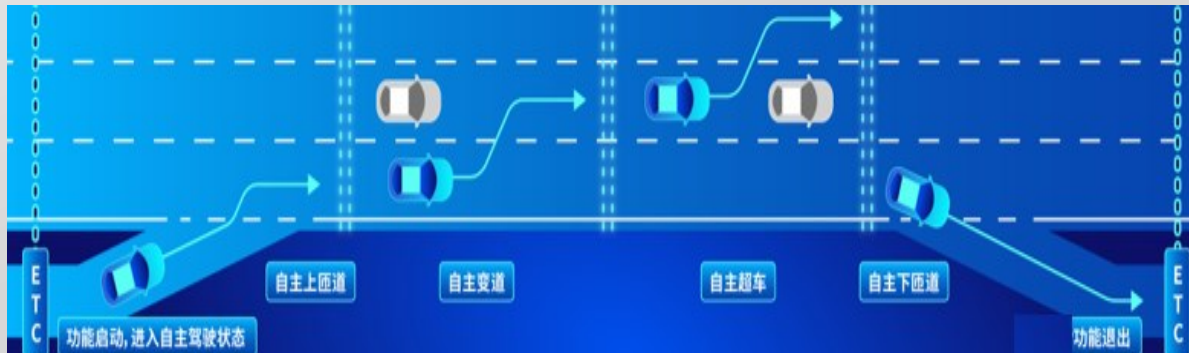
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02 HWP current situation and problems

□ HWP introduction

- Be able to drive on highways or urban expressways at a speed within the speed limit. The driver must actively activate the system, but does not have to continuously monitor the system. The driver can take over the system at any time. When the system sends a take over request to the driver, enough time will be reserved for the driver to take over the driving task. If the driver does not take over the driving task in time, the system should implement the risk mitigation strategy in time.



02 HWP current situation and problems

□ HWP application situation

- Regulations and standards : Relevant laws and regulations (UN R157 ALKS) on automatic driving below 60km / h have been issued. It is expected that relevant applications and operations may start in Europe, Japan, South Korea and other countries in 2021. China has been organizing relevant demonstration application preparation, and plans to support expressways as the basis of road test and demonstration application road.

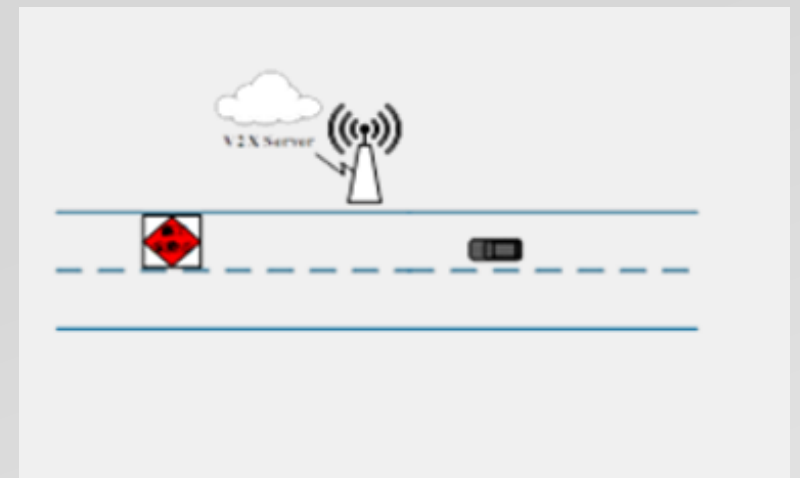


UN R157
1. Scope and purpose 2. Definitions
5. System Safety and Fail-safe Response
6. Human Machine Interface / Operator Information
7. Object and Event Detection and Response
8. Data Storage System for Automated Driving
Annexes 4
Annexes 5

02 HWP current situation and problems

□ HWP application situation

- HD map: HD map provides auxiliary location and a priori knowledge which is closely related to the safety of automatic driving to make up for the limitation of sensor's perception distance and perception accuracy. The HD map data covers national expressways and urban expressways, and the update frequency is quarterly.
- Smart highway road: In China, many cities have all carried out the construction of c-v2x smart highway road, which are to realize vehicle road collaborative and automatic driving



02 HWP current situation and problems

□ HWP application problems

- Lack of policies and regulations for HWP on the road permission. At present, the licenses issued in China are test licenses, not operation licenses, commercial deployment of HWP cannot be carried out
- Lack of accurate dynamic information. For example, temporary construction, weather and accident information and slippery roads and ice can not be identified and handled
- 4G / 5G coverage is insufficient and there is no GPS enhancement measure in the tunnel
- The update frequency of HD map is slow, and it is updated on a quarterly basis, which can not meet the real-time positioning requirements.



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03 Suggestions on Implementation Path

□ In the near future

- HD maps are updated from quarter to month
- Part of dynamic information access via C-V2X
- Expand the coverage of RTK
- Build 5G cloud platform to realize data acquisition and access function

□ Medium and long term

- HD map is updated monthly to weekly until it is updated in real time
- All dynamic information access via C-V2X
- In special areas such as bridges and tunnels, RTK signal enhancement equipment will be added
- 5G cloud platform realizes data analysis and mining function

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- ❑ 5G has come, people—vehicle—road—cloud cooperation, intelligent transportation is expected in the future
- ❑ Regulations and standards, HD map, smart highway road support are the main problem of HWP application
- ❑ HD maps updated frequency, dynamic information access via C-V2X, expand the coverage of RTK and 5G cloud platform construction are the suggested path to HWP for series production vehicles

Thank you for your attention

