

Transportation

Bullet train network still moving at speed

More lines were added to the nation's railway infrastructure last year as work moved forward to meet the government's construction targets. **Luo Wangshu** reports.

The opening of two high-speed rail lines on Dec 28 and the start of work on a new line the following day signaled that China's high-speed rail construction program continues to move forward at a rapid pace.

Last year, four major high-speed lines were opened, bringing the total distance covered by the nation's high-speed rail network to more than 22,000 km, accounting for 60 percent of the high-speed rail networks around the world, according to China Railway Corp, the national rail operator.

The four lines are: the Zhengzhou-Xuzhou railway connecting central and East China; the Chongqing-Wanzhou railway, the first high-speed railway to enter the Three Gorges area; the Kunming-Guiyang railway which links Shanghai and Kunming; and the Kunming-Baise railway, connecting Kunming and Guangzhou.

Of the four, the newest, the Kunming-Guiyang railway, is part of the Shanghai-Kunming line, and at 2,252 kilometers it is the longest of China's east-west rail lines.

"High-speed rail continued its stable and steady development in 2016, the first year of the 13th Five-Year Plan (2016-20). The most significant moment was the opening of the Shanghai-Kunming rail line as a passage to link east and west," said Yang Hao, a professor of rail transportation management at Beijing Jiaotong University.

"Only two sections of the north-south and east-west high-speed railway grid have not yet opened — the lines between Jinan and Shijiazhuang and between Baoji and Lanzhou. At the current rate of progress, we expect to fulfill our target before 2020, much earlier than scheduled" he said.

Quality of operations

The high-speed grid of four north-south lines and four east-west lines is on course to meet a 2008 target to complete the work by 2020.

"The highlight of the year was that the high-speed rail grid, with four north-south lines and four east-west lines, is taking shape," said Yu Zhanfu, principal of the Beijing office of Roland Berger Strategy Consultants. "In addition to opening more lines, the high quality of operations, such as the punctuality of departures and arrivals, is very impressive."

Last year, nearly 99 percent of bullet trains departed on time and more than 95 percent arrived on time, according to the CRC.

In July, two Chinese-designed bullet trains passed in opposite directions at world-record speeds of 420 km/h during a test run conducted by the corporation.

"The success of the test demonstrates that China has mastered comprehensive knowledge of the bullet train's

High-speed rail lines opened last year:

- 1. Zhengzhou-Xuzhou**
Length: 360 km
Date opened: Sept 10
Initial design speed: 300 km per hour
- 2. Chongqing-Wanzhou**
Length: 245 km
Date opened: Nov 28
Initial design speed: 200 km/h
- 3. Guiyang-Kunming**
Length: 463 km
Date opened: Dec 28
Initial design speed: 300 km/h
- 4. Kunming-Baise**
Length: 486 km
Date opened: Dec 28
Initial design speed: 200 km/h

11 years to initially expand the national high-speed rail network to 10,000 km in length

3 years to expand network an additional 10,000 km in length to 20,000 km

60 percent of the high-speed rail networks around the world are in China

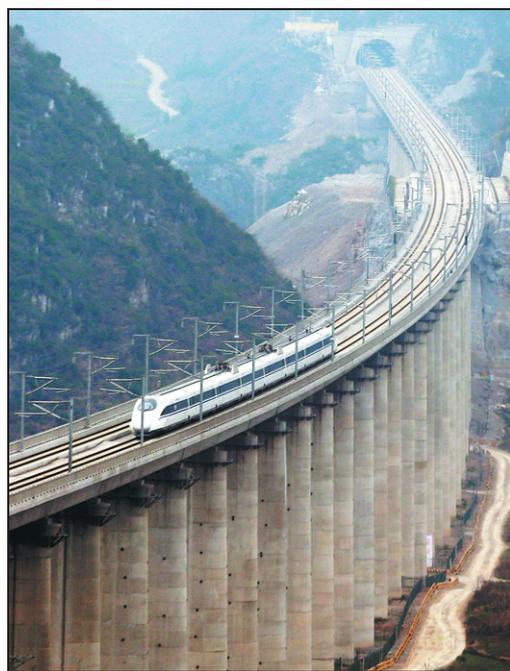
Sources: Shanghai Maglev Transportation Development Co, China Railway Corp and the National Development and Reform Commission

Riding the rails

High-speed rail lines opened in 2016

The national high-speed rail network, as envisaged in the 2008 national railway plan, including four rail lines north to south and four lines east to west. According to plan, the eight lines will be completed by 2020

High-speed lines under construction



A train crosses a bridge in Guizhou province on Dec 29, the first day of operations for the Kunming-Guiyang high-speed railway. ZOU HONG / CHINA DAILY



An attendant welcomes passengers to the Zhengzhou-Xuzhou high-speed service in August. PROVIDED TO CHINA DAILY



A driver prepares to depart Chongqing North Railway Station on the Chongqing-Wanzhou high-speed line in November. LIU CHAN / XINHUA

core technologies," said Zhou Li, director of the CRC's science and technology administration department. "It also shows that China's high-speed train technology ranks among the most advanced in the world, and even leads the world in some technologies."

The test measured the trains' performance, particularly the traction, braking and software systems, which all employ Chinese technology.

In addition to setting a technological record, the number of passengers hit a record high

in August.

The corporation's trains have carried about 5 billion passengers since 2008, and the number of people using the high-speed network has risen by 30 percent every year.

Last year, more than 1.4 billion trips were made on China's bullet trains, accounting for more than 52 percent of total passenger numbers, according to CRC data

On Dec 29, Yang Yudong, head of the National Railway Administration, told a media briefing that during the period

of the 13th Five-Year Plan, China will invest 3.5 trillion yuan (\$503 billion) to expand the railway network and accelerate development, and by 2020, high-speed rail lines will stretch 30,000 km as part of a final targeted network of 150,000 km.

In July, the National Development and Reform Commission, the nation's top economic planner, issued an updated national railway development plan that envisions a 175,000-km rail network by the end of 2025, by which time the country will have 38,000 km of high-speed track, according to the plan. Moreover, by 2030, the nation's rail network will expand to nearly 200,000 km, including 45,000 km of high-speed lines.

"We will accelerate the construction of railways in China's central and western regions, and we will also boost the expansion of intercity and suburban rail links," said Zhang Dawei, deputy head of the Ministry of Transport's planning department. "By the end of 2020, more than 80 percent of mainland cities with

with the prime ministers of Hungary and Serbia, Premier Li Keqiang said China is willing to continue helping with the construction of the flagship Budapest to Belgrade railway.

The line will have a total length of 350 km, and trains will reach a maximum speed of 200 km per hour.

"China learned about high-speed railway technology from foreign countries, but now it has mastered and developed 'home-made' core technology. The country's high-speed rail technology is advanced, and the diverse environment covered and massive operational

experience have proved that," said Yu Zhanfu, principal of the Beijing office of Roland Berger Strategy Consultants.

Yang, from Beijing Jiaotong University, said the going-out plan for China's high-speed railways will follow the Silk Road Economic Belt and the 21st Century Maritime Silk Road.

Wang Huiyao, president of the Center for China and Globalization, a think tank in Beijing, said: "Like the US-made Boeing 77 and France's Airbus, China's high-speed railway could be an important project to help the country export its technology in the future."

The right side of the tracks

By LUO WANGSHU

Wang Jinda is an experienced bullet train driver. However, the 34-year-old stands out from his coworkers because he has experience of operating many different types of trains, such as diesel locomotives and bullet trains.

"I am lucky to have experienced the leap forward in China's railway development and driven different types of trains," he said.

Wang, who has worked as a train driver since 2001 when he was 19, is following in a family tradition; his mother and grandfather both worked on the railway in Yunnan province in Southwest China.

His grandfather worked for the Yunnan-Vietnam Railway, which was built by France between 1904 and 1910 to connect Haiphong in Vietnam with Kunming, the capital of Yunnan, to expand the trading network and facilitate the importation of European goods.

Because the railway was built by the French, the engineers laid a 1,000-millimeter-wide track, the standard in France at the time, making it the only mainline in China to use the narrow-gauge system.

"My family is so proud that I was able to become a bullet train driver, and I am so proud of my job," said Wang, who was selected for training last year.

In July, he drove one of the trains during a test run on the Yunnan-Shanghai high-speed railway, attaining a speed of 330 km per hour, a provincial record.

The complex geological features in the province mean that Yunnan and the Tibet and Ningxia Hui autonomous regions are the only areas of the Chinese mainland that have yet to join the high-speed rail network.

On Dec 28, two major high-speed lines opened to link Kunming with Shanghai and Guangzhou, Guangdong province, and Wang drove the first bullet train from Kunming to Guiyang, the capital of Guizhou province.

From the old 1,000-mm-gauge railway to the new high-speed railway, Wang has witnessed the changes in Yunnan's rail network. Now, he hopes to see the high-speed service bring more tourism and business opportunities to his hometown.

"Now it (Kunming) is becoming a transportation hub linking Southern Asia and Southeast Asia," he said.

The 2,252-km-long Shanghai to Kunming line, which crosses five provinces — Zhejiang, Jiangxi, Hunan, Guizhou and Yunnan — cuts the journey time between Shanghai and Kunming to just 11 hours from the previous 34.

Rail technology could be China's global calling card

By LUO WANGSHU

China is fully prepared to export a full supply chain of high-speed railway technology, according to industry experts.

China Railway Corp, the national rail operator, said exports of railway equipment and railway construction projects are proceeding well, and breakthroughs are being made in a number of projects overseas.

Among the projects, the first full-chain commission, the Jakarta to Bandung high-speed railway in Indonesia — which includes technology, design, construction, equip-

ment manufacture, supply of resources, operations management and staff training — has been granted a construction permit and work is proceeding smoothly.

"China's railways have established a comprehensive and advanced technology system, which is able to provide overseas customers with solutions from many different perspectives, including financing, construction, operations, and research and development," said Yang Zhongmin, the CRC's deputy chief engineer, who added that China's railway system is competitive in terms of technology and economy of use.

350 km

length of the 200-km-per-hour Budapest to Belgrade railway, a high-speed rail project that China is helping to build

According to Yang, the nation's railway equipment and infrastructure service businesses have entered markets in Asia, Europe, North America and Africa.

Last year, Joko Widodo,

president of Indonesia, and Malaysian Prime Minister Najib Razak, rode Chinese-made bullet trains.

Yang Hao, a professor of rail transportation management at Beijing Jiaotong University, said China has a major advantage in that it is able to export a full range of railway technology: "For example, it is inconvenient to import the technology for the signaling system from one country and civil engineering technology from another."

Last year, China's high-speed rail project made progress in its "going-out" policy.

In November, when he met

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3.5 trillion yuan

amount of money China will invest to expand the railway network and accelerate development during the period of the 13th Five-Year Plan (2016-20)

populations of at least 1 million will be served by high-speed railways."

Continuous development

Yu, from Roland Berger, urged continuous development of the network: "The country's top planners must ensure that the work (planned in 2008) is mostly done, and then release a new plan."

China will continue to expand the rail network in the future, according to Yu. "In the more economically developed regions, such as the eastern and southern coastal areas, we have already seen the high-speed rail industry transformed into a powerful economic driving force. But in less-developed areas, such as central and western regions, it will take time to see the (financial) returns from high-speed rail lines," he said.

Yang from Beijing Jiaotong University, said the decision to expand the high-speed network was a wise one: "Once a line has been built, it can be used for years. From a long-term perspective, it is not possible to just build high-speed rail lines in the eastern regions. Balance is important in development."

In October, 61-year-old Lu Dongfu was appointed as the CRC's new general manager, replacing 67-year-old Sheng Guangzu, who was China's last minister of railways before rail operations were handed over to the corporation.

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Wang Jinda, bullet train driver in Yunnan

