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TRANSRAPID NEW THOUGHT TO CHINA'S TRAFFIC CONFUSION

ABSTRACT

China is by far the largest uniform economic region of the world. It is growing fast both in relative and in absolute terms. Principal decisions need to be taken before long to establish an adequate transport system covering distances of up to 5000 km easily in one day and serving numerous intermediate junctions at short time intervals. Even long distance connections across the Asian continent with India and with Europe must be taken into consideration.

KEY WORDS

Transrapid system, China, long-distance transport

China, a brilliant civilisation covering 9.6 million square kilometres, with a population of about 1.3 billion, has long been worried about her traffic jam, which hinders country's further development in all scopes. The government is seeking a reasonable transportation system to adjust to the national situations. To select the most excellent transportation technology from the world, counts as the predominant in traffic jam resolution. Besides, there has been an increasing demand for passenger transportation rather than cargo. The predicted number of 13.3 billion passengers in 1998 requires sufficient, fast, safe, convenient and comfortable transportation means, while the traditional ones can hardly fulfil them all, not to mention such strategic problems as environment protection, resource efficiency, etc. Transrapid, a brand-new superspeed maglev system sets promising light to China's transportation industry, especially to passenger transportation. Its safety, high speed, economic quality, low energy consumption, high feasibility and low impact on environment, may satisfy the above needs to a large extent.

In the view of physical conditions, China has all landforms, among which mountainous areas cover two-thirds of the country's territory, with plains reduced to only one-third. Taking the edge of Quingzang Plateau and Daxing'anling-Taihang Mountain-eastern part of Yungui Plateau as two demarcation

lines, China can be evidently divided into three parts, namely Three Stairs.

For the first stair lying to the east, huge plains and a few hills scatter interlacingly with an average latitude of less than 500 m. In the country's most advanced areas, although there is a high density of transportation lines, current transportation can hardly bear the burden. This has been mainly manifested in the following aspects:

1. Large passenger travel demand

With the favourable economic and geographical conditions, 90% of the country's population concentrates here. The government has been devoted to high-speed railroad and motorway construction, whereas a radical solution has not yet been found.

2. Low transportation quality

Time counts in modern economic world. The too crowded passenger transportation wastes passengers' time. Traditional transportation technology also leads to low speed and discomfort. Although civil airlines have been developed rapidly, the high ticket price holds many passengers' back. In the meantime, even kept at a low price, city public transportation remains unattractive because of its backward development and low service standard.

3. Severe environment pollution

Transportation noise and air pollution are especially severe in this economically developed and city gathering area. Environment protection can hardly compete with a desire for economic benefit so that pollution may even become worse.

4. Limited land and energy resources

The average land per capita in China's large cities is only 60 to 80 square meters which results in very limited land for road construction. A radical solution to city traffic jam is to highly improve land use efficiency. Meanwhile, there is a relative energy shortage in this area.

The transrapid is suited for many applications in China's Eastern part. A high speed of 500 km/h strings the Eastern cities more closely, which also brings convenience to passenger transiting among the city groups. Built high in the air, the track occupies a small area and with extremely little noise and air pollution added, it does little harm to the environment. Apart from high safety, the Transrapid can efficiently transport passengers. The high speed, low price, high efficiency and safety may fulfil many of the passengers' demands.

Located at the second stair, this part consists of China's plateau, basin and mountainous areas with an average latitude of one to two thousand metres. Compared to the East, the most complicated landforms restrain transportation development. A large sum of money has to be invested into tunnels, winding mountain paths and terrain changing. More energy

has to be consumed for traditional vehicles to climb slopes.

The high flexibility and availability of Transrapid give full power to its operation. The gradient limit of railroad is 3%, while Transrapid can climb a slope grade of 10% and it integrates into the landscapes sensitively. Also, at equal speed, Transrapid consumes 30% less energy than a modern high speed train. The above prominent advantages contribute to low construction and operation cost.

The third stair is composed of the great Qingzang Plateau called "roof of the world" with an average latitude of 4000 metres. Railroads are scarcely scattered at the edge of the plateau. Qingzang Plateau gives birth to China's civilisation cradle, the Yangtze and Yellow rivers. Tibet, an old and mysterious land, which attracts people's earnest desire to visit it, does not possess a single railroad of its own. In order to ex-



Figure 1

Largely unnoticed by the world, since the ending of the frightful cultural revolution and since the introduction of economic reforms by Deng Hsiao Ping in the mid-80s, China has experienced an enormous upswing in production. The rapid increase in living standards of the, today 1.2 to just 1.3 milliard persons, has forced a radical renewal and increase in capacity of the whole Chinese transport system, both for goods and for passengers. And in this, China has a great advantage only recently achieved in Europe: the existence of a large unitary economic region. The transport market in China is not well known outside the country but the indicators are loud and clear: for example, the three dam section of the Yangtze-Jiang (some 500 km) carried in 1997 some 40 million passengers (of whom 40,000 were foreigners). The country needs a speedier long-distance network, able to carry: 200-500 million passengers annually in a few hours over 2000 – 3000 km, the great mass of post, courier goods and containerised freight over night from one end of the land to the other, and to link China with other more distant economic regions in Eurasia. Now is the time to demonstrate to China the possibilities offered in the near future by magnetic levitation, the Transrapid – and with all the geographical implications.

exploit the frozen land and ice-covering mountains, the government is puzzled with further construction.

The outstanding performance of the Transrapid can fit in the vile physical environment. The relatively low construction cost, low energy consumption and easier track building may help to stimulate the road construction so as to turn people's dream of Tibet into reality.

This June (1998), some of China's scientists made a pledge to the central government to adopt the world's most advanced Transrapid. They argued that its high speed could compete with that of a flight and that the most advanced highest technology should be introduced to catch up with time.

Whether to develop high-speed wheel railroads or to develop the Transrapid, this presents a problem. The National Railway Ministry, thus dispatched a troupe of experts to make an all-round investigation. By taking the Beijing-Shanghai railroad as a study case, one of the country's important railroads, they compared both the technologies in the aspects of economic technology, safety, cost, benefit, etc. At last, they tended to reject the latter because they considered that we'd better adopt mature technology and should not run a risk to try the Transrapid that has no successful models in operation yet. At present, it is the high speed Transrapid that attracts the world's interest. There's still a long way for the Transrapid to conquer the transportation world.