

Mr. Zhao Changjiang

Mr. Zhao Changjiang is a senior engineer with a Doctor Degree. He served in TSDI (The Third Survey and Design Institute of China Railway) for 14 years (1995-2009), working on planning, research and technical management. In 2009, he was promoted to the Development and Planning Department of the former Ministry of Railways.

Now he continues to serve at the Planning and Statistics Department of the newly founded CRC (China Railways Corporation), as a deputy director, working on planning management and project pre-stage management.

Doctor Zhao has won many honors granted by the municipal government and the Ministry.

The experience of construction and finance
in high speed Railway stations of China
China Railways Corporation

1. Basics of the current situation and planning

During recent years, in order to meet the increase in traffic demands triggered by rapid social and economic development, China railway especially HSRs has gone through a progress of rapid development, and the overall structure and quality of the railway network have been significantly improved. By the end of the year 2012, the operational length of China Railway reached 98,000km, including 9,300 km of HSRs, 5,800km of which operates at speed of 300-350km/h and 3,500km at speed of 200-250km/h. In 2012, China railway delivered 1.89b passengers, 30% of which by HSRs.

According to the national 12th five- year plan (2011-2015), by the end of 2015, the operational length of China Railway will reach 120,000km, and the planned express railway traffic network will be basically in place. One key task of this plan is to build an express railway traffic network, backboneed by four north-south HSR corridors and four east-west HSR corridors. The operational length of this express railway traffic network will reach 40,000km, which will cover capital cities of all the provinces and cities with

a population of more than half a million. And by that time, HSR lines will reach 18,000km.

2. Development concepts

HSR stations are the joint points between HSR lines and cities, and are important bridges which link cities to the outside world. As important windows to the outside, HSR stations shall be closely connected with other traffic modes to facilitate the evacuation of passenger flow. And at the same time, as large scale infrastructures and landmark buildings of cities, HSR stations shall also reflect local history, architecture and culture, etc.

In the planning and development of HSR stations, the Chinese Railway has been adhering to the concept of **building HSR stations into local comprehensive traffic hubs, and harmonizing HSR stations with overall urban planning and local culture**, and the principle of **safe, comfortable, function-oriented, diversified development and economically rational**, and has been working hard to construct HSR stations into energy-saving and environment-friendly comprehensive traffic hubs which integrate functions of passenger traffic, intermodality and representative of regional cultures.

Siting of stations is considered combined with the development level and overall planning of cities, and tries to locate stations at places with concentrated passenger flow.

The scale of stations is decided based on the principle of **function-based, future-oriented, strictly controlled**, and on the premise of satisfying the passenger service function, retail, catering and entertainment facilities are also provided.

For the passenger service function, HSR stations serves as modernized comprehensive traffic hubs which provide seamless connection among various traffic modes to facilitate the arrival and departure of passengers.

For the overall layout of HSR stations, passenger passages are simplified and guiding system are strengthened to improve the efficiency of the stations.

Architecture of HSR stations is harmonized with their surroundings and reflects local culture.

To control the cost, HSR stations are designed to be simple and practical to cut down the construction cost, and energy-saving and environment-friendly technologies and materials are used to cut down the operation cost.

3. Development achievements

During the past few years, with the development of HSR lines and inter-region main lines, a great number of large scale stations have been constructed and put into operation, including Beijing South Station, Shanghai Hongqiao Station, Nanjing South Station, Wuhan station, Guangzhou South Station, Zhengzhou

East Station, Xi'an North Station, Chengdu East Station, Harbin Station, etc. all of which serve as comprehensive traffic hubs having seamless connection with other traffic modes. By the end of the year 2012, there were 114 HSR stations constructed and put into operation. And for the on-going HSR stations, a series of advanced technologies and research achievements are being applied, based on the principle of **function-based, service focused and economically rational.**

(1) Design and construction techniques using “integrated building-bridge structure”

It efficiently makes use of the space and achieves desirable architecture effect as well.

(2) Design and construction techniques for comprehensive traffic hubs that integrate multiple traffic modes

The concept of integration is taken into consideration as early as the design stage to make sure the seamless connection among railway, metro, bus, etc.

(3) Advanced energy-saving techniques

Advanced energy-saving techniques including solar photovoltaic power system, GSHP (Ground Source Heat Pump) and CCHP (combined cooling heat and power) technologies, etc., are used to reduce energy consumption.

(4) Architectural style and guiding system

Local cultural element is taken into consideration during the architectural design, and special China HSR Logos and colors are used in guiding systems.

4. Financing

Since the HSR stations integrate railway passenger traffic, urban traffic and related comprehensive business development, in the construction of China HSR stations, except for the investments from central and local governments, funds are also raised from railway companies, bonds and loans. Large stations like Beijing South Station, Shanghai Hongqiao Station and Wuhan Station are financed independently, while middle and small stations are often financed as part of HSR projects.

Financing channels of China HSR stations includes: central government budget, national bonds, railway construction fund, self-financing by railway companies, investments by local government and companies, railway bonds, foreign loans and domestic bank loans, etc.

During the period 2004-2012, 3.1 trillion RMB were invested in railway infrastructure construction, within in which, central government budget and national bonds took up 4%, railway construction fund took up 12%, self-financing by railway companies took up 9%, investments by local government and

companies took up 19%, railway bonds took up 19%, foreign loads took up 1% and domestic bank loads took up 36%.

Now, the China Railway is conducting reform to the existing financing system, and the Chinese government intends to establish a **national fund for railway development**, which aims to raise investments for railway construction from more channels and in more flexible ways, to ensure the sustainable development of railways.