

# Chapter 2

## ROAD TRANSPORT IN THE PRC

### 2.1 The National Transport System

By the end of 2004, the PRC's transport network comprised some 1.87 million kms of public roads (of which 34,300 kms were expressways); 73,000 kms of railway lines; 124,000 kms of navigable inland waterways; and 175,000 kms of domestic air routes. There were also over 3,500 river and coastal ports. All ports, shipping and inland water transport are the responsibility of MOC. The same applies to roads and road transport, although much of this re-



sponsibility is delegated to provincial and lower-level administrations. Railway and air transport, infrastructure and services, and city bus services come under separate ministries.

With the economy growing by over 8–9 percent p. a. , aggregate demand has risen rapidly by an average of 6.6 and 7.6 percent p. a. between 1994 and 2004 in terms of passenger-kms and t-kms recorded respectively.[ 1 ] Air transport has grown the fastest ,but from a low base. Of the other more established modes ,road transport demand has grown the fastest in terms of passenger-kms ( Figure 2 ) but its growth in t-kms was exceeded by inland water transport ( Figure 3 ). Between 1994 and 2004 , road transport's share of passengers grew from 87.3 per-

cent to 91.9 percent , and of passenger-kms from 49.1 to 53.6 percent. Over the same period , road freight's share of tons carried dropped slightly ,from 75.8 to 73.0 percent , and in terms of t-kms from 13.5 to 11.3 percent ,largely due to a recent jump in the traffic carried by inland waterways ,but its share will probably increase in the future. Rising incomes and consumer demand and the economy's diversification from heavy industries , which favor inland waterway and rail transport , will likely bring an increase in road transport's share.

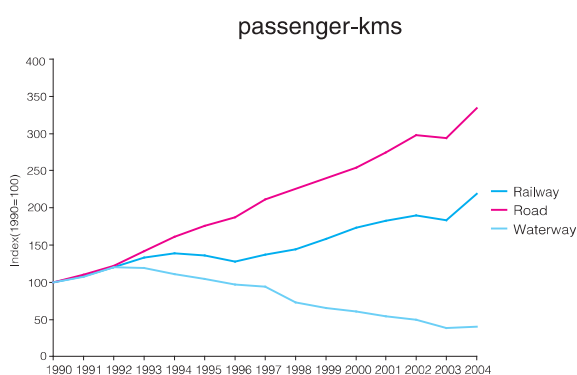
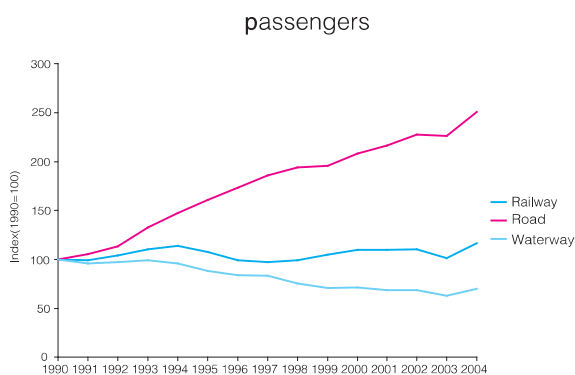


Figure 2 Growth in Passenger Traffic , 1990 – 2004 ( 1990 = 100 )

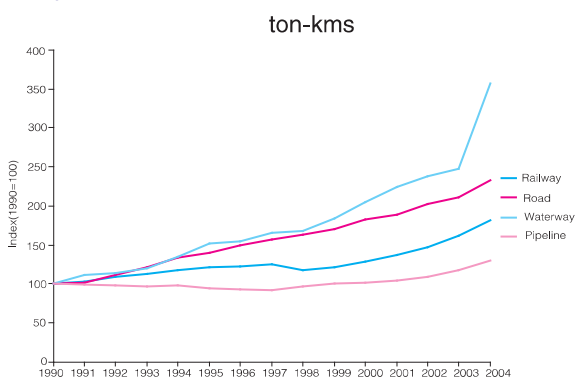
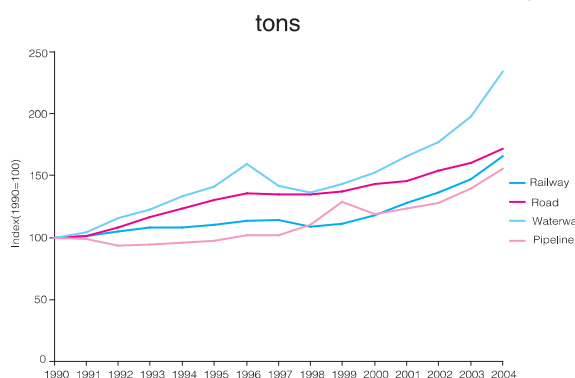


Figure 3 Growth in Goods Traffic , 1990 – 2004 ( 1990 = 100 )

Source of Figure 2 and Figure 3 : MOC

[ 1 ] Transport demand is sampled regularly by the National Bureau of Statistics ( NBS ) , but coverage of the informal sector is probably incomplete. The demand for road transport and its share of the total may be higher than officially recorded.

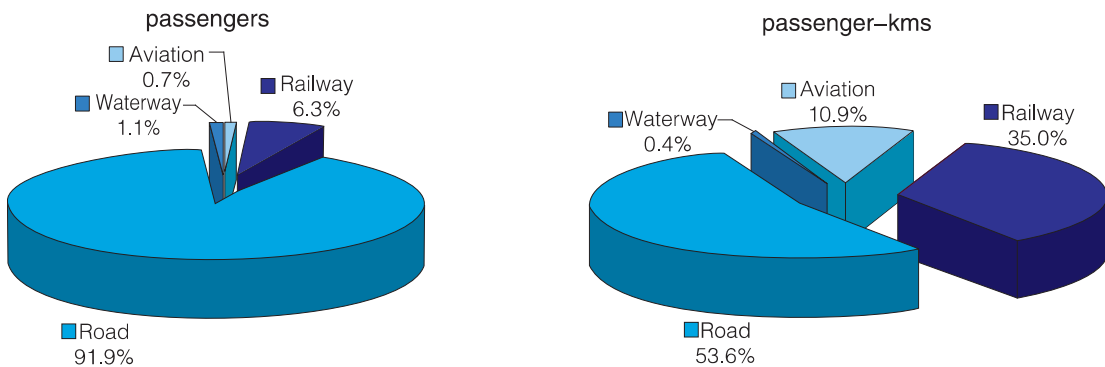


Figure 4 Mode Shares , Passenger Traffic , 2004

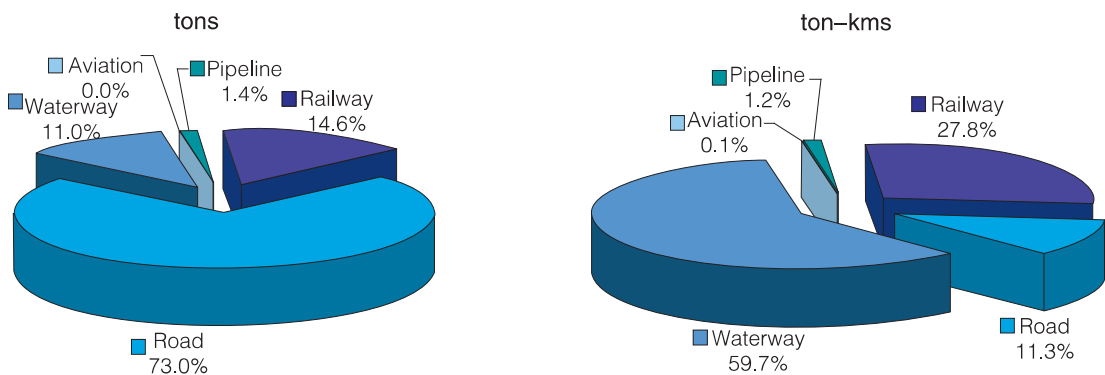


Figure 5 Mode Shares , Goods Traffic , 2004

Source of Figure 4 and Figure 5 : MOC

## 2.2 Road Infrastructure

Roads are classified by administrative responsibility—i. e. , national , provincial/municipal , county , township , and access roads [ 2 ]—by design standards , and pavement strength. Of the 1.87 million kms of roads in 2004 , 1.52 million kms were classified , under expressways , class I highways , road

classes II , III , and IV ; thus , making up 2 , 2 , 12 , 18 , and 47 percent of the total respectively. Unclassified roads make up the remaining 19 percent ( Figure 6 ). Generally , expressways carry traffic in the range of 25,000 – 55,000 vehicles per day ( vehs/day ) ; Class I roads 10,000 – 30,000 vehs/day ; Class II roads 5,000 – 15,000 vehs/day ; Class III 2,000 – 6,000 vehs/day ; and Class IV less than 2,000 vehs/day.

[ 2 ] Access roads are within the boundaries of mining , industrial , agricultural , tourism , military , and port areas

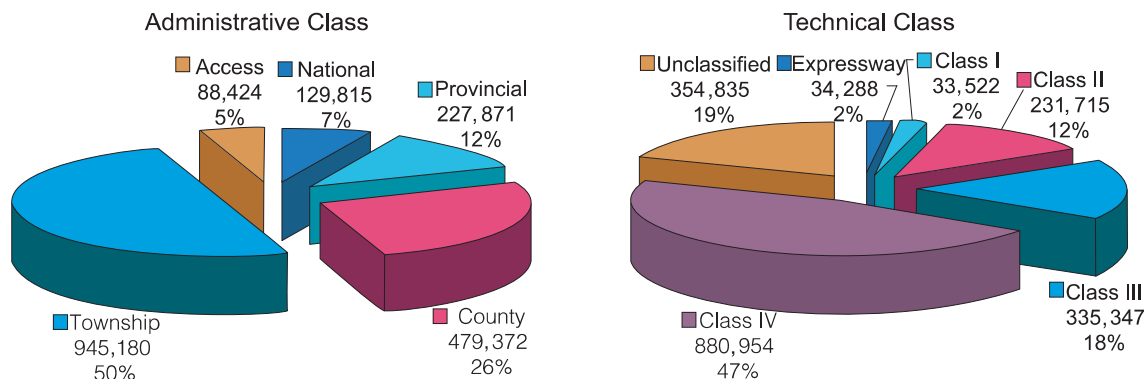


Figure 6 Road Network by Administrative and Technical Class , 2004

Source : MOC

Although the density of the network—at 1.46 kms per 1,000 population in 2004—is lower than in other Asian countries , it has been increasing rapidly. Since 1990 , the Government has built a total of 775,000 kms of new highways ( expressways and roads under classes I to IV ). Most of the present expressway network of 34,288 kms was built only the last 10 years. This massive expansion and upgrading of road infrastructure has contributed substantially to the economy’s transformation and has played a major role in efforts to develop the west under the western development strategy ( WDS ) , redressing the economic imbalance with the Eastern Seaboard.[ 3 ] By substantially reducing journey times and costs for in-

ter-provincial passenger and freight journeys , it has helped integrate western-region production and consumption centers with the rest of the economy and the outside world.

### 2.3 Road Financing

Road expenditures are financed from national , municipal , provincial , and local government budgets , user charges and fees , foreign investments and loans ( including loans from international aid agencies ) , and domestic bank borrowing. Figure 7 summarizes the contributions made by the various sources in 2004.[ 4 ]

[ 3 ] Set out in State Council Circular on Policies and Measures for the Development of the Western Region , 26 October 2000. The Western Region includes the Provinces of Sichuan , Guizhou , Yunnan , Shanxi , Gansu and Qinghai , Chongqing Municipality and Tibet Autonomous Region , Ningxia Hui Autonomous Region , Xinjiang Uygur Autonomous Region , Inner Mongolia Autonomous Region , and Guangxi Zhuang Autonomous Region.

[ 4 ] Source : MOC.

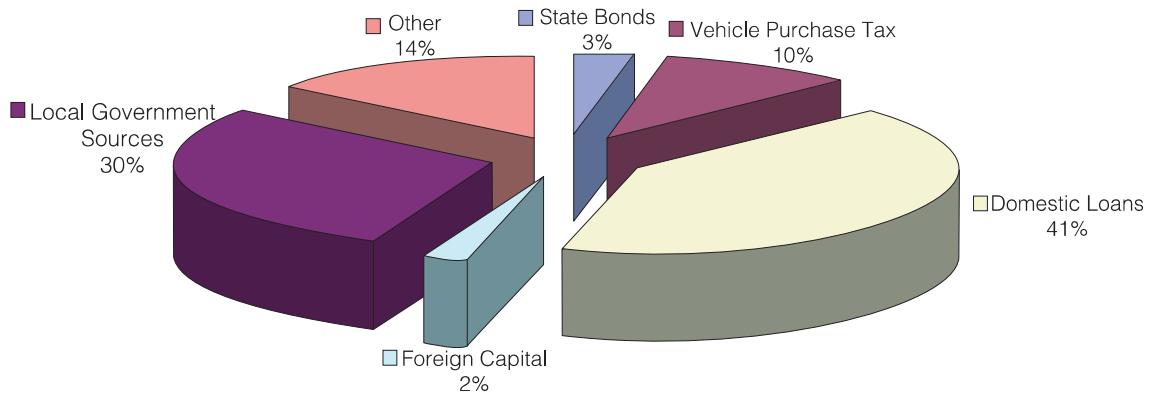


Figure 7 Sources of Funds for Road Infrastructure Expenditure , 2004

Source : MOC

Tolls are an important source of finance for expressways. The Highway Law allows tolls on highways that were built using loans or funds provided by enterprises , economic organizations , or individuals— but not on wholly government-funded highways , unless toll rights have been assigned to such organizations. The regulations governing tolls are set out in MOC's Regulations on the Collection of Vehicle Tolls for High-Grade Highways and Large Highway Bridges and Tunnels Constructed with Loans ( effective February 1988 ) and Regulations Concerning the Establishment of Toll Stations Along Highways ( effective June 1994 ). Tolls can be used to service debt and recover operating expenses. According to the Highway Law , rates must be set by reference to an appropriate return on funds invested ; the rates charged on other toll roads ; users' ability to pay ; the benefits of the tolled road to users ; and traffic flows. In practice , toll setting is a compromise between financial and economic aims made by the municipal or provincial agen-

cies responsible. The result tends to be a patchwork of independent—though inter-connected—toll-roads , each charging different rates and amounting—for most long-distance journeys—to a substantial outlay for the trip.[ 5 ]

In addition to tolls , there are two other road user charges :

- a road maintenance fee , levied by highway authorities on the revenues of passenger transport enterprises and vehicles' registered load capacity ; and
- a vehicle purchase fee , levied at the rate of 10 percent of the retail price of vehicles ; revenues from this are used mainly to finance the national trunk highway system ( NTHS ) , with priority given to roads in the western region.

In October 1999 , an amendment to the Highway Law provided for a new system of user taxation. A fuel tax was to be introduced and , starting January 2001 , also a vehicle purchase tax replacing the vehi-

[ 5 ] The Heilongjiang Dragon Transportation Group reports that it pays over 0.5 yuan ( CNY ) per bus-km on road tolls , or about 8 percent of its variable costs. A survey of eight freight operators in 2004 found that tolls amounted to 20 –40 percent of variable costs ( Source : Jim Dai , Yuepeng Li , Xiutian Liu , Yang Wang , Nancy Wong , Chen Zhou , 2004 the People's Republic of China Road Transportation Enterprise Survey Report , The Logistics Institute – Asia Pacific ( TLI-AP ) Singapore , February 2005 ). Some operators have been able to negotiate discounted rates with toll-road enterprises.

cle purchase fee. But implementation of the fuel tax was—and continues to be—delayed because of the high international price of oil. The result is that the structure of user taxation does not correspond with the costs imposed by road users :there is no component of tax levied on the basis of vehicle-kms of road use ,and the vehicle purchase fee is not structured according to laden axle loads ,the best measure of road damaging potential. Other countries have been better able to match users' tax contributions with the road damage and other external costs they impose by applying a combination of fuel tax ( related to road use ) and annual vehicle fee( usually reflecting potential pavement damaging-power in equivalent standard axle loads ( ESALs )<sup>6</sup> ) structured so that it reflects the relative cost contribution of each vehicle type.

According to MOC's draft plan for 2006–2010 ,total road investment needs over the next 5 years are

likely to be about CNY 1, 830 billion ( \$221 billion ) ,of which CNY846 billion is for expressways. Available revenues are predicted at CNY840 billion from user taxes and CNY50 billion from toll collections ,leaving a gap of CNY940 billion to be funded from national or regional ( municipal , provincial , county , or township ) government budgets , loans or private sources. The Government has tried to encourage private financing but ,so far , investors have been unwilling to take on the risks of build-operate-transfer ( BOT ) projects. Some provincial and lower-level governments also find it difficult to fund non-expressway expenditures ,particularly local roads in poor areas. Provincial governments generally provide some grants to counties and townships to help finance their road expenditures ,but an increasing proportion of their own road budgets is being used to meet the national priority for expressway and highway construction.

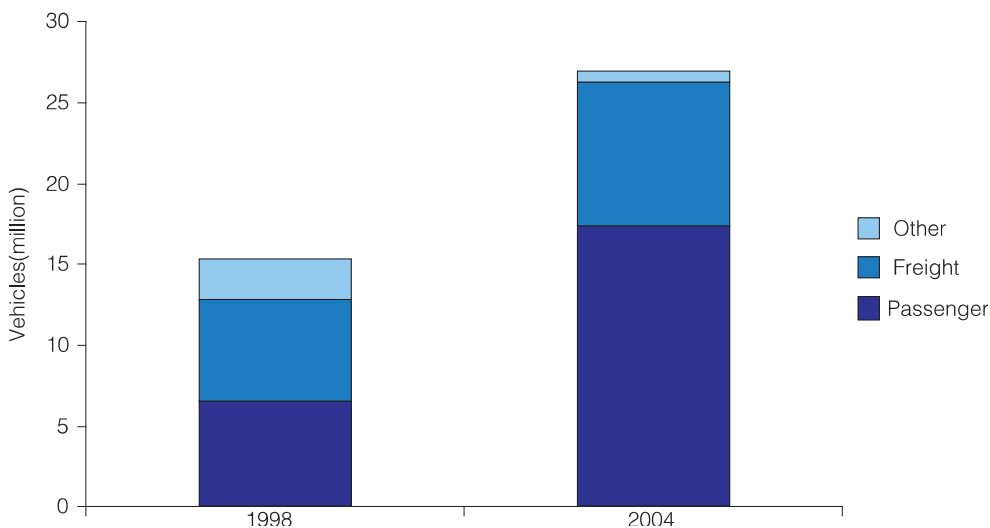


Figure 8 Growth and Composition of the Vehicle Fleet , 1998–2004

Source : MOC

[ 6 ] A measure of the damage caused to a pavement by a vehicle axle relative to that done by an 8. 16-ton standard axle.

## 2.4 The Vehicle Fleet

In 2004, the PRC's fleet amounted to 26.9 million vehicles, excluding military ones. Of these, 17.4 million were passenger-carrying, 8.9 million freight vehicles, and 0.6 million others (Figure 8). The total rose by 3.1 million in 2004, with the share of trucks, at 33 percent, down from 41 percent 6 years earlier. Despite the rapid growth in the fleet, there are still only about 2.1 vehicles (trucks, cars, or buses) per 100 people.

The private fleet has grown by more than 20 times in the last 10 years, and will likely continue growing rapidly with rising incomes. This will cause an increase in the volume of road traffic, possibly outpacing capacity and worsening traffic congestion and air quality in or near urban areas. In both urban and rural areas, traffic flow is also hindered by bicycles and other slow-moving nonmotorized vehicles, though these are a declining percentage of the total.

## 2.5 The Road Transport Industry

The road freight industry is made up of state-owned transport enterprises, joint-venture (JV) firms, private companies, industrial groups offering services to supplement their main activities (own-account operators), and smaller private owner-operators. Freight forwarders play a role in consolidating shipments and negotiating rates, but they are less well-established than in Europe and North America. Entry to the trucking industry is relatively easy, helping to ensure considerable—sometimes intense—competition in all but specialized markets. Since 1984, privately-owned trucks have been allowed to carry goods for state-owned factories and cooperatives. As a result, they have enjoyed growth in mar-

ket share at the expense of state-owned companies, many of which are being privatized themselves or placed at arm's length from the industries that own them, usually in the form of joint-stock companies. MOC is encouraging the private sector to augment the capacity of the road transport industry and has chosen several enterprises as pilots to implement consolidation and restructuring reforms under a demonstration project. In several provinces, the authorities are also trying to consolidate provincial enterprises in preparation for greater competition under WTO rules. Even without these initiatives, the opening of the economy has led to some consolidation among transport groups and the development of national networks of alliances, some with foreign participation, that are starting to offer integrated logistics solutions to their customers (see Chapter 6).

Bus services are extensive and frequent, even on relatively minor routes. The typical range of services includes long-distance 40–45 seat express services based usually in provincial centers and operating on inter-provincial/inter-city trunk routes; medium-distance 18–30-seat buses based in county/township centers; and smaller local 6–8-seat microbus/van services linking villages to township centers—a range of choices differentiated well by quality and price. The inter-city services are usually offered by provincial- or municipal-owned transport enterprises but there is a growing number of private operators, most of which start with only a few vehicles but tend to be more focused on customer service to attract passengers. The range and availability of services tend, of course, to decline with distance (that is, away from county and township centers), but where demand exists, services are usually available to accommodate it. There is some flexibility in setting fares: under a 1998 joint MOC/SDPC<sup>[ 7 ]</sup>, regulation road transport tariffs can be set within  $\pm 20$  percent of advisory tariffs issued by MOC, although in practice the degree

[ 7 ] State Development Planning Commission, now replaced by the NDRC.

of freedom allowed to operators to vary their fares differs from province to province.

## 2.6 Vehicle Assembly and Manufacturing

The PRC's vehicle assembly and manufacturing industry has improved rapidly in quality and efficiency, and is capable of producing trucks and buses as good as any found in developed countries, often with the assistance of foreign joint venture (JV) partners. WTO membership should further stimulate competition and investment, raise standards, lower costs, and increase the range of vehicles available. By replacing older, less efficient vehicles, modernization and expansion of the fleet also has the effect of raising vehicle efficiency and safety, reducing fuel consumption and vehicle emissions, and bringing designs and technologies better suited to the needs of the market. Newly-built vehicles are of very good quality. Despite a system of vehicle inspection and testing designed to get unsafe vehicles off the road, however, a proportion of older, slower vehicles still cause a disproportionate share of traffic delay, air pollution, and noise. With rapid growth in the fleet and a strengthening of roadworthiness testing procedures, however, this proportion should fall.

## 2.7 Road Safety

According to official statistics, there were 667,507 road accidents in 2003 [ 8 ] with 104,372 deaths ( a 4.6 percent decrease from the level of 2002, after a long period of increase ), 494,174 injuries, and direct economic losses of over CNY3.4 bil-

lion. Had unrecorded accidents been included, the number of deaths might have been 150,000 or more per annum. At 438 recorded deaths per 100,000 vehicles in 2003, the PRC's accident rate is already very high indeed by international standards.[ 9 ]

The records of bus and truck operators interviewed by the project show little consistency in accident rates. Most appear to record only the most serious, but many accidents might go unrecorded as a result of the common practice of contracting out services to drivers. One bus operator reported a worsening of accident severity with the opening of expressways due to the higher speeds.

There are strict requirements regarding the maintenance of road vehicles, and safety inspections ( Section 3.3 ). In addition, drivers nominated in applications for new buses or bus routes must have at least 3 years of accident-free driving; similar conditions apply to trucks. There are also conditions relating to drivers' safety records in the categorization of bus operators. From observation, bus and truck driving standards appear to be reasonably good but some dangerous practices can still be seen ( e.g., lane changing on expressways, dangerous overtaking on single-carriageway roads and aggressive driving ).

Most traffic accidents occur because drivers, motorcyclists, cyclists, and pedestrians are unaware of the risks and ignore safety regulations. Standards of driver education and testing, and the quality of road safety education in schools, appear to be below western standards. Drivers tend to be taught and tested on the mechanics of driving and on the rules of the road, rather than on safety awareness and defensive driving techniques. The development of a high-

[ 8 ] Statistics for 2004 are not yet available.

[ 9 ] Comparable figures for other countries in deaths per 100,000 vehicles are 15.3 for Australia, 20.6 for Denmark, 23.5 for France, 13.2 for Japan, 78.2 for the Republic of Korea, 54.0 for Turkey, 12.1 for the United Kingdom, and 19.3 for the United States of America ( Source : ADB ).

standard expressway network might help reduce the rate ( though not the severity ) of accidents by transferring long-distance traffic to modern roads with safe-design features , but changes in a driver's behavior are also needed. Under a road safety master-

plan , several funding agencies , including ADB , are supporting programs to help raise safety education standards and public awareness and strengthen the capacity of the Ministry of Public Security ( MPS ) in traffic safety planning and enforcement.

