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BRIC Spotlight Report

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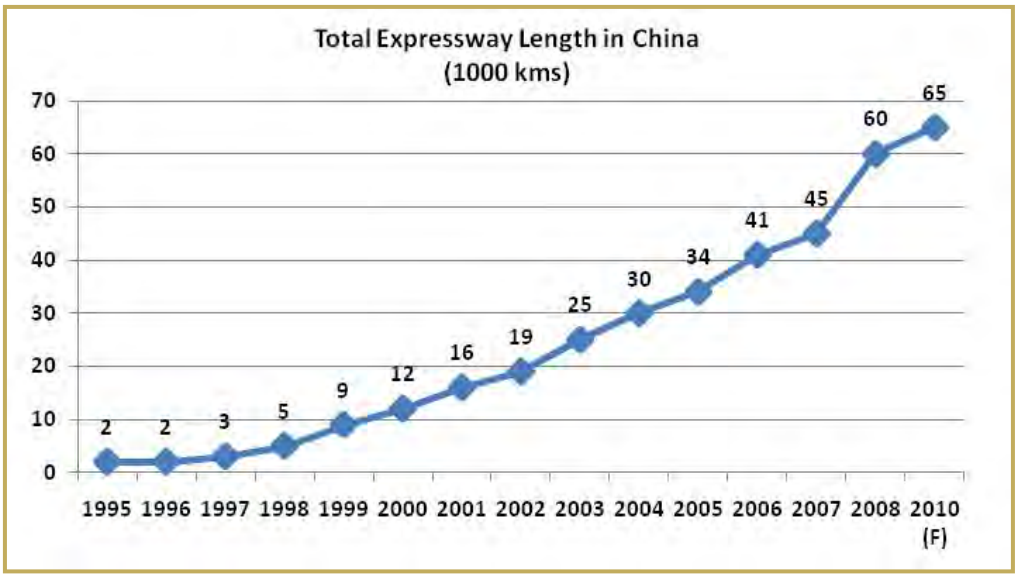
Toll Roads in China: Speeding Up Growth

Fast Facts

- China's expressway network of 65,000 kilometers (40,389 miles) is the second largest in the world, next only to the U.S.
- By 2020 the government plans to reach three million kilometers (1.86 miles) of expressways and highways, up from two million kilometers (1.24 miles) in 2008.
- China houses more toll roads than any other country, with Chinese toll roads representing more than 70% of the world's total toll roads.
- The government finances the majority of the road projects through its own budget and debt, while the private sector plays a limited role.
- The toll road sector was one of the three most profitable businesses in China for 2009, along with real estate and finance.

Infrastructure has played an instrumental role in the Chinese economy's ascent to the position of a global economic powerhouse. And the overarching importance of infrastructure in China was underscored yet again when the sector grabbed a 38% lion's share of the $586 billion Chinese stimulus package introduced in November 2008. Out of all the infrastructure sectors, the effort to improve the country's roads has received the strongest impetus and investment from the Chinese government. According to consulting firm KPMG, since 2000 China's expressway network has been growing on an average of 20% per year. With this, the country has zoomed to the second position globally in terms of expressway network, next only to the U.S.



Source: Infrastructure in China: Foundation for Growth, *KPMG*, 2009

Driving forces of road construction

Outlined in a series of five-year plans, the development of infrastructure in the Chinese economy has remained an integral part of its economic development initiatives, But expressway construction in China only gained momentum in 1989, when the forces of economic liberalization were gathering steam. As a result of these comprehensive economic reforms, the Chinese economy surged to an average annual growth rate of 9% in the three decades spanning 1978-2008, a remarkable achievement. Driven by industrial production and exports, this higher economic growth was naturally accompanied by a greater demand for freight transport, which in turn created a demand for construction of new roads. Higher living standards along with improved levels of domestic consumption further added to this transport demand. What's more, China's zooming car sales and its emergence as the largest car market globally in 2009, also necessitated the quick construction of highways and expressways. Notably, the building of highways is a crucial factor in the country's "Go West" policy aimed for the integrated development of central and western China, which lags behind the more economically prosperous east, as well as some parts of the north[1].

[1] 'Infrastructure in China: Foundation for Growth', *KPMG*, 2009

National Trunk Highway System: Backbone of China's road network

Source: Infrastructure in China: Foundation for Growth, *KPMG*, 2009

China's ambitious National Trunk Highway System (NTHS), launched in 1990 originally envisaged 35,000 kilometers (21,748 miles) of expressways that would link all the major cities with each other as well as the ports. While this core of the Chinese transport system, covering a population of almost one billion, was due to be completed in 2020, it was functional by 2007, 13 years ahead of schedule. The NTHS, also known as the 7918 network, links all provincial capitals as well as cities with a population of more than 200,000, and incorporates the following:

- 7 Highways from Beijing
- 9 North to South vertical expressways
- 18 East to West horizontal expressways

Building expressways at a breakneck speed, China today boasts of 65,000 kilometers (40,389 miles) of expressway network, the second largest in the world, compared to a mere 147 kilometers (91.34 miles) in 1989 . The country is poised to expand this network further to 85,000 kilometers (52,817 miles) by 2020, according to the Ministry of Transport. For greater integration of rural areas in the economic development process, the government also plans to build and modernize about 270,000 kilometers (167,770 miles) of rural roads.

Regulatory framework for roads: Government at the helm

The fast-paced expansion of the road network in China, especially expressways, over the past 15 years has been possible due to the government's systematic tiered approach. The development has been led by the State Council as a central entity for overall planning and standards, while the Provincial Transport Departments are responsible for detailed planning, design as well as building. Successive five-year plans have also outlined specific provincial targets for road

The governance or regulatory framework for roads in China is as follows[2]:

State Council: This is the highest executive organ of state administration, with the premier at the helm, along with ministers and state councilors. The State Council has the responsibility of approving and issuing plans and policies for road sector development.

Ministry of Transportation: The Ministry of Transportation (MOT) assumes the role of policy oversight as well as regulation of all transport modes, except railways.

Provincial Transport Departments & Transport Bureaus: The 27 Provincial Transport Departments and the transport bureaus for the four mega cities- Beijing, Chongqing, Shanghai and Tianjin- are responsible for the implementation of the transport programs and policies. They are also accountable for raising funds for the road projects, and for their operation as well as maintenance.

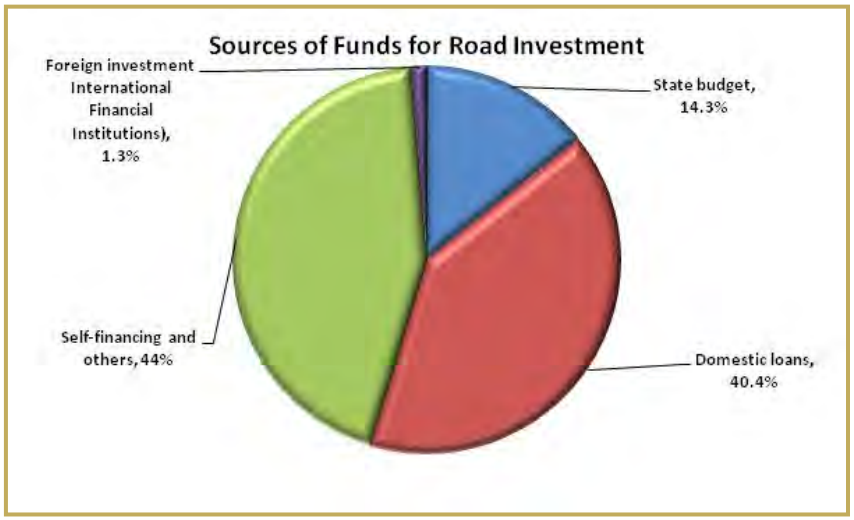
Financing of road projects

On the funding front, the provinces finance about 65%-90% of the capital cost needed to construct and maintain the expressways through their own budgets and debt. MOT sets policies, standards and provides investment support for construction. While expanding the inter-provincial National Trunk Highway System, the government decided to adopt a toll-based network, which would be predominantly financed by debt[3].

While the financing and management of the expressway network predominantly remains in the public sector domain, the government has adopted a distinctive form of Public-Private Partnership (PPP) financing for some expressway projects. For example, after completing the construction of a toll expressway, provincial governments set up an expressway corporation as a public limited company, listed on the stock exchange. The provincial government then invests the money paid by the shareholders into construction of new toll roads. As such, China followed a *one road-one company* model, which allows for joint venture, securitized ownership, direct private sector investment, as well as different forms of leasing and concessions. Overall, private investments constitute a mere 7% of expressway financing in China. Here, the build-operate-transfer (BOT) method of road construction and management, which is a popular form of PPP financing, has been recently introduced in China. It is a tendered process, in which the chosen concessionaire (private entity) finances, builds and operates a road for a specified period.

[2] 'Toll Road Development in PRC', Chuntai Zhang, ADB Consultant, November 2009

[3] 'A Review of Institutional Arrangements for Road Asset Management: Lessons for the Developing World', Cesar Queiroz and Henry Kerali, *The World Bank*, 2010



Source: 'A Review of Institutional Arrangements for Road Asset Management: Lessons for the Developing World', Cesar Queiroz and Henry Kerali, *The World Bank*, 2010.

China and India: Contrasting approach to road projects

In terms of the total road network, China ranks second, while India ranks third globally. A common characteristic of the road network in both countries is the predominance of rural roads, which constitute almost 90% of the total road length in China and 79% in India. While India boasts of a highway network of 66,590 kilometers (41,377 miles), its minuscule expressway network of 200 kilometers (124.3 miles) is dwarfed by China's 65,000 kilometers (40,389 miles) expressway network[4].

While traditionally road construction in India was entirely undertaken and financed by the government, budgetary constraints have resulted in alternative models for road projects. With the objective of attracting private investment in road development, maintenance and operation, the National Highways Act (NH Act) of 1956 was amended in June 1995. These amendments facilitated private entities to invest in the NH projects, as well as levy, collect and retain fee from users, and regulate traffic on these highways as per the provisions of the Motor Vehicle Act of 1988.

The National Highways Development Program (NHDP) forms the backbone of India's road network with a length of 66,590 kilometers (41,377 miles). While this constitutes only 2% of India's total road network it, it carries about 40% of the total road traffic. Launched in 2001, the NHDP is spread over seven phases to be completed by 2015. This ambitious program consists of connecting the four metropolitan cities of New Delhi, Mumbai, Chennai and Kolkata (the Golden Quadrilateral), while substantially upgrading its existing network too.

[4] 'Position Paper on the Roads Sector in India', Ministry of Finance, *Government of India*, July 2009

In contrast to China, PPP models have been widely used in the roads sector in India, where the private sector takes the lead, and the government performs the facilitator's role. For instance, in the period from 2007-2012, private investment in roads is estimated to be 34% of the total investment required, while in the period 2002-2007 it was less than 5%. The three propagated models of PPP by the Ministry of Road Transport and Highways are[5]:

- **Build, operate and transfer (BOT) Toll model:** In the BOT (Toll) model, the concessionaire (private sector) has to bear the cost of construction as well as annual maintenance. The private sector recovers these costs along with the interest and a return on investment through future toll collection while operating the facility. However, to make the project more viable and attractive for the private players, the government also has made provision for a capital grant of up to 40% of the project cost.

- **BOT (Annuity) model:** In the BOT (Annuity) model, the government pays no grant and the private sector meets the entire upfront, construction and maintenance cost. The investment is recovered along with a pre-determined rate of return in the form of annuities payable by the government every year. Unlike the BOT (Toll) model, in the annuity model the client (government) assumes all the risk with respect to traffic, as it collects the toll.

- **Special Purpose Vehicle (SPVs):** SPVs are separate legal entities formed for the funding of road projects, with minimal financial support from the government authority. Most of these funds come from financial institutions and beneficiary organizations in the form of equities and debt. The investment made in the development of roads is then recovered by the SPV through the collection of tolls.

While the policy guidelines for toll-based BOT projects were approved in 1997, in a major landmark move, it was decided in 2005 that all future projects under the NHDP would be awarded only on a BOT basis. It is estimated that the BOT (Toll) model would constitute 67% of the contracts under the NHDP.

So while in China the government plays an instrumental role in road network development, India has encouraged and relied more on the private sector, two very disparate approaches to road development.

[5] Government of India, Ministry of Road Transport and Highways

An overview of prominent Chinese toll road companies

Company	Market Capitalization ($ Millions)	Stock Exchange Listing
Jiangsu Expressway	1190	Hong Kong H-Shares & Shanghai Stock Exchange A Shares
Zhejiang Expressway	1353	Hong Kong H-Shares
Anhui Expressway	1335.5	Hong Kong H-Shares & Shanghai Stock Exchange A Shares
Shenzhen Expressway	1408.1	Hong Kong H-Shares & Shanghai Stock Exchange A Shares
HUAYU Expressway	63.72	Hong Kong Stock Exchange
Sichuan Expressway	530	Hong Kong H-Shares & Shanghai Stock Exchange A Shares
China Communications Construction Co. Ltd.	4179	Hong Kong H-Shares

JIANGSU EXPRESSWAY: One of the major listed companies in the Chinese toll road industry in terms of assets managed, Jiangsu Expressway is engaged in the investment, construction, operation and management of a portion of toll road expressways within Jiangsu Province. Its core asset is the Jiangsu section of the Shanghai-Nanjing Expressway. The company still has all or some equity interests of toll roads and bridges within Jiangsu Province. As of December 31, 2009, the highway mileage managed by the Company exceeded 700 kilometers (435 miles), with total assets amounting to RMB25.5 billion ($3.75 billion). H-shares constitute 24.26% of the total issued share capital.

ZHEJIANG EXPRESSWAY: The primary vehicle of the Zhejiang provincial government for investing in, developing and operating expressways and roads in Zhejiang Province, Zhejiang Expressway boasts of substantial assets under its management. The company and its subsidiaries also carry out certain ancillary businesses such as automobile servicing, the operation of gas stations and billboard advertising along expressways, as well as the operation of a securities business. Major assets under management include the 248 kilometer (154 miles) Shanghai-Hangzhou-Ningbo Expressway, the 142 kilometer (88.2 miles) Shangsan Expressway, ancillary facilities along the two expressways, and Zheshang Securities. As of December 31, 2009, total assets of the Company and its subsidiaries amounted to RMB32.4 billion ($4.8 billion). The H-

Shares of the company, which represent approximately 33% of the issued share capital of the Company, were listed on the Hong Kong Stock Exchange in May 1997, and the company subsequently obtained a secondary listing on the London Stock Exchange in May 2000.

SHENZHEN EXPRESSWAY: The company is primarily engaged in the investment, construction, operation and management of toll highways and roads in Shenzhen, Guangdong, Hubei, Hunan and Jiangsu. As of the end of the 2009, the mileage of the highways invested by the Company (on an equity basis) exceeded 400 kilometers (248.5 miles). H-shares make up about 32.28% of the total share capital of the firm, while the company has total assets worth RMB22.25 billion ($3.3 billion). The construction management of seven projects has been entrusted to the Company, with an investment amount of over RMB6.2 billion ($914 million) already completed.

SICHUAN EXPRESSWAY: Mainly involved in the investment, construction, operation, and management of road infrastructure projects in Sichuan Province, the company also operates other businesses related to toll roads. It owns all or has a substantial interest in toll roads in Sichuan Province such as the Chengyu Expressway, Chengya Expressway, Chengle Expressway and the Chengbei Exit Expressways. By the end of 2009, the length of expressways owned by the company reached about 467 kilometers (290 miles), with total assets of RMB10.64 billion ($1.6 billion). H-shares constitute 29.28% of the total share capital.

HUAYU EXPRESSWAY: The company is engaged in investing, building, operating and managing infrastructure projects in China. At present, the ongoing project of the group is the Sui-Yue Expressway (Hunan Section), which is a dual three-lane expressway with a planned length of approximately 24.08 km (14.96 miles) to be completed by 2011. The group intends to operate the Sui-Yue Expressway (Hunan Section) once it is completed and open to traffic. Its total assets total $134 million. Established in July 1993, Shenzhen Huayu Investment & Development Co., Ltd ("Huayu Investment"), a part of the group, also engages in expressway investment, construction, operation and management in China. Currently Huayu Investment owns a total of five projects in Hunan and Shenzhen:

- *Sui-Yue Expressway Hunan Section*
- *Shuiguan Expressway*
- *Shuiguan Expressway Extension Line*
- *Shenzhen Qingping Expressway*
- *Shenzhen Eastern Expressway*

CHINA COMMUNICATIONS CONSTRUCTION COMPANY LTD.: Founded by the China Communications Construction Group, the China Communications Construction Co. Ltd. is the first large state-owned transportation infrastructure group, which has entered the overseas capital market, with its stock selected as a component of the Morgan Stanley Capital International Index (MSCI), as well as the Hang Seng China Enterprises Index (HSCEI). It ranks 224 globally in the

list of Fortune 500 companies for 2010 according to revenues. The Group is the largest port construction company and also boasts of a leading position in road and bridge construction as well as design in China. It also occupies a dominant position in dredging, railways, and port machinery manufacturing businesses. Some important road projects undertaken by this company are the Jinan-Qingdao Expressway, Shanghai-Nanjing Expressway, Beijing Capital Airport Expressway, Beijing-Tianjin-Tanggu Expressway and the Beijing-Zhuhai Expressway.

Earnings Growth				
	2007	**2008**	**2009**	**2010Q1**
Jiangsu Expressway	39.27%	-3%	29.41%	39%
Zhejiang Expressway	46.2%	-27.8%	-5%	17%
Anhui Expressway	-42%	23%	-0.4%	4%
Shenzhen Expressway	16.45%	-19.2%	7%	39%
HUAYU Expressway	-26.5%	263.9%	-525%	-
Sichuan Expressway	66%	9.1%	38.61%	67.44%
China Communications Construction Co. Ltd.	88.6%	0.7%	18.5%	-

Risks involved in road projects

The primary risks involved in the development of any road project can be classified as follows[6]:

Development risks: These relate to the risks faced by the concessionaire or the sponsor before the initiation of construction, in the form of land acquisition for the project, environmental clearance and creditworthiness issues.

[6] 'Risk Management in Toll Road Concessions', Lara A. El-Amm, *MIT*, February 2003

Construction risks: Risks that arise during the course of the construction of the road project such as difficult site conditions, engineering and technical difficulties as well as poor performance of suppliers and contractors.

Operation risks: These are the significant risks that arise once the road is operational and the tolls are collected in the form of incorrectly estimated traffic demand, toll levels and the toll collection technology.

As most expressway projects have a strong backing and support of the government, development and construction risks for China's expressways are limited. However, operational risks do pose a few real challenging issues for Chinese toll roads.

One problem facing the toll road sector are the toll rates, which appear exorbitant at 12 cents per mile, working out to be more than the cost of fuel for many types of cars[7]. For instance, given the vast expanse of the country, a road trip from the South of China to the capital Beijing would cost about $200 in tolls. This poses a major challenge for toll road companies seeking to increase their toll incomes and profit margins. However, one possible solution has been the adoption of weight-based toll methodology for freight vehicles by the 27 provinces and municipalities, which has yielded results in terms of an increase in toll incomes and improved profit performances too.

Moreover, these road projects are often plagued with uncertainties relating to traffic levels and the demand for toll roads, which result in inaccurately estimated toll revenues. Traffic volumes are highly sensitive to domestic as well as external macroeconomic conditions. This has been experienced by China during the recent global economic crisis when toll roads that served export activities, connecting important ports, saw a decline in traffic levels.

Another issue of concern could be the fact that the rapid and ongoing expansion of the expressway network in the country may exceed the existing demand and as well lead to a division of traffic from toll roads earlier constructed. This duplication may lead to lower revenues for several such toll roads.

The Chinese government has also committed over $300 billion to the construction of high speed rail lines during the next 20 years. While currently the expanse of the rail network in the country does not adequately link all its cities as well as its road network does, this could emerge as a significant competition to the Chinese toll roads in the future, undermining their profitability.

Despite challenges, prospects for the future remain bright

The Chinese toll road sector seems to have rebounded strongly since the commencement of 2010, clocking strong increases in toll revenues and net profits in the first quarter. Jiangsu

[7] 'The Cost of Driving in China', Paul Midler, *forbes.com*, April 2010

Expressway, Zhejiang Expressway, Shenzhen Expressway and Sichuan Expressway have all registered double digit growth in their earnings supported by a robust recovery in traffic volumes. While Zhejiang Expressway recorded a 10% increase in its toll revenues during this period, Shenzhen Expressway witnessed a phenomenal 96.4% increase. Sichuan Expressway also recorded a healthy 20% rise in its toll incomes in the first seven months of this year compared to the previous year. With a rosy export scenario and buoyant domestic retail sales, future prospects for the toll road sector remain favorable. Needless to say, well-equipped with a world-class, extensive, and expansive road network, China is poised to facilitate its fast-paced economic development, and to emerge even stronger as a global economic juggernaut.

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