

High-speed rail trips get easier as network expands

Passengers can now reach most of China's major cities by bullet train, thanks to a network that includes linkages of a number of rail routes, as well as efficient major transfer hubs.



A high-speed train heads to Ulanqab from Hohhot in the Inner Mongolia autonomous region in August, marking the opening of the region's first high-speed railway. [Tang Zhe/For China Daily]

According to China Railway Corp, the national rail operator, direct high-speed train services have been arranged between cities with a large number of passengers, including Beijing-Kunming, Harbin-Shanghai and Chengdu-Guangzhou. Those direct services link big cities in different regions by taking more than one rail route.

Service between Dalian, Liaoning province, and Xi'an, Shaanxi province, involves eight high-speed rail routes that link 18 medium-size and large cities.

Running the network is no easy task. A high-speed rail route must not only carry out bullet train services running only on a single line but also on multiple lines.

The major transfer hub design allows easy transfers to other bullet trains. Passengers can make travel plans and buy connected tickets in advance. When they arrive at the transfer station, they can use a transfer gateway to board the next service, with no need to exit the gate and enter again. The major

transfer hub design offsets the lack of direct service in some areas, providing more convenient travel choices.

Lanzhou West station, the major transfer hub linking the Xinjiang Uygur autonomous region with the rest of China, is expected to receive more than 5,000 transfer passengers a day, said Wang Jian, the deputy head of the station. The Baoji-Lanzhou rail route opened in July, and Wang estimates daily passengers will reach 25,000. The route links Lanzhou with the high-speed rail network.

No direct service links Xinjiang with most cities beyond Lanzhou. A passenger from Beijing can take a direct service to Lanzhou and then transfer at Lanzhou West station to Xinjiang.

China's high-speed rail network has surpassed 20,000 kilometers, spanning all provincial level regions except Tibet and the Ningxia Hui autonomous region. Hub cities are scattered around the country and linked by the high-speed network.

The world's longest high-speed rail service in operation is the 2,760-kilometer Beijing-Kunming service, according to China Railway Corp. Beijing has a distinct spring, summer, fall and winter, whereas Kunming has been called "the spring city" because the weather never gets very cold.

Like the Beijing-Kunming service, departure and arrival cities are different, requiring a different model of bullet train to adjust to diverse local environment.

In the northeastern region's winter, when the lowest temperature can hit -40 C, bullet trains need to adjust. In the northwest region's deserts, featuring strong winds and sandstorms, such as along the Lanzhou-Xinjiang line, bullet trains have stormproof designs.

According to a plan released by the National Development and Reform Commission in July 2016, China will expand the high-speed rail network to 30,000 km by 2020, linking 80 percent of major cities. By 2030, the network will link all cities with populations of more than 500,000.

Riding China's rails

China's high-speed rail network stretched 22,000 kilometers as of 2016, accounting for 65 percent of the world's total high-speed railway.

The world's longest bullet train service reaches 2,760 kilometers from Beijing to Kunming, Yunnan province.

The world's longest continuous high-speed rail track reaches 2,298 kilometers between Beijing and Guangzhou, Guangdong province.

China is the only country with trains running at 350 km/h. Service on several Chinese lines have reached that speed, including Beijing-Tianjin, Beijing-Shanghai and Shanghai-Ningbo.

Chinese scientists planning jumbo launched rocket

A new solid fuel rocket, launchable from the Yun-20 transport plane is being developed by Chinese scientists, reports China Central Television (CCTV).

The Y-20, or Transport-20 is China's first domestically made jumbo air freighter, designed to be used as a workhorse by the Chinese air force. It's capable of carrying out various long-distance air transportation tasks involving both cargo and passengers. 47-meter in length, 15 meters high, and with a 50-meter wingspan, the Y-20 has maximum take-off weight of over 200 tons and a maximum payload of 66 tons.

In addition to being used as a transport plane, the Chinese air force makes it available as a test platform for new technology. According to experts at the China Academy of Launch Vehicle Technology (CALVT), they are developing a new solid fuel rocket which could be launched by the Yun-20 in flight, sending a 100-kg load into near-earth orbit. Military expert, Wang Mingliang, says it's also possible the Yun-20 will be used to carry drones in the future.

It's anticipated that the Yun-20 could be refitted as refueling plane carrying over 90 tons of fuel, as well as airborne early warning aircraft with larger radar and a cabin for passengers.

China's top procuratorate increases int'l judicial cooperation

China's Supreme People's Procuratorate (SPP) has signed more than 130 bilateral cooperation agreements and memoranda of understanding with 98 overseas judicial organs so far to improve handling of transnational crime.

China's membership of the United Nations Convention against Corruption has made it possible for the SPP to seek or offer judicial assistance in criminal cases with judicial organs in 175 countries and regions.

The SPP has been designated as one of the Chinese central authorities in 13 legal assistance agreements signed between China and foreign countries.

Since the 18th National Congress of the Communist Party of China in 2012, the SPP has signed 24 cooperation agreements, memoranda of understanding, and

plans with judiciaries in 19 countries and regions.

International cooperation has helped to fight corruption, terrorism, money laundering, internet and drug crime, according to the SPP.

Procuratorates have handled 632 international criminal cases since 2013.

China's science award looks to emulate Nobel Prize

The awarding ceremony of the second edition of the Future Science Prize, hailed as the "Nobel Prize of China", was held in Beijing on Saturday.

The Life Science Prize was awarded to Shi Yigong for his research on the structure of spliceosome, a substance which is crucial in gene expression.

The Physical Science Prize was then awarded to Pan Jianwei. Pan was the lead scientist of world's first quantum satellite launched by China last year, which marked a step closer to the country's goal of building an unhackable global communications network.

The Mathematics and Computer Science Prize was presented to Xu Chenyang for his contributions to birational algebraic geometry.

Each of the laureates won \$1 million.

The Future Science Prize was initiated in 2016 by a group of entrepreneurs and scientists, with a view to honor outstanding scientists who research on basic science and its application.

"The founding of the awards is aimed at encouraging more young scientists to work out of their curiosity and be dedicated to fields which require long-term efforts," said Li Kai, a computer science professor from Princeton University and a member of the Future Science Prize Committee.

Li added the research of the winners, which can be from any country, must be original, have global influence and long-term significance, and be completed in Chinese mainland, Hong Kong, Macao or Taiwan.

China steps up building science and tech power

China has made a series of achievements in science and technology over the past month as the country quickens its pace in becoming a leading science and tech power by the middle of the century.

China has been a leader in quantum technologies, which eliminate the possibility of wiretapping and secure communication. In early September, it was announced the Beijing-Shanghai quantum communication network has met requirements to open for service.

The 2,000-km network, the world's first, will be used for secure data transmission in the military, finance and government affairs fields.

The country has also completed a test of its high-throughput satellite Shijian-13, designating it as Zhongxing-16. With a transfer capacity of 20 Gbps, the satellite is capable of providing better Internet access on planes and high-speed trains, as well as in less-developed regions.

In a step toward launching a Mars probe around 2020, planners have mapped out a 400-million-yuan (61 million U.S. dollars) development plan to turn a red rock basin in Qaidam basin in northwest China's Qinghai Province into a Mars scientific research base and eco-tourism site.

The base is expected to consist of a "Mars community" and a "Mars campsite." The campsite will have a number of experimental module-like accommodations.

Underground research has also moved swiftly. Researchers recently acquired hot dry rock (HDR), with temperatures of 236 degrees Celsius, from 3,705 meters below Gonghe basin in Qinghai Province.

HDR is usually buried 3,000 to 10,000 meters under the earth's surface. It can be used to generate clean electricity via its high temperatures. The breakthrough means China is a step closer to easing environmental problems related to the greenhouse effect and acid rain.

China has made innovation the core of its 13th five-year plan (2016-2020), with the aim of becoming an "innovation nation" by 2020, an international leader in innovation by 2030, and a world powerhouse in scientific and technological innovation by 2050.

"We will accelerate R&D and commercialization of new materials, artificial intelligence, integrated circuits, bio-pharmacy, 5G mobile communications, and other technology to develop industrial clusters in these fields," said a government work report issued this year.

Such efforts will help the country improve convenience of transportation, raise living standards, resolve energy resource shortages, and boost economic development.

Developers said on Wednesday that track has been laid for China's longest high-speed railway at high latitudes, and the railway is scheduled to open in June 2018.

Running at 200 km per hour, the 343-km railway linking Harbin, capital of the northeast province of Heilongjiang, and Jiamusi in the same province, runs through four tunnels and over 120 bridges. It will cut travel time to 1.5 hours from 7 hours.

On the environmental front, an in-orbit test of China's first orbiting carbon observatory satellite was successfully completed in September. Scientists will convert magnetic signals received from the satellite into visible spectral signals, and then calculate the concentration of carbon dioxide.

While development of science and technology promises a better future, it also saves the lives of millions of people today.

According to a study published in late August, Chinese scientists have found a compound that helps a tumor-targeting virus kill liver cancer more effectively while sparing healthy cells, offering new hope for treating the world's second most common cancer killer.

A therapy that uses viruses to selectively kill cancer cells is rapidly progressing through clinical evaluation, but the therapeutic efficacy in humans has been less than expected from pre-clinical studies, according to the study published in the U.S. journal Science Translational Medicine.

China needs science and technology more than ever and the country's scientists should occupy the world's science and technology high ground, said Bai Chunli, president of the Chinese Academy of Sciences (CAS).

The quickest and easiest way to achieve innovation is through a global cooperation network to boost innovation.

The G20 Blueprint on Innovative Growth, adopted at the Hangzhou summit in September last year, commits governments to creating a favorable environment for creativity and development.

Scientific innovation was also a central topic at the Belt and Road forum in Beijing in May, with China proposing a Belt and Road Science, Technology and Innovation Cooperation Action Plan.

A science and technology cooperation network along the Belt and Road will be completed in 2030, Bai said.