Certain information and statistics set out in this section and elsewhere in this prospectus relating to the Chinese economy and the industry in which we operate is derived from various official government publications. Certain information set forth in this section has been extracted from an industry study report we commissioned from OC&C, an independent industry consulting firm. We believe that the sources of this information are appropriate sources for such information and have taken reasonable care in extracting and reproducing such information. We have no reason to believe that such information is false or misleading or that any fact has been omitted that would render such information false or misleading. The information has not been independently verified by us, the Joint Sponsors, the Underwriters or any other party involved in the Global Offering and no representation is given as to its accuracy.

We commissioned OC&C, a global industry consulting firm with over 20 years of industry experience in the transportation sector, to conduct a detailed analysis of and to report on China's ITS market and industry, and, in particular, ITS applications in the expressway, railway and urban traffic (including urban roadways and rapid transit) sectors.

The methodology employed by OC&C combines primary and secondary research to provide analysis of the ITS market in China. Data collection was carried out by analysts with specific knowledge of the ITS industry. Secondary sources such as company reports and trade data of industry groups, government policies and government statistics provided the context for the analysis of historical data and estimates. In addition, OC&C conducted interviews with industry experts in order to support its estimates. The interviews also served as a method of cross-checking and verifying data and assumptions.

Certain information set forth in this section has been extracted from the industry report prepared by OC&C (the "OC&C Industry Report" or the "Industry Report"). The consulting fees paid by the Company to OC&C in connection with the preparation of the Industry Report for this prospectus is approximately US$138,000.

Certain other information and statistics set forth in this section is derived from various official government publications which are not commissioned by our Company.

OVERVIEW OF TRANSPORT INFRASTRUCTURE IN THE PRC

Relationship Between China's Economic Growth and Transportation Needs

China's economy has grown significantly since it began its economic reforms in 1978. Between 2001 and 2008, China's GDP increased from over RMB10 trillion to over RMB30 trillion.[1] China's real GDP growth rate of 9% in 2008 is also the highest among the four BRIC countries. This growth continued in 2009, when China experienced GDP growth of 8.7% in 2009.[2] China has emerged as the third largest economic body in the world measured by nominal GDP, and is predicted to surpass Japan in 2010 to assume second place behind the U.S.[3] Both foreign and domestic trade have continued to grow in China as a result of its economic growth, and in 2008, China's foreign trade exceeded RMB18 trillion.[4]

---

1 China Statistical Yearbooks

2 2009 National Economic and Social Development Statistics Bulletin

3 "China Economy shows strong growth in 2009" BBC. January 21, 2010

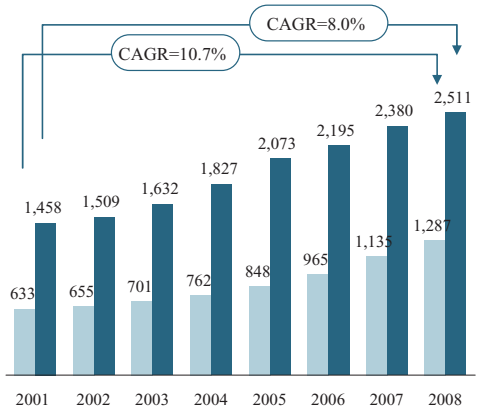
4 China Ministry of Commerce

Freight transportation

Historically, there has been a close correlation between China's GDP development and its freight transportation needs. The increased demand for transportation is largely driven by the increased level of domestic and foreign trade, which is underpinned by strong growth in the manufacturing sector. A regression analysis of the past 18 years revealed strong correlations between road and railway freight turnovers and total GDP values. Accordingly, as China's trade activities increased, both road and rail freight turnovers achieved CAGRs of 10.7% and 8.0% respectively over the past seven years. In 2008, China's road freight turnover was 1,287 billion tons per kilometer, while rail freight turnover was 2,511 billion tons per kilometer.

China's road and rail freight turnover (2001-2008)

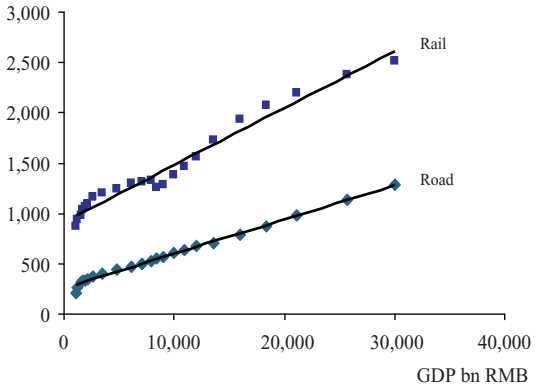
Unit: bn ton per km



Source: China Statistical Yearbook; China Railways Yearbook

China's road and rail freight turnover vs GDP (1991-2008)

Unit: bn ton per km



Source: China Statistical Yearbook, China Railways Yearbook; OC&C

In summary, the growth in China's GDP, driven by domestic and foreign trade growth, strengthens the need for a more connected transportation network and better transportation infrastructure.

Passenger transportation

Similar to freight transportation, passenger turnover has shown a high correlation with GDP growth over the last 18 years. With the rapid development of China's national economy, China has also experienced a significant corresponding increase in passenger traffic volume. Some of the main factors contributing to the growth in passenger traffic volume are:

- *Urbanization.* China has seen a trend of urbanization as the national economy has developed, where the urbanization rate is currently 46% and expected to reach 60% in 2020. However urbanization has not been uniform across the country and there are extreme variations in population densities in different parts of the country. The vast majority of the population lives in the country's well-developed eastern side, where urban area densities can exceed 2,200 persons per square kilometer. By contrast, the less developed areas of western China are far more sparsely settled. According to China City Statistical Yearbook, by the end of 2008, there were eight "mega cities" in China with populations in excess of 10 million and 265 large cities with populations exceeding one million.[5]
- *Motorization.* China's automobile market grew at a rate of 53% in 2009 exceeding 13 million automobiles in annual sales volume and surpassing the United States as the world's largest vehicle market. Total private vehicle numbers have increased from 7.7 million in 2001 to 35 million in 2008, indicating a CAGR of 24% over that period.

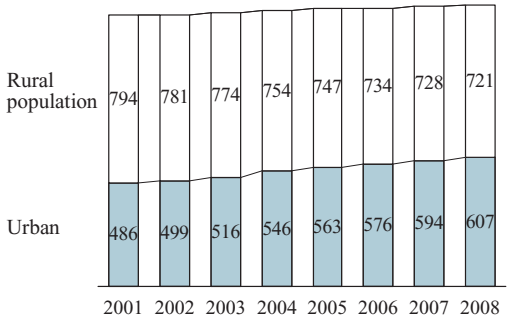
[5] China City Statistical Year book 2008; "City" here refers to administrative area, including both urban and suburban populations

- *Population growth.* China's current population of 1.33 billion accounts for 20% of the world's population.[6] China's population growth rate has slowed to approximately 0.6% due to the government's strict population control policies. However due to the large population base, it is estimated that by 2010, China's population will grow by 20 million, approximately equal to Australia's total population, and reach 1.35 billion.

The trends of urbanization, increased vehicle ownership and population growth have resulted in greater traffic flows, increased traffic densities and expansions of city perimeters, which drive the need for greater transportation services and more urban traffic infrastructure.

China's urbanization trend

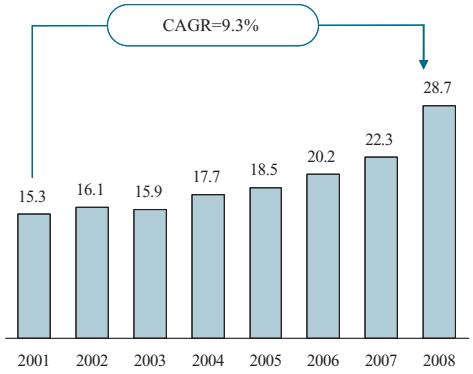
Unit: mn people



Source: China Statistical Yearbook

China's total passengers by year

Unit: bn passengers



Source: China Statistical Yearbook
Note: Data includes passengers for roads, railways, waterways and civil aviation

Development of Transportation Infrastructure in China

An expanding population coupled with a fast growing economy and rapid trade growth require more advanced transportation systems to move goods and people around the country efficiently. In order to provide sufficient support for the continuation of rapid GDP growth and to keep up with the country's urbanization trend, China has invested heavily to build up its transportation infrastructure in railways, roads, waterways, and civil aviation. In recent years, the growth in transportation infrastructure development, particularly for expressways and railways, has been driven by three plans announced by the PRC government. The most recent of these was the RMB4 trillion stimulus package, announced by the PRC government amid global economic downturn in 2008, where RMB2 trillion was allocated towards infrastructure investment.

Government Plan	High-Level Objectives	Time Horizon
7918 Plan	55,000 km of expressway by 2010	2005-2030
	85,000 km of expressway by 2030	
Mid to Long Term Railway Network Plan	120,000 km of total railway network by 2020	2004-2020 (revised in 2008)
	16,000 km of high-speed dedicated passenger lines by 2020	
	60,000 km of second track by 2020	
	72,000 km of electrified railways by 2020	
RMB4 trillion stimulus package	RMB2 trillion allocated to infrastructure construction	2008 onward

Source: Ministry of Transport; Ministry of Railways

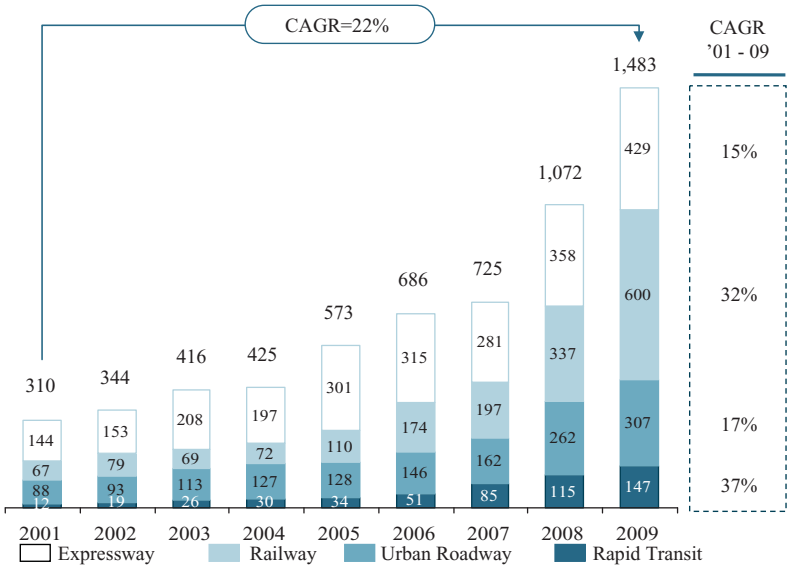
As highlighted in the following charts, the total transportation infrastructure expenditures in expressways, railways and urban traffic for 2006, 2007 and 2008 were RMB686 billion, RMB725 billion and RMB1,072 billion, respectively. In 2009, largely due to the government's stimulus package, total transportation investment

[6] National Bureau of Statistics of China

surged to RMB1,483 billion, representing a 22% CAGR from 2001 to 2009. Railways accounted for the bulk of this investment, reaching RMB600 billion in 2009, representing a 32% CAGR from 2001 to 2009. Expressway construction formed the second largest investment sector, exceeded RMB429 billion in 2009 and representing a CAGR of 15% from 2001 to 2009.

China's transportation infrastructure investment

Unit: bn RMB



Source: Ministry of Communications; China Railways Yearbook; OC&C

Expressway Infrastructure

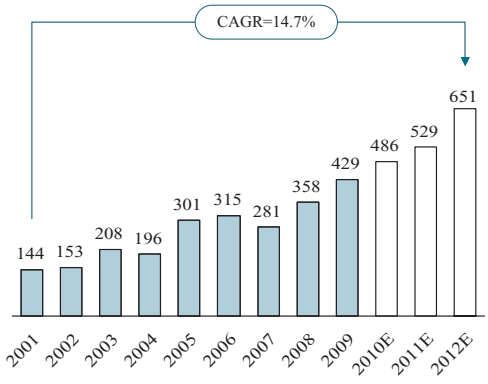
China's expressway network is the second longest in the world with a total length of approximately 65,021 kilometers as at the end of 2009.[7] China also has the world's longest tollway network with a total length of 100,000 km including both expressways and non-expressways, accounting for about 70% of the global total. Approximately 24,000 kilometers of new expressway were added during the Tenth Five-Year Plan from 2001 to 2005, and an additional 30,000 kilometers of new expressways are expected to be built during the Eleventh Five-Year Plan.[8] Despite the addition, China's expressway density is still lower than developed countries such as Germany, Japan and the U.S, who have expressway densities of 3.52 km/100km^2, 1.67 km/100km^2 and 1.02 km/100km^2 in 2009, respectively, according to the Country Statistics and Ministry of Communications. China's expressway density of 0.68 km/100km^2 is one-third less than the density of the U.S., and over 80% less than the density of Germany.

7 U.S. Federal Statistics; China Statistical Yearbook
8 China Statistical Yearbook

In December 2004, the Ministry of Communications, the government agency responsible for road and water transportation regulations in China, announced a development plan for the National Trunk Highway System ("NTHS"). More commonly known as the "7918 Plan," the NTHS will consist of seven radials from Beijing, nine north-south major highways and 18 east-west corridors. After its completion, the NTHS will connect all provincial capitals and cities with populations of at least 500,000. Under this plan, China will expand the NTHS to 55,000 kilometers by 2010, and to 85,000 kilometers by 2030. China's total network length is estimated to reach 72,500 km in 2010 and 130,000 km in 2030, including local construction by provincial governments to connect to the NTHS. With the additional investment in expressways from the government's stimulus plan, it is estimated that the total expressway network length will reach 87,500 km by 2012. The map entitled "China's Expressway Network (7918 Plan)" in this section shows the extent of coverage under the 7918 Plan.

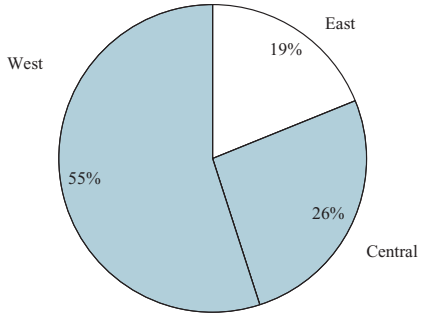
China's expressway investment (excluding tunnels)

Unit: bn RMB



Source: OC&C

2005-2030 expressway investment by region



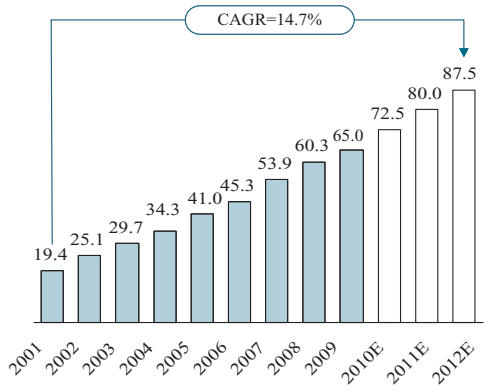
Source: OC&C

The charts above highlight historical annual investment in expressways in the PRC. Annual expressway infrastructure investment is expected to increase from RMB429 billion in 2009 to RMB651 billion in 2012. Under the 7918 Plan, 55% of China's expressway investment will be apportioned to the western regions, 26% to the central regions, and the remaining 19% to the eastern regions.

When expressways were first developed in China, construction initially focused on the more developed eastern regions, where the terrain is predominately flat. As shown in the shaded chart above, with increased development in China's central and western regions, which are more mountainous, expressway tunnels will become increasingly important. As indicated in the graphs below, growth in expressway tunnel length is expected to outpace overall expressway growth, with expressway tunnel length expected to increase from 1,009 km in 2009 to 1,989 km in 2012.

China's expressway length in operation

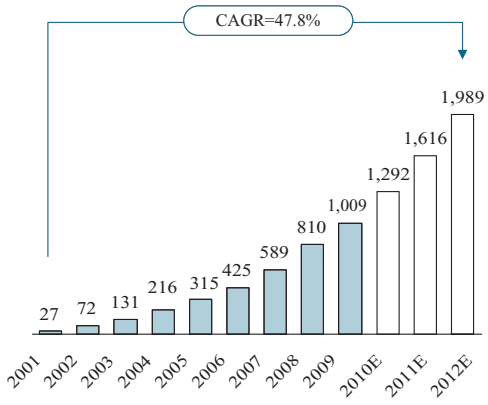
Unit: thousand km



Source: OC&C

China's expressway tunnel length in operation

Unit: km



Source: OC&C

China's Expressway Network (7918 Plan)

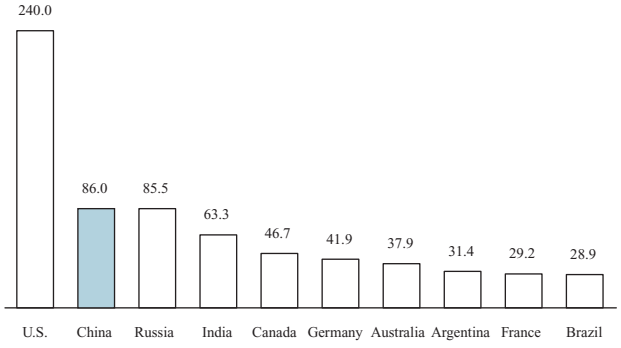
Source: Ministry of Communications

Railway Infrastructure

China has the longest railway network in Asia, and is ranked second globally by length after the United States.[9] However, given its large population and economic significance, China's railway network remains significantly underdeveloped compared to other large countries. As China's economy and population continued to grow in the past decades, the limited railway transportation capacity became an obstacle to further economic development, where rail transportation only met 40% of total demand in 2008.

Length of railway network by countries[1]

Unit: thousand km



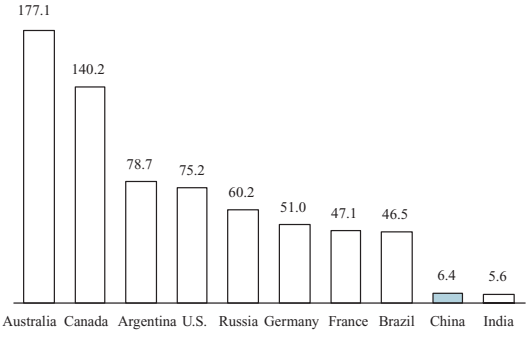
Note:

1) Data for China and Russia is as of 2009 and all other countries are as of 2008

Source: China Railway Yearbook; Association of American Railroads; Russian Railways; related country statistics

Length of railway vs. population[1]

Unit: cm/person



Note:

1) Data for China and Russia is as of 2009 and all other countries are as of 2008

Source: China Railway Yearbook; Association of American Railroads; Russian Railways; related country statistics

To solve the issue on railway capacity, the Ministry of Railways announced a Mid to Long Term Railway Network Plan (the "Railway Network Plan") in early 2004. More recently, the RMB4 trillion stimulus package announced in November 2008 provided the largest allocation to the railway infrastructure construction among all sectors, which accelerated several railway projects. In November 2008, the Ministry of Railways also announced a revised Railway Network Plan, where under the revised plan:

- China will invest RMB2 trillion in total railway infrastructure investment, up from the original target of RMB1.25 trillion and five times the amount spent during the Tenth Five-year Plan.
- China's railway network will be improved in the eastern and central regions, and expanded in western regions.
- Railway network length will increase by 34,000 km between 2008 and 2020, bringing the total network length to 120,000 km, which is 20,000 km longer than originally planned in 2004.
- High-speed dedicated passenger lines, lines designed to have peak speeds of 250 km/h or more, will increase from its current network length of 3,800 km to a total network length of 16,000 km by 2020, 4,000 km longer than originally planned. Based on current construction plans, this target is expected to be met earlier than planned, where the total network length for high-speed railways will reach over 27,000 km by the end of 2014.
- To better incorporate technology into railway construction, 34,000 km of electrified railways and 22,000 km of second tracks, which are additional construction and upgrades not counted in official total length, will be added to the network.

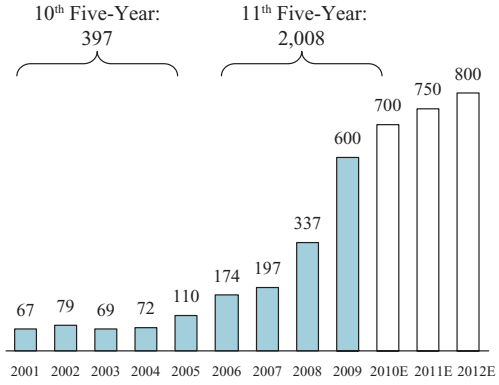
To meet the revised target and the increasing transportation demand, investment in railway infrastructure construction has been growing exponentially in recent years. Annual railway infrastructure investment for 2007,

[9] Ministry of Railways official announcement, January 2010

2008 and 2009 were RMB194 billion, RMB337 billion and RMB600 billion, respectively. In January 2010, the Ministry of Railways announced plans to invest RMB700 billion in railway infrastructure, and it is estimated by OC&C that RMB750 billion and RMB800 billion will be spent in 2011 and 2012, respectively.

2001-2012 Investment in rail transport [1]

Unit: bn RMB

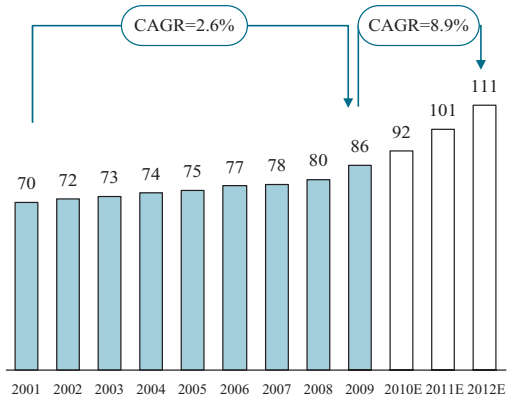


1) Excludes investment on train purchasing

Source: China Railways Yearbook; OC&C

Length of railway in operation in China

Unit: thousand km

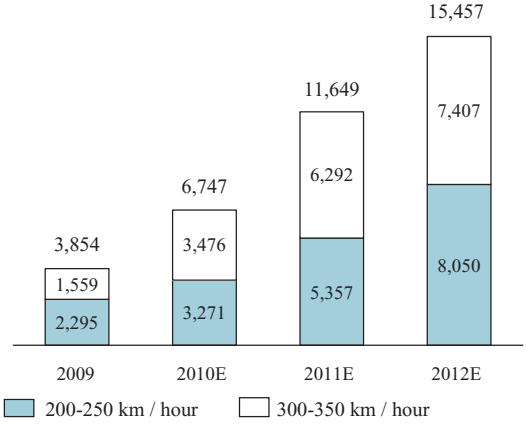


Source: China Railways Yearbook; 11th Five-year plan; OC&C

Approximately 75% of annual railway investment from 2010 to 2012 will be directed towards high-speed railways as part of a nationwide speed acceleration program. The operation of high-speed railways poses a threat to other forms of transportation, especially civil aviation, where a number of short-haul flights routes in Europe have been superseded by high-speed railway connections. China's high-speed railway network length is currently 3,800 km. By 2012, China is expected to have over 15,000 km of high-speed railways as shown in the graph below. Based on current project plans and progress of construction, where an estimated 4,500 km and 7,500 km of high-speed railway will be put into use in 2013 and 2014, respectively, China's total high-speed railway network is expected to reach over 27,000 km in 2014. The charts below highlight the growth in China's high-speed railway network.

China High-Speed Railways

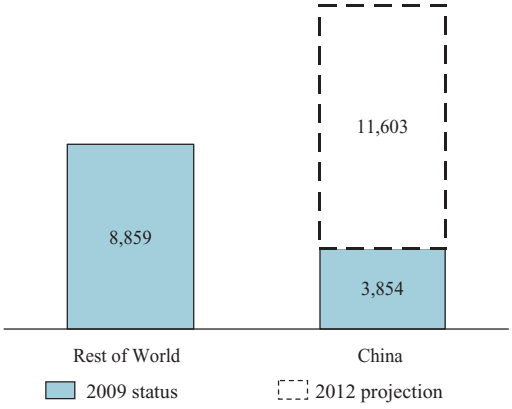
Unit: km



Source: China Railways Yearbook; OC&C

China vs. Global High-Speed Railways Length

Unit: km



Source: China Railways Yearbook; International Union of Railways; OC&C

Eleventh Five-Year Plan—Railway

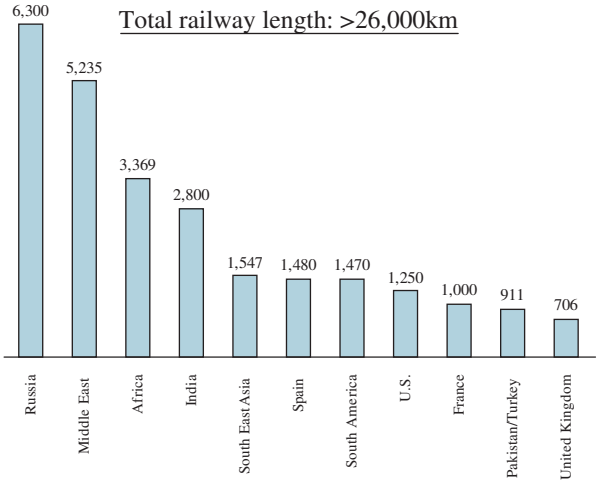
Source: Ministry of Railways

On a global basis, passenger and freight transportation is on the rise all over the world. As a result, demand for railway networks is more apparent in less developed nations while countries with existing railway networks are also actively planning to construct high-speed railways to improve transport efficiency. Among countries with official announced plans, additions to total railway lengths will exceed 26,000 km, with infrastructure spending of approximately RMB5,500 billion expected to be invested on new railway construction over the next five years.

The United States, Russia, and various nations from Europe, Africa, the Middle East and South America have significant plans to develop railway networks. The United States, which already has the world's longest railway network, announced a strategic plan in April 2009 to construct high-speed railways in order to reduce reliance on cars and spur economic development. A total railway length of 1,250 km is likely to be built in ten corridors, with initial investment of RMB54 billion and OC&C estimates a total investment of RMB375 billion from 2010 to 2015. According to the Russian Transportation Strategic Development Plan announced in November 2008, Russia also plans to add a combination of second tracks, electrified railways, high-speed railways and very high-speed railways to their network, with total investment in railway infrastructure expected to exceed RMB13,660 billion from 2010 to 2030. The charts below highlight, on a global basis, investment amounts dedicated to railway infrastructure and expected network length increases.

2010-2015 expected new railway length by country[1]

Unit: km

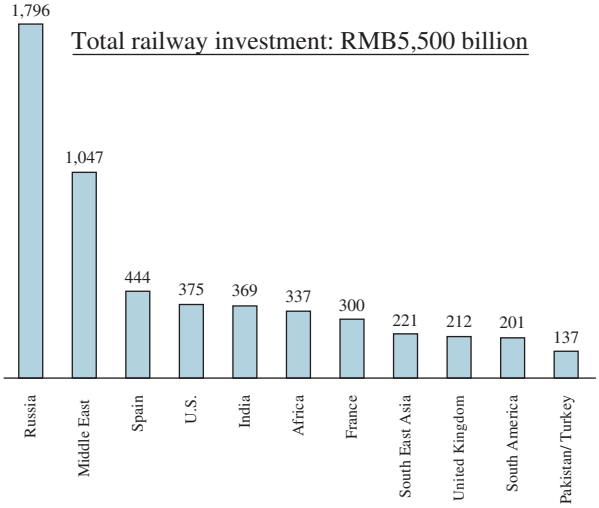


Source: Russia Transportation Strategic Development Plan, U.S. Department of Transport, and other official government announcements, OC&C Analysis

1) Listed countries with known government announcement

2010-2015 expected investment in railway infrastructure by country[1]

Unit: bn RMB



Source: Russia Transportation Strategic Development Plan, U.S. Department of Transport, and other official government announcements, OC&C Analysis

1) Based on countries with known official government announced plans on railway constructions, U.S. investment based on OC&C analysis

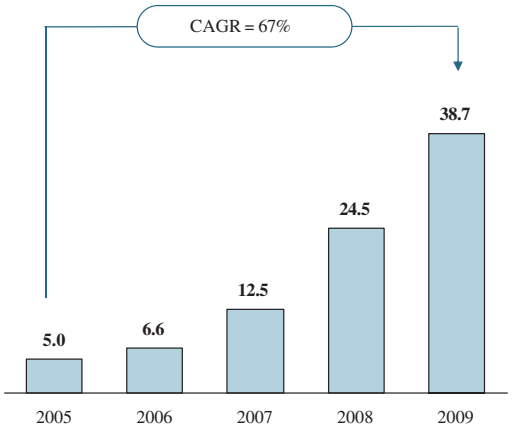
With such significant potential globally, Chinese railway construction companies are increasingly involved in foreign railway markets. China continues to accumulate experience in railway and especially high-speed railway constructions, and hold several competitive strengths in foreign markets.

- China has replaced Russia to own the world's second longest railway network, and has extensive experience in the construction of railway infrastructure and related ITS systems.
- China has developed leading technology in a number of fields, including renovation of existing lines and construction of high-speed dedicated passenger lines, therefore is positioned to cater for different market needs.
- Chinese companies have a cost advantage on railway infrastructure construction compared to Western companies.

Accordingly, during the 2010 Ministry of Railways Conference, the government encouraged Chinese companies to further expand into the overseas market, with leading railway construction companies such as China Railway Group Limited and China Railway Construction Corporation Limited demonstrating strong results from global expansions in recent years.

2005-2009 combined overseas revenue of
China Railway Group Limited & China Railway Construction Corporation Limited

Unit: bn RMB



Source: China Railway Group Limited and China Railway Construction Corporation Limited Annual Reports

Urban Traffic Infrastructure

Development of China's urban traffic infrastructure includes development in two segments: roadways and rapid transit (including light rail). Urban traffic is an independent segment not included in national transportation system planning. However in a well developed and integrated urban traffic network, rapid transit and urban roadway should act as good substitutes for and complements of each other.

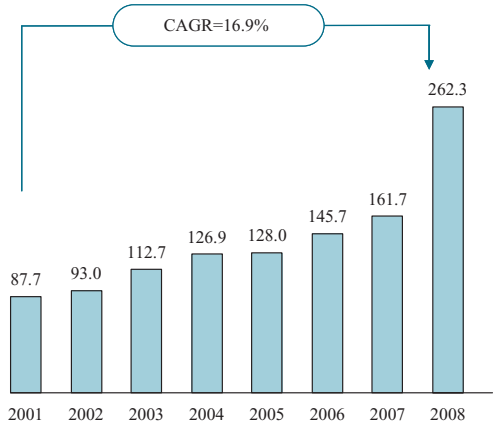
Urban roadways are mainly driven by three key factors, namely urbanization, suburbanization, and motorization,

- *Urbanization*. China's current urbanization rate of 46% is expected to reach 60% by 2020. According to OC&C estimates, this represents an urban population increase of 250 million from 2008 to 2020. China's growing urban population have resulted in quickly expanding city perimeters and increasing demand for urban transport services.
- *Suburbanization*. While nationwide, the rural population is gradually migrating towards urban areas, suburbanization has been increasing as space becomes more limited in city centers. This is evident in Beijing over the past five years, where the resident population in the four inner districts has declined while resident population increased substantially in the four outer districts. Additionally, local governments have been promoting new industrial and technological parks on the fringe of urban areas, such as the Shanghai Zhangjiang High-Tech Park and Ningbo Daxie Island Economic-Technological Development Area, thus pushing urban development further into rural areas.
- *Motorization*. China now has the world's largest automobile market, with automobile sales volume growing by 53% in 2009 and private vehicle ownership growing at a CAGR of 24% between 2001 and 2008. The growth of China's automobile industry and increased private vehicle ownership has amplified the need for a better connected urban roadway transport system.

Driven by these factors, annual investment in urban roadways have grown at a CAGR of 17% from 2001 to 2008, reaching a total investment amount of RMB262 billion in 2008. Furthermore, due to major road upgrades every eight years and increases in construction unit costs, the growth in urban roadway investment amount typically outpaces the growth in roadway network length.

Urban roadway investment

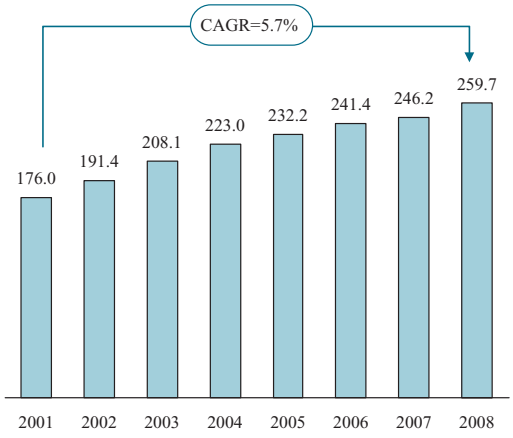
Unit: bn RMB



Source: China Urban Construction Statistics Yearbook; OC&C

Urban road length

Unit: thousand km



Source: China Urban Construction Statistics Yearbook

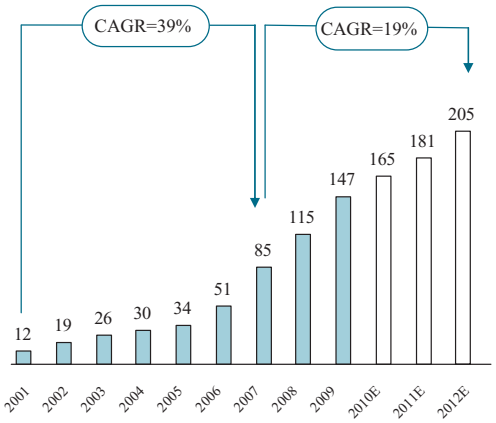
Rapid transit also plays a significant role in improving transportation efficiency, offering several benefits over urban roadways.

- Rapid transit systems have a much higher capacity than roadway bus services. It is estimated that during peak hours, a subway train can transport 40,000 to 60,000 people per hour, while a bus can only transport 1,800 people per hour.
- Rapid transit systems allow users to avoid traffic congestion, a common occurrence on roadways. Underground and light-rail trains can be relied on to provide a punctual travel experience that is appreciated by daily commuters.
- As rapid transit systems use an electric power supply, it generates little pollution and places less burden on the environment
- Safer transport is provided on rapid transit systems than roadway transport. Accidents on rapid transit are rare due to higher technology standards and stricter management rules.

Accordingly, the Chinese government has imposed a "Public Transit as Priority" policy, where the development of rapid transit became a top priority among national development plans. Similarly, urban traffic development has been set as one of the major areas in the Eleventh Five-Year Plan. Annual investment in rapid transit has grown at a CAGR of 39% from 2001 to 2007, reaching a total investment of RMB85 billion in 2007 and is expected to grow at a CAGR of 19% and reach RMB205 billion in 2012.

Rapid transit investment

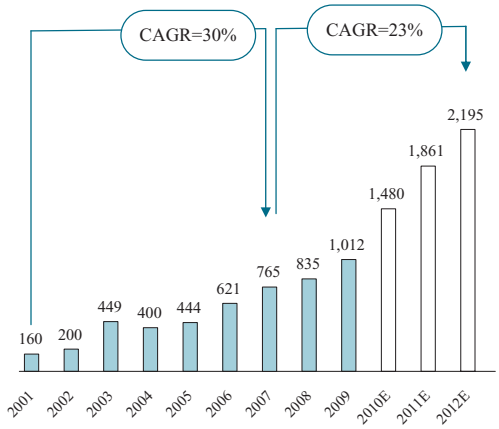
Unit: bn RMB



Source: China statistical yearbook; OC&C

Rapid transit length

Unit: km



Source: China statistical yearbook; OC&C

According to the No. 81 Circular issued by the General Office of States Council on Enhancing the Administration of Urban Rail Transit Construction, a city may apply for subway construction if the city's population exceeds 3 million, GDP exceeds RMB100 billion and the revenue budget exceeds RMB10 billion. By the end of 2009, 11 cities in China had rapid transit systems in place and are still actively expanding their network, where their expansion plans were accelerated due to the government's stimulus package. Additionally, 21 cities have been approved to build, or are currently building a subway system. The planned lengths for various major cities are listed in the table below. It is expected that another nine cities will be eligible to apply for subway systems between 2010 and 2012.

China's total rapid transit length reached 765 km in 2007, and is expected to grow at a CAGR of 23% to 2012, reaching 2,195 km. There is also further potential for the rapid transit market to grow as cities expand their rapid transit network and more cities become eligible. It is estimated that by 2015, China will have a total rapid transit network length of 3,440 km.

China's rapid transit expansion

Source: China City Yearbook

China's rapid transit length by city (2007-2012)

Unit: km

City	2007	2008	2009	2010E	2011E	2012E
Beijing	142	200	228	276	358	440
Shanghai	251	253	330	400	450	500
Tianjin	71	79	72	130	164	198
Wuhan	10	10	10	28	28	72
Guangzhou	116	113	150	222	222	278
Dalian	73	87	87	87	108	108
Chongqing	19	19	19	19	57	100
Changchun	39	32	40	47	47	47
Shenzhen	22	22	25	146	178	178
Nanjing	22	22	22	84	84	84
Shenyang			28	40	40	40
Chengdu					16	16
Hangzhou					69	87
Xi'an					21	27
Foshan					19	19
Total	765	837	1,012	1,480	1,861	2,195

Source: China Statistical Bureau; China city and provincial government announcements

INTELLIGENT TRANSPORTATION SYSTEMS IN THE PRC

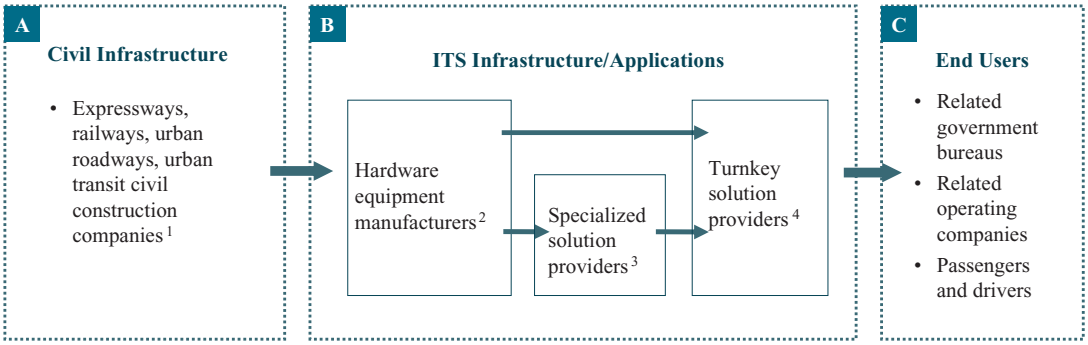
Intelligent Transportation Systems Industry Overview

Intelligent Transportation Systems provide information and data exchange for various types of transportation infrastructure by deploying solutions such as communication, surveillance, and tolling. The 14th World Congress on ITS, defined ITS as comprehensive systems that integrate and apply advanced information, communication, control, sensor and computer technology to effectively coordinate people, vehicles, and roads/rails to realize real-time information transfer, as well as on-time, highly efficient, safe, and energy-efficient transportation.

Intelligent Transportation Systems value chain

The following diagram illustrates the typical value chain and the relationships between each role.

Transportation infrastructure industry value chain



Source: OC&C

1) Construction companies such as China Communications Construction Company, China Railway Construction Corporation, etc.
2) Equipment manufacturers such as Huawei, Zhongxing Intelligent Transport System Beijing Co., Ltd., etc.
3) Specialized solution providers such as Fiberhome Telecommunication Technologies Co., Ltd., etc.
4) Turnkey solution providers such as Shanghai Electrical Apparatus Research Institute (Group) Co., Ltd., Shanghai Communications Technology Development Co., Ltd., China Railway Signal and Communication Corporation, etc.

Note: Some ITS solution providers provide both Specialized Solutions and Turnkey Solutions.

There are four main segments in the ITS industry value chain, namely end customers, Turnkey Solution providers, Specialized Solution providers and hardware equipment manufacturers. The segments perform the following roles:

- End customers are the project owners, who are typically government bureaus such as the Provincial Communication Department, Ministry of Railways or Public Traffic Management Bureau. These parties usually hold strong bargaining positions in the value chain, selecting ITS players based on their qualifications, track records, reputation, technical background, financial strength and marketing abilities.
- Turnkey Solution providers purchase equipment and software from Specialized Solution providers or directly from manufacturers, and integrate these to create an ITS infrastructure for end-customers in civil transport infrastructure sectors such as expressways and railways. In some sectors, such as railway, Turnkey Providers are highly regulated, and only select groups are permitted to carry out turnkey projects across China.
- Specialized Solution providers usually act as suppliers to Turnkey Solution providers, although some may contract directly with end customers. Specialized Solution providers provide the design, development and implementation of hardware products, software products or individual ITS solutions, to cater to specific needs in a client's existing or planned ITS infrastructure system. These providers may cover a number of sub-systems, such as communications, surveillance, tolling, or signaling sub-systems, or may focus on a specific sub-system or systems.
- Hardware equipment manufacturers provide equipment to individual equipment devices to either Turnkey Solution or Specialized Solution providers for integration and further processing.

The value chain described above is reflective of the value chain for the expressway, railway and urban roadway ITS sectors. The value chain is slightly different for the rapid transit ITS sector, where Specialized Solution providers typically complete specific projects outsourced by the rapid transit operator.

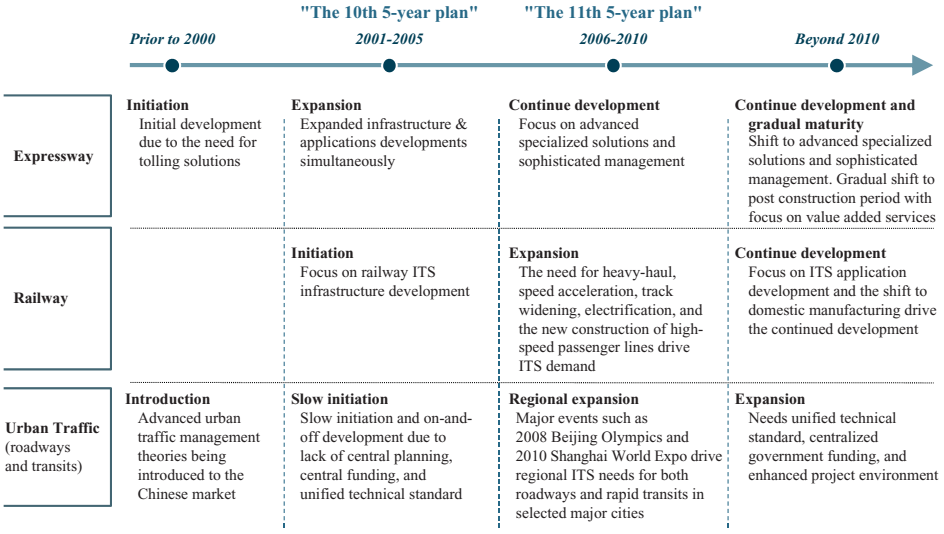
Contracts for Turnkey Solution providers and Specialized Solution providers across the ITS sectors and segments are typically awarded through a bidding process. More information on the bidding process can be found in the section entitled "Business—Project Operations Process" in this prospectus.

Development stages of China's ITS market

Development of an ITS market normally goes through multiple stages. It typically starts from the introduction of concepts and ideas, to initiation of early developments, to expansion and roll-out of ITS infrastructure and applications. This is followed by the continued development of advanced Specialized Solutions, which solve discrete problems for clients' particular transport infrastructure, and finally shift toward a focus on value added services at the maturity stage, such as post-construction operation and maintenance ("O&M") and follow-up value-added services.

China's ITS industry is still at an early stage in terms of infrastructure and applications. While China's economic growth and accelerating urbanization have led to development of its transportation infrastructure, China has also recognized a need to use roads, railways and urban transportation networks more effectively. China initiated its ITS efforts in 1994 with goals to enhance transportation management, to improve network throughput, and to reduce the negative effect of transportation to the environment. The chart below demonstrates the development stages of different ITS market segments in China.

China ITS market segment development stages



Source: OC&C

For expressways, despite heavy investment in building up the ITS infrastructure, China's expressway ITS system is still in the early development stage. Compared to an average proportion of 7%-10% of ITS investment to total expressway investment in developed countries, China has only reached 1%-1.5%. Yet, ITS infrastructure is a necessity in China, due to the fact that over 90% of expressways are tollways which, at a minimum, require tolling solutions. Given that China has the longest total tollway network in the world, a larger-scale, more advanced expressway ITS infrastructure is needed. China's increasing traffic density also drives the continued development of communication and surveillance ITS applications. As more expressway ITS infrastructure is installed, the ITS market will shift towards focusing on applications (specialized solutions) and post-construction service (value-added services) in the future.

For railways, the nationwide speed acceleration, new construction of high-speed passenger lines, heavy-haul railway improvement programs and infrastructure build-out provide the foundation for railway ITS system installations and upgrades. Since railway transportation has become a bottleneck for PRC economic development in recent years, the government is determined to build a world-class railway network in the coming few years. As the ITS infrastructure is installed, the trend within the railway ITS market will shift towards the development of ITS applications such as intelligent systems for safety, freight transportation, passenger transportation, and traveling. Such systems will help improve transportation operations and efficiency while improving passenger satisfaction. The ITS investment as percentage of total railway investment is expected to grow.

For urban roadways, the ITS market is far less developed but undergoing regional expansions due to new road construction, increasing population density, expansion of urban areas and special events such as the 2008 Beijing Olympics, the 2010 Shanghai World Expo, and the 2010 Asian Games. Urban roadways provide a large but fragmented ITS market, as the construction of urban roadways is usually planned by local or municipal governments rather than the central government. This local planning results in a lack of centralized funding, lack of technical standards, and complex project environments has resulted in actual investment historically fallen short of budget. However from 2010 and onwards, urban roadway transport and public security will be placed under a more centralized control, where the Public Traffic Management Bureau and Public Security Bureau will be responsible for creating a safe and efficient environment, to promote a "Safe City" concept, creating much greater potential for urban roadway ITS applications. Urban roadway ITS offer many potential benefits, such as relieving traffic congestion, reducing carbon emission, improving road safety, hence should be considered as a necessity. As the effects of urbanization, suburbanization and motorization increase across China, the necessity for ITS solutions will become more significant.

For rapid transit, the mass development of rapid transit infrastructure did not begin until the late 1990s and early 2000s. However due to the organized central planning and funding, the rapid transit ITS market is currently undergoing vast development in several cities across China.

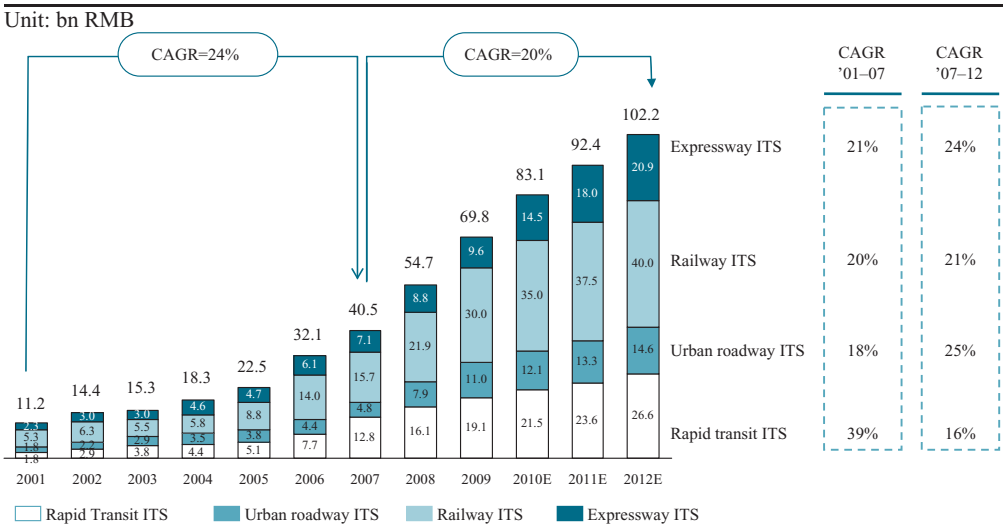
In 2008, the Ministry of Communications, Civil Aviation Administration of China and Bureau of Postal Services merged to form the Ministry of Transport, where in the future, expressways, highways, waterways and civil aviation will be governed by a single centralized body. This integration is expected to pave the way for the establishment of a modern, integrated transportation system, where an integrated ITS solutions will be overlaid. While improving the overall efficiency of the transportation system, this integration is also likely to have the following implications on China's ITS industry:

- The need for integrated ITS solutions across multiple applications, such as seamless transitions for container shipping from expressway ITS systems to waterway ITS systems.
- Unified technology standards, such as communication protocols, surveillance image transfer protocols.
- Industry players being horizontally integrated across ITS sectors are likely to be able to cater latest technology across ITS sectors to market needs.

China's ITS market

China's ITS market is driven by a significantly expanding transportation infrastructure and increasing need for more effective and efficient transportation management. Coupled with ITS development still at an early stage, there exists enormous potential for the installation, upgrade and use of ITS applications. Annual investment in the ITS industry has grown significantly, reaching total ITS investment exceeding RMB40.5 billion in 2007, almost four times the level of 2001. Annual investment is expected to grow at over 20% from 2007 onwards, exceeding RMB102 billion by 2012.

China ITS market overview



Source: OC&C

Expressways

Expressway ITS industry segments

An expressway can be broken down into two major components—the physical infrastructure and the information technology layered on top of that. While the physical infrastructure provides the necessary infrastructure for the movement of goods and passengers, ITS, the information technology layer, provides for data collection and analysis that facilitate the efficient management of the expressway. As over 90% of China's expressways in China are toll roads, ITS is a necessity for expressway operators.

Expressway ITS involve three primary solutions: communication, surveillance and tolling solutions:

- Communication solutions are the backbone of all other sub-systems. By utilizing high-speed data networks, standard data connection protocol and digital information exchange systems, these solutions provide voice, data and image communication throughout the expressway system.
- Surveillance solutions can help operators better manage expressways. Generally, an expressway surveillance system will include multiple sets of on-road cameras and a control center at the provincial level. It enables expressway operators to monitor traffic flows, respond quickly and accurately to traffic incident sites, reduce traffic incidents and congestion, and provide timely information to expressway users.
- Tolling solutions in expressway operations consist of toll lane management systems, toll booths management systems sub centers, and collection centers. In addition to performing toll collection functions, such solutions also collect traffic flow and traffic pattern information. A recent study has shown that toll leakage could reach as high as 10% of tolling revenue, therefore reducing intentional toll leakage is a key success factor for tolling solutions.

These solutions serve many different types of users, including expressway operators, expressway users and government agencies.

- For expressway operators: tolling solutions can reduce leakage and effectively track revenue; surveillance solutions can track traffic flow and traffic patterns can maximize an expressway's utilization by responding to congestions and planning road maintenance in off hours.
- For expressway users: automatic tolling can increase the speed of traffic flow; effective surveillance, linked by communication systems can track traffic data and advise drivers of congestion information

via in-car GPS, short-range radios, or real-time road signs. This reduces travel time, improves safety, and potentially reduces overall travel costs.

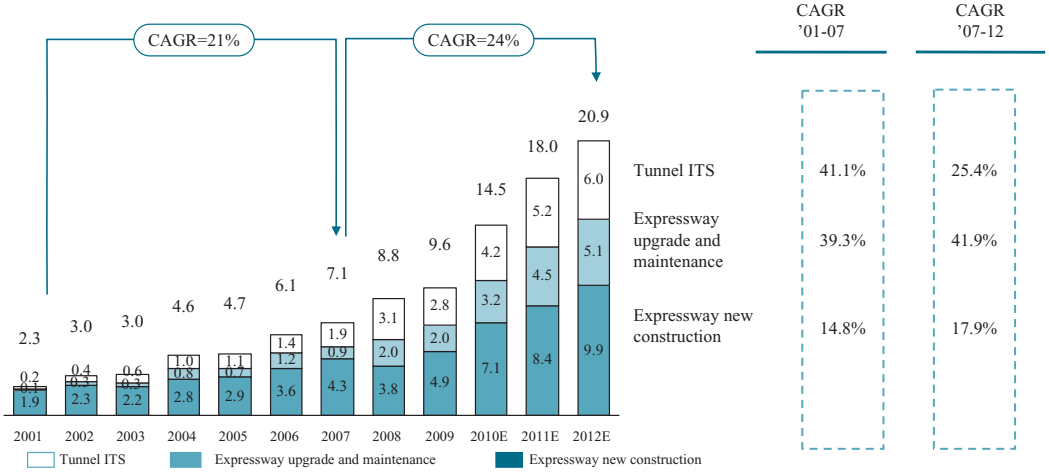
- For government agencies: ITS communication platforms, including dedicated control centers at the provincial level can monitor all expressways within the province and collect traffic information for ongoing analysis.

Expressway ITS market size

Chinese ITS investment in expressway ITS (including tunnels) has grown from RMB2.3 billion in 2001 to RMB7.1 billion in 2007, reflecting a CAGR of 21%. The market is expected to continue growing to RMB18.0 billion and RMB20.9 billion by 2011 and 2012 respectively, implying a CAGR of 24% between 2007 and 2012. The figure below shows the historical growth and future forecast of China's expressway ITS investment, separated into investment for new ITS construction, ITS upgrades and maintenance, and tunnel ITS.

Historical growth and forecast of expressway ITS investment

Unit: bn RMB



Source: OC&C

For new expressway construction, the Chinese government has invested heavily in expressway infrastructure since 1998, resulting in 45,600 kilometers of new expressways being constructed from 2001 to 2009. Driven by the 7918 Plan and provincial governments' intention to connect local roadways to the NTHS, the national expressway network is expected to expand to approximately 72,500 kilometers and 130,000 kilometers by 2010 and 2030, respectively. Accordingly, ITS investment on newly constructed expressways, which makes up about 1%-1.5% of total expressway investment has grown from RMB1.9 billion in 2001 to RMB4.3 billion in 2007 and annual investment is expected to reach RMB9.9 billion by 2012, growing at a CAGR of 17.9%.

Expressway ITS systems need annual maintenance and large scale upgrade and replacement every six years. In 2001, the maintenance and upgrade market in expressway ITS was minimal due to the limited expressway network at that time. Additional investments are expected in the maintenance and upgrade of existing ITS systems with the development of new expressway infrastructure, China's existing expressways facing maintenance and upgrade requirements, and continuous advancement of new technology and solutions. The maintenance and upgrade market reached an estimated RMB0.9 billion in 2007, representing a CAGR of 39.3% from 2001 to 2007. This market is expected to grow to an estimated RMB5.1 billion by 2012, growing at a CAGR of 41.9%.

Tunnel construction is expected to become increasingly important and outpace expressway construction. China's expressway infrastructure development was initially focused on the well-developed eastern regions. As

expressway investment shifts to central and western regions under the 7918 Plan, it is expected that significantly more tunnels will be constructed during this period, given the mountainous terrain of the western regions. Tunnels are typically more technically complex than standard expressway ITS, due to the requirements for ensuring adequate safety and throughput, as well as the need for lighting control systems, ventilation systems, and humidity control systems. ITS investment on expressway tunnels is expected to increase from RMB1.9 billion in 2007 to RMB6.0 billion in 2012, growing at a CAGR of 25.4%.

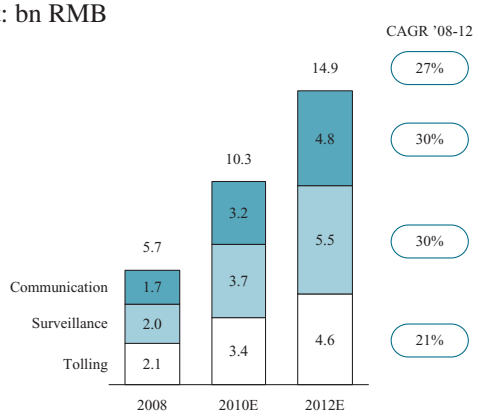
Regional and segmental market analysis

From a regional perspective, the central and western regions are expected to become important ITS markets as expressway investment expand to these regions. According to the 7918 Plan, the ITS investment will be apportioned as follows: 55% to the western region, 26% to the central region, and only 19% to the eastern region.

In terms of product segments, the expressway ITS market (excluding tunnels) can be broken down into tolling, surveillance, and communication. The surveillance and communication segments are expected to enjoy the fastest growth to 2012, growing at an estimated 30% CAGR, while the tolling segment is expected to grow at an estimated 21% CAGR during the same period.

Expressway ITS investment by segment [1]

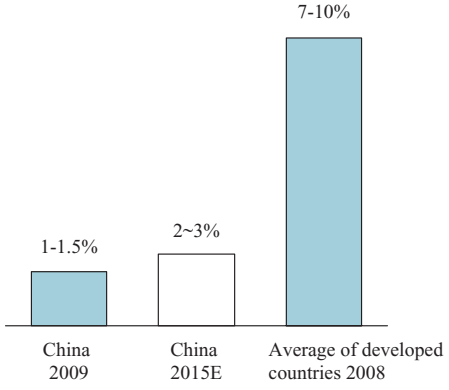
Unit: bn RMB



Source: OC&C

1) Excludes tunnels

ITS investment as % of total expressway investment



Source: China Urban Construction Statistics Yearbook

Industry trends and drivers of expressway ITS

In addition to the significant expressway infrastructure investment, there are other factors that are expected to drive the development potential of expressway ITS, as well as emerging trends that can be seen as the market grows:

- *Increasing penetration rates*. China's ITS investment of 1% to 1.5% as a percentage of total expressway investment is very small compared to developed countries' average of 7% to 10%. Developed countries have a higher percentage due to the use of higher end products and more sophisticated solutions. Currently, China's expressways have relatively low densities of ITS devices and a low level of value-added services. However, increased traffic densities have created a greater demand for traffic safety and efficiency from passengers. Similarly, the Chinese government has established guidelines for expressway transportation which emphasize safety and efficiency.

  These demands and guidelines impose higher requirements for expressway ITS, such as a greater density of surveillance devices and more timely information on traffic flows and accidents, therefore also driving the penetration rates of expressway ITS. By 2015, ITS investment is expected to account for 2% to 3% of total expressway investment.

- *Ongoing ITS services such as value-added services*. As the ITS market in China matures, there will be increasing demand to further optimize expressway efficiency and data management.

From a consumer perspective, value-added services can also be developed to make traffic information from various sources available to end-users to reduce travel time, improve safety and potentially reduce overall travel costs. Value-added services contracts have begun to be awarded, and are expected to become increasingly significant across China's eastern regions over the next two to three years.

From a business perspective, highly-standardized, efficient and effective post-construction maintenance of ITS infrastructure for expressway operators is likely to be one of the major trends going forward. This is expected to emerge as the expressway infrastructure moves from a construction to an operating focus. With the typical O&M services for expressway ITS in developed countries ranging between 5% to 10% of ITS capital costs, China's expressway ITS market potential for O&M services could reach RMB3.6 billion to RMB7.2 billion annually in the future.

Furthermore, to fulfill the need for efficient operation and effective resource planning, software based management platforms such as ERP solutions or inter-provincial information systems that can help expressway operators obtain real-time operational information and fulfill operational tasks will be widely used in the near future.

- *Networked tolling on a provincial level has experienced significant growth, while implementation of inter-provincial networked tolling is not expected to be material in the short-term*. With the support of the central government since 2000, provincial level networked tolling systems have grown substantially. However, inter-provincial networked tolling continues to face obstacles and provincial communication departments still lack strong incentive to cooperate across provinces. However given the determination of the central government to build up the ITS information platform, cross-province networked tolling may gain traction over the long term.

- *Electronic Toll Collection ("ETC")*. The Ministry of Communications has issued technical guidelines supporting ETC trials and implementation. So far, Guangdong Province is the leading province in ETC application, with systems installed in approximately 10% of toll stations. Many other provinces have begun trials of ETC on various expressways. ETC requires additional costs for electronic road labels and ETC toll booths. However local governments have encouraged the use of ETC, with some provinces introducing discounted fees for cars using ETC. In the long term, however, as traffic density become more intensive and more vehicle owners realize the benefit of ETC systems, ETC is expected to gradually gain wider application. As a global example, Japan's ETC penetration rate grew from 10% to 75% in approximately five years, surpassing the 70% penetration rate in the U.S. It is expected that once China's ETC penetration reaches a critical level, a similar market trend may occur.

- *Total coverage surveillance*. It is expected that the demand for total coverage surveillance systems that provide constant live video feeds of any section of the expressway at any point in time will increase. Together with video detection technologies, unexpected incidents throughout the highway can be identified, monitored, and reported to the operators on time, which makes it possible to response to incidents more quickly and efficiently, to reduce the impact of the incidents, and to eliminate potential follow-up accidents.

Railways

Railway ITS industry segments

China's railway ITS industry is at a relatively early stage of development. Similar to the expressway sector, the main focus to date has been the roll-out of ITS infrastructure, which for railway includes communication, signaling and power supply systems.

- Communication Systems serve as a backbone platform to transmit wired and wireless information to ensure secure communications between the locomotive and the station at all times.

- Signaling Systems ensure safety distance between locomotives, track various physical movements of locomotives on the railway and send appropriate signals accordingly to advise locomotive drivers as to speed, timing and coordination with other locomotives traveling along common tracks.

- Power Supply Systems ensure a reliable supply of power and cover all electricity consumption along the railway (e.g., communication and signaling equipment and railway station) except for traction power.

Traction power involves the supply of power from the railway track to the locomotive. It involves a dedicated power system supplying power along the track, the contact line transferring power from the track to locomotives, and the equipment on the train transforming power from the contact line. While related to power supply, traction power is not considered part of railway ITS due to close association with the locomotive market segment.

Over time, ITS applications, such as centralized traffic control, freight transportation, advanced ticket booking and travel guide systems are expected to be increasingly layered on to the fundamental ITS infrastructure.

Through comprehensive hardware and software systems, ITS applications in the railway sector can meet the needs of rail operators, passengers, freight shippers and government agencies.

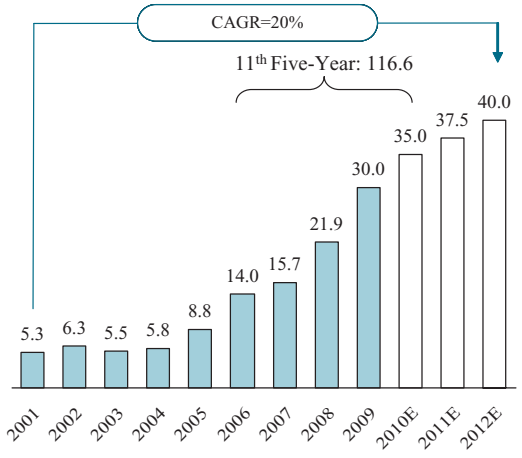
- For rail operators, ITS systems can deal with large volumes of information automatically and reduce mistakes attributable to human error. As a result, locomotives can run at very high speeds with shorter spacing between trains, thus exploiting the capacity of railway mileage.
- For passengers, ITS systems allow safe and reliable operation of high-speed trains and the collection of real-time schedule information. As a result, passengers are able to plan ahead and know that they will arrive at their destination more quickly, more safely and on time.
- For freight shippers, enhanced communication technology based upon GSM-R systems has allowed for reliable communication on heavy-haul trains as well as effective means to track and manage shipped goods en route.
- For government agencies, in addition to facilitating the role of rail operator, which is often a government function, ITS systems can collect and analyze railway passenger and freight data to increase the efficiency of existing railways and assist in the strategic planning of future lines.

Railway ITS market size

With the rapid increase in China's GDP, railway capacity became a bottleneck to the further growth of the Chinese economy and demand for rail transportation has increased beyond the speed of railway construction in China. Demand for railway capacity will be met by new railway infrastructure construction as well as a comprehensive speed acceleration program. According to the Eleventh Five-Year Plan, the RMB4 trillion stimulus package and the revised Mid to Long Term Railway Development Plan, investment in railway construction will grow to RMB2,008 billion[10] between 2006 and 2010. Of this investment, an average of 1%-2% is designated for communication systems, 3%-5% for signaling systems, and 1% for power supply systems.[11] On aggregate, the addressable market size for railway ITS solution during the Eleventh Five-Year plan is estimated at RMB116.6 billion.[12] In line with the large investment in railways construction, railway ITS investments are expected to grow to RMB37.5 billion in 2011 and RMB40 billion in 2012.

Total market size of ITS applications in railway [1]

Unit: bn RMB

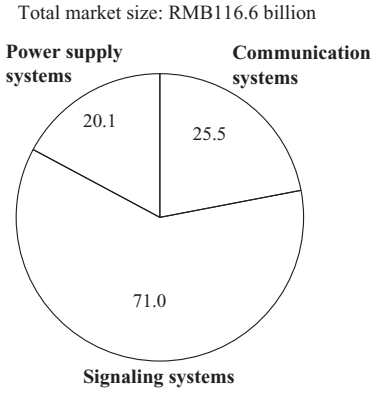


Source: OC&C

1) Includes communication, signaling and power supply systems

Railway ITS market by segment (2006-2010)

Unit: bn RMB



Source: OC&C

The railway ITS market is comprised of communication, signaling and power supply systems.

For communications systems, the total market size for 2006 to 2010 is estimated to be RMB26 billion. The market size in 2009 was RMB6 billion and expected to grow to RMB7.5 billion and RMB8 billion annually for 2011 and 2012. Upgrading existing wireless systems with GSM-R technology will further expand the market for ITS communication solutions. Additionally, as domestic technology continues to mature, it is expected that market momentum will shift towards domestic players who have lower cost structures.

For signaling systems, the total market size for 2006 to 2010 is estimated to be RMB71 billion. The total market size in 2009 was RMB18 billion and expected to grow to RMB22.5 billion and RMB24 billion for 2011 and 2012 respectively. Unit costs of signaling systems correlate with train speed, i.e., the faster the train, the higher the cost. For lines with operational speeds below 200 kilometers per hour, expenditures on signaling systems are about RMB1.0 million to 1.5 million per kilometer. For very high-speed lines with operational speeds above 300 kilometers per hour, expenditures on signaling systems can rise to RMB10 million per kilometer. While this market was previously dominated by foreign players with technical advantages, the market for normal speed and high-speed (above 200 km/hr) has gradually shifted towards domestic players, and only the very high-speed (above 300 km/hr) is controlled by international firms.

10 Including new and renewal lines, excluding train purchasing

11 OC&C Analysis

12 Including communication systems, signaling systems and power supply systems

For power supply systems, the total market size for 2006 to 2010 is estimated to be RMB20 billion and expected to grow to RMB7 billion and RMB8 billion for 2011 and 2012, respectively. The need of larger installed base for power supply has been driven by high-speed railways and heavy haul tracks, which require denser communications, signaling and surveillance systems.

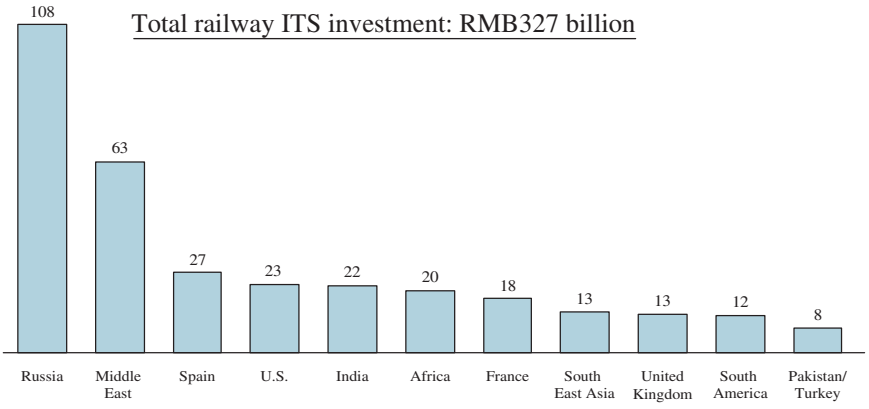
For traction power, the total market size for 2009 was approximately RMB36 billion and typically accounts for 6% of railway investment.

Foreign railway ITS market for domestic ITS players

Based on announced railway construction plans of foreign countries, OC&C estimates this will result in a railway ITS market size, which includes communication, signaling and power supply systems, of RMB327 billion.

2010-2015 expected investment in railway ITS by country[1]

Unit: bn RMB



Source: OC&C Analysis

1) Railway ITS includes communication, signaling and power supply sectors.

Industry trends and drivers of railway ITS

The government has begun several initiatives that will further stimulate the railway ITS sector in addition to the significant investment in new railway infrastructure construction. Furthermore, railway ITS applications in China are still at an early stage, hence there is large potential for the railway ITS market in the coming years. As the railway ITS market grows, a number of trends are also likely to emerge.

- *Increased ITS complexity from railway speed acceleration and new high-speed railway construction*. The Ministry of Railways has carried out six waves of train speed acceleration since 1997, increasing freight and passenger transportation capacity by 12% and 18%, respectively. Complex ITS applications will be required to accommodate these initiatives. As an example, reducing the intervals between trains will require more complex and reliable railway ITS to ensure safety. Similarly, increasing train speeds will demand more advanced communication, signaling, and train control systems.

- *Ongoing ITS services such as value-added services*. As a result of intensive investment in railway infrastructure during the past years, China has established a broad network infrastructure to collect information on train operation, passenger and freight transportation and develop value-added services. The Ministry of Railways has developed several application systems to leverage the value of these kinds of information, such as travel guide systems, on-board ticket booking systems, freight tracking systems. These service systems are expected to be rolled out widely in the near future.

  Another future trend is the increasing need for maintenance work to ensure stability in railway systems. It is estimated that in some European countries such as France, EUR8,000 to EUR10,000 per kilometer

is spent annually on O&M for railway ITS. It is expected that China's O&M market for railway ITS is likely to emerge once China's current focus shifts from railway construction. In the wireless communications sector, maintenance service contracts in China have begun to be awarded in 2008 and the potential total market size for O&M services is estimated to reach RMB6.5 billion to RMB8.4 billion annually.[13]

- *Higher local content rate*. Driven by both cost and domestic industry development considerations, the PRC government in 2003 set a target of 70% minimum local content rate for China's railway ITS sector. The Chinese government reinforced the target in 2007 and the local content rate of 70% is now realized in some sectors of the railway ITS market, and higher local content rates are expected to be the trend in future.
- *Wide application of GSM-R technology*. To solve the rail transportation capacity problem, the Ministry of Railways established an intensive construction plan for high-speed and heavy-haul railways in the coming years. Currently, GSM-R remains the only commercially viable technology for communications systems for high-speed and heavy-haul railways. GSM-R technology is currently being employed in the construction of new railways, as well as the upgrade of existing railways.
- *Emerging surveillance systems market*. Most railway lines are not yet equipped with surveillance systems. After railway operational requirements are met, surveillance systems are increasingly required for safety and process control. The Ministry of Railways promotes all newly built lines to install surveillance systems and upgrade all existing lines with such systems, when funds are sufficient.
- *Joint ventures between state-owned enterprises and foreign companies*. Global market leaders such as Siemens AG, Alstom (China) Investment Co., Ltd. and Bombardier Inc. have all entered joint ventures relationship with state-owned enterprises, in hopes to get market entry qualification. It is a mutually beneficial relationship, whereby state-owned enterprises can leverage advanced know-how of foreign partners to expand their high-end product lines while foreign companies gain entry to the Chinese market.
- *Overseas expansions.* The foreign railway infrastructure construction market provides significant opportunity for Chinese ITS companies, who have begun to play an active role in this market. In order to better capture these growing opportunities, the most feasible method is through partnerships with major railway construction companies such as China Railway Group Limited and China Railway Construction Corporation Limited. As the Chinese government now encourages an alliance approach between railway construction companies and railway ITS companies, Chinese ITS companies are expected to further capitalize on the global reach of leading Chinese construction companies.

Urban Traffic—Urban Roadways

Urban roadway ITS industry segments

Urban Traffic ITS can be broken down into two primary segments: roadway and rapid transit, including subway and light rail. In the urban roadway segment, ITS focuses on building integrated traffic command and control systems, which provide scientific traffic management, enhanced access to less congested roads and quick response to emergency events. The primary sub-systems, which can be deployed independently, are listed below:

- Surveillance Systems include traffic closed-circuit television monitoring, large screen integrated display, variable information panel and parking guide systems.
- Traffic Control Systems coordinate traffic signal timing to increase traffic flow and reduce delays.
- Electronic Police Systems detect, record, transmit and manage information on behaviors that breach traffic rules. Images and basic information of offending vehicles are sent to a control center for processing.

[13] Based on an exchange rate of EUR1.00 = RMB9.346

- Urban Tolling Systems surcharge users of an urban roadway network in periods of peak demand to reduce traffic congestion by integrating optic sensors and pattern recognition technologies with ETC technology.

Through comprehensive hardware and software systems, ITS applications can meet the needs of public transport providers, urban residents and government agencies.

- For roadway public transport providers: punctuality and safety can be enhanced through GPS systems that allow a centralized dispatcher to monitor the position of each bus and dispatch addition buses or emergency vehicles in the event of delays or accidents, respectively.
- For roadway users: whether driving vehicles or using public transportation, the travel time and cost can be reduced by integrated urban traffic control systems that can coordinate signals and optimize traffic flow based upon real time traffic conditions.
- For government agencies: such as police, traffic administration, hospitals and fire stations: ITS systems allow the efficient and accurate assessment of real-time traffic information, allowing reduced response time to traffic accidents or other emergency situations. In addition, automated surveillance and electronic police systems allow for uniform enforcement of traffic regulations. Indirect benefits of reduced traffic congestion and waiting time are lower carbon emissions and better energy conservation, providing a greener city environment.

Urban roadway ITS market size

Urban roadway ITS first began in 2000. Industry players initially consisted of university research centers and other technical companies as ITS investment was low and few integrated systems were deployed. In 2003, ITS construction levels increased in order to relieve traffic congestion. However as local governments lacked experience in city planning, urban roadway ITS was typically installed using small-scale incompatible systems and the general application levels were still relatively low.

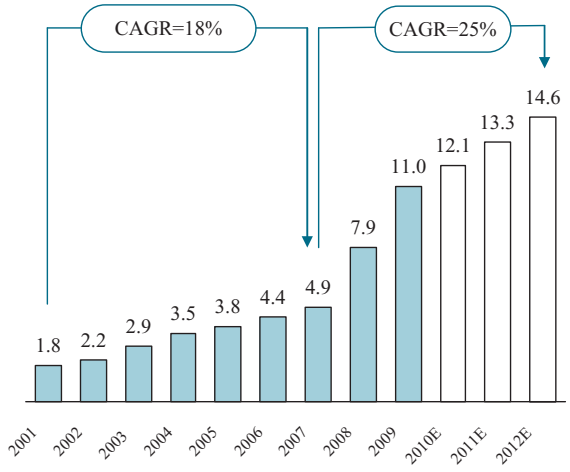
Beginning in 2005, Governments engaged in larger scale urban roadway ITS projects to ensure compatibility and sustainability. According to government plans, China will install real time traffic control systems in more than 50 major cities, public transit management systems in more than 100 major cities, and urban transit information management systems in more than 200 cities. The use of ITS applications has also expanded from first-tier cities and provincial capitals to municipal cities.

Special events also contributed to the growth of the roadway ITS market. In 2008, Beijing invested in various roadway applications to monitor traffic conditions and optimize traffic signals during the Beijing Olympic Games, resulting in overall transport efficiency on roadways improving by 15%.

Driven by increasing urbanization, motorization, suburbanization and hosting of special events, the urban roadway ITS market reached RMB11.0 billion in 2009. Surveillance solutions are the largest segment, accounting for RMB4.0 billion of the market in 2009. Traffic control systems accounted for RMB2.3 billion, electronic police systems accounted for RMB1.8 billion and miscellaneous systems accounted for the remaining RMB2.8 billion. It is estimated that urban roadway ITS will reach a market size of RMB14.6 billion by 2012, growing at a CAGR of 25% from 2007 to 2012.

Urban roadway ITS investment

Unit: bn RMB



Sources: China Statistical Yearbook; Beijing Public Traffic; Municipal Bureau; OC&C

While growth in this market was strong, the urban roadway ITS market faced a number of challenges that hampered its development. A lack of centralized funding, lack of technical standards, and complex project environments has resulted in actual investment historically fallen short of budget. However from 2010 and onwards, urban roadway transport and public security will be placed under a more centralized control, where the Public Traffic Management Bureau and Public Security Bureau will be responsible for creating a safe and efficient environment, to promote a "Safe City" concept, creating much greater potential for urban roadway ITS applications.

Industry trends and drivers of urban roadway ITS

- *Urbanization, suburbanization and motorization*. The increase of these trends, along with special events such as the 2008 Beijing Olympic Games, have led to greater demand for more complex ITS systems. On the roadway side, continuous ITS equipment maintenance will generate ITS spending to replace worn-out equipment and to improve ITS systems.
- *Central government support for roadway investment*. The Ministry of Communications proposed the following China ITS Development Objectives for 2006 to 2010: China will install real time traffic control systems in more than 50 major cities, public transit management systems in more than 100 major cities, and urban transit information management systems in more than 200 cities. Such central government support will be important in ensuring funding availability for actually implementing roadway ITS spending as well as laying the foundation for establishing unified technical standards. This is expected to increase attractiveness of the roadway ITS market, creating further opportunities and higher average project sizes.
- *Value-added services*. Major cities have seen repeated and intensive ITS application construction. Most ITS suppliers currently offer solutions in surveillance systems, urban traffic control systems, and electronic police systems. Going forward, value- added services and value-added operations are expected to see an upward trend in total investment. Value-added services such as advanced traffic

information system will likely show significant market opportunities as traffic congestion becomes more serious, with municipal cities and county cities the main targets.

- *Non-road uses*. With the Public Traffic Management Bureau and the Public Security Bureau co-operating to create a safe and efficient city environment, ITS applications will be used not only for traffic systems, but also in public locations. In Chongqing alone, approximately 500,000 video cameras will be installed over the next five years, implying a market size of RMB20 billion.

Urban Traffic—Rapid Transit

Rapid transit ITS industry segments

ITS systems have broad applications in urban rapid transit, including: communication systems, signaling systems, and total surveillance systems.

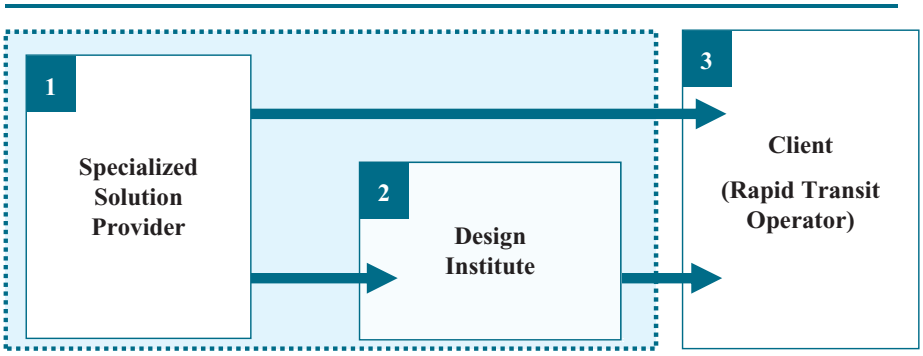
- Communication Systems consist of many independent sub-systems that allow wired or wireless communication of voice, images and data from subways and subway stations to central control centers.
- Signaling Systems play a crucial role in ensuring safe operations and enabling efficiency enhancing operation such as automatic train control for subways and light rails.
- Total Surveillance Systems comprise of advanced technologies to form the basis of rapid transit operations surveillance. They consist of multiple sub-systems to monitor real-time information and improve operational efficiency.

ITS applications can meet the needs of rapid transit passengers, as well as operators who need to coordinate passenger flows of up to 40,000 to 60,000 per hour on a subway train.

- For rapid transit operators, ITS applications allow automatic operation of subways and light rails which can increase safety and reliability by avoiding mistakes caused by human error.
- For rapid transit passengers, passenger information systems and automatic ticketing systems enhance the passenger experience while automating and securing revenue collection functions for the operators.

A different value chain applies to the rapid transit ITS market compared to other ITS markets. Specialized Solution providers usually bid on projects of a specialized scope that are outsourced by rapid transit operators.

Rapid Transit ITS value chain



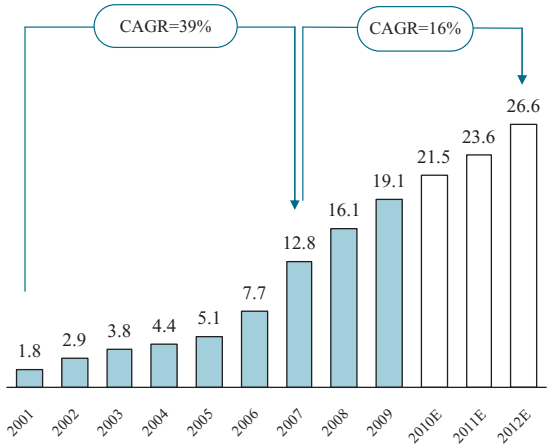
Rapid transit ITS market size

Under the Chinese government's "Public Transit as Priority" policy, annual investment in rapid transit is expected to grow from RMB147 billion in 2009 to reach RMB205 billion in 2012. Driven by intensive rapid transit construction, central government support, lower equipment costs and rising equipment localization rate, the domestic rapid transit ITS market has grown rapidly in recent years. Rapid transit ITS typically accounts for approximately 13% of total investment, as shown in the following chart. In 2009, rapid transit ITS reached a

market size of RMB19.1 billion. Signaling and total surveillance form the largest markets in this sector, each with a market size of RMB7.6 billion, while the communications segment accounted for the remaining RMB3.8 billion. The rapid transit ITS market is expected to reach a market size of RMB26.6 billion by 2012, growing at a CAGR of 16% from 2007 to 2012.

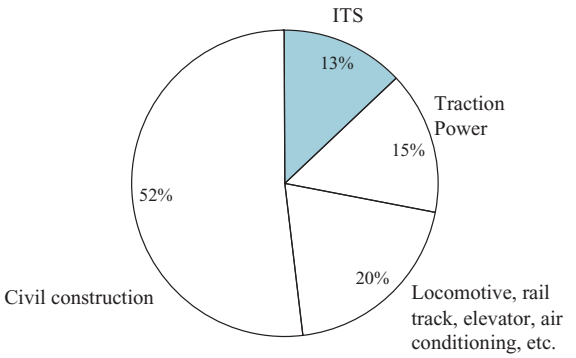
Rapid transit ITS investment

Unit: bn RMB



Sources: China statistical yearbook; OC&C

Rapid transit investment breakdown



Source: OC&C

Industry trends and drivers of rapid transit ITS

- *Ongoing ITS services*. Similar to the expressway and railway ITS sectors, the rapid transit ITS market will gradually shift towards value-added services as the construction of rapid transit systems are completed. Based on the operating models of developed rapid transit systems globally and China's current rapid transit length of 1,012 km, the potential market size for O&M services in China's existing rapid transit system could reach RMB1.6 billion to RMB1.8 billion annually, and would be potentially higher as more rapid transit lines and systems are added across Chinese cities.
- *Domestic players gaining market share from higher localization rates*. The Chinese government has increased the localization of its rapid transit ITS market, where the required localization rate is currently 70%. While some components are still dominated by foreign players, domestic companies have developed expertise in communications, signaling and surveillance solutions and capturing significant market share following the government's localization rate policy.
- *Improved ITS applications for passengers*. As the ITS requirements for managing rapid transit systems are satisfied, the ITS market will be focused towards passengers. ITS applications will begin to address the future needs relating to passenger information services, travel guide systems and re-direction.
- *Integration with other transport ITS sectors*. In recent years, rapid transit in major Chinese cities has evolved to connecting passengers within cities to major airports and railway stations. Rapid transit ITS in future will be required to link with other ITS applications, such as aviation ITS and railway ITS.