



“National Comprehensive Three-dimensional Transportation Network Planning Outline”

Policy Briefing and English Translation

National Comprehensive Three-dimensional Transportation Network Planning Outline

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1. Summary of the *National Comprehensive Three-dimensional Transportation Network Planning Outline*

On 24 February 2021, the *National Comprehensive Three-dimensional Transportation Network Planning Outline* was issued by the *Central Committee of the Communist Party of China (CPC)* and the *State Council of the People's Republic of China*.

The outline is a **strategic top-level policy** guiding the development of a comprehensive and fully integrated transport system in China with a **planning period from 2021 to 2035, and a vision to the middle of this century**. The policy builds up on the [Outline for Building China's Strength in Transport](#), which was released on 19 September 2019¹ and is fully aligned with the goals of the *14th Five-Year Plan (2021-2025)* and the *Long Range Objectives Through 2035* and other relevant policies, roadmaps and targets (see *Figure 1*).

The outline lays the foundation of China's ambition to transform from a speed- and scale-centered and comparatively isolated development model within the transport sector towards an **integrated, innovative, smart and intelligent, quality- and efficiency-centered, world-class transport model** with deep integration of the transport, information and energy sectors, and covering land, water and air transport



Figure 1. Selection of China's key transport development and climate policies, roadmaps and targets

(Source: GIZ)

¹ The *Outline for Building China's Strength in Transport* was approved by the *Communist Party of China Central Committee*

(CPCCC) and the *State Council* and describes the future vision and roadmap of China's transport sector with a clear message: China wants to become a global transport superpower by 2050.

modes and the international transport and logistics system.

In terms of infrastructure, the outline aims to establish a **national comprehensive three-dimensional transport network** comprising of **6 Axes, 7 Corridors and 8 Channels**, which will connect **4 Poles, 8 Clusters and 9 Groups**² as the foundation of inter-provincial and regional integration - with international connectivity- (see below Figure 1 and Annex “Schematic layout of the main skeleton of the *National Comprehensive Three-Dimensional Transportation Network*”), and respective infrastructure construction and the development of related industries.



Figure 2. Schematic layout of the main skeleton of the national comprehensive three-dimensional transportation network (Source: *National Comprehensive Three-dimensional Transportation Network Planning Outline*)

According to the outline, the **average annual growth rate of passenger travel** in China (including car travel) is expected to be **about**

3.2% from 2021 to 2035, the **average annual growth rate of freight transport** is expected to be **about 2% from 2021 to 2035**, and the **average annual growth rate of postal express business** is **about 6.3%**.

In particular, the country’s **central and western regions have a large potential for growth in both passenger and freight transport**, which comes along with the **challenge of efficient utilization of resources and allocation of funds**, but also presents many **investment opportunities**.

By 2035, the total scale of the national comprehensive three-dimensional transportation network will be **about 700,000 kilometers** (excluding international land routes, air and sea routes and postal routes). Among them, there will be about 200,000 km of railways, 460,000 km of roads and 25,000 km of high-grade waterways. There will be 27 major coastal ports, 36 major inland river ports, about 400 civil transport airports, and about 80 postal express hubs.

Transport services will continue to transform towards user-oriented, innovative and upgrade-oriented development. *The "National 123 Travel Traffic Circle"*³ and the *"Global 123 Express Cargo Flow Circle"*⁴ will be established by 2035.

The **sustainable, green and low carbon development** of the transport sector in China is a priority objective in the context of the country’s **2030 carbon dioxide emission peaking** and **2060 carbon neutrality** goals⁵.

² Poles: Beijing-Tianjin-Hebei (Jing-jin-Ji), Yangtze River Delta, Guangdong-Hong Kong-Macau-Greater Bay Area and Chengdu-Chongqing economic circle; Clusters: Middle reaches of Yangtze River, Shandong Peninsula, West Coast of the Strait, Central Plains, Harbin-Changchun, Central-South Liaoning, Beibu Gulf and Guanzhong Plain; Groups: Hohhot- Baotou- Erdos - Yulin, Central Guizhou, Central Yunnan, Central Shanxi, Northern Slopes of

Tianshan, Lanzhou- Xining, the Yellow River area· in Ningxia, Lhasa and Kashgar

³ 1-hour commute for metropolitan areas, 2-hour commute between city clusters, and 3-hour commute between major cities

⁴ 1-day delivery in China, 2-day delivery in neighboring countries, and 3-day delivery in major cities worldwide

⁵ As announced by Chinese president Xi Jinping during the General Debate of the 75th session of the UN General Assembly on 22

According to the outline, China will accelerate the green and low-carbon development, reach the peak of carbon dioxide emissions in the transport sector as early as possible, reduce the intensity of pollutants and greenhouse gas emissions, focus on ecological environmental protection and mitigation, and promote the harmonious development of transport and nature. This shall be achieved by the accelerated promotion of renewable and clean energy, resource saving and energy efficiency in transport, the reduction of packaging and waste, the promotion of multimodal transport and the focus on green modes including rail and inland waterway freight transport, public transport, cycling and walking, and the general promotion of green travel behavior.

The outline further describes the integration of China's transport and logistics system and industry with the world including **infrastructure connectivity**, the strengthening of the **One Belt, One Road**⁶, the enhancement of the **internationalization of Chinese standards** and the development of **new governance mechanisms** for integrated transport.

Overall, the *National Comprehensive Three-dimensional Transportation Network Planning Outline* is a key cornerstone in achieving the *Chinese Dream* or *Great Rejuvenation of China*⁷. As a top-level policy, it serves the coordinated future development of China's

transport sector. The policy, aligned with the above-mentioned *Outline for Building China's Strength in Transport*, lays the foundation for the coming Five-Year Plans (e.g. Transport 14th Five-Year Plans) and other short-, medium-, and long-term policies and implementation plans, as well as the formulation of promotion and pilot programs and plans on national and sub-national level.

September 2020 & the 2020 Climate Ambition Summit held on 12 December 2020

⁶ Focus on "seven land-based international transport channels, including the New Asia-Europe Continental Bridge, China-Mongolia-Russia, China-Central Asia-West Asia, China-Indochina Peninsula, China-Pakistan, China-Nepal-India and Bangladesh-China-India-Myanmar", and "four maritime international transport corridors from the Pacific Ocean to America via Japan and South Korea, from Southeast Asia to Oceania, from Southeast Asia and South Asia to Europe and Africa via the Indian Ocean, and the Polar Silk Road across the Arctic Ocean".

⁷ According to the development concept of the Chinese government, China "stood up" in 1949, beginning with the reform towards a modern nation and solving the "problems of food and clothing", becomes "rich" until 2021 by achieving a "moderately well-off society" and will become "strong" by 2049 by achieving a "prosperous, democratic, civilized and harmonious modern socialist society".

2. Translation of the *National Comprehensive Three-dimensional Transportation Network Planning Outline* into English language

Below is the translation of the original policy *Outline of the National Comprehensive Three-dimensional Transportation Network Plan* into English language. The translation is provided by Sebastian Ibold and Xia Yun of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The table of contents and all footnotes have been added by GIZ in order to provide to the reader a better overview of the policy contents and a better understanding of relevant background information.

Link to the original policy:

<https://mp.weixin.qq.com/s/OX7uQ6KrrCkuNITonh9OWw?scene=1&clicktime=1614491908&enterid=1614491908&from=groupmessage&isappinstalled=0>

Translation:

The Central Committee of the Communist Party of China and The State Council issued the **National Comprehensive Three-dimensional Transportation Network Planning Outline**.

Beijing, Feb. 24 (Xinhua) - Recently, the Central Committee of the Communist Party of China (CPC) and the State Council issued the "**National Comprehensive Three-dimensional Transportation Network Planning Outline**" and issued a notice requiring all regions and departments to seriously implement it in conjunction with the actual situation.

The full text of the **National Comprehensive Three-dimensional Transportation Network Planning Outline** is as follows.

National Comprehensive Three-dimensional Transportation Network Planning Outline

This planning outline is developed to accelerate the construction of a strong transportation country, build a modern and high-quality national comprehensive three-dimensional transportation network, support the construction of a modern economic system and a modern socialist power. The planning period is from 2021 to 2035, with a vision to the middle of this century.

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I. Basis for Planning

(I) Current situation of development

Since the reform and opening up, especially the 18th Party Congress, under the strong leadership of the Party Central Committee with Comrade Xi Jinping at the core, China's transport development has made world-renowned achievements. The infrastructure network will be basically formed and the comprehensive transport system will be improved; the capacity and level of transport services will be greatly improved and the people's satisfaction will be significantly enhanced; great success will be made in scientific and technological innovation area and the technical level of facilities construction and transport equipment will be significantly improved; modernization of transport construction will be accelerated and the level of safe, intelligent and green development will be continuously improved; the opening of transport to the outside world will be continuously expanded and the pace of going out will be accelerated. The development of transport will be effectively promoted the territorial development and protection, the coordinated development of urban and rural areas, and the optimization of the layout of productive forces, giving full play to the fundamental, pioneering, strategic and service roles for economic and social development, and providing strong support for the successful completion of a moderately prosperous society.

At the same time, there are still some shortcomings in China's transport development, and the problem of imbalance and inadequacy is still prominent. The layout of a comprehensive transportation network still needs to be improved, the structure needs to be optimized, interconnection and network resilience still need to be enhanced; comprehensive transportation integration needs to be strengthened, the level of intensive use of resources needs to be

improved, the synergetic integration of transportation and related industries needs to be deepened, the support capacity of the whole industry chain still needs to be improved; the quality and efficiency of comprehensive transportation development and service are not on a high level, the modern logistics system needs to be improved, the ability of scientific and technological innovation, safety, and the level of green development needs to be further improved. The level of intelligent and green development has to be further improved; the task of reforming key areas of transportation is still arduous.

(II) Trends and needs

At present and in the future, China's development is still in a period of important with strategic opportunities, but there are new opportunities and challenges. The world today is undergoing a major change unprecedented in a century, a new round of scientific and technological and industrial revolution is developing intensively, the power of countries contrast is adjusting profoundly, peace and development are still the theme of the era, and the concept of A community with a shared future for mankind is gaining popularity. At the same time, the international environment is becoming increasingly complex, with instability and uncertainty increasing significantly, the impact of the epidemic is widespread and far-reaching, economic globalization has encountered a counter-current, and the world has entered a period of turbulent change. China has shifted to a stage of high-quality development, with significant institutional advantages, a long-term economic upturn, vast market space, increased development resilience and social stability, and the start of a new journey to build a modern socialist country, but the problem of unbalanced and insufficient development remains prominent.

The new domestic and international situation has put forward new and higher requirements for speeding up the construction of a strong transportation nation and building a modern and high-quality national comprehensive three-dimensional transportation network, which must give more prominence to the core position of innovation and focus on transportation innovation-driven and intelligent development; give more prominence to coordination and focus on the integrated development of various modes of transport and coordinated development of urban and rural regional transportation; give more prominence to green development and focus on territorial space development and ecological and environmental protection; give more prominence to opening-up to the world, focusing on external connectivity and openness, safety and stability of the international supply chain; give more prominence to shared development, focusing on building transport sector for people's satisfaction and to meet the growing needs of the people for a better life. Efforts should be made to promote higher quality, more efficient, fairer, more sustainable and safer development of transport, so as to play an important role in expanding the scale, improving the efficiency, enhancing the dynamics, reducing the cost and ensuring the safety of the domestic economic cycle, and providing strong support for the comprehensive construction of a modern socialist country.

(III) Demand for transportation

The demand for passenger travel is growing steadily, and the demand for high quality and diversification and personalised needs is increasing. The average annual growth rate of passenger travel (including car travel) is expected to be about 3.2% from 2021 to 2035.

⁸ Describes economic, political, cultural, social, and ecological progress

⁹ Strategy to comprehensively deepen reform, comprehensively advance rule of law, and comprehensively strictly govern the

The proportion of high-speed rail, civil aviation and car trips will continue to rise, and demand for international passenger travel and passenger travel in urban clusters will become more robust. The eastern region will remain the most concentrated region for travel demand in China, while the growth rate of travel demand in the central and western regions will accelerate.

Demand for freight transportation is rising steadily, with demand for high-value, small-volume and time-sensitive goods climbing rapidly. The average annual growth rate of freight transport for the whole society is expected to be about 2% from 2021 to 2035, and the average annual growth rate of postal express business is about 6.3%. Foreign trade freight transportation maintains a long-term growth trend, and the bulk cargo volume will remain high for some time to come. Freight demand in the eastern region still maintains a large scale, and the growth rate in the central and western regions will be faster than that in the eastern region.

II. General Requirements

(I) Guiding Ideology

Guided by Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era, thoroughly implementing the spirit of the 19th CPC National Congress and the 2nd, 3rd, 4th and 5th Plenary Sessions of the 19th CPC Central Committee, promoting the general layout of "Five in One"⁸ and coordinating the strategic layout of "Four-pronged Comprehensive Strategy"⁹, adhering to the general keynote of driving progress while maintaining stability. Implementation of the new development

Party so as to provide strong impetus and guarantee for comprehensively building a moderately prosperous society

concept and construction of a new development pattern will be based on the new development stage. The main line is to deepen the structural reform on the supply side, the fundamental driving force is reform and innovation, and the fundamental objective is to meet the growing needs of the people for a better life, to coordinate development and security, to give full play to both central and local initiatives, and to pay more attention to quality and efficiency, integration and innovation. The aim is to create first-class facilities, technology, management and services, build a modern and high-quality national comprehensive three-dimensional transportation network that is convenient and smooth, economical and efficient, green and intensive, intelligent and advanced, safe and reliable, accelerate the construction of a strong transportation country, and serve as a pioneer for the comprehensive construction of a modern socialist country.

(II) Working Principles

--Serve the overall situation and serve the people. Based on the overall situation of building a modern socialist country, insist on moderate advancement, promote the coordinated development of transportation and national spatial development and protection, industrial development and new-type urbanization, promote the strategy of civil-military integration, and effectively support major national strategies. Based on the strategic base of expanding domestic demand, we will increase investment potential and effectively promote the virtuous cycle of the national economy. Adhere to the people as the centre, build transport sector for people's satisfaction and to meet the growing needs of the people for a better life.

-- Reform and opening-up based on national conditions. Accurately grasp the requirements of the new development stage, climate character and resource endowment, strengthen the economical and leverage resources, and explore

the development mode and path of modernization of transportation with Chinese characteristics. We will give full play to the decisive role of the market in resource allocation, the government will play a better role. Deepen the reform of the transport system, break down the institutional mechanisms that restrict high-quality development, and build a unified, open, competitive and orderly transport market. We will serve the "One Belt, One Road" construction, strengthen international connectivity, deepen opening up and cooperation in transport area, and improve the security, accessibility and reliability of global transport networks and logistics supply chain systems.

--Optimising structure and integration. Adhere to the concept of systematic development, strengthen forward-looking thinking, global planning, strategic layout and overall promotion. Strengthen planning and coordination, optimise network layout, innovate transport organisation, adjust transport structure, and achieve a higher level of dynamic balance between supply and demand. Promote integrated development, strengthen the integration and intensive use of transport resources, and promote the in-depth integration of transport and related industries. Strengthen connectivity, enhance the level of networking of facilities and integration of transport services, and improve the overall efficiency of integrated transport.

--Innovation and Intelligence, safety and green. Adhere to the core position of innovation, focus on technology empowerment, promote transport efficiency, expand functions and increase dynamic energy. Promote the digitalisation and networking of transport infrastructure and enhance the level of intelligent development of transport. Integrate development and safety, and strengthen transport safety and emergency security capacity. Accelerate green and low-carbon development, reach the peak of carbon dioxide emissions in the transport sector as early as possible, reduce the intensity of pollutants and greenhouse gas emissions, focus on ecological environmental protection and restoration, and

promote the harmonious development of transport and nature.

(III) Development Goals

By 2035, a modern, high-quality national comprehensive three-dimensional transportation network will be basically built that is convenient and unobstructed, economical and efficient, green and intensive, intelligent and advanced, safe and reliable, realizing international and domestic interconnection, three-dimensional access to major cities nationwide, and effective coverage of county-level nodes, and providing strong support for the "National 123 Travel Traffic Circle" (1-hour commute for metropolitan areas, 2-hour commute for city clusters) and the "Global 123 Express Cargo and Logistics Circle" (1-day delivery in China, 2-day delivery in neighboring countries, and 3-day delivery in major cities worldwide). The quality, and intelligent and green development of transport infrastructure will among the highest in the world. Transport sector is fully adapted to the growing needs of the people for a better life, strongly safeguarding national security and supporting the basic realization of socialist modernization in China.

Column 1 Developing Goals 2035

Convenient and unobstructed. The coverage of population served by high speed transport services will be significantly increased, and except for some remote areas, the country will basically achieve 15 minutes' access to national highways, 30 minutes' access to motorways and 60 minutes' access to railways for county-level administrative centres, and 45 minutes' access to high-speed railways and 60 minutes' access to airports for municipal and prefecture-level administrative centres. The one-day access between prefecture-level cities will basically be achieved. City centres can be reached in half an

hour from the comprehensive passenger transport hub. Public transport transfer time between integrated passenger transport hubs in the city centre will not exceed one hour. The accessibility of transport infrastructure is significantly increased, the convenience of the whole chain of passenger travel is significantly improved, and the "123 travel traffic circle" in China is basically realized.

Economical and efficient. The national comprehensive three-dimensional transport network facilities are more efficiently, the proportion of multimodal transport and the efficiency of transshipment are significantly improved, the transport structure is more optimized, logistics costs are further reduced, transport hubs are basically equipped with posting functions and realize seamless connection with post hubs, and the "global 123 express cargo and logistics circle" is basically realized.

Green and Intensive. The level of intensification and integration of the use of resources in the comprehensive transport corridor will be increased significantly. Basically, the construction of transport infrastructure realizes a green process. Energy consumption per unit of transport turnover is continuously reduced, carbon dioxide emission intensity is significantly lower than in 2020, and traffic pollution prevention and control reach the world advanced level.

Intelligent and advanced. The national comprehensive three-dimensional transportation network infrastructure realizes digitalization of the whole element and the whole cycle. The construction of the ubiquitous advanced transportation information infrastructure is basically completed, the realization of Beidou space-time information services, transportation perception full coverage. The technology of intelligent trains, Internet Connected Vehicles (Internet Connected Vehicles, autonomous driving, vehicle-road coordination), intelligent general aviation vehicles, intelligent

ships and postal express facilities will reach a world advanced level.

Safe and reliable. The durability and effectiveness of transport facilities will be significantly enhanced, and the safety and prevention capabilities of transport facilities are significantly improved. The resilience of the transport network and the ability to cope with various major risks will be significantly improved, and the transport of important materials is efficient and reliable. A three-dimensional and coordinated transport safety monitoring and rescue system by road, waterway, and air transportation is basically in place. The level of transport safety will reach a world-leading level, effectively safeguarding people's property and the security of the country.

By the middle of the century, a modern and high-quality national integrated three-dimensional transport network will be fully established, with a world-class transport infrastructure system, an effective balance between transport supply and demand, quality and equal service, and security. New technologies will be widely applied to achieve digitalization, connectivity, indigenization and green development. Travel will be safe, convenient and comfortable, logistics will be efficient and economical and reliable, so that people can enjoy their travels and goods will be transported efficiently, so that we can build a strong transportation nation and be the first to build a powerful socialist modern country.

Table 1 Major Indicators by 2035

	<i>Indicators</i>	<i>Target value</i>
<i>Convenient and unobstructed</i>	<i>Proportion of population served by rapid transit within 1 hour</i>	<i>Over 80%</i>
	<i>Half-hour accessibility from city centre to integrated passenger transport hub</i>	<i>Over 90%</i>
<i>Economical and efficient</i>	<i>Rate 1-hour completion of multimodal transport changes</i>	<i>Over 90%</i>
	<i>Utilization rate of the national comprehensive three-dimensional transportation network's backbone</i>	<i>60%-85%</i>
<i>Green and Intensive</i>	<i>Increase in the rate of comprehensive utilization of multi-modal land space for new transport infrastructure in major corridors</i>	<i>80%</i>
	<i>Proportion of green construction of transport infrastructure</i>	<i>95%</i>
<i>Intelligent and advanced</i>	<i>Digitalization rate of transport infrastructure</i>	<i>90%</i>
<i>Safe and reliable</i>	<i>Ratio of multi-path connectivity in key regions Over 95%</i>	<i>95%</i>
	<i>Integration rate of safety facilities in national comprehensive three-dimensional transportation network</i>	<i>95%</i>

III. Optimizing the national comprehensive three-dimensional transportation layout

(I) Building a comprehensive national three-dimensional transportation network

The national comprehensive three-dimensional transportation network connects all administrative regions at the county level and above, border crossings, national defense facilities, major scenic spots, etc. With integration as the guide, efforts will be made to make up for shortcomings, emphasize connections, optimize the network and improve efficiency, with more emphasis on optimizing the use of stock resources and improving the quality of incremental supply. We will improve the infrastructure networks of railways, roads, water transport, civil aviation and postal express services, and build a national comprehensive three-dimensional transportation network with railways as the backbone, roads as the basis, and water transport and civil aviation giving full play to their comparative advantages.

By 2035, the total scale of the national comprehensive three-dimensional transportation network will be about 700,000 kilometers (excluding international land routes, air and sea routes and postal routes). Among them, about 200,000 km of railways, 460,000 km of roads and 25,000 km of high-grade waterways. There are 27 major coastal ports, 36 major inland river ports, about 400 civil transport airports, and about 80 postal express hubs.

Column 2 National Comprehensive Three-dimensional Transportation Network Layout

Railways. The national railway network includes high-speed railways and general speed railways. Among them, 70,000 kilometres of high-speed

railways (including some achievement railways) and 130,000 kilometres of general-speed railways (including some municipal railways), totaling about 200,000 kilometres. A high-speed railway network consisting of eight longitudinal and eight transverse high-speed railways as the backbone and regional high-speed railways as the articulation; a general-speed railway network consisting of several longitudinal and transverse general-speed railways as the backbone and regional general-speed railways as the articulation; intercity railway networks to be built first in key city clusters such as Beijing-Tianjin-Hebei, Yangtze River Delta, Guangdong-Hong Kong-Macao Greater Bay Area and Chengdu-Chongqing Region Twin Cities Economic Circle, with other city clusters gradually becoming intercity railway networks. Study and promote the layout of high-speed magnetic levitation channels between mega cities and the construction of pilot lines.

Highways. Including the national highway network and the ordinary national highway network, totaling about 460,000 km, of which, the national highway network is about 160,000 km, consisting of 7 capital city radial lines, 11 vertical lines, 18 horizontal lines and several regional ring roads, metropolitan area ring roads, city roundabouts, liaison lines and parallel lines; the ordinary national highway network is about 300,000 km, consisting of 12 capital city radial lines, 47 general lines and 60 horizontal lines and several liaison lines.

Waterways. This includes the national waterway network and the country's main ports. The national waterway network consists of national high-grade waterways and international counterpart river waterways at national borders. Among them, there are 25,000 kilometres of national high-grade waterways in the "four vertical and four horizontal networks"; the international navigable rivers at the national border mainly include the Heilongjiang River, the Erguna River, the Yalu River, the Tumen River, the Ruili River, the Lancang River and the Red River. There are 63 major ports in China, including 27

major coastal ports and 36 major inland river ports.

Civil aviation. This includes the national civil transport airports and the national airway network. The total number of national civil transport airports is about 400, and a national integrated airport system with a world-class airport cluster and international aviation (cargo hub) as the core, regional hubs as the backbone, and non-hub airports and general aviation airports as important supplements will basically be built. In accordance with the requirements of highlighting hubs, radiating the region, layering and connecting, three-dimensional layout, advanced navigation technology as the main focus and traditional navigation technology as a supplement, accelerating the construction of terminal control areas in busy areas, accelerating the construction of a clear structure and smoothly connected international air route network, building a high-altitude air route network based on advanced operation methods such as large-capacity corridors, parallel routes and one-way circulation; building a network based on performance-based navigation as the main focus and traditional navigation technology as a supplement. The construction of a route network of medium and low altitude routes based on performance-based navigation, supplemented by traditional navigation, to meet the needs of various aviation users.

Postal Express. Including national postal express hubs and postal routes. National postal express hubs mainly consist of five global international postal express hub clusters such as Beijing Tianjin Xiongan, Shanghai Nanjing Hangzhou, Wuhan (Ezhou) Zhengzhou Changsha, Guangzhou Shenzhen, Chengdu Chongqing Xi'an, about 20 regional international postal express hubs, and about 45 national postal express hubs. Relying on the national comprehensive three-dimensional transportation network, the layout of air mail routes, railway mail routes, highway mail routes and waterway mail routes.

(II) Accelerating the construction of the main skeleton of a highly efficient national comprehensive three-dimensional transportation network

The main skeleton of the national comprehensive three-dimensional transportation network consists of the most important lines in the national comprehensive three-dimensional transportation network, which are the main arteries of inter-regional, inter-city, inter-provincial and international transportation in China, and is the main axis supporting the spatial development and protection of the national territory, as well as the backbone network with the highest efficiency of resource allocation and the largest volume of transportation for all modes of transportation.

Based on the national regional development strategy and the pattern of territorial spatial development and protection and taking into account the characteristics of future transport development and spatial distribution, the key regions are divided into three categories according to the volume level of transport demand. The four regions of Beijing-Tianjin-Hebei¹⁰, Yangtze River Delta, Guangdong-Hong Kong-Macau-Greater Bay Area and Chengdu-Chongqing economic circle as poles, the eight regions of the middle reaches of Yangtze River, Shandong Peninsula, West Coast of the Strait, Central Plains, Harbin-Changchun, Central-South Liaoning, Beibu Gulf and Guanzhong Plain as clusters, and the nine regions of Hohhot-Baotou- Erdos - Yulin, Central Guizhou, Central Yunnan, Central Shanxi, Northern Slopes of Tianshan, Lanzhou- Xining, the Yellow River area in Ningxia, Lhasa and Kashgar as groups. In accordance with the linkage between poles, clusters and groups, the main skeleton of the national comprehensive three-dimensional transport network consisting of main axes, corridors and channels will be created. The main

¹⁰ Jing-Jin-Ji

skeleton of the national comprehensive three-dimensional transportation network is about 290,000 kilometers, including 56,000 kilometers of national high-speed railways, 71,000 kilometers of conventional railways; 61,000 kilometers of national highways, 72,000 kilometers of other national trunk roads; 25,000 kilometers of national high-grade navigation channels.

Accelerate the construction of 6 main axes. Strengthen the connection between the 4 poles of Beijing-Tianjin-Hebei, the Yangtze River Delta, the Guangdong-Hong Kong-Macao Greater Bay Area and Chengdu-Chongqing economic circle, and build comprehensive, multi-channel, three-dimensional, high-capacity and high speed transportation axes. Expanding the influence and transportation resource allocation capacity of the 4 poles, building a key platform for the coordinated development of China's comprehensive three-dimensional transportation and the convergence and transformation of domestic and international transportation, and giving full play to the important role of promoting north-south interaction and east-west integration of the regional development.

Accelerate the construction of 7 corridors. Strengthen the role of the 4 poles of Beijing-Tianjin-Hebei, Yangtze River Delta, Guangdong-Hong Kong-Macao-Greater Bay Area and Chengdu-Chongqing economic circle to expand the influence strengthen the links between the poles and clusters and groups, build multi-modal, multi-channel and convenient transportation corridors such as Beijing-Harbin, Beijing-Tibet, Continental Bridge, Western Land and Sea, Shanghai-Kunming, Chengdu-Chongqing-Kunming and Guangzhou-Kunming, etc., and optimize and improve the main structure with multi-centre and connectivity.

Accelerate the construction of 8 channels. Strengthen the articulation and coordination between the main axes and the corridors, enhance the connection between clusters and groups, strengthen the connection of resource-

and industry concentrated areas and important ports, build transport channels such as Suifen River- Manzhouli, Beijing- Huichun (Jing-Yan), border regions, Fuzhou-Yinchuan, Erlianhot-Zhanjiang, Sichuan-Tibet, Hunan-Guangxi and Xiamen- Chengdu, promote internal and external connectivity to border regions and coastal regions, and expand the coverage of the transport network in the central and western and northeastern regions.

Column 3: Layout of the backbone of the national comprehensive three-dimensional transport network

6 main axes

Beijing-Tianjin-Hebei-Yangtze River Delta axe.
Route 1: Beijing to Hangzhou via Tianjin, Cangzhou and Qingdao. Route 2: Beijing to Shanghai via Tianjin, Cangzhou, Jinan and Bengbu. Route 3: Beijing to Shanghai via Tianjin, Weifang and Huai'an. Route 4: Coastal sea route from Tianjin Port to Shanghai Port.

Beijing-Tianjin-Hebei-Guangdong-Hong Kong-Macao axe.
Route 1: Beijing to Hong Kong (Macao) via Xiongan, Hengshui, Fuyang, Jiujiang and Ganzhou. Spur: Fuyang to Taipei via Huangshan and Fuzhou. Route 2: Beijing to Shenzhen via Shijiazhuang, Zhengzhou, Wuhan, Changsha and Guangzhou.

Beijing-Tianjin-Hebei-Chengdu-Chongqing axe.
Route 1: Beijing to Chengdu via Shijiazhuang, Taiyuan and Xi'an. Route 2: Beijing to Chongqing via Taiyuan, Yan'an and Xi'an.

Yangtze River Delta - Guangdong, Hong Kong and Macao axe.
Route 1: Shanghai to Shenzhen via Ningbo and Fuzhou. Route 2: Shanghai to Guangzhou via Hangzhou and Nanping. Route 3: Shanghai Port to Zhanjiang Port coastal sea route.

Yangtze River Delta-Chengdu-Chongqing Main axes.
Route 1: Shanghai to Chongqing via Nanjing, Hefei, Wuhan and Wanzhou. Route 2:

Shanghai to Chengdu via Jiujiang, Wuhan and Chongqing.

Guangdong, Hong Kong, Macau - Chengdu-Chongqing axe. Route 1: Guangzhou to Chengdu via Guilin and Guiyang. Route 2: Guangzhou to Chongqing via Yongzhou and Huaihua.

7 corridors

Beijing-Harbin corridor. Route 1: Beijing to Harbin via Shenyang and Changchun. Route 2: Beijing to Harbin via Chengde, Shenyang and Changchun. Spur 1: Shenyang to Qingdao via Dalian. Spur 2: Shenyang to Dandong.

Beijing-Tibet corridor. Route 1: Beijing to Yadong via Hohhot, Baotou, Yinchuan, Lanzhou, Golmud and Lhasa. Spur: Qinhuangdao to Ordos via Datong. Route 2: Qingdao Economic South, Shijiazhuang, Taiyuan, Yinchuan, Xining to Lhasa. Spur: Huanghua to Baotou via Xinzhou.

Continental Bridge corridor. Route 1: Lianyungang to Horgos/Alaska Pass via Zhengzhou, Xi'an, Xining, Urumqi. Route 2: Shanghai to Xi'an via Nanjing, Hefei and Nanyang. Spur: Nanjing to Luoyang via Pingdingshan.

Western Land and Sea corridor. Route 1: Xining to Sanya via Lanzhou, Chengdu/Chongqing, Guiyang, Nanning, Zhanjiang. Route 2: Ganchimadu to Nanning via Yinchuan, Baoji, Chongqing, Bijie and Baise.

Shanghai-Kunming corridor. Route 1: Shanghai to Ruili via Hangzhou, Shangrao, Nanchang, Changsha, Huaihua, Guiyang, Kunming. Route 2: Shanghai to Kunming via Hangzhou, Jingdezhen, Nanchang, Changsha, Jishou and Zunyi.

Chengdu-Chongqing-Kunming corridor. Route 1: Chengdu to Maban/Hekou via Panzhihua and Kunming. Route 2: Chongqing to Kunming via Shaotong.

Guangzhou-Kunming corridor. Route 1: Shenzhen to Ruili via Guangzhou, Wuzhou, Nanning, Xinyi and Kunming. Route 2: Shenzhen to Kunming via Zhanjiang, Nanning, Wenshan.

8 channels

Suifeng River-Manzhouli channel. Suifenhe to Manzhouli via Harbin. Spur 1: Harbin to Tongjiang. Spur 2: Harbin to Heihe.

Jing-Yan channel. Beijing to Hunchun via Chengde, Tongliao and Changchun.

Border channel. Heihe to Lhasa via Qiqihar, Ulanhot, Hohhot, Linhe, Hami, Urumqi, Kulle, Kashgar and Ali. Spur 1: Kashgar to Hongqilafu. Spur 2: Kashgar to Turgaat.

Fu-Yin channel. Fuzhou to Yinchuan via Nanchang, Wuhan and Xi'an. Spur: Xi'an to Baotou via Yan'an.

Er-Zhan channel. Erlianhaote to Zhanjiang via Datong, Taiyuan, Luoyang, Nanyang, Yichang, Huaihua and Guilin.

Sichuan-Tibet channel. Chengdu to Zhangmu via Linzhi.

Xiang-Gui channel. Changsha to Pingxiang via Guilin and Nanning.

Xia-Rong channel. Xiamen to Chengdu via Ganzhou, Changsha, Qianjiang and Chongqing.

(III) Building a multi-level integrated national integrated transport hub system

Building a national integrated transport hub system with integrated transport hub clusters, hub cities and hub ports and stations. To build four international integrated transport hub clusters in Beijing-Tianjin-Hebei, the Yangtze River Delta, the Guangdong-Hong Kong-Macao Greater Bay Area and Chengdu-Chongqing economic circle. Accelerate the construction of about 20 international comprehensive transportation hub cities and about 80 national comprehensive transportation hub cities. Promote the construction of a number of international hub ports and national hub ports.

Column 4 International Integrated Transport Hub

1 International integrated transport hub clusters

Beijing-Tianjin-Hebei hub cluster with Beijing and Tianjin as the centre linking Shijiazhuang, Xiong'an and other cities, Yangtze River Delta hub cluster with Shanghai, Hangzhou and Nanjing as the centre linking Hefei, Ningbo and other cities, Guangdong-Hong Kong-Macao Greater Bay Area hub cluster with Guangzhou, Shenzhen and Hong Kong as the centre linking Zhuhai, Macau and other cities, and Chengdu-Chongqing twin-city economic circle hub cluster with Chengdu and Chongqing as the centre.

2 International integrated transport hub cities

To build about 20 international integrated transport hub cities, including Beijing, Tianjin, Shanghai, Nanjing, Hangzhou, Guangzhou, Shenzhen, Chengdu, Chongqing, Shenyang, Dalian, Harbin, Qingdao, Xiamen, Zhengzhou, Wuhan, Haikou, Kunming, Xi'an and Urumqi.

3 international integrated transport hub stations

-International railway hubs: railway hubs with strong international transport services capacities will be built in cities such as Beijing, Shanghai, Guangzhou, Chongqing, Chengdu, Xi'an, Zhengzhou, Wuhan, Changsha, Urumqi, Yiwu, Suzhou and Harbin, as well as ports such as Manzhouli, Suifenhe, Erlianhot, Alashankou and Horgos.

-International hub seaports: to give full play to the role of international hub seaports such as Shanghai Port, Dalian Port, Tianjin Port, Qingdao Port, Lianyungang Port, Ningbo Zhoushan Port, Xiamen Port, Shenzhen Port, Guangzhou Port, Beibu Gulf Port and Yangpu Port, consolidate and enhance the status of Shanghai as an international shipping centre, accelerate the construction of shipping hubs that radiate the world, and promote the construction of international shipping centres such as Tianjin North, Xiamen Southeast and Dalian Northeast Asia.

-International aviation (cargo) hubs: consolidate the role of international aviation hubs such as Beijing, Shanghai, Guangzhou, Chengdu, Kunming, Shenzhen, Chongqing, Xi'an, Urumqi and Harbin, and promote the construction of international air cargo hubs such as Zhengzhou, Tianjin, Hefei and Ezhou.

-International postal express processing centre: in international postal express hub cities and port cities, relying on international aviation hubs, international railway hubs, international hub seaports, highway ports etc., about 40 international postal express processing centres will be built.

(IV) Optimizing the transportation network towards the global transport

Focusing on the opening-up pattern of linking land and sea inside and outside the country, and providing mutual assistance in both directions, efforts will be made to form a transportation network with complete functions, three-dimensional interconnection, and integration of road-, waterway- and air transport. We will develop diversified international transport channels, focusing on seven land-based international transport channels, including the New Asia-Europe Continental Bridge, China-Mongolia-Russia, China-Central Asia-West Asia, China- China-Indochina Peninsula , China-Pakistan, China-Nepal-India and Bangladesh-China-India-Myanmar. Taking China-Europe block trains as focus, develop the international block trains, and promote the facilitation of international road transport. Strengthen the influence of international shipping centres, improve four maritime international transport corridors from the Pacific Ocean to America via Japan and South Korea, from Southeast Asia to Oceania, from Southeast Asia and South Asia to Europe and Africa via the Indian Ocean, and the Polar Silk Road across the Arctic Ocean, ensure the international transport of national priority

goods and resources such as crude oil, iron ore, grain and liquefied natural gas, expand the international maritime logistics network, and accelerate the development of the cruise ship economy. Relying on international aviation hubs, we will build an air passenger and cargo transport network that is well connected and covers the whole world. We will also build an international trunk mail route network that covers all continents, connects the world, is mutually beneficial, and is coordinated and efficient.

IV. Promoting the integrated development of comprehensive transportation

(I) Promoting the integrated development of various modes of transport

Coordinate the planning and construction of comprehensive transportation corridors. Strengthen the role of territorial spatial planning in guiding and constraining infrastructure planning and construction and strengthen the convergence and coordination with related planning. We will make economical and intensive use of route resources of transport channels, shoreline resources, land resources, airspace resources and water resources, promote the development of transport channels from individual development to integrated development and from two-dimensional development to three-dimensional development, reduce the division of space and improve the efficiency of the use of territorial space. The planning and construction of multiple modes of transport and the exploration and

application of new modes of transport will be considered in an integrated manner, so as to achieve coordination and deep integration of road-, water- and air transport modes. We will make good use of the existing transport channels, strengthen proofing for the working concept for transport channel infrastructure across rivers, across the sea and through environmentally sensitive areas, and promote the coordination of linear infrastructure such as railways and highways and the spatial integration of cross-sections. Strengthen the integration of integrated transport corridors with communications, energy, water conservancy and other infrastructure, and improve the efficiency of the use of corridor resources.

Promote the integrated planning and construction of integrated transport hubs. Promote the unified planning, design, construction and coordinated management of integrated transport hubs and postal and express hubs. Promote the centralized layout of various modes of transport in new integrated passenger transport hubs to achieve space and land sharing, three-dimensional or same-platform transition, and create an 24-hours, integrated transition environment. Promote the integration of transport facilities and shared space with service function in existing integrated passenger transport hubs. Accelerate the construction of multimodal transport facilities and distribution systems in integrated freight hubs, coordinate the functions of hubs for transshipment, ports, bonded zone and postal express, and enhance the efficiency of multimodal transport and integrated logistics services. In accordance with the principles of station-city integration¹¹, city-industry integration and openness and sharing, the space will be reserved for the development of the hubs, the purpose of the land use will be controlled and the timing of land development will be coordinated.

¹¹ Integrated station-city development is a model that integrates the development of a transport hub station and the surrounding urban neighborhood.

Column 5: Requirements for integrated planning and construction of integrated transport hubs

1 Integrated Passenger Hubs

Integrated passenger transport hubs should have convenient transfer between various modes of transport, complete public interchange facilities, and safety buffers should be considered for hubs with high passenger flows. To strengthen the connection between the planning of trunk railways, intercity railways, urban (suburban) railways, urban railways and airport layout planning, and to achieve the basic connection of more than 2 transport tracks in international aviation hubs. National integrated railway passenger transport hubs should basically realise the connection of more than 2 suburban railways or urban railways. International and national comprehensive transportation hubs within the city rail transport planning and construction priority to connect through the city's comprehensive passenger hub, different comprehensive passenger hubs to build the number of interchanges not more than 2 times. Railway hubs and urban rail transit stations should be designed, built and operated simultaneously.

2 Integrated freight hubs

Integrated freight transport hubs are smoothly connected to the national comprehensive three-dimensional transport network. For 10 million TEU port, integrated freight corridor and inland port system will be built. In port areas with scaling container and dry transport in major coastal and inland river ports national widely construction of railways to go straight through the port areas will be actively promoted, and railway connection will be built in new port areas for dry bulk cargo in important ports, and the coordinated management of ports and railways will be promoted. Security and efficiency of air express cargo will be enhanced, international air cargo hubs will have coordinated large-scope planning of the distribution system, express cargo corridors will be built.

Promote the effective internal and external urban transport connection. Promote the integration and construction of trunk railways, intercity railways and suburban railways, and build a network" covering operation, management and services of the railways and urban rails, so as to achieve interconnection of facilities, interoperability of ticket systems, mutual recognition of security checks, information sharing and compatibility of payments. Strengthen the efficient connection between roads in the peripheral areas of the city and urban roads, systematically optimise the arrival and departure road network for cities , promote the coordination in planning and construction and management, and reduce fragmentation and interference to the city's urban planning. Improve the urban logistics and distribution system and strengthen the integration of intercity trunk transport and last mile distribution. Strengthen the organic integration of railway and road passenger hubs and airports with urban public transport network systems and guide the rational and orderly development of cities along high-capacity public transport corridors.

(II) Promoting the integration of transport infrastructure networks with transport service networks, information networks and energy networks

Promote the integration and development of transport infrastructure networks and transport service networks. Promote the integration of infrastructure, equipment, standards, information and management, upgrade the service of intelligent dynamic operation management of the transportation network, create a convenient transportation service network oriented to a high speed whole chain, build a multimodal transportation network with the integration and coordination of air-,

waterway-, road-, and underground transport, improve the supply chain service system.

Promote the integration and development of transport infrastructure networks and information networks. Strengthen the integrated layout and coordinated construction of transport infrastructure and information infrastructure, promote the deployment and application of telematics, strengthen the coordination with the construction of New Infrastructure¹², and enhance the cross-industry coordination of standards related to means of transport, communications, intelligent transportation and transport management.

Promote the integration and development of transport infrastructure network and energy network. Promote the integrated layout planning and construction of transport infrastructure and energy facilities, fully consider the transportation modes for coal, oil and gas, electricity and other energies, strengthen the common construction and sharing of transport and energy infrastructure, improve the efficiency of facility utilization, and reduce the consumption of energy resources. Promote the integration of transport infrastructure networks with smart grids and adapt to the requirements of new energy development.

(III) Promoting coordinated development of regional transport

Promote the integrated development of transport in key regions. Build a "Beijing-Tianjin-Hebei region on rails"¹³, accelerate the integration of in the Beijing-Tianjin-Hebei region, build a world-class transport system, and construct a comprehensive transport system in

¹² The New Infrastructure mainly includes the construction of 5G base stations, ultra-high voltage facilities, intercity high-speed railways and urban rail transport, charging infrastructure for electro vehicles, big data centres, artificial intelligence and

Xiongan New Area with high standards and quality. We will also build the "Yangtze River Delta on rails" and a shipping hub that influences globally, create a pilot area for high-quality transport development, and enhance our overall competitiveness and influence. The Guangdong-Hong Kong-Macao Greater Bay Area will achieve a high level of interconnection, build the Golden Waterway of the Xijiang River¹⁴, consolidate and enhance the international competitiveness and impact of port clusters and airport clusters, and build a transportation hub cluster with global influence. The Chengdu-Chongqing economic circle is oriented towards enhancing external connectivity, strengthening the gateway hub function and building an integrated comprehensive transport system. Build a modern comprehensive three-dimensional transport corridor along the Yangtze River Economic Belt with smooth east-west access, north-south influencing, effective coverage and three-dimensional interconnection. Support the construction of a free trade port in Hainan, promote the construction of an international shipping hub and an aviation hub in the new western land- sea corridor, and accelerate the construction of a modern integrated transport system. Coordinate the ecological protection of the Yellow River Basin with the high-quality development of transport, and optimize the spatial layout of transport infrastructure.

Promote the coordinated development of transport in the eastern, central, western and northeastern regions. Accelerate the optimization and upgrading the transport network of the eastern region, improve the transportation capacity of densely populated and economically dense areas, and strengthen the function of international transport services for opening up to the outside world. Promote the construction of large corridors and hubs in the central region, and better play the function

industrial internet and is an infrastructure system involving many industrial chains

¹³ Promote mode shift from road to rail transport and construction of rail network.

¹⁴ Waterway from Nanning to Guangzhou

of bearing the east and enlightening the west, connecting the south and the north. Strengthen the layout of transport infrastructure in the western region, promote the construction of new land and sea channels in the west, and build a network of channels for opening up to the outside world in both directions. Optimize the layout of hubs, improve the hub system, develop general aviation, and improve travel conditions for residents in remote areas. Promote the development of transport in the northeast region to improve quality and efficiency, strengthen the capacity of connection to Beijing-Tianjin-Hebei and other regions, and build a transport hub for opening up to Northeast Asia. Support the development of transport in old revolutionary base areas, regions inhabited by ethnic groups and border areas and promote the construction of transport facilities along the border and rivers and coasts.

Promote the integrated development of transport within city clusters. Build a convenient and efficient inter-city transportation network, accelerate the networking of rail transportation in city clusters, improve the network of express highways in city clusters, strengthen the smooth connection of roads and railways in city boundary areas, and basically realize a 2-hour transportation circle within city clusters. Strengthen the road network connectivity of important ports, stations and airports within city clusters, promote the coordinated use of resources, information sharing, cooperation based on division of responsibilities and collaboration, and mutual benefits between port clusters and airport clusters within city clusters, and improve the overall efficiency and international competitiveness of transport hub system in city clusters. Coordinate intercity transport networks, transport capacity and transport organisation to improve the efficiency of transport services. Study the layout of comprehensive general aviation airports, move general aviation activities from busy airports, develop urban helicopter transport services, and

build rapid air transport networks within city clusters. Establish and improve institutional mechanisms for coordinated transport development within urban agglomerations, and promote the integration of relevant policies, regulations, and standards.

Promote the integrated development of transport in metropolitan areas. Build a high volume and high-speed rail transport network connecting satellite cities and new towns to city centres, promote public transport operations, strengthen road transport connections, and create a one-hour "door-to-door" commuting circle. Promote the optimization of the urban road network structure and the formation of a well-organized and smoothly connected road network system. We will also develop shared transport in an orderly manner, strengthen the construction of active mobility systems such as walking and cycling in cities, allocate parking facilities in a reasonable manner, carry out pavement cleaning operations, build bicycle lanes according to local conditions, and encourage the public to travel green. In-depth implementation of the public transport priority development strategy¹⁵, the construction of urban public transport systems with urban rail transport as the backbone and conventional public transport as the mainstay, and the promotion of public transport-oriented urban land development models to increase the green transport sharing rate in cities. Super-sized cities make full use of underground space and buildings for rail transport to optimize passenger flow.

Promote the integrated development of urban and rural transport. Coordinate the planning of local highway networks, strengthen the articulation and coordination with national highways, rural roads and other modes of transport, and build a provincial road network with clear functions, reasonable layout and appropriate scale. Accelerate the upgrading of rural transport infrastructure, comprehensively promote the construction of "four good rural

¹⁵ http://www.gov.cn/zwgk/2013-01/05/content_2304962.htm

roads¹⁶", and realize the integrated planning, construction, management and maintenance of urban and rural transport infrastructure. Smooth urban-rural transport links promote county-rural (household) road connectivity, urban-rural passenger transport integration, and solve the problem of the "last mile". Improve the level of equalization of public services in urban and rural transport, and consolidate and expand the achievements of poverty alleviation and rural revitalization.

(IV) Promoting the integrated development of transportation and related industries

Promote the integrated development of transportation and postal express. Promote the construction of dedicated postal express handling sites, transport channels and loading and unloading facilities at railway, airport, urban rail and other transport yards. Realize centralized security inspection and centralized loading of mail and express mail at important transportation hubs, and develop special transportation facilities and equipment for air, rail and waterborne express mail. Promote the effective connection of mail and express mail loading and unloading standards and tracking data between different modes of transport, and realize information sharing. Develop air express and high-speed rail express, promote multimodal mail and express mail transportation, realize smooth connection across sectors, regions and transport modes, and promote the transparency of the whole transportation process. Promote the integration and sharing of facilities and resources such as rural postal and

express outlets, integrated service stations and bus stations.

Promote the integrated development of transportation and modern logistics. Strengthen the construction of modern logistics systems, optimize the layout of national logistics corridors and hubs, strengthen the construction of functional areas such as national logistics hubs for emergency response, cold chain and sorting and processing, improve the connection with ports, smoothly connect logistics corridors with the traffic line network of urban distribution networks, and improve the capacity of dry and branch connections and transit and distribution efficiency. Accelerate the construction of backbone and end-of-line networks for rural logistics infrastructure. Develop high-speed railway express transport and promote the development of double-stack container railway transport. Accelerate the development of air logistics and strengthen the capacity of international air cargo. Cultivate and strengthen a number of modern logistics enterprises with international competitiveness, encourage enterprises to actively participate in the reconfiguration and upgrading of global supply chains, build global supply chain service centres relying on comprehensive transportation hub cities, and create an open, secure and stable global logistics supply chain system.

Promote the integrated development of transportation and tourism. Give full play to the fundamental role of transportation in promoting the comprehensive development of tourism, speed up the planning and construction of national scenic routes and tourism transportation systems, and create natural scenic routes with wide influence. Strengthen the function of the transport network of "fast access and slow tour",¹⁷ and strengthen the

¹⁶ In 2015, the Ministry of Transport has formulated the "Opinions on Promoting the Construction of "Four Good Rural Roads", and started to organise the construction of "Four Good Rural Roads" nationwide with the main content of building, managing, maintaining and operating rural roads.—Eds.

¹⁷ "Fast access": construction of a transport network relying on high-speed railways, intercity railways,

civil aviation and highways, to improve the accessibility and convenience of tourist destinations and to enable tourists to travel long distances to and from destinations quickly.

"Slow tour": construction of a transportation network meets the tourism experience and

connection between the main transport routes and important tourism scenic spots. Improve the functions of tourism service facilities along highways, service areas, passenger hubs, cruise ship and yacht terminals, support the construction of transport infrastructure related to red tourism, rural tourism, holiday and leisure tourism, and self-drive travel, and promote the integrated development of general aviation and tourism. Improve the transportation and distribution system of key tourist attractions, encourage the development of customized tourism transportation services, enrich cruise tourism services, and form a positive interactive pattern in which transportation drives tourism and tourism promotes transportation development.

Promote the integrated development of transportation and equipment manufacturing and other related industries. Strengthen cross-industry cooperation between transportation and modern agriculture, manufacturing, commerce and finance, and develop transportation platform economy, hub economy, channel economy and low-altitude economy¹⁸. Support the transportation equipment manufacturing industry to extend its service chain, promote the application of modern equipment in the transportation sector, drive the industrialization and commercialization of domestic aviation equipment, and strengthen the mutual support between transportation and modern equipment manufacturing. Promote the integration of transportation with manufacturing and distribution resources, and encourage innovation in logistics organization models and business models. Promote the industrialization of intelligent transportation.

integrates dining, accommodation, travel, shopping, and entertainment services.

¹⁸ An economic concept based on low-altitude airspace (airspace with a vertical distance of less than 1,000 meters from the ground level directly

V. Promoting the high-quality development of comprehensive transportation

(I) Promoting safe development

Enhance safety and security capabilities. Strengthen early warning, prevention and control mechanisms and capacity building for transport safety risks. Accelerate the construction of multiple channels, modes and paths in urban clusters, key areas, important ports, major manufacturing and energy industry bases, and areas prone to natural disasters, and enhance the resilience and safety of transportation network systems. Improve the transportation security system for strategic materials such as food and energy, and enhance the safety and security level of industrial chains and supply chains. Strengthen the safety and security of passages, maritime cruises, search and rescue and salvage, and the capacity building of ocean-going deep-sea polar rescue, and improve the transport safety supervision system and search and rescue system. Improve the security protection system of key information infrastructure, enhance the security protection capability of important convergence infrastructure such as vehicle network and ship network, strengthen the security protection of transportation information system, strengthen the strength of key technological innovation and enhance the capability of independent and controllable. Improve the safety level of transportation equipment. Improve the safety publicity and education system, and strengthen the safety awareness and rule of law awareness of all people.

below, which can be extended to 4,000 meters according to different regions) and led by the general aviation industry.

Improve the safety level of transportation infrastructure. Establish and improve a quality security system for whole life cycle of modern engineering from construction to operational quality, and improve the regulations, systems and standards for transport safety. Strengthen preventive maintenance and safety assessment of transport infrastructure, strengthen long-term performance observation, improve data collection, testing and diagnosis, repair and treatment technology system, increase disease management, and eliminate safety hazards in a timely manner. Promote the use of new materials, technologies and techniques to improve the quality and service life of transport infrastructure. Improve the safety responsibility system, innovate the safety management mode, strengthen the construction and operation safety risk prevention and control of key transportation infrastructure, and improve the safety level of transportation facilities.

Improve the transport emergency protection system. Establish and improve a comprehensive transport emergency management coordination mechanism with multi-departmental linkage, multi-modal coordination and multi-body participation, and improve a scientific and coordinated comprehensive transport emergency plan system. Build an emergency transport data centre and promote information interconnection and sharing. Build a comprehensive transport emergency network that is fast and accessible, powerful, functional, safe and reliable. Improve the modernization, specialization and intelligence of emergency transport equipment, and promote the standardization, modularization and efficiency of emergency transport. Coordinate the construction of land, water and air emergency rescue capabilities, and build a multi-level comprehensive transport emergency equipment and materials and capacity reserve system. Scientific planning and layout of emergency rescue bases, fire rescue stations, etc., strengthening the construction of supporting facilities for emergency equipment, emergency communications, material storage and

transportation, disaster prevention and epidemic prevention, pollution emergency disposal, etc. in important corridors, and improving the ability to quickly repair facilities and respond to emergencies. Establish and improve the monitoring and prevention system of safety risks and key safety risks in the industry system, and strengthen the whole process and network monitoring and early warning of dangerous goods transportation.

(II) Promoting intelligent development

Upgrade the level of intelligent development. Accelerate the capacity of transport science and technology innovation, and promote the digitalization and networking of transport infrastructure. Promote the application of satellite communication technology, new communication technology, high-definition remote sensing satellite, artificial intelligence and other industry applications, build a full-coverage, replaceable and safe industry Beidou high-precision basic service network, and promote the large-scale application of industry Beidou terminals. Build a high-precision transportation geographic information platform and accelerate the independent innovation and application of building information model technology in various fields. Layout traffic sensing systems in an all-round manner, synchronize planning and construction with transport infrastructure, deploy active early warning facilities in key areas, and enhance multi-dimensional monitoring, precise control and collaborative service capabilities. Strengthen the research and development of intelligent means of transport and key special equipment, and promote the application of intelligent connected vehicles (intelligent cars, autonomous driving and IVICS) and intelligent general aviation vehicles. Encourage logistics parks, ports, airports and freight yards to widely apply technologies such as the Internet of Things and automation, and promote the application of

automated storage & retrieval system, guided transport vehicles, intelligent transport sorting and loading and unloading equipment. Build a comprehensive transportation data centre system and improve the comprehensive transportation information platform. Improve the mechanism for opening and sharing scientific and technological resources, and build a number of innovation platforms with international influence.

Accelerate the intelligentization of existing facilities. Use new technologies to empower the development of transport infrastructure, enhance the quality and upgrade of existing transport infrastructure, and improve the efficiency of facility utilization and service levels. Use modern control technology to enhance the intelligentization of train dispatching and command and transport management of the entire railway network. Promote intelligent road network management and travel information services, and improve road transport monitoring equipment and supporting networks. Strengthen the online monitoring of the operation status of high-grade inland waterways, and promote the development of ship-shore cooperation and automated terminals and yards. Develop a new generation of air traffic management systems, promote intelligent air transport services, transport management and airspace management, and promote information sharing among all parties. Promote the synergistic development of intelligent network-linked vehicles and smart cities, build an integrated sensing system for urban roads, buildings and public facilities, and create a smart travel platform based on an urban information model platform that integrates dynamic and static data of the city.

(III) Promoting green development and create humanistic culture

Promote green and low-carbon development. Promote the coordination of space for transport infrastructure and ecology, maximize the protection of important ecological function areas, transport infrastructure will be kept away from ecologically sensitive areas. Strengthen the protection of permanent basic agricultural land. Implement projects to restore and enhance the ecology and build an ecological transportation network. Strengthen scientific research and improve construction techniques to reduce traffic noise, pollutants and carbon dioxide emissions from the start. Strengthen traffic pollution monitoring and comprehensive management, enhance environmental risk prevention and control of transport, and implement ecological compensation mechanisms. Optimize and adjust the transport structure, promote the construction of multimodal logistics parks and special railway lines, and form a pattern of medium- and long-distance transport of bulk goods and containers, mainly by rail and water transport. Strengthen the renewal and use of facilities of renewable energy, new energy and clean energy equipment and the recycling of waste building materials, promote the clean, low-carbon and efficient development of transportation energy power systems, and promote the green, reduced and recyclable express packaging.

Strengthen the creation of humanistic culture. Improve the functional configuration of transport infrastructure, transport equipment and the standard specification system of transport services to meet the diversified and personalized needs of different passenger groups. Strengthen the construction of barrier-free facilities, improve barrier-free facilities, and enhance the convenience and service level for travel of special groups. Improve the transport service system for the elderly to meet the transport needs of an ageing society. Innovate

service models and improve the human-oriented services and refinement of transport services. Strengthen publicity and education on transport and civilization, promote excellent transportation culture, and raise the awareness of law-abiding and moral level of transportation participants.

(IV) Improving governance capacity

Deepen the reform of the transport industry. Deepen the reform of simplifying government and decentralization, combining management and administration, and optimizing services, continuously optimize the business environment, and form a unified, open and competitive transportation market. Establish and improve institutional mechanisms to adapt to the high-quality development of national integrated three-dimensional transport, and improve the strategic planning and policy system for integrated transport development. Promote market-oriented reform of competitive segments of the railway industry, deepen the reform of the national air traffic control system, and realize the separation of postal universal service business and competitive business operation. Improve the policy consultation mechanism between transport and territorial spatial development, urban and rural construction, ecological and environmental protection, promote the integration of multiple regulations, and improve policy unity, rule consistency and implementation synergy. Accelerate the development of standards and norms for integrated transport hubs, multimodal transport and new business models, strengthen the coordination of standards for different modes of transport, and build a standard system that is consistent with high-quality development. Strengthen international exchange and cooperation in transportation, actively participate in international transportation organizations, promote international mutual recognition of standards, and enhance the

international impact of Chinese standards. Based on big data and credit information sharing, build a new governance mechanism for integrated transport.

Strengthen the rule of law in transport. Adhere to the rule of law to lead and deepen the construction of transport rule of law government departments. Promote the process of formulating and revising key legislation on integrated transport, promote the effective interface between the legal systems of different modes of transport, and improve the integrated transport legislation system. Comprehensively strengthen the standardization of construction, improve the capacity and level of the transport law enforcement team, and strictly regulate fair and civilized law enforcement. Implement a system of legal literacy, create a good rule of law environment in the industry, and apply the requirements of the rule of law to all aspects of integrated transport planning, construction, management, operation and services, and safety production.

Strengthen the construction of the labor force. Optimize the structure of the labor force, strengthen the construction of interdisciplinary scientific research teams, and create a number of influential transportation science and technology leaders and innovation teams. Promote the spirit of model workers and craftsmen, and improve the institutional mechanism for the introduction, training, use, evaluation, flow and incentive of talents and the governance mechanism for the construction of industry culture led by socialist core values. Strengthen the training of innovative, applied and skilled talents, build a loyal and innocent, and responsible leading team and create an army of well-qualified workers.

VI. Guarantee measures

(I) Strengthening the leadership of the Party

Adhere to and strengthen the overall leadership of the Party, enhance the "four consciousnesses"¹⁹, firmly "four self-confidences"²⁰, achieve "two safeguards"²¹, give full play to the Party's leading role of overseeing the overall situation and coordinating all parties, always put the Party's leadership through the whole process of accelerating the construction of a strong transportation country, give full play to the role of Party organizations at all levels in promoting the construction and development of a national comprehensive three-dimensional transportation network, motivate cadres to take charge, fully mobilize the enthusiasm, initiative and creativity of cadres at all levels of officers and entrepreneurs, continuously improve the ability and level of implementing the new development concept, building a new development pattern and promoting high-quality development, so as to provide a fundamental guarantee for achieving the objectives and tasks of this plan outline.

(II) Strengthening organization and coordination

Strengthen the construction of the organization and guarantee system for the implementation of this plan outline, establish and improve the implementation coordination and promotion mechanism, strengthen departmental

coordination and upward and downward linkage, and promote the integrated planning and coordinated construction of various types of transportation infrastructure. Departments such as finance, natural resources, housing and urban-rural construction, and ecological environment should refine and improve supporting policies and standards and specifications for finance, land use, sea use, urban and rural construction, and environmental protection. Improve the mechanism for linking the outline of this plan with various types of planning at all levels.

(III) Strengthening resource support

Strengthen the supply of land and other resources for national comprehensive three-dimensional transport network planning projects, strictly control land use in the planning and construction process, highlight three-dimensional, intensive and economical thinking, improve the degree of composite transport land, revitalize idle transport land resources, and improve policies related to public transport-led land development. Establish a coordination mechanism and dynamic adjustment management policy between land and space planning and other related planning and transportation planning.

¹⁹ The concept of "four consciousnesses" was first put forward at a meeting of the Political Bureau of the CPC Central Committee on January 29, 2016. It describes the need that CPC party members should enhance their political awareness and integrity, awareness of the big picture and long-term situation, awareness of the leading core of the CPC and awareness of alignment of their work with the CPC's principals.

²⁰ The "four self-confidences" are "self-confidence in the Road of socialism with Chinese Characteristics, Chinese theory, Chinese

political system and Chinese culture of socialism with Chinese characteristics" which pointed out by Hu Jintao and Xi Jinping.

²¹ The "two safeguards" refer to resolutely upholding the core position of General Secretary Xi Jinping in the Party Central Committee and the core position of the whole Party, and resolutely upholding the authority and centralized leadership of the Party Central Committee

(IV) Strengthening financial security

Establish and improve a financial guarantee system that is in line with the characteristics of the stage of transport development, implement the financial affairs and expenditure responsibilities of the central and local governments in the field of transport, and ensure that various special funds for transport support transport development. Innovate investment and financing policies and improve long-term funding channels that match the funding needs and duration of projects. Construct an investment mechanism that forms a sustainable development of efficiency growth and risk prevention and control, and prevent and resolve debt risks. Improve the policy system for supporting the construction and operation of public welfare infrastructure, and increase support for less developed regions and border areas. Further adjust and improve the funding policies to support the development of postal and water transport. Support all types of financial institutions to provide financing for market-oriented transport development in accordance with the law and guide social capital to actively participate in the construction of transport infrastructure.

(V) Strengthening implementation management

Establish a comprehensive transportation planning and management system. The implementation process of this planning outline should strengthen the convergence with national economic and social development, territorial space, regional development, watersheds and other related plans, and integrate with urban and rural construction and development. In the preparation of transport-related plans, all regions should be well connected with the outline of this plan, and relevant projects should be incorporated into

territorial and spatial plans and relevant special plans. The Ministry of Transport, together with relevant departments, shall strengthen the dynamic monitoring and evaluation of the implementation of this plan outline, organize pilot projects for the construction of a strong transport country, scientifically demonstrate and organize the implementation of a number of major projects in such areas as corridors, hubs, technological innovation, safety, green and low-carbon, strengthen the statistics and monitoring of the progress of the implementation of this plan outline, carry out regular evaluation of the plan, and make dynamic adjustments or revisions according to the national development plan. Major matters will be reported to the Party Central Committee and the State Council in a timely manner.

Annex: Schematic layout of the main skeleton of the national comprehensive three-dimensional transportation network

附件





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