China Intelligent Connected Vehicle Technology Roadmap[1]

Source: 1. China Automotive Engineering Institute, <Energy Saving and New Energy Vehicle Technology Roadmap>, Oct. 2016

Intelligent Connected Vehicle Technology Roadmap[1]

General Program

- Short term - partial automatic (PA degree) driving applications focus on autonomous environmental awareness, supplemented by promoting networking information service
- Middle term - conditional automatic (CA degree) drive under complicated conditions based on networking environmental awareness
- Long term - high-level/ fully automatic driving technology can realize V2X cooperative controls

Source: 1. China Automotive Engineering Institute, <Energy Saving and New Energy Vehicle Technology Roadmap>, Oct. 2016

Intelligent Connected Vehicle

Development Objectives

Year 2020

- Form a preliminary independent system for intelligent connected vehicles. Initiate intelligent city construction
- New vehicle equipment ratio reaches 50% for conditional automatic driving and the below-grade (DA/PA/CA)
- Reduce 30% of traffic accidents. Increase traffic efficiency by 30%. Decrease oil consumption and emission by 5%

Year 2030

- Construct intelligent connected vehicles industry chain and intelligent traffic system
- New vehicle equipment ratio reaches 80% for automatic driving at DA/PA/CA/HA/FA degree
- Reduce 80% of traffic accidents. Increase traffic efficiency by 30% for ordinary road. Decrease oil consumption and emissions by 20%

Technology Path

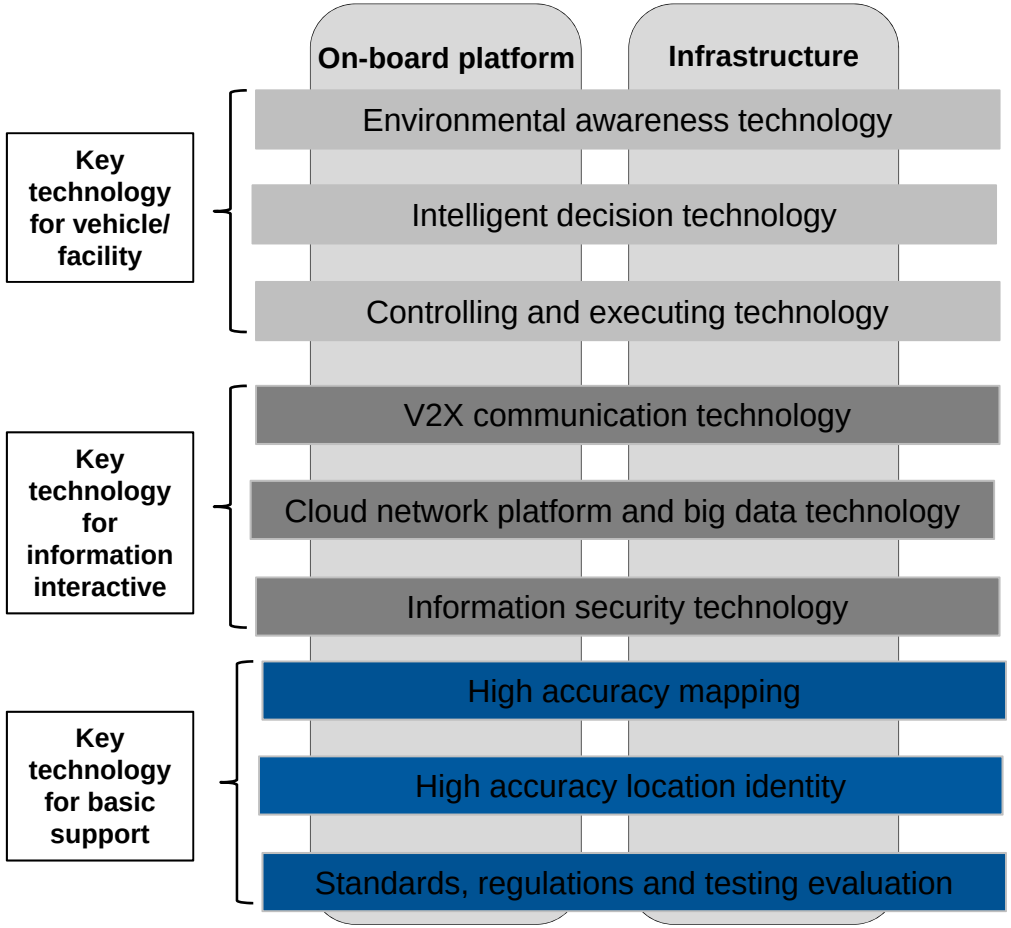
- Accelerate perception, location and communication technology development
- Develop multisource information fusion technique
- Promote standards for intelligent connected vehicle
- Promote informationizing and intelligentizing of road traffic facilities.

Develop Priority

- Construct intelligent connected vehicles environmental awareness system
- Integrate control technology for intelligent electric vehicles
- Application of vehicle V2X wireless communication technology
- Information security detection and protecting technology
- Deeply cognitive technology for machine vision
- Research and application for integrated technology in a cloud network
- Construction of evaluation system and test environment for intelligent connected vehicles
- Comprehensive research on high precision map

Intelligent Connected Vehicle

Framework and Develop Vision



Develop Vision

- **Security**

  Decrease traffic accidents and traffic accident casualties substantially

- **Efficiency**

  Increase traffic efficiency remarkably

- **Energy saving and emission reduction**

  Reduce traffic energy consumption and pollution emission effectively

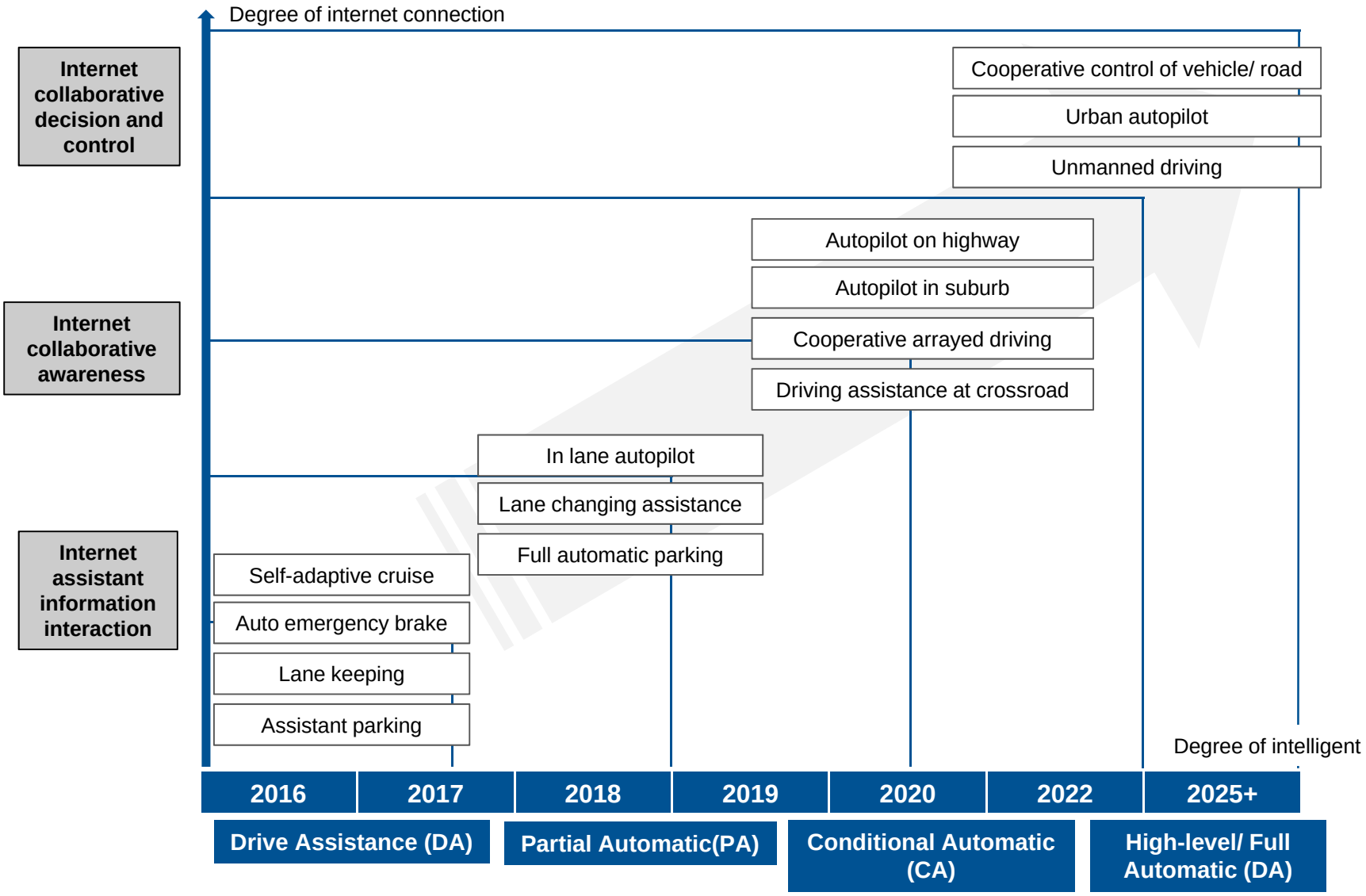
- **Comfort and convenience**

  Promote comfortable driving, liberate drivers

- **Humanity**

  Provide aged and disabled people driving ability

Intelligent Connected Vehicle



Intelligent Connected Vehicle

Project type	Technical innovation demand	Prior project
Basal Prospection	• Deep perceptiveness of machine vision • Road scene awareness technology based on deep learning • Local path real time planning and evaluation method study on autopilot • On-board wireless communication technology • Cloud network integration study and application • Theory model of intelligent connected vehicles security • Integrate study on high accuracy dynamic map	• Development of software and hardware with their industrialization for awareness and cognition under a complicated environment
Applied Technology	• Environmental awareness system for intelligent connected vehicles • Decision control function development of autopilot based on driver behavior • Integrated control technology study on intelligent electronic vehicles • Electric and electrical EE architecture design of intelligent connected vehicles • On-board security, traffic efficiency and energy saving study based on V2X • Construction of basic data interactive platform for intelligent connected vehicles • Study on information security detection and protection technology for intelligent connected vehicles • Awareness and cognition system based on high accuracy map and high accuracy position and orientation technology	• Study, testing, application demonstration and their industrialization for on-board V2X wireless communication system • Classified platform architecture and interaction standard for intelligent connected vehicles • Key technology and application for high accuracy map and high accuracy location detection
Demonstration and Industrialization	• Environmental awareness control system study and industry application • Application demonstration of assisted driving and partial autopilot under V2X environment • Big date sharing and application of collaboration for intelligent connection • Integrated test and evaluation system study on high accuracy map • Intelligent vehicles development for intelligent city	• Key technical study and industrialization development for information security protection and evaluation • Integrated design, demonstration and extension for intelligent city and intelligent vehicles
Generic Platform	• Experimental platform for on-board V2X wireless communication technology testing • Testing evaluation system and testing environment construction for intelligent connected vehicles • Information security monitoring and testing evaluation platform for intelligent connected vehicles • Regulations and standards construction for intelligent connected vehicles • Standardization of data model and storage form for high accuracy map	• Industry standardization study on intelligent connected vehicles • Testing evaluation system and testing environment construction for intelligent connected vehicles