Research on Standardization Development of Vehicle Network Industry

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ABSTRACT: The Internet of Vehicles (Intelligent Networked Vehicles) industry is a new type of industry that is deeply integrated in the automotive, electronics, information and communication, road transportation and other industries. The development of car networking industry is conducive to improving the level of auto networking and intelligence, realizing automatic driving, developing intelligent transportation, promoting information consumption, promoting structural reforms on the supply side, as promoting the construction of manufacturing and network powers, and achieving high-quality development. It is great of significance. At present, Chinese car networking industry has entered a fast lane, technological innovation has become increasingly active, new applications have flourished, and the scale of the industry has continued to expand. However, there are also problems ,such as the need to break through key core technologies, the need to improve the industrial ecology, and the need for sound policies and regulations. In order to further promote the sustainable and healthy development of the industry, this action plan is formulated.
Keyword: Intelligent networked vehicles,information and communication,structural reforms,policies and regulations,action plan

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I. TOTAL REQUIREMENTS

a. Guiding Ideology

Guided by Xi Jinping's new era of socialism with Chinese characteristics, he fully implements the spirit of the 19th and 19th Central Committees of the Party, adheres to the new development concept, and persists in promoting high-quality development with network communication technology, electronic information technology.The integration of automobile manufacturing technology is the main line, giving full play to the technological advantages of Chinese network communication industry, the market advantage of the electronic information industry and the scale advantage of the automobile industry, optimizing the policy environment, strengthening cross-industry cooperation, breaking through key technologies, consolidating the industrial base, and promoting the formation. There is a new ecosystem of car networking industry with deep integration, active innovation, security and credibility, and strong competitiveness.

b. The Basic Principle

ⅰ. System Deployment and Overall Promotion.:Strengthen the top-level design, we must improve departmental coordination and linkages, and make strategic deployment and phased implementation. We need coordinate the promotion of key technology research and development, standard specification development, test demonstration and infrastructure construction, while build an environment and foundation for the healthy development of the industry.

ⅱ. Innovation Leading, Application Driven: We need promote cross-industry collaborative innovation, fully mobilize all parties, strengthen cooperation between industry, universities and research institutes, while break through technological bottlenecks, and continuously improve innovation capabilities. We may consolidate the industrial base, foster innovative applications, increase the scale of users, and accelerate the formation of a new ecosystem of industrial innovation and development.

ⅲ. Complementary Advantages and Open Cooperation: We need promote industrial cooperation, platform interoperability, system interconnection, and build a new industrial structure with complementary advantages and integrated development. As well as we must strengthen international exchanges and cooperation to jointly promote the transformation of the automotive industry and the transformation of application models.

ⅳ. Strengthen Management and Ensure Safety: We must clarify the main responsibility, improve the management system, strengthen the

protection mechanism, and build a management system to ensure personal safety.

c. Action Goal

By 2020, the breakthrough in cross-industry integration of Internet of Vehicles (Intelligent Networked Vehicles) industry has been achieved. Intelligent networked vehicles with high-level auto-driving functions have been applied to specific scene scales. The comprehensive application system of vehicle networking has been basically constructed, and user penetration has been greatly improved. The level of intelligent road infrastructure has been significantly improved. The policies, regulations, standards and safety systems for industrial development have been initially established. The industrial ecology of open integration and innovation has basically taken shape to meet the diversified, individualized and escalating consumer needs of the people.

ⅰ. Key Technologies: We may build an intelligent networked vehicle technology system capable of supporting conditional automatic driving (L3 level) and above, and form a safe and reliable software and hardware integration and application capability. The core technologies of intelligent networked automobile computing basic platform, platform wire control and intelligent drive have made breakthroughs, and the level of L3 level integration technology has been greatly improved. We will realize the industrialization and commercial deployment of vehicle-network wireless communication technology (LTE-V2X) based on the fourth-generation mobile communication technology, accelerate the development of key technologies. Such as the vehicle-based wireless communication technology (5G-V2X) based on the fifth-generation mobile communication technology design and commercial applications in some scenarios, building a car network architecture that combines communication and computing.

ⅱ. Standard System: We can complete the establishment of key standards for the Internet of Vehicles (Intelligent Networked Vehicles), significantly increase the effective supply of standards, and improve the industry standard system. Improve the comprehensive test and verification capabilities, which improve the test evaluation system, build a scene database, form a test specification and data sharing, and form a group of regional, distinctive, and pilot demonstration applications.

ⅲ. Infrastructure: We need realize the coverage of LTE-V2X on some expressways and major urban roads, carry out 5G-V2X demonstration applications, build a narrowband Internet of Things (NB-IoT) network and a vehicle-road collaborative environment, and improve the scale application of high-precision space-time services for vehicles. In order to high-quality development level, we must provide the necessary conditions for new technology applications, such as car networking and automatic driving.

ⅳ. Application Services: The penetration rate of the Internet of Vehicles users has reached more than 30%, the driving rate of the new vehicle driving assistance system (L2) has reached more than 30%, and the assembly rate of the new vehicle-mounted information service terminals has reached more than 60%. The application system has been built,that comprehensive coverage of information services, safety and energy effects.

ⅴ. Security: The industrial safety management system was initially formed.The safety management system and safety protection mechanism were implemented, and the safety technology and product research and development achieved initial results. The construction of safety technology support means achieved initial results, and the safety guarantee and service capabilities were gradually improved.

After 2020, through continuous efforts, the vehicle networking industry will be promoted to leapfrog development, technological innovation, standard systems, infrastructure, application services and security systems will be fully established, and intelligent networked vehicles with high-level autopilot functions and 5G-V2X will be gradually realized. With large-scale commercial applications, "people-car-road-cloud" achieves high synergy, and the growing needs of the people's better life are better met.

II. BREAK THROUGH KEY TECHNOLOGIES AND PROMOTE INDUSTRIAL DEVELOPMENT

a. Accelerate The Key Core Technology of Intelligent Networked Vehicles

It need to make full use of various innovative resources, accelerate the development and application of key components and systems of intelligent networked vehicles, while focus on breaking through the core technologies of intelligent network connected vehicles, such as complex environment perception, new electronic and electrical architecture, and vehicle platform line control. One we may accelerate the joint development and transformation of sensor systems, such as vehicle vision systems, laser/millimeter wave radars, multi-domain controllers, and inertial navigation. Two,we may accelerate the research and development of key components, such as intelligent vehicle terminals and car-level chips, while promote the industrial application of a new generation of artificial intelligence, high-precision

positioning and dynamic map technology in intelligent networked vehicles. Three,we may accelerate the development and industrialization of high-performance vehicle intelligent drive, line control, line-controlled steering, and electronic stability systems to achieve precise, coordinated and reliable control of vehicles.

b. Promote The Construction of Intelligent Networked Vehicle Decision-making Control Platform

We will Link national key scientific and technological achievements, speed up the establishment of Chinese standard intelligent networked car scene database through joint research and cooperative development,and perfect the software development environment suitable for deep learning.We need develop the in-vehicle operating system for software and hardware collaborative computing and communication integration, while accelerate develop hardware interface unit, storage management unit and V2X communication unit for intelligent networked vehicles to accelerate the formation of L3 and above intelligent networked vehicle computing infrastructure platform design suitable for Chinese road conditions. Safe, fast and effective control requirements is mostly to meet the vehicle dynamic chassis and body electronic components.

c.Strengthen Wireless Communication Technology Research and Development and Industrialization

It is strong support for LTE-V2X, 5G-V2X and other wireless communication key technologies research and industrialization. In order to accelerate the application of multi-access edge computing, network function virtualization, 5G network slicing and other technologies in the industry, we build a system of communication and computing, improve the agility of multi-access edge computing, and achieve more business innovation. In order to accelerate the deployment and product development of the V2X computing platform, we build a multi-level distributed V2X computing platform system with center-area-edge-terminals to meet the V2X business requirements.

III. IMPROVE THE STANDARD SYSTEM , PROMOTE TEST VERIFICATION AND DEMONSTRATION APPLICATIONS

a. Standard System

ⅰ. It is gived full play to the foundation, guidance and normative role of the standard system in the ecology of the vehicle networking industry. In order to accelerate the implementation of the "Guidelines for the Construction of the National Vehicle Network Industry Standard System", we update and supplement it in a timely manner according to the needs of industrial development. In order to accelerate the formulation and improvement of basic general categories, technical categories, test evaluation categories, service specification categories and safety certification standards, and increase the effective supply of standards, we encourage the simultaneous promotion of international standardization of key technologies, and lead the development of technology and standards with standards.

ⅱ. Accelerate the revision and revision of relevant standards for intelligent networked vehicle basic general, advanced driver assistance system (ADAS), automatic driving, information security, network connection functions, etc., we use with the test scene as the entry point and the vehicle function evaluation as the target, the system automatically develops Research and development of relevant standards and specifications for driving test evaluation. Carry out 5G-V2X technology research and development and standard formulation, and promote the integration innovation and standard research of multi-access edge computing and LTE-V2X technology. Strengthen the connection with relevant infrastructure standards such as smart city construction, accelerate the research and development of technical requirements , and test methods for base station equipment, roadside units and vehicle terminal equipment. Promote the development of end-to-end interconnection standards between the vehicle networking service platform and the traffic control information service platform. Establish interconnection and data interaction standards between electric vehicles, charging piles and platforms. Research and development of relevant standards for promoting vehicle network wireless communication security, vehicle networking platform and application security, data security and user personal information protection.

b. Accelerate Frequency and Business License Argumentation

The release of the Internet of Vehicles (Intelligent Networked Cars) direct communication uses the 5905-5925MHz band management regulations. In combination with technology and industrial development and the frequency application of relevant units, frequency licenses will be issued in a timely manner. Promote 5G-V2X related frequency requirements research. Strengthen research on LTE-V2X infrastructure operation qualification and vehicle networking business qualification.

c. Drive Test Verification

ⅰ. Building an intelligent networked vehicle test evaluation system, improving the test methods and testing specifications of individual technologies and vehicle products, as well as comprehensively improve test and verification capabilities. We must strengthen the capacity building of test demonstration zones, promote the uniformity of test specifications and database sharing. While we need to promote the construction of China's road traffic scene library to provide basic support for product development testing, safety assessment and functional evaluation. We may expand the scope of intelligent networked public road testing and explore pilot tests for highways.

ⅱ. Improving the technical test and verification of vehicle-mounted terminals and roadside units in different electromagnetic environments, building a vehicle network cloud platform test and verification system, and improving related test and verification capabilities, we need to study the requirements of electromagnetic environment protection for vehicle networking, and improve the management methods for network access licenses for wireless communication equipment for vehicles. While we may promote the development of technologies, such as simulation tests and road test tests, and form comprehensive test verification capabilities for laboratories, closed roads, semi-enclosed roads and open roads.

d. Promote Demonstration Applications

It need to Strengthen cooperation with the Ministry of Public Security, the Ministry of Transport and other local governments, encourage the participation of all parties in the industry chain, conduct test and verification of semi-open areas and open roads, and ensure the reliability of communication between vehicle terminals, roadside units and cloud platforms. , compatibility and security, step by step end-to-end technical verification and interoperability testing. Demonstration applications such as automatic driving commuting, intelligent logistics distribution, and intelligent sanitation in airports, ports, BRT lanes, and industrial parks. Promote regional demonstration applications in Shanghai, Beijing-Hebei, Chongqing, Wuxi, Hangzhou, Wuhan, Changchun, Guangzhou and Changsha, and support the Beijing Winter Olympics and Xiong'an New District to develop vehicle networking applications. The construction of a national-level vehicle network pilot zone will continuously improve the level of intelligent transportation management and the experience of residents' travel services.

IV. CO-CONSTRUCTION AND COOPERATION TO PROMOTE THE INFRASTRUCTURE OF CAR NETWORKING INDUSTRY

a. Improve Communication Network Facilities

Promoting the transformation and upgrade of LTE networks to meet the large-scale application of the Internet of Vehicles, we improve the coverage level of LTE-V2X network on major highways and major cities, the data access specifications of roadside units, the integration access capability of roadside units and road infrastructure, intelligent management and control facilities, as well as promote LTE-V2X The combination of network upgrade and roadside unit deployment. It is established to 5G-V2X demonstration application network in key areas and key road sections to provide wireless communication services with ultra-low latency, ultra-high reliability and large bandwidth. The digital transformation and construction of road infrastructure and traffic sign signs will be promoted in phases and in sub-regions, and networks such as narrow-band Internet of Things (NB-IoT) will be deployed at key nodes such as bridges and tunnels.

b. Promote The Construction and Management of Big Data and Cloud platforms

Promoting the interconnection of various types of vehicle networking platforms, information exchange and data sharing between intelligent networked vehicles, road infrastructure, communication base stations, vehicle networking platforms and application services, and build a market-oriented mechanism for data usage and maintenance to ensure vehicle safety and effectiveness. We encourage the construction of comprehensive big data and cloud platforms across industries and departments to support the scale development and continuous innovation of vehicle networking applications.

c. Building An Intelligent Road Infrastructure

Promoting the deep integration of network communication technology, artificial intelligence technology and road traffic infrastructure, and provide necessary conditions for new technology applications such as car networking and automatic driving. Deploy edge computing capabilities for typical scenarios and hotspots, and build a low-latency, large-bandwidth, high-computation vehicle-based collaborative environment. Support the construction of facilities such as Beidou satellite navigation system and differential base station, improve the scale application level of high-precision space-time service for vehicles, and meet the high-precision positioning and navigation

requirements of vehicles. In some highways and some major urban roads, it supports the construction of an intelligent infrastructure environment that integrates the capabilities of perception, communication, and computing.

V. DEVELOP INTEGRATED APPLICATIONS TO PROMOTE MARKET PENETRATION

a. Expand the Scale of Car Networking Users

In order to encourage telecom operators to introduce incentives ,such as preferential tariffs and vigorously develop car network users,we support the automobile enterprise to install the online vehicle information service terminal in front, and improve the new vehicle driving rate of the driving assistance system. While that support the related operating vehicles such as buses, large trucks, taxis, and network vehicles to increase the networking rate.

b. Development of Integrated Information Services

Cultivating innovative applications such as smart travel, road rescue, and data services for passenger cars, improving integrated information services and remote monitoring systems for a variety of operating vehicles, and promoting areas for public security traffic management, commercial transport vehicle scheduling, and road transport supervision. As transportation services, development of new formats such as shared cars,and Innovative business model to promote the integration of the Internet of Vehicles industry with smart tourism and smart business.

c. Expand Electric Vehicle Networking Applications

In order to develop electric vehicle real-time online monitoring system and big data analysis capabilities to achieve charging early warning, optimize charging and discharging scheduling, and improve charging and switching efficiency. We need support the strengthening of monitoring of core components such as electric vehicle batteries, and encourage the use of decommissioned battery screening, grading and ladder utilization. While we must expand the networking application of electric vehicles, promote the interconnection and data interaction of electric vehicles, charging piles, charging service platforms, power battery traceability systems, online monitoring platforms, etc., realize the safety management of electric vehicles throughout the life cycle, and improve the safety level of electric vehicles.

d. Promote Traffic Safety and Energy Efficiency Technology Applications

In order to promote the "people-car-road-cloud" collaborative interaction based on technologies such as LTE-V2X and 5G-V2X, and actively develop traffic safety and energy effects. We promote the scale application of vehicle road interactive information services such as traffic incident warning, accident alarm, traffic control and control, and promote accident warning and coordination based on "car/car" communication. When the relevant technologies, products and commercial operation conditions are mature. The application of control technology enhances the ability of traffic safety and congestion to actively regulate, that Promote the application of vehicle communication technology in vehicles and road transportation infrastructure to improve traffic safety. While that will be Promoted to the application of driving strategies for different road conditions, and the formation of highway trucks to improve traffic efficiency.

e. Create A Car Life Cycle Service

In order to establish a network-based automotive design, manufacturing, and service integration system, and build an intelligent networked automotive data management system. The collection, analysis and application of vehicle operation data are realized through the Internet of Vehicles to form diversified application services and system management, which provides guarantee for the safe operation of vehicles. We promote vehicle-accurate marketing, customized maintenance services, personalized insurance packages, transparent maintenance services and differentiated car experiences to achieve scale-based application of personalized car services based on big data platforms,by using vehicle networking technology to improve vehicle recycling and recycling levels.

VI. COMBINING TECHNOLOGY TO PROMOTE THE IMPROVEMENT OF SECURITY SYSTEM

a. Sound Safety Management System

Focus on the operational safety, network security and data security of products and systems, clarify the relevant main responsibilities, and conduct safety supervision and inspection regularly. We need to improve the safety management of event notification, emergency response and responsibility identification for the Internet of Vehicles network and data security.

b.Focusing on breakthroughs in the development of core technologies for functional safety, network security and data security in the industry, supporting the development of security products such as security protection, vulnerability

mining, intrusion detection and situational awareness. Supervise and urge enterprises to strengthen network security protection and data security protection, and build a comprehensive factor security detection and evaluation system for intelligent networked vehicles, wireless communication networks, vehicle networking data and networks, and conduct security capability assessment.

c. Promote The Construction of Safety Technology

Enhancing the support ability of industrial safety technology, focusing on improving the level of hidden danger investigation, risk detection and emergency response, and building safety platforms such as monitoring and early warning, threat analysis, risk assessment, test verification and data security. We promote enterprises to increase safety investment, innovate safety service and consulting and other service models, and enhance the industry's security services capabilities.

VII. SAFETY MEASURES

a. Strengthen Organizational Leadership

Given full play to the role of the State Construction Powerhouse Construction Leading Group Vehicle Network Industry Development Special Committee, in order to strengthen overall planning, strengthen departmental cooperation, solve key problems, and create a favorable environment conducive to the development of the car networking industry. We need strengthen cooperation between the ministries and provinces, give play to the advantages of regional resources, jointly promote demonstration and application and industrialization, foster a number of leading enterprises, and build industrial clusters. While also strengthen industry tracking research, summary assessment and supervision and guidance to ensure that key tasks are promoted in an orderly manner.

b. Increase Policy Support

Given play to the guiding role of financial funds, encourage local governments to increase investment, in order to improve coordination mechanisms, and increase support for key technology research and development, demonstration applications and industrial applications,we must encourage local governments to support industrial development in a variety of ways, and explore the development of intelligent networked car time-sharing preferential policies. Strengthen production integration, guide credit supply, and attract various types of social capital such as venture capital to participate in the development of the Internet of Vehicles industry.

c. Building An Industrial Ecosystem

In order to accelerate the construction of the intelligent network of the automobile manufacturing innovation center, and build a joint collaborative innovation and results transformation platform for industry, academia and research. We actively play the role of overall coordination of industrial alliances, promote the effective integration of upstream and downstream of the industrial chain and related industries, and build technological innovation and industrial ecosystem.While that encourage new business models, actively cultivate innovative applications, build innovative and entrepreneurial service platforms, and promote the formation of new businesses, new markets and new ecosystems.

d. Optimize The Industrial Development Environment

Promoting the formulation of policies and regulations conducive to industrial innovation, timely revision of institutional regulations that restrict industrial development, and provide policy and institutional guarantees for large-scale testing demonstration and commercial application. We may accelerate the construction of the intelligent network connection vehicle test evaluation system, and establish and improve the intelligent network connection vehicle production access management system. Promote technical exchanges and industrial cooperation by using high-end platforms such as the World Intelligent Networked Automotive Conference. Adhere to the principle of inclusive and prudent, strengthen post-event supervision of products and applications, strengthen the protection and effective use of intellectual property rights, and improve the credit management mechanism.

e. Improve The Talent Training System

We attach great importance to the role of talent team building in industrial development, combining training and introduction, introducing high-end talents and young talents in a planned and multi-channel manner, cultivating high-level innovation and entrepreneurship teams, and accelerating the formation of a team of experts with international leading standards. Promote discipline construction and professional layout, promote the construction of interdisciplinary and professional industries that are conducive to industrial integration, and promote the construction of an interdisciplinary training system.

f. Promote International Exchanges and Cooperation Between Hong Kong, Macao and Taiwan

Using China, Europe, China, Russia, China, the United States, China, France, China,

Japan, China and South Korea, as well as relevant industrial dialogue mechanisms or activity platforms across the Taiwan Straits to strengthen pragmatic cooperation and exchanges, promote the interface with the world's advanced technology and industrial chain, and achieve a high starting point. And sustainable development. Actively participate in the formulation and coordination of relevant international standards, focusing on strengthening exchanges and cooperation in common technologies, test evaluation and frequency planning. Encourage leading global companies to set up production bases and R&D institutions in China, support domestic outstanding enterprises to actively explore overseas markets, and build an industrial structure of open development, cooperation and win-win.

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