

**Synopsis of the Presentation on the Country's "Medium-to-Long-Term
Railway Network Plan" on 1 March 2010 by Mr. ZHENG Jian,
Chief Planner of the Ministry of Railways of the State Council,
at the Seminar on "Express Rail Link in Mainland and Hong Kong"
organised by the Central Policy Unit**

Introduction

In the three decades or so since the beginning of reform and opening-up, our country has achieved great success in maintaining prosperous economic development. With the scientific and harmonious development of China's economy and society, railways in the country have embarked on a new phase of accelerated development and modernisation.

An Overview of China's Railways

2. China's railways have been developing in accordance with the national strategy to actively meet the overall needs of economic and social development since 2003. By grasping the prime-time opportunity in the country's development, historical headway has been made in expediting the reform and development of railway transport mainly through the rapid expansion of railway transport capacity and the enhancement of railway technologies and facilities. As at to-date, the length of the country's railways in operation reached 86 000 km, climbing to second place in the world. Of these, 3 676 km were high-speed railways in operation between 250 - 350km/hour and 2 876 km were railways re-constructed with speed raised to 200 - 250 km/hour. China's high-speed railways under construction amounted to 13 000 km, the longest in the world. In 2009, the total passenger and freight delivery volume of the country's railways reached 1.52 billion passengers and 3.32 billion tonnes respectively, while the total passenger and freight turnover stood at 787.9 billion person-km and 3311.8 billion tonne-km respectively. Thus, China's railways in operation, accounting for just 6% of the global total, took up 25% of the world's railway workload.

3. In accordance with the national modernisation strategy, and starting out to meet the requirements of economic and social development, the country's railways are expected to have their network, facilities, management and services upgraded to the world's advanced

standards by 2020. Modernisation will then be basically achieved and the provision of reliable transport capacity will be assured for realizing the goal of building a moderately affluent society in all respects.

Planning up to 2020

4. Development objectives and planning up to 2020 are summarised below:

Development objectives

- Total scale of the railway network to go beyond 120 000 km, covering all Mainland cities with a population of more than 200 000; and the length of high-speed railways to exceed 16 000 km.
- Heavy traffic routes to adopt separate passenger and freight railways; to complete the construction of regional trunk lines connecting the eastern, western, southern, northern and central regions of the country; to maintain adequate coal transport capacity; to construction a number of new lines to facilitate regional development; and to achieve a structured layout of major passenger and freight transport hubs with full-range facilities and services.
- On technological equipment, to build on the technology basis of 200-350 km/h multiple units and high-power AC transmission locomotives to develop high-speed multiple unit and high-power locomotive product series that suit China's needs; and to promote the wider use of advanced multiple units and high-power locomotives.
- On operation management, to realise safe, resource-conserving and clean development by practicing scientific operation management; to achieve fundamental transformation of the economic development mode; and to come on par with the best in the world in terms of transport efficiency and cost effectiveness.
- On passenger and freight services, to develop comprehensive services and facilities; to ensure safe, economical, efficient and comfortable passenger transport; to maintain convenient and efficient freight transport; and to capitalise fully on modern railway logistics.

Development Plan

Passenger Transport

- To build a “four-vertical and four-horizontal” express passenger railway network, with the length of high-speed railways exceeding 16 000 km. The “four-vertical and four-horizontal” railways are: (i) Beijing-Harbin (Dalian) (350 km/h); (ii) Beijing-Shanghai (350 km/h); (iii) Beijing-Guangzhou (Hong Kong) (350 km/h); (iv) Shanghai-Shenzhen coastal areas (250-350 km/h); (v) Xuzhou-Lanzhou (350 km/h); (vi) Qingdao-Taiyuan (250 km/h); (vii) Shanghai-Chengdu (200-350 km/h); and (viii) Shanghai-Kunming (350 km/h).
- To develop a country-wide express railway network for passenger transport, with the country’s high-speed railways as the backbone, and supplemented by the intercity railways of Huanbohai, Yangtze River Delta, Pearl River Delta, Changzhutan, Chengyu, Zhengzhou, Wuhan, Guanzhong and the West Coast of the Taiwan Strait, etc.

Freight Transport

- To develop heavy-duty freight transport service: To meet the needs of the construction of major national coal bases and of coal transport by adopting separate passenger and freight railways for heavy-traffic routes such as the Beijing-Shanghai and Beijing-Guangzhou lines, giving priority to the development of coal transport routes and relevant distributing railways in the “Three Xi”, eastern part of Inner Mongolia and Xinjiang while reconstructing the existing major coal transport lines for enhanced capacity, and speeding up the construction of passageways that utilise foreign resources; and to plan and build 10 000 km of new lines.

Railway Network

- To improve the railway network layout: To expedite the construction of cross-region network trunk routes to enable high-volume incoming and outgoing passenger and freight traffic in order to solve the long-standing problem of inadequate cross-region railway capacity, especially in accessing the south-western, north-western and north-eastern regions; to develop more new lines to facilitate regional development and support balanced development among regions and the building of a new socialist countryside;

and to step up the technical renovation of the existing network in order to enhance the capacity of existing passageways while accelerating the construction of new lines; and to plan and build 31 000 km of new lines and 19 000 km of additional sub-lines for existing lines, and realise the electrification of 25 000 km of existing lines.

Node-link Configuration

- Implementation of Node-link configuration: To develop new lines and reconstruct existing lines in alignment with the overall layout of transport hubs and urban planning; to step up the establishment of railway hubs, improve the layout of passenger and freight transport facilities and secure node-link co-ordination so as to ensure the overall effectiveness of the railway network. On passenger transport system establishment, 1 066 modern terminals will be in place by 2020, meeting the “functional, systematic, advanced, cultural and economic” requirements and forming a modern passenger terminal system that suits the needs of specific passenger flow patterns and facilitates passenger transport organisation and management by categories.
- On freight transport system development, the layout of marshalling yards will be optimised and the division of labour rationalised to enhance transport efficiency and effectiveness. In addition, full efforts will be committed to developing multimodal transport. Eighteen container central stations will be built, and double-decker container transport links will be improved to achieve “seamless transshipment” with roadborne and waterborne cargoes.

Modernisation

- Taking forward the modernisation of rolling stock: Importance will be attached to high-speed multiple unit technology development. By 2020, electric multiple units will become the mainstay of passenger transfer facilities. Strenuous efforts will be made on developing 25-tonne axle weight locomotives for heavy-duty freight transport. Attention will be dedicated to electrification, aiming to have electric locomotives taking up more than 80% of the railway transportation workload. Passenger trains and cargo trains will be upgraded or replaced. New passenger trains will be developed to meet the needs of travellers at different levels and of various operational conditions. Much work will also be done to develop container trains, cold storage trains, trains for coal transport and designated trains for special goods transportation.

Informatisation

- Realisation of informatisation: Modern communication technologies will be applied to establish an information transmission system which mainly adopts the optical data system and the Global System for Mobile Communication - Railway (GSM-R) and is compatible with other information transmission systems. Based on the GSM-R, an integrated railway mobile communication system will be developed to provide a multi-functional platform for mobile communication for the purposes of train dispatching and command, business mobile communication, information transmission, and train control. The Centralised Traffic Control (CTC) system of the next generation will be gradually established and developed into the cab signal-based Chinese Train Control System (CTCS), which will make intelligent dispatching and command a reality.
- To accomplish informatisation of both passenger and freight services marketing through developing an advanced, automated ticketing and inspection system, establishing systems for railway customer services management and passenger services marketing, and developing railway e-commerce.

Stage Objectives for 2012 and Progress

5. According to the Medium-to-Long-Term Railway Network Plan and judging from the current progress of railway construction and modernisation of technological equipment, the length of railways in operation will increase to 110 000 km by 2012, with both the electrification rate and double-track rate rising above 50%. An advanced and well-developed railway network has started to take shape, alleviating the “bottleneck” restriction in railway transportation.

6. An advanced and well-developed railway network has started to take shape. By 2012, a total of 13 000 km of high speed railways and intercity railways will be in operation, forming an early-stage high-speed passenger rail transport network covering the whole country. To date, 3 676 km of high-speed railways have been completed, including the Beijing-Tianjin Intercity, Wuhan-Guangzhou, Zhengzhou-Xian, Shijiazhuang-Taiyuan, Wenzhou-Fuzhou, Ningbo-Taizhou-Wenzhou, Hefei-Nanjing, Hefei-Wuhan and Qingdao-Jinan lines. Another 13 000 km are under construction.

7. The country's high-speed railways under construction are as follows:

Project	Commencement Date	Designed Speed	Length (km)
Guangzhou-Shenzhen-Hong Kong Express Rail Link	2005/12/18	350	102
Guangzhou-Zhuhai Intercity Mass Rapid Transit	2005/12/18	200	141
Changchun-Jilin Intercity Rail	2007/5/3	250	96
Nanchang-Jiujiang Intercity Rail	2007/6/28	250	97
Harbin-Dalian Passenger Designated Line	2007/8/24	350	892
Hainan East Ring Intercity Rail	2007/9/29	250	308
Xiamen-Shenzhen Railway	2007/11/22	250	501
Beijing-Shanghai High-Speed Railway	2008/4/18	350	1318
Shanghai-Nanjing Intercity Rail	2008/7/1	300	300
Beijing-Shijiazhuang Passenger Designated Line (Beijing-Guangzhou)	2008/10/7	350	283
Guangzhou-Guiyang Railway	2008/10/13	300	857
Shijiazhuang-Wuhan Passenger Designated Line (Beijing-Guangzhou)	2008/10/15	350	840
Tianjin-Qinhuangdao Passenger Railway	2008/11/6	350	261
Nanning-Guangzhou High Speed Railway	2008/11/9	250	577

Hangzhou-Ningbo Passenger Designated Line	2008/12/11	350	150
Shanghai-Hangzhou Passenger Designated Line	2009/2/26	350	160
Harbin-Qiqihar Passenger Designated Line	2009/8/21	300	288
Lanzhou-Urumqi Passenger Designated Line	2009/11/4	300	1778
Xian-Baoji Passenger Designated Line	2009/11/28	250	138
Datong-Xian Passenger Designated Line	2009/12/3	250	859

8. Meanwhile, a high-capacity intercity trunk line network is basically established. An additional 15 000 km of intercity trunk railways and 10 000 km of double-track railways are due to complete by 2012. Presently, construction works for high-capacity intercity passageways, including the Lanzhou-Chongqing, Baotou-Xian and Taiyuan-Zhongwei (Yinchuan) lines are in full swing. Works for more than 20 000 km of intercity trunk lines are either underway or soon to commence. In the western region, 12 000 km of railways, including high-speed lines and intercity trunk lines, will be put into operation. The length of railways in operation will exceed 40 000 km and the density of the railway network will be doubled. By ensuring the provision of reliable transportation, the western region's advantages of resources will be turned into advantages of economic development. By 2012, a total of 804 new passenger terminals will be in operation.

9. A large number of modern passenger terminals are also set to open. They are generally characterised by abundant capacity, full-range functions, advanced facilities, energy-saving and environmental-friendly features, and an organic blending with the culture of the local community. Passenger terminals in provincial capitals and other major terminals will be provided with seamless interchange connecting with other transportation systems such as subways and buses, thereby realising the "zero-distance transfer" for passengers and serving as modern, integrated transportation hubs.

10. Advanced technology is widely adopted in railway infrastructure construction. For example, state-of-the-art railway technologies like ballastless tracks, seamless permanent ways, etc. are largely used to cater for high-speed, high-density transport needs. The GSM-R digital communication network is extensively used, with 12 core nodes established at Beijing, Wuhan, Xian, etc., forming a 3-dimensional band-shaped communication network with complete wired and wireless coverage. Dispatching control centres have been set up in Beijing, Shanghai, Wuhan and Guangzhou to implement the Train Dispatching Command System (TDCS) for full-distance coverage. The Centralised Traffic Control (CTC) system and Chinese Train Control System (CTCS) are widely adopted for high-speed, intercity and coal transport railways, while the Supervisory Control And Data Acquisition (SCADA) system is used for remote monitoring, control and operation of the tractive power supply system.

11. Our country's trains are up to the world's advanced standards. By 2012, China will have 800 high-speed multiple-units and 7900 high-power locomotives in operation, with 25 000, or 60 %, of passenger trains being air-conditioned. There will also be an extensive use of high power electric locomotives (6-axle, 7200 kW or 9600 kW, AC transmission) and high power diesel locomotives (6000 Horsepower, AC transmission). All busy trunk lines and major coal transport lines will be served by trains with high-power AC transmission locomotives. Replacement of freight trains will be expedited, with mixed-use freight trains of 70-tonne and 80-tonne load weight, and freight designated trains of 30-tonne axle-weight widely introduced.

12. There has also been significant progress in the modernisation of maintenance and repair services. A modern servicing system has been put in place, with 4 locomotive servicing bases established in Beijing, Shanghai, Wuhan and Guangzhou, supported by 35 depots, for the purpose of centralising the servicing of locomotives. Infrastructure at the four integrated servicing bases in Beijing, Shanghai, Wuhan and Guangzhou has been completed, forming a sound system for high-speed railway servicing.

13. The use of information technology has entered a new phase: Intelligent service systems and high-speed railway ticketing systems have been implemented in major passenger terminals to provide more efficient and convenient service for commuters; professional information management systems have been established to meet the operational, mechanical, engineering, electrical and rolling stock needs of railways, providing technological support

for the optimisation of transport resources configuration; and improvements have been made in the information management systems for matters relating to man power, financial and accounting, railway construction and integrated business, thus further raising the quality of management.

**Brief on the Intercity Railway Network in the PRD Region and the
Mainland section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link**

14. The PRD region includes 8 cities along the Pearl River: Guangzhou, Foshan, Zhuhai, Dongguan, Zhongshan, Huizhou, Jiangmen and Zhaoqing, covering an area of 41 700 km². This is one of the regions in the country with the highest urban density, most developed economy and greatest development potential. As a highly centralised city cluster has been formed here, resulting in huge demand for passenger transport service, it is projected that by 2020, the demand for intercity passenger transport will reach 3.2 billion passenger trips.

15. The Guangzhou-Shenzhen-Hong Kong Express Rail Link (ERL) starts from the Guangzhou South Station, goes via Panyu and Dongguan, and links up with the Hong Kong section at the Shenzhen River in the Huanggang Free Trade Zone in Futian, Shenzhen. The Mainland section of the ERL runs a total distance of 114 km. Construction of the Guangdong section of the ERL is now underway in full swing, with the Guangzhou-Shenzhen section and the Futian Station scheduled for commissioning in 2010 and late 2012 respectively.

**Economic and Social Implications of the
Guangzhou-Shenzhen-Hong Kong Express Rail Link on Hong Kong**

16. Construction of the ERL has profound and long-term implications on Hong Kong, given its status as one of the most developed cities in the world. Chief Planner Mr ZHENG Jian expects that upon completion of the Hong Kong section, the ERL will benefit Hong Kong not only in economic terms, but also in environmental, social and cultural aspects.

(I) *Expediting the integration of Hong Kong with the Mainland*

17. With the increasingly close co-operation between Hong Kong and the Mainland, cross-border traffic volume keeps growing. The number of land-based cross-boundary passengers increased from 75 million in 1998 to 163 million in 2008. At present, about 660 000 Hong Kong residents make a round trip to the Mainland at least once a week. After the

commissioning of the ERL, Hong Kong residents will no longer have to change train when visiting major cities in the Mainland.

(II) Effectively Meeting the Travelling Needs of the Public

18. As the global environmental issue gains prominence, the construction of high-speed railways has become a priority in railway projects in developed countries. While achieving rapid economic growth, Hong Kong also faces the grave challenges of population growth, land resources shortage and worsening ecological environment etc.

19. Hong Kong has a population density 6.12 times that of Beijing, or 2.76 times that of Shanghai. The ERL will strike a better balance between the transport needs of densely populated cities and the preservation of environmental resources.

(III) Creating Opportunities for Hong Kong's Future Economic Development

20. Tourism has all along been a pillar industry for Hong Kong. Upon the completion of the ERL, more Mainland consumers will be attracted to Hong Kong, bringing about new opportunities for the local tourism, retail and logistics sectors and creating more jobs.

21. Steady economic growth in the Mainland has given rise to an enormous market. The commissioning of the ERL will expand the scope of activities and room for development for the Hong Kong community at large, offering more chances for them to pursue business or career in the Mainland.

Question and Answer Session

22. Noting the different approaches adopted in locating high-speed railway stations in different Mainland cities, a participant asked whether it would be better to have a station situated in the suburb or downtown. In response, Mr ZHENG commented that the first consideration in locating a station was that it should be convenient for the public and capable of meeting their travelling needs. A second factor to consider was consistency with town planning. Thus, as a general principle, a station should be located in the urban area as far as possible. He added that it was a wise decision for the Hong Kong Station to be located in Kowloon.

23. A participant asked about the causes for the leaps and bounds in high-speed railway development in the Mainland in recent years. Mr ZHENG replied that actually, the country had all along been making planning, construction and lobbying efforts in the background. These had gone unnoticed until US President Mr Obama referred and drew public attention to China's high-speed railways in his State of Union Address. Mr ZHENG remarked that the fruitful results achieved were mainly attributable to the importance that the Central Committee of the Chinese Communist Party had attached to the issue and its setting of the Medium-to-Long-Term Plan, and the national policies of pooling efforts for accomplishing major tasks, stepping up the development of railway infrastructure, strategically introducing foreign technology through joint projects, and maintaining very good teamwork. Mr CHEW Tai-chong added that China's advanced railway engineering technologies and excellent working teams and leadership explained the quick achievement of such good results.

24. A participant asked about the co-ordination between railway and civil aviation development. Mr ZHENG remarked that there were no conflicts between railway and civil aviation development as the two modes of transport had different characteristics and could develop in parallel, offering more choices for the public. Given the current domestic situation, railway development would encourage the better use of energy. Mr CHEW pointed out that using the railway could reduce the need for short-haul flights, thus releasing resources for the long-haul ones. Besides, utilising the railway for short trips could save on energy. As such, the parallel development of railway and civil aviation could in indeed optimise the use of resources and facilities.

25. In response to a participant's question about the causes for the difference in train speed between different sections of high-speed railways, Mr. ZHENG explained that trains ran at 250 km/h at some sections and 350 km/h at others, mainly for two reasons. First, some sections were designed for both passenger and freight transport purposes; and second, there were considerations relating to local environment, geographical conditions and construction cost.