THE WORLD BANK OPERATIONS EVALUATION DEPARTMENT

The World Bank's Assistance to China's Transport Sector

Anthony Churchill and Cordula Thum

Director-General, Operations Evaluation: Gregory K. Ingram
Director: Ajay Chhibber
Manager: R. Kyle Peters
Task Manager: Gene Tidrick

This paper is available upon request from OED. It was prepared in 2002 as a background paper for the China Country Assistance Evaluation.

2005
The World Bank
Washington, D.C.

ENHANCING DEVELOPMENT EFFECTIVENESS THROUGH EXCELLENCE AND INDEPENDENCE IN EVALUATION

The Operations Evaluation Department (OED) is an independent unit within the World Bank; it reports directly to the Bank's Board of Executive Directors. OED assesses what works, and what does not; how a borrower plans to run and maintain a project; and the lasting contribution of the Bank to a country's overall development. The goals of evaluation are to learn from experience, to provide an objective basis for assessing the results of the Bank's work, and to provide accountability in the achievement of its objectives. It also improves Bank work by identifying and disseminating the lessons learned from experience and by framing recommendations drawn from evaluation findings.

OED Working Papers are an informal series to disseminate the findings of work in progress to encourage the exchange of ideas about development effectiveness through evaluation.

Contact:
Operations Evaluation Department
Knowledge and Evaluation Capacity Development (OEDKE)
e-mail: eline@worldbank.org
Telephone: 202-458-4497
Facsimile: 202-522-3125
http:/www.worldbank.org/oed

Acronyms

AAA	Analytical and Advisory Services
ADB	Asian Development Bank
APDB	Asia Pacific Daily Brief
BOT	Build operate transfer
BTTE	Beijing-Tianjing-Tanggu Expressway
CAS	Country Assistance Strategy
ERR	Economic Rate of Return
FY	Fiscal Year
GDP	Gross Domestic Product
GOC	Government of China
IBRD	International Bank for Reconstruction and Development
IDA	International Development Agency
IPO	Initial Public Offering
ITS	Intelligent Transport System
IWT	Inland Waterways Transport
IWW	Inland Waterways
MOC	Ministry of Communications
MOR	Ministry of Railway
NTHS	National Trunk Highway System
OED	Operations Evaluation Department
PCD	Provincial Communication Department
PID	Project Information Document
PMS	Pavement Management System
PPIAF	Public Private Infrastructure Advisory Facility
QAG	Quality Assurance Group
RDB	Road Data Base
RIS	Railway Investment Study
RMB	Renminbi
RMF	Road Maintenance Fee
S&P	Standard & Poor's
SDPC	State Development and Planning Commission
SOE	State-owned Enterprise
TA	Technical Assistance
TMIS	Traffic Management Information System
VPF	Vehicle Purchase Fee
WDP	World Bank Discussion Paper
WTO	World Trade Organization

Table of Contents

Preface

This paper is one of the background papers prepared as an input to the China Country Assistance Evaluation.

Findings are based on a review of project appraisal and completion reports, sector reports, and a number of other documents produced by the Borrower, the Bank, OED, and research papers.

Bank staff were interviewed at headquarters. Their valuable assistance is gratefully acknowledged.

1. Transport Sector Performance and Policy Challenges

1.1 China's economic development since the opening of its economy in the late 1970s has resulted in an eight percent average annual rate of economic growth. Key facets of this growth are rapidly increasing domestic and foreign trade as well as increasing personal mobility and consumption of energy.

1.2 These in turn, have caused the demand for transport to surge. Supply capacity, however, is constrained and this is now recognized as one of the most serious bottlenecks to future economic growth and efficiency. Since the early 1980s, transport demand has grown much faster than capacity and the ability of the system to deal with it. This has led to increasing bottlenecks and delays, an enormous backlog of deferred investments. Compared to other countries, road and rail network density in China is still very low, particularly when measured on an area basis (further, see 1.9).

1.3 The transport sector's lack of capacity has been somewhat compensated for by the very high utilization of infrastructure and vehicles. Five long-term trends are evident in the demand for transport: 1) freight transport will grow more slowly than the economy (the share in rail freight tends to shrink but absolute economic growth continues); 2) passenger transport will grow more quickly than the economy; 3) the infrastructure and assets needed to satisfy a given level of transport demand will increase as users demand higher-quality service; 4) the share of rail will fall, but the absolute output will continue to grow; 5) demand for multi-modal transport services will grow faster than for single-mode services.

1.4 The deficiencies of the Chinese road and highway system have in particular created a bottleneck in China's economic development. Some estimates suggest that China's highways will only grow at an annual rate of 2.5 percent over the next decade, while the number of vehicles in China grew at a rate that peaked in the early 1990's at 18 percent and is now about 6 percent. China's real GDP growth is predicted to be approximately 8 percent over the next ten years. The current highway capacity is seriously insufficient, with more than half the nation's highways exceeding designed traffic capacity limits, a problem which also hinders foreign investment in other sectors. Until China radically increases its highway capacity, the business confidence fostered by a stable infrastructure and economic growth in general, will continue to suffer.

1.5 Like other centrally planned economies, China's transport system exhibits high freight intensity, measured in ton-km dollar of output, and a low personal mobility in its population. It is sometimes suggested that the unusual size of China and the location of its raw materials explains much of the transport intensity of the economy relative to other continental economies. The most common explanation for the high degree of transport intensity in China (in combination with energy intensity) is the relative importance of the heavy "smoke stack" industries in the industrial sector:

- Linkage between heavy industry, coal-fired electricity and rail transport
- Lack of incentives for processing raw materials to reduce weight before shipping.
- Array of incentives for cross hauling of commodities of all kinds.

1.6 However, China's infrastructure is undergoing rapid expansion. China's established road and rail infrastructure is impressive by any standard.

China's Ambitious Infrastructure Capacity Expansion Plan

1.7 The government's tenth five-year plan -- launched midway through 2001 -- envisages an increase in total outlays of around 15-20% per year. Even if only a fraction of this is finally implemented, proposed expenditures will see surface transport radically transformed.

Highway and Road Network

1.8 China's road network ranks among the sparsest in the world relative to geographic area and population. A few inter-provincial expressways have been built to date and about 20 percent of rural communities have no all-weather vehicular access. In recent years, governments at all level have embarked on a major highway capital investment and improvement program. China's road network today is about 1.4 million-km, with some 16,300 km of expressways and some 20,000 km of other high-grade highways (class I) in operation.

Length of Transportation Routes (10 000km)

Year	Railways	Highways	Navigable Inland Waterways
1980	5.33	88.33	10.85
1985	5.5	94.24	10.91
1990	5.78	102.83	10.92
1995	5.97	115.7	11.06
2000	6.87	140.27	11.93

1.9 When compared with other countries, road density in China is still very low, measured both in relation to area and population. This lack of capacity has been somewhat compensated by the high utilization of infrastructure (with so far the notable exception of many of the tolled expressways) and vehicles, with rates so high that they prevent improving service quality. As users demand more and better transport services, this lack of capacity and declining quality of service will become more restricting unless investment is significantly increased (see paragraph later).

1.10 The main component of China's transport strategy remains the development of the "national trunk highway system" (NTHS). This 35,000 km network of 12 interprovincial second grades and above highways will link 95 major Chinese cities and 600 million people into Beijing. This trunk system will serve as the main spines in the national highway network, which would link together smaller roads and will incorporate five north-south and seven east-west highway routes. The combined lengths of the four priority highways shown above (*) amount to 14,500 km in length. Of this, the majority will consist of second-class highways (average speed 60 km/h), although major sections will be expressway.

The Five North-South routes

From	To	Distance
Tongjiang, Heilongjiang	Sanya, Hainan*	5,200 km
Beijing	Fuzhou, Fujian	2,500 km
Beijing	Zhuhai, Guangdong*	2,400 km
Erlianhaote, Inner Mongolia	Hekou, Yunnan	3,600 km
Chongqing, Sichuan	Zhenjiang, Jiangsu	1,400 km

The Seven East-West routes

From	To	Distance
Suifenhe, Heilongjiang	Manzhouli, Inner Mong	1,300 km
Dandong, Liaoning	Lhasa, Tibet	4,600 km
Qingdao, Shandong	Yinchuan, Ningxia	1,600 km
Lianyugang, Jiangsu	Huoerguosi, Xinjiang*	4,400 km
Shanghai	Chengdu, Sichuan*	2,500 km
Shanghai	Ruili, Yunnan	4,000 km
Hengyang, Hunan	Kunming, Yunnan	2,000 km

1.11 The Chinese government has also prioritized three major sections of highway independent of the above plan. According to a joint study recently conducted by the Ministry of Communications and the National Bureau of Statistics, around 227,000 km of the total—just over 13% -- are paved or sealed 'class one' and 'class two' roads, while the remainder include unsealed 'class three' and 'class four'

From	To	Distance
Beijing	Shenyang, Liaoning	850 km
Beijing	Shanghai	1460 km
Chengdu, Sichuan	Beihai, Guangxi	2300 km

routes. The joint study shows that there are over 250,000 bridges along main roads (spanning 10.65 million metres), and 1,780 tunnels (extending 710,000 metres).

1.12 In November 2001, the Ministry of Communications released plans to complete five vertical and seven horizontal expressways over the next half-decade along north-south and east-west axes. Much of the proposed construction is directed as part of the government's drive to 'develop the west' (see APDB, August 2, 2001, I). An estimated 150,000 km of new roads are expected to be built in the western provinces over the next five to ten years. Estimates of the capital annually required covering this planned road construction over the span of the current five- year plan range as high as 20 billion dollars. An expected doubling of car ownership (to 34 million cars) by 2010 will ensure demand-side pressures remain high (see APDB, July 26, 2001, I).

Railways Network

1.13 According to Ministry of Railway statistics, nationwide rail track currently stands at just less than 68,000 km, a figure comparable with the large and well-established railway systems in the United States, Russia and India. Of this total, around 5,500 km is provincially administered and maintained by local authorities. This includes 193 km of urban track (including underground) located in Beijing, Shanghai, Guangzhou, Tianjin and Hong Kong—a remarkably small total given the area and population of these conurbations. Standard gauge track constitutes around 94% of total track length, of which 13,500 km is electrified and 20,300 km is so-called 'double-track' rail (parallel lines permitting simultaneous two-way use). Railway services are available in all provinces except for Tibet. A 1,140-km railway linking Lhasa with Golmud in Qinghai Province—announced last year and budgeted at 2.5 billion-dollars—is a major nation-building symbol for the authorities, but remains beset by logistical difficulties.

Length of Railways Transportation Routes (10.000 km)

Year	Total Length of Railways in Operations	Electrified Railways	Nonelectrified Railways
1975	4.6	2%	98%
1980	5.33	3%	97%
1985	5.5	8%	92%
1990	5.78	12%	88%
1995	5.97	16%	84%
2000	6.87	22%	78%

1.14 According to a report issued by state-owned China Rail in early 2002, the government aims to lay down 6,000 km of new rail, 3,000 km of double tracks and to realize 5,000 km of electrified railways by 2005. Another 450 km of urban rail in up to ten major centers is also envisaged. At around 80 million dollars per kilometer for subway construction, this latter commitment alone is a sizeable undertaking.

Inland Waterways Network

1.15 China has 5,800 rivers navigable for 11,930 km, 15 rivers over 1,000 km long and 12 lakes with an area greater than 1,000km^2. Nevertheless, the major Inland Waterways comprise only four rivers and one canal, which carries 80% of total Inland Waterways traffic. Yangtze River system is by far the largest Inland Waterway.

Year	Navigable Inland Waterways (10,000km)
1980	10,85
1985	10,91
1990	10,92
1995	11,06
2000	11,93

1.16 China has a long history of using this extensive waterway network of rivers and lakes and canal construction. However, significant under funding in this subsector has caused the infrastructure and floating equipment to deteriorate badly, and reduced the net size of the navigable network from 170,000 km in 1960 to 148,800 km in 1970 and to 11,930 in 2000. The lack of a multipurpose infrastructure development approach and methodology and

coordination among the various ministries in charge of infrastructure also contribute to Inland Waterways decline. For example, many hydropower dams have been built without consulting other interested agencies and without providing ship locks to allow uninterrupted Inland Waterway transport.

1.17 Inland Waterways construction and maintenance is not self-financing. The main source of revenue has been the waterway maintenance fee, levied as a percentage of the shipping companies' and private ship-owners gross revenue. These amounts permit only minimum channel maintenance by the Provincial Communications Departments (PCDs) and MOC contributes to their costs. The PCDs have introduced a waterway construction fee that is calculated on a ton-km basis. With regard to the river ports, the local communication bureaus collect a port construction fee to partly finance their development, but this is not sufficient to sustain port development.

CROSS-CUTTING ISSUES IN CHINA'S INFRASTRUCTURE SECTOR

Infrastructure Financing and Private Sector Participation

1.18 China uses mainly off-budget sources to fund its highway expansion and maintenance program. The two main sources of funding for the road sector are the Road Maintenance Fee (RMF) at the provincial level, and the Vehicle Purchase Fee (VPF) at the national level. Both the RMF and VPF provide nearly 70% of highway funding while the private sector financing also plays an important role, in particular for new expressways (see further, 1.20). While the RMF is criticized for being an inefficient way of funding for road expansion, as it does not relate road usage to costs of construction and maintenance, the fact that it is an off-budget revenue source has provided a stable source of funding for China's ambitious highway development program.

1.19 Sector funding increased dramatically over the last three years in response to financial stimulus. While in 1997 China invested about US$13 billion in highways, investments more than doubled to US$27 billion in 1998, 1999 and 2000. Of these, about 60% went to high-grade highways (including about 30% for the NTHS), 25% to the improvement of existing roads and 15% to rural roads. Since the launch of the ninth five-year plan in 1996, the central authorities have annually spent an average of 24 billion dollars on road construction (reaching 31 billion in 2001), and 7.8 billion dollars per year on arterial rail works. Last year, land transport construction accounted for approximately 5% of GDP and 20% of the national budget. However, China's investment in infrastructure has not kept pace with demand. Physical infrastructure has expanded only 7 to 8 per cent per year on average over the past decade, while infrastructure utilization has soared 13 to 14 per cent per year. As a result, facilities are stretched to the limit.

Equity Financing

1.20 Commentators have championed China as the new ideal market for applying a financing technique called asset-backed securitization. China's huge demand for capital is evident. The country's ongoing expansion to modernize its highways, bridges, and power plants has pressured it to continually seek new sources of capital. Asset securitization is a flexible financing technique that frees up illiquid assets or receivables while providing lower interest rates to borrowers, greater liquidity to investors, lower funding costs to banks, and a lower cost of capital to the economy. The marvel of asset-backed securitization is that it transforms illiquid assets into freely tradable liquid assets and thereby provides another means

of raising capital to supplement the traditional method of issuing debt or equity. In April 1997, China pioneered its first asset-backed securitization.

1.21 Over the last decade, some 80 Joint-Venture transactions, between Hong Kong and mainland developers and their mainland counterpart highway agencies in 14 provinces, have mobilized an additional RMB 75 billion (US$9 billion) from private sources. In addition, asset securitization, i.e. the sale of highway equity through Initial Public Offerings (IPOs) and private placements, as a substitute for long-term debt financing, has raised another RMB 16 billion (US$2 billion) through 19 transactions so far. All together, the private sector has contributed nearly 10% of China's total commitment to new construction since the inception of economic reform in the early 1980s.

Debt Financing

1.22 The new highway law also encourages debt issuance for infrastructure financing. In August 1996, securitized bonds for Zhuhai paved the way for other international offerings of Chinese infrastructure debt. The Zhuhai Highway Co, a special-purpose vehicle of the Zhuhai municipal government, raised $200 million in U.S. markets by issuing two-tranche (10-year/9.125 percent coupon, 12-year/11.5 percent coupon) bonds backed by the revenue stream from toll booths and vehicle registration fees. In June 1997, Greater Beijing Regional Expressways Ltd., raised $275 million by issuing two-tranche (7-year/9.25 percent coupon, 10- year/9.5 percent coupon) bullet bonds with 5 seven-year calls.

1.23 The Beijing bonds' lower credit rating (Standard & Poor's BB) than the Zhuhai bonds' rating (S&P BBB) was due to several differences between the two issues: Beijing's issue is guaranteed only by the company itself (by cash flow from its three already-operational toll roads), and carries both currency and construction risks, whereas Zhuhai's carries no currency or construction risks and is backed by municipal revenues. Morgan Stanley led both groundbreaking deals.

BOT in China's infrastructure

1.24 Another financing instrument is the build, operate, transfer (BOT) method. There are some drawbacks to using project financing for infrastructure development. It invariably involves long negotiation phases, many parties to the agreements (such as contractors, suppliers and sponsors) and reliance on experienced advisors, all of which add to the cost of such financing. Market projections of road usage must be relied upon to predict revenue streams available for debt repayment. Concerns about repayment guarantees (which meant the financing was not of the usual limited- or non-recourse type), foreign exchange convertibility, and China's legal environment kept project financing from widespread use until only the mid-1990s. The new highway law will make investment in toll road projects easier, and foreign exchange convertibility restrictions were relaxed in 1996.

1.25 However, China has not used BOT financing for transport projects thus far, although there were five large projects approved from the State Planning Commission. The Chinese government has conducted widespread feasibility studies as to the potential of this type of arrangement.

1.26 The use of private capital to finance roads through toll systems, securitization of road ways and other financial engineering methods, particularly using foreign capital, are second best solutions and can only play a minor role in meeting the need to dramatically increase road capacity. Most roads are public rather than private goods and ultimately more efficient

means will have to be found to tap into domestic savings. Taxes, particularly fuel taxes and other road user charges, along with fiscal transfers are an almost universal solution to highway finance that is still grossly underutilized in China. It is also not clear that there are any cost advantages to issuing securitized debt over general public debt. In the end it is the sovereign who pays. Finding ways of moving beyond the focus on limited financial engineering solutions to highway financing is a major unfinished business for the future.

The Sector's Administrative Framework

1.27 In addition to financing, the most important crosscutting issue is in the transport sector's administrative framework. Under current arrangements, the Ministry of Communications and Ministry of Railways compete for jurisdiction . Provincial governments have become adept at exploiting institutional rivalry. For example, Sichuan and Guizhou provinces have some of the highest concentrations of road and rail to population and land anywhere in the world. While this is partially owing to the location of strategic trade and transport routes, bureaucratic politics is also a consideration. In 1997, the World Bank recommended that the central government establish an overarching Ministry of Transport and Communication to merge the two institutions. However, there have been no substantive moves toward this goal, partly because this does not reflect a high priority for both ministries

Transport services

1.28 Over the last 15 years, great emphasis has been put on the construction of new infrastructure and substantial results have been achieved with the completion of over 16,000 km of high-grade highways. So far less attention has been given to improve transport services to fully draw the benefit of infrastructure development. Investments in vehicles and related services are usually five to ten times the investment in the actual roadway.

1.29 The question is now how to develop efficient road transport companies for both freight and passengers. What should be the legal framework, regulation and credit facilities so that road transport can be competitive with foreign transport/logistic companies, which may enter the Chinese market after the WTO comes into force. Also, what should be the regulation of entry, (if any) in terms of the financial capacity of the companies, the quality of their personnel and equipment with a view to ensure safety of operations, and finally should there be any regulation of prices and tariffs charged. Although intermodal coordination should be enhanced to take advantage of the respective advantages of the various transport modes, the issue of the public sector role remains to be defined. Information technology is transforming the intermodal freight industry by enabling it to integrate the operation across the supply chain (logistics). Advanced communication and information systems provide real time information on intermodal transport operations and conditions of the transport infrastructure. Recently, Intelligent Transport Systems (ITS) have been given attention by countries trying to improve the use of their transport system while minimizing new infrastructure investments. The development of ITS is required to support a modern logistics system. The introduction of logistics will be particularly important for development of the West, to reduce not only their transport costs but also administrative costs, delays along the logistics chain and the cost of inventories. These will all be necessary to encourage production in these provinces rather than at locations closer to large domestic markets in the East and export outlets. As labor costs increase in coastal areas, industry may well be interested to move inland, if logistics arrangements are adequate.

1.30 Recently, both ITS and logistics have gained high political visibility in China, but the development of these systems is hampered in part by the fact that a number of different

agencies are competing for responsibility in such development. For instance, MOC has designated 45 hub cities and has started building terminal infrastructure in some of them; however, many of them do not have intermodal access.

1.31 To fully implement the above policies and make progress toward a comprehensive transport system, using ITS and logistics, it will be necessary, in the medium to longer term, to have a Ministry of Transport, combining the modes presently under the separate jurisdiction of the Ministry of Communications (MOC) dealing with roads, ports and waterways, the Ministry of Railways (MOR) and the Civil Aviation Authority. The main duties of such a ministry would be: transport policy, inter-modal coordination, regulation and safety.

2. Relevance of Bank Assistance Strategy

COUNTRY ASSISTANCE STRATEGIES AND TRANSPORT

2.1 Generally speaking, *the* major objective of the China Country Assistance Strategy (since the 1980s) was to alleviate infrastructure bottlenecks, in providing financial resources and promoting sector reforms in China.

2.2 The Bank's Country Assistance Strategy (CAS) for China presented to the Board on May 10, 1995 supports the needs of China to alleviate infrastructure constraints. It states "in response to the request by the Chinese authorities and, until greater inflows from the private sector can be attracted, approximately 50 percent of the Bank Group's lending commitments for FY95-97 will support infrastructure development". In addition, a major emphasis was given to promote reforms through projects designed to raise overall efficiency and stimulate private capital flows.

2.3 The Bank's Country Assistance Strategy (CAS) for China presented to the Board on March 18, 1997 and the progress note presented on March 28, 1998 supports China's needs to rapidly modernize and expand its infrastructure network. "Each project [in the infrastructure sector] aims to improve the *quality* of services by maintaining and upgrading existing assets, raising operating efficiency, meeting the needs of the users, and reducing environmental impacts" (CAS 1997). The CAS emphasizes in particular the Bank's engagement to develop a framework for private highway financing in China.

TRANSPORT SECTOR STRATEGY

2.4 The World Bank's involvement in the Chinese transport sector has been documented in the "Railway Strategy" (1993), the "Highway Sector Strategy" (1994), the "Urban Sector Strategy" (1997) as well as the "Highway Strategy Review" (2001) (see more in Chapter 3 – Transport Lending Program).

Sector Strategies	
1993/02/25	China – Railway Strategy (Report Nr. 10592)
1994/02/24	China – Highway development and management: issues, options, and strategies (Report Nr. 11819)
1997/01/31	China's urban transport development strategy: proceedings of a symposium in Beijing, November 8-10,1995 (WDP 352)
1998/04/23	China – Forward with one spirit: a strategy for the transport sector (Report Nr. 15959)
2001/10/01	China – Highway Strategy Review (Final Draft Paper)

2.5 In 1997/98, the World Bank worked together with the Chinese government in completing a review of the transport sector and preparing an *intermodal* transport strategy

(China – Forward with one spirit: a strategy for the transport sector). The strategy identified two primary objectives. These were to enhance China's economic growth and increase its competitiveness in world markets as well as reduce income disparities between inland and coastal provinces and rural and urban areas. The strategy provides proposals for increasing competition and efficiency, identifies the changing patterns of demand for transport, and advances the analysis of investment needs of the sector and their financing. Sector cross-cutting issues as well as an institutional structure with future needs of the sector were also proposed.

Cross-cutting issues in the Transport Sector Strategy

Highway Finance

2.6 China has been discussing the introduction of a fuel tax for some years. However, traditionally, transport fuel taxation has not been a revenue source in China, and when a few years earlier a proposal was made for its introduction as an alternative revenue source, it was not endorsed by the Government. Fuel taxation is regarded as a major policy issue in China, which would require the proposal for its acceptance be considered at the highest level of the Government. In light of its rejection before, the concerned ministries of the Central Government were reluctant to pursue this matter any further because of difficult technical and political issues associated with (i) the level of such a tax and the amount of revenues desired, (ii) what proportion of these revenues would go back to the road system and how these revenues would be allocated between MOC and the provinces, and (iii) whether the fuel tax would be accompanied by an axle load charge to ensure that heavy vehicles pay for the additional damage they cause to roads and which cannot normally be covered by the fuel tax.

2.7 The new road law of 1998 mandates the introduction of such a tax, but no implementation is decided yet. Fuel prices in China are among the lowest in the world, yet there is no decision on either the level of such a tax and the amount of revenues desired, nor on what proportion of these revenues would go back to the road system and how these revenues would be allocated between MOC and the provinces. There is no decision either as to whether the fuel tax would be accompanied by an axle-load charge to ensure that heavy vehicles pay for the additional damage they cause to roads and which cannot normally be covered by the fuel tax. One way to overcome the reluctance of the provinces to shift from the road maintenance fee to a fuel tax would be to set-up an escrow account for each province. The funds would then be used to finance a provincial road development plan approved by MOC.

Intermodal Coordination

2.8 In addition to financing, the most important cross-cutting issue is the transport sector's administrative framework. Under current arrangements, the Ministry of Communications and the Ministry of Railways as well as the Ministry of Construction compete for jurisdiction. Provincial governments have become adept of exploiting institutional rivalry. Sichuan and Guizhou provinces, for example have some of the highest concentrations of road and rail to population and land anywhere in the world. While this is partially owing to the location of strategic trade and transport routes, bureaucratic politics is also a consideration. In 1997, the World Bank recommended that the central government establish an overarching Ministry of Transport and Communications to merge the two institutions. The Strategy proposed the merging of two ministries and two agencies, with a view to internalizing conflicts, increasing intermodalism and reducing the administrative burden on the sector. However, there have

been no substantive moves toward this proposition until now. Staff interviews came to the conclusion that this merger will take place in the next couple of years.

Transport Services

2.9 The 'observed' inefficiencies in the road haulage business have produced an ambivalent response on the part of the Bank. On the one hand, is the observation that the thousands of small trucking firms, usually with only one vehicle, produce 'cheap' transport; on the other hand there is the observation that better 'organized' and larger firms would be able to take advantage of 'modern' vehicles and communication systems and, of course, would be easier to regulate with respect to pollution and safety.

2.10 This is a dangerous ambivalence. Many countries, including the U.S., have attempted to bring order to the apparent chaotic (or competitive) nature of the road haulage business. The usual result is the establishment of inefficient monopolies with a politically active regulatory system that can become a large source of corruption. Alternatives need to be considered before pushing for greater direct state intervention in this sector

ADDITIONAL ANALYTICAL AND ADVISORY ACTIVITIES (AAA) IN THE TRANSPORT SECTOR

2.11 Although the World Bank has loaned more than US$10.5 billion to the Chinese transport sector (see Chapter 3 – Transport Lending Program), the conventional wisdom is that its most important contribution ("The World Bank is more than the money it lends") has not been, and is unlikely to be, its funding of investments, but its impact on generating new ideas and stimulating new approaches to problems.

2.12 Several important studies (Economic and Sector Work or ESW, which is a subset of AAA) have been carried out by the Bank in the last years. The main objectives of these studies were

- to help define the future content and objectives of the Bank's lending program
- to support China in implementing policy improvements towards a balanced inter-modal transport system;
- to improve the regulatory framework for the trucking industry
- to strengthen market integration and serve a market-oriented economy.

VALUE-ADDED THROUGH ESW

2.13 Senior officials in the Chinese Government and World Bank Staff have remarked that the money is often much less important than the ideas that the World Bank brings. China has in many senses been a "model borrower" from the World Bank, with investment loans being disbursed on or close to schedule, procurement procedures being closely followed, and with human resettlement and environmental issues usually addressed with a seriousness found in few other countries. It is only the implementation of technical assistance that there is a serious difference of perspective, but in this it is in company with many other Bank borrowers. The problem is possibly more cultural than a lack of willingness, since China makes institutional and operational changes slowly and carefully, with many pilot applications before full-scale implementation. But once a need for change and the way to do it are decided, implementation is as rapid as elsewhere, whereas the World Bank tends to look for more rapid decision-making processes. The Bank's impatience causes misunderstandings and often led to a mandatory inclusion of a TA component that the Chinese had no understanding of or intention to doing anything about.

2.14 However, recommendations from ESW were only very partially disseminated and implemented. A good example of this is the 1995 study 'Investment Strategies for China's Coal and Electricity Delivery Systems". In spite of winning a number of awards, there is little evidence of use of the tools developed by this study in recent investment decisions. Despite this shortcoming, the impact of the Bank's technical assistance in the sector is widely acknowledged as "very positive", by all staff contacted for the preparation of this background paper. They point out that the effect of ESW is greater than can be measured through the implementation of specific measures and that it takes times to implement change.

2.15 In this regard, the 1999 OED assessment on the China transport portfolio has also clearly determined that the policy dialogue between China and the Bank in the transport sector needs to be further strengthened. The inadequacy of the sector work in China in infrastructure is in danger of limiting strategic options in the sector and related sub-sectors. The highway safety issue is only one case in point where the Bank simply does not know enough to properly advise on what needs to be done in an area that is presently very costly to China. Sector work on feeder roads has been limited and rather generic and poor information may lead the Bank into trying to finance investments in an area that it is not particularly well suited, and which, in the long run may be unnecessary.

3. Assessment of the Transport Lending Program: Efficiency and Efficacy

OVERVIEW OF THE PROGRAM

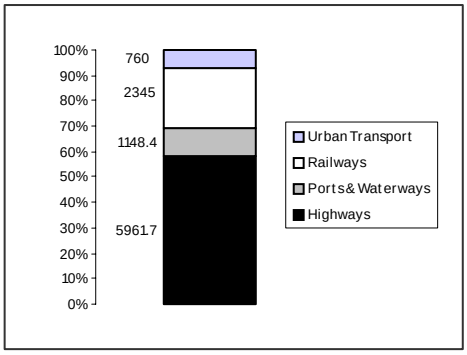
3.1 The World Bank's transport lending strategy in China is constrained to a narrow window of opportunity. If there is a reasonable chance that a project will be financially viable without substantial government intervention, it is best left to the private sector, and if it is not financially sustainable under the terms of World Bank financing, then the World Bank cannot finance it. That is why many World Bank transport projects in China are for roads that have a strong development potential but not yet enough traffic to be attractive to private lenders. In railways, the Bank is mostly involved in financing lines to newly developing inland areas, and in waterways, to improving the major accesses to the principal rivers. The focus of urban transport projects is now moving away from the construction of ring roads, putting a new focus on corridor development, traffic management, and improving public transport. The World Bank has not provided finance for ports projects in China since 1993, as the private sector has shown a willingness to do so.

3.2 In 18 years, the World Bank has approved US$10.5 billion in loans and credits for 58 transport projects. At the end of fiscal year 2002, 31 projects have been completed and 22 are being implemented. Another 5 projects are on pipeline. Transport has also accounted for a major share (close to 30%) of the Bank's total lending to China between 1983 and 2001.

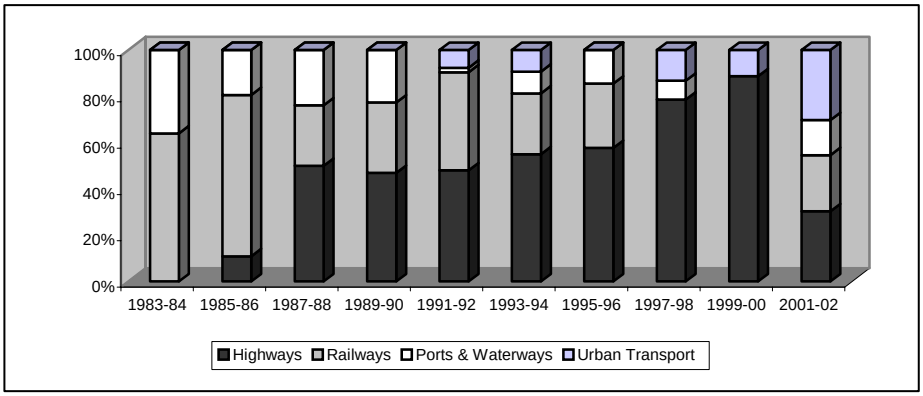
3.3 A critical underlying issue in this context is the question about the emphasis that was given to the infrastructure sector in general and transport in particular. A common explanation is that of a borrower-centered approach ("China is genuinely in the driver's seat"), thus the Chinese request for support of infrastructure development, and in particular transport. This borrower-centered approach has been emphasized in all China Country Assistance Documents. It might be explained by the fact that focusing on infrastructure, notably on transport was relatively apolitical.

3.4 From the Chinese point of view, "the Bank is seen both as a source of funding and international expertise". The Chinese ED states in the 1997 CAS Board Discussion that the Bank's support is "one key that opens two locks". It provides direct financial support and meanwhile it brings in the private investment through the co financing, guarantee, and technical assistance.

3.5 Overall, highways have taken the lion's share of lending (59%), followed by railways (23%), ports & waterways (11%) and urban transport (7%). In addition, the sector received US$705,000 in Public-Private Infrastructure Advisory Facility (PPIAF) grants through the Bank. Furthermore, the Bank has carried out a substantial amount of analytical and advisory (AAA) services, financed under a variety of trust funds (particularly the Policy and Human Resources Development Fund, or PHRD), as well as the Bank's own budget.



3.6 The modal distribution of the Bank's transport lending program has changed over time. While there was an initial emphasis (1983-1986) on the railways sector, the distribution shifted over the period of 1989-1996 towards a more diversified lending program with a growing significance of the highways sector. The period between 1997 and 2000 was strongly dominated by heavy lending to the highways sector. The Bank's involvement in the urban transport sector started only in 1991.



3.7 The Bank's transport sector program in China can be roughly broken down into four distinct periods:

(a) The ***Early Years*** (1983-1988), during which the Bank's assistance, in transport as well as in other sectors, aimed at helping China's reintegration into the global economy, following years of isolation. Its focus on removing bottlenecks to the country's accelerating economic growth and on institutional development (with an emphasis on technology transfer and capacity building). To this end, the Bank provided a broad range of lending and non-lending assistance in the highway, railways, and ports sectors.

(b) The ***Years of Transition*** (1991-93), which followed the two-year hiatus in Bank lending in the aftermath of Tiananmen Square. The focus on consolidating earlier assistance to the transport sector (including the approval of several projects that had been prepared prior to the halt in Bank lending), with an added emphasis on exposing selected Provincial Communication Departments (PCD), the Ministry of Railways, as well as the Ministry of Communications (MOC) to the latest technology, improving

their efficiency via technical assistance and training in technical, financial, and managerial areas.

(c) The ***Years of Heavy Lending and Intensified Dialogue*** (1994-1998), during which the Bank's agenda shifted to a "higher plane" in combination with a strong emphasis on project lending commitments. This coincided with a second wave of economic reforms initiated by China in the early 1990s and the greater urgency attached to transport by the government in light of persistent traffic shortages and congestion problems in fast-growing Eastern China. Transport lending during that period has been complemented by a wide range of AAA services (see previous chapter). Notwithstanding a heavy concentration in highways (the NTHS), the Bank also provided assistance in railways as well as started assistance in inland waterways and urban transport. The projects' objectives and the characteristics of their physical and institutional components changed over time to reflect the evolution of the Bank's assistance strategy in the sector

(d) The ***Years of Portfolio Constraints, Shift to the West and Continued Dialogue*** (1999-2002) are marked by the fact that China lost IDA, the challenge to combine development in the West with the Chinese system of repayments by beneficiaries, while IBRD terms are mentioned to be unsuitable for most projects in poor provinces, rural development, and the social sectors. Meanwhile, the policy dialogue in railways is starting with the reform decisions of the Central Government in 1999. The highways sector is remaining the biggest part of the portfolio with continued emphasis on institutional and policy issues as well as rural roads, while the waterways sector seems to become an adequate solution to integrate the Western Provinces with the rest of the economy.

3.8 The typical Bank financed operation in the transport sector has been province-based, in particular since the early 1990s (with the exception of the railways sector). Moreover, the Bank used in its transport sector lending program (like in the other sectors) a pilot approach towards sector reform.

EFFICACY AND EFFICIENCY OF BANK-SUPPORTED TRANSPORT PROJECTS: OED AND QAG RATINGS

3.9 The overall satisfactory outcome of transport sector projects in China is likely to sustain their benefits but had substantial and modest institutional development impacts. Out of the 28 transport projects rated, 2 projects had a highly satisfactory outcome while the remaining 26 projects had satisfactory outcomes. Sustainability seems to be likely as it is in the case of 26 projects, 2 projects showed a highly likely sustainability. The projects ratings have come to the conclusion that 19 projects have substantial institutional development impacts,

Ratings of Transport Projects (06.30.02)

Numbers of projects rated in each subsector	*Approval Fiscal Years*	*Closing Fiscal Years*	*Outcome*	*Sustainability*	*Institutional dev impact*
Highways Projects (12)	1985 - 1995	1991 - 2001	S (12)	Highly L (2) L (10)	Sub (8) Mod (4)
Ports & Waterways Projects (8)	1983 - 1993	1988 - 1999	HS (2) S (6)	L (8)	Sub (6) Mod (2)
Railways Projects (6)	1984 – 1992	1991 - 1999	S (6)	L (6)	Sub (3) Mod (2) Neg (1)
Urban Transport Projects (2)	1992 – 1994	1999 - 2001	S (2)	L (2)	Sub (2)
GRAND TOTAL (28)			HS (2) S (26)	Highly L (2) L (26)	Sub (19) Mod (8) Neg (1)

while 8 projects have moderate impacts, and 1 project has a negligible impact.

3.10 The physical targets of the projects have been substantially met with satisfactory internal economic returns. The economic rate of return (ERR) for China projects in the highway sector, for example range from 15-39% at completion, while the ERR's Staff Appraisal Report (SAP) estimates range from 15-44%. Performance with safeguard policies including environmental, cultural property, and involuntary resettlement has been satisfactory.

3.11 Recent supervision ratings and the Quality Assurance Group's "projects at risk" report on ongoing projects indicate that all transport projects in China have satisfactory implementation progress and are likely to achieve their development objectives.

3.12 Notwithstanding these positive assessments a number of problems have occurred during the implementation of transport projects. Issues on capital investments primarily include:

- Insufficient soil investigations during feasibility studies,
- Underestimation of the technical complexity of expressway construction leading to inadequate engineering designs,
- Insufficient bid documents, that all too often lead to significant cost variations of civil works,
- Delays in resettlement operations that have affected works schedule
- Insufficient attention at design stage to restoring local access resulting in costly changes during construction,
- Insufficient quality control of construction,
- Late tendering of electrical and mechanical facilities components, this has delayed the completion of some projects or restrained the quality and efficiency of operations during several months.

3.13 Less-than-satisfactory engineering design was not an isolated case, and the Bank Group had experiences with some financed highway projects in China. Since the Bank has no resources to undertake in-depth review of designs and technical specifications, from 1991 onward the Bank Group mobilized Consultant Trust Funds and involved consultants in the preparation phase of the engineering design and technical specifications, working jointly with local design institutions. Such an approach was aimed at improving the quality of design documentation through participation in the design process, rather than reviewing already completed packages, in which case there had been a reluctance to introduce changes once the documentation had been completed. Recently, the Bank Group achieved the same objective through including in project preparation mission teams a highway design specialist to scrutinize the engineering design and technical specifications.

3.14 Moreover, China is far away from the principles of the contract's general conditions according to which the Employer, Supervision and Contractor should be separate and independent entities. While over the years the administrative and financial independence of the contracting entities evolved quite extensively, the staffing of the supervision units is still predominately provided from local highway administration units. Assuring the impartiality of the construction supervision units is imperative, and therefore, the creation of an independent construction supervision industry in China should be pursued as a matter of high priority.

3.15 As combined effect of the poor performance of the contractors, and the inexperience of the supervision units in the initial phase of project implementation, the execution and the

quality of the works were not controlled effectively, and, consequently, a substantial portion of the works often failed to meet the technical specifications.

3.16 Even though substantial delays, quality deficiencies, questions about the impartiality of the construction supervision unit, and poor performance of the contractors encountered during the implementation of the projects, the key components as well as the minor components of the project, were implemented satisfactorily. However, there is a general statement to make about the fact that the implementation of institutional components was less successful than physical components in the projects (see further, 3.24 and following).

3.17 While the central government appreciates Bank involvement in the sector leading generally to improved design reviews, supervision and resulting construction quality, there is still a definite need to reinforce rigid construction quality standards, control and enforcement in Bank highway projects. The use of state enterprises in highway construction combined with poor supervision methods or confusion between the role of the state as owner and as contractor can produce opportunities for both corruption and inefficiency. Physical performance in the railway sector (engineering and construction) has generally been quite good or, at least, better than any other country in the Bank's railway lending experience.

THE ROADS SECTOR

3.18 Since 1983, the Bank has implemented a total of 27 highway projects with 13 projects closed, focusing primarily on the NTHS. 14 new highway projects are under active preparation while 4 more highway projects have been proposed to future Bank loan financing.

3.19 By 2001, total lending to China's highway sector exceeded US$5.96 billion. While the Bank operations in the highway sector have generally consisted of construction of a major expressway sector plus construction or improvement of lower class roads, all projects were combined with technical assistance (TA) and training on a variety of topics related to the reform and modernization of the sector. The bulk of projects have been used to increase the capacity of road infrastructure and, to a smaller extent, to improve its maintenance. The Bank strategy (Highway Development and Management: Issues, Options and Strategies) supports continued institutional development and sectoral reforms aimed at modernizing the highway system and its management, as well as investment of high-priority links of the NTHS and the provincial road network that feeds into it.

3.20 In recent years, the Bank loans have been used primarily for construction of the NTHS. The Government has been reluctant to borrow for road maintenance, rural roads and externalities, such as road safety. This can be explained by the fact that:

- Financing required for these activities involve mostly local costs;
- Expenditures are dispersed, occur in small lots, and are thus difficult and cumbersome to handle under Bank procurement guidelines;
- Despite high economic returns, such components do not generate financial returns to repay Bank loans; and
- Institutional fragmentation makes implementation of inter-agencies programs difficult.

3.21 The Bank's highway projects have assisted in the following strategic areas:

- *Highway capacity expansion* to support domestic and international trade and regional integration by adding some 3,500 km of expressways, out of a total of over 16,000 km of expressways now open to traffic;

- *Upgrading and improvement of some 15,000 km of secondary and rural roads* to support rural development and poverty reduction in selected low-income areas including several western provinces;
- *Institutional capacity building and policy reform* in about 20 provinces to improve and sustain road planning and management; construction quality; road financing, road maintenance, environmental and resettlement assessments and management, road traffic safety, and developing market-based road pricing (toll rates);
- *Support to highway securitization* by permitting use of Bank-financed highway assets for listing in the Hong Kong and Shenzhen equity markets through provincial expressway shareholding companies. The securitization has been an idea of the Chinese (see further, 3.45).

3.22 Each project also endeavors to address matters that would contribute to the modernization and increase efficiency of the road system – how to do more, do it better and with less resources. This objective is normally achieved through the projects´ TA components.

3.23 The Bank's long-term involvement in China's highway sector has succeeded in addressing a wide range of sector issues. The OED report (1999) recommends continued Bank participation in the sector with emphasis towards broader policy and institutional reforms. Key sector issues and reforms which the Bank pursued and still is pursuing are as follows:

Building Sector Institutions: Road Safety Issues

3.24 Road Safety has proven to be a difficult area in the Bank's policy dialogue in the highway sector. The 1980s restructuring separated responsibilities for road safety, resulting in fragmentation of safety functions and making it difficult for the Bank to find an audience for road safety initiatives. A major technical and policy study was prepared as the basis for a road safety component in the Sichuan Project. However, the road safety program formulated for the project was not implemented. The absence of activity is attributable to lack of coordination and ownership on the part of central and provincial government agencies as well as a lack of systematic follow-up by the Bank.

3.25 Meanwhile the death toll continues to rise rapidly. It is acknowledged that the reported 80-90,000 fatalities per year in road accidents understate the actual number by at least 50%. This is the world's highest rate in fatalities per year in road accidents – at least three times the U.S. figure with a fraction of the number of vehicles. The Bank activity has so far remained limited to only one of the three EEEs (Engineering, Education, Enforcement), namely the engineering aspects of road safety, such as removal of black spots.

3.26 The Bank has addressed the "Engineering" side of road safety with some success. Since early 1999, this issue has been taken up seriously, even escalating to the level of the State Council (after the collapse of some bridges). A new law was passed giving responsibility for life to designers and contractors for faulty design or construction. Based upon that law, SDPC and MOC have issued a series of regulations on project design, procurement and the designation of legally responsible persons for design, construction and supervision. MOC will establish further rules regarding qualification for entering the market as designer, contractor and supervisor.

New Directions

3.27 Improving design is a necessary but not sufficient measure to have a significant impact on highway safety; the major issue is always driver behavior. Changing driver behavior is a notoriously difficult goal and few developing countries have had much success. A key variable in changing driver behavior is always the insurance system in place. State insurance companies tend to charge low premiums unrelated to driver or company records. Payments are also low and unrelated to accident costs. Thus one of the major incentives for a drivers' licensing and training systems along with adequate record keeping are low to non-existent. In the developed world, the decline in high rates of traffic fatalities coincided with the introduction of insurance systems that linked premiums to driver behavior and payments to more realistic costs of accidents.

3.28 In addition there are numerous other factors that have an indirect impact on safety. Taxes or pricing systems on tires, for example, may encourage a re-treading industry that usually produces unsafe tires with consequent higher accident rates. Low fuel prices will discourage proper maintenance of vehicle engines. Poorly designed vehicles coming out of state factories can also contribute to the carnage on the highways. Unfortunately, a comprehensive analysis of the factors affecting traffic safety in China does not exist. It is an obvious area for sector work by the Bank and an area in which the Bank could draw on the relevant international experience in advising the Chinese on the appropriate solutions.

3.29 As in most developing countries, enforcement of licensing and traffic regulations in China is in the hands of the security apparatus. Enforcement of traffic regulations is seldom a priority activity. In most of the developed world successful policing of the road system has evolved into a specialty that requires an independence from general security concerns as well as specialized training and incentive structures. Most states like China find it difficult to divorce traffic enforcement from security. There are opportunities, however, to promote a more professional approach to traffic management through the development of specialized training and promotional opportunities within the limits of existing policing structures.

Improving Construction Quality

3.30 Highway construction quality is one of the most serious concerns of the sector. The problem has both technical and administrative roots (as illustrated in paras 3.12 to 3.15). While the central government appreciates Bank involvement in the sector due to better design reviews, supervision and resulting construction quality of the Bank projects as compared to locally financed projects, there is a definite need to reinforce rigid construction quality standards, control and enforcement in future Bank highway loans.

3.31 However, the "Review of the Highway Sector Strategy" (2001) remarked that much progress remains to be done to change the mentalities of the customers, the contractors and the supervisors in the respect of quality .

3.32 Some attempts have been made to reduce the exposure of contractors to ruinously tight pricing, and to elicit bids that would be closer to realistic prices, allowing adequate financial resources for construction, as well as fair return for the Contractor's effort. However, contractors complain about the excesses of price competition, and suggest that abnormally low bids should be disregarded. They argue that contractors running into financial difficulties induced by excessively low pricing will be unable to perform, or will strive to reestablish a normal cash flow through claims.

New directions

3.33 In many contracts that have been let at very low prices, both contractors and owners have suffered. On the other hand, it is difficult for the owner to asses accurately what should be a minimum reasonable threshold; and the more diverse the competition, the harder it will be to establish such a threshold. A common practice is that of bracketing, i.e., considering only those bids that lie within a certain range above or below the engineer's estimate, which has been introduced in China on a national basis under the tendering law of 1999. In this system, the lowest responsive bid within the range gets the award. In this case, ingenuity in pricing is discouraged through the arbitrary setting of brackets. It also introduces opportunities for 'gaming' the system and encourages corrupt practices. As long as the role of project owner and contractor are confused, no bidding system will be able to overcome the present pricing problem. Bracketing in Bank financed projects does not reflect best practice under either the rules of the institution or general international procedures.

Enhancing Accessibility to Remote and Low Income Areas

3.34 The provincial highway program in China aims to favorably impact poverty levels, through targeted interventions in low-income areas. Provincial and central government agencies often refrain from borrowing for this purpose since no dedicated revenue source for loan repayment is easily identified (unlike for toll roads).

3.35 Bank experience in other parts of the world, particularly Africa has shown that the lack of roads feeding into the main networks is a serious constraint on agricultural development. Since most of the poor are in these remoter regions, it follows that a feeder road program has a direct impact of addressing poverty issues.

3.36 Is this the case in China? It is not obvious that the lack of feeder roads in China is the main constraint on regional development.

1) Most of the rural areas in China are densely populated and intensively cultivated at a subsistence level. In Africa and other countries, the population is widely scattered and large areas of land uncultivated. Building of feeder roads, particularly when they are connected to a relatively underutilized network will bring unutilized land into cultivation. In China, improvements in feeder roads are likely to change cropping patterns and increase the movement out of subsistence agriculture rather than bring new land under cultivation.

2) In China many of the remote areas are too far from the main highway network to benefit from feeder roads that feed into an already inadequate and over utilized road system. A significant lowering of transport costs requires a denser, higher quality, road network to which to connect the feeder roads. In Africa short connections to an already existing underutilized road network will result in dramatic declines in transportation costs.

3) There are major differences in demand conditions in China than in many other parts of the world. The existence of well-established and dense populations in most areas with relatively sophisticated political and information systems means that the construction of a new road quickly gets translated into a demand for connections. The activity in road construction around existing and new main roads is a case in point. In other countries with low population densities and inadequate social communication systems, the demand for feeder roads is externally driven, not a matter of local demand.

3.37 The Chinese may well be right in saying they do not require assistance in this area. They see the problem as the lack of main road system with which to connect the feeder roads and are confident that once the main roads are established local demand will quickly insure the development of an adequate feeder road network. This, at least, is a more acceptable reason for declining Bank support for feeder roads than the requirement that the Bank can only finance financially self-supporting projects.

3.38 However, the Bank has been doing some effort to include rural road improvement components in its highway projects. Since 1995, Bank projects in 5 provinces have included components called "Rural Improvement for Poverty Alleviation" (RIPA). This program focuses on linking those villages and townships, which do not have basic, all weather access, to existing road networks of a higher order.

Sustaining Road Maintenance

3.39 Several of the most important lessons learned in implementation of highway projects worldwide concern road maintenance. Bank policy papers in 1979 and 1988 underscored the fact that neglect of road maintenance can ultimately result in very high costs to restore infrastructure, and that new road construction must be balanced with the need for road maintenance. Previously, this was not an issue in China – adequate funds were being set aside for this purpose and maintenance was adequately carried out. However, with the expansion of the NTHS, with its high costs, the rapid increase in traffic volumes, and the trend toward using larger trucks with heavier axle loads, concern is growing about the accelerating maintenance requirements in the future.

3.40 In the past, central and provincial road agencies have resisted Bank funding for road maintenance and allocated funds to the construction of new highways, especially revenue-generating roads rather than free access tolled roads, as the latter cannot repay loans in the absence of traffic income. The Bank has financed a number of maintenance studies in different provinces as well as the development of road data base (RDB) and pavement management system (PMS). Implementation of the latter is progressing, but the use of the system for programming work is still rare. The maintenance objective is still frustrated by the shortage of funds and political intervention. Highway Maintenance is still done mostly by the road administrations, although some provinces are starting to experiment with maintenance by contracts as well.

New Directions

3.41 The allocation of funds between maintenance and new construction remains a major problem and will continue to be a problem as long as the basic financial structure for road financing remains unresolved. Based on an estimate that about one third of the road maintenance fee revenues (30 billion Yuan) actually goes to maintenance, this would mean that maintenance expenditures are about Yuan 10 billion a year or less than 4% of the total expenditures of 216 billion Yuan in the last two years. Inadequate maintenance expenditures are an almost universal problem, particularly in those countries undergoing rapid capacity expansion. In the face of overall funding constraints, maintenance is inevitably postponed. It is not yet a major problem in China but shows all the signs of becoming one in the near future. Special funds or earmarking for maintenance has seldom worked anywhere.

3.42 More recent efforts around the world to improve the priority of maintenance expenditures have involved the direct participation of highway users in the decision making

process. Highway user associations and similar groups have been formed to pressure governments into maintaining the highways. Regular data on increased cost of highway use (e.g., Freight rates) associated with declining quality of the road have proven to be a powerful tool in focusing attention on maintenance.

Highway Financing

3.43 There is nothing to wonder that highway financing has been the object of much TA activity in China, in particular since the mid-1990s. Early on, TA on the subject was included in the Beijing-Tianjin-Tanggu Expressway Project and later in the Guangdong Provincial Highway Project. In recognition of the increasing financial resource needs for the expansion, improvement, rehabilitation, and maintenance of the highway network, it was considered appropriate to carry out a study to help identify alternative sources of financing for highway sector development in China during the last decade of the century (under the BTTE Project, carried out in 1990 and 1991). The key conclusion and recommendation of the study was that the bulk of revenues for the road sector should be raised through taxing fuel (see further, 2.6). The Bank, in light of the standoff at Central Government level regarding the fuel taxation issue, and considering that highway financing is primarily a municipal/provincial responsibility, decided to pursue the highway issue at the provincial level under the Bank-financed Guangdong Provincial Highway Project. The final report of the provincial highway finance study, completed in March 1995, identified 19 potential resources of financing options: (a) issuing bonds and stock, (b) exploring possible overseas financing private investors, (c) selling operational rights of existing toll facilities to private investors, and (d) investigating BOT arrangements for expressway projects.

3.44 Independently of the World Bank, many Chinese authorities are creating stock companies, with share issues in Hong Kong, to raise finance for new expressways. Typically the province's contribution is an existing toll highway and its future revenue stream, and the company's objective is to leverage this revenue to generate investment finance for further toll roads. Regarding private sector financing, the Bank gave its no objection to the securitization of roads included in Bank's projects in a number of provinces. Projects attracting full private sector financing are likely to be feasible only in the Eastern/Coastal region. Even in the East, such projects are likely to be in or near urbanized areas, where traffic levels are high (say at least 20,000 vehicles per day) rather than in rural areas. In the more urbanized areas, advantage could also be taken of the increased land values resulting from the investment by including the right of their exploitation in concessions. Projects with unique locations such as bridges and tunnels may also be suitable for full market financing. Highway projects in the Central and Western regions will require either partial or total financing by the central and/or local Governments. In the future, the Bank is ready to participate in projects which require some Government contribution in order to be attractive to the private sector.

3.45 In addition, the Bank has developed a pilot BOT concession model (a bridge to be built across the Yangtze River near Wuhan in Hubei Province) usable for Chinese toll road projects, and regards BOT as a good way to increase private investment in China's infrastructure as the bank decreases its own support for such projects. Bank involvement in BOT development for the highway sector has failed. For instance, the Junshan Bridge project which was designated by the State Development and Planning Commission (SDPC) as one of its five original pilot BOT projects in 1994 was originally included under the Third National Highway (NH3) Project. A US$1 million TA grant was used to conduct a bankability study for the BOT bridge and prepare bidding and concession documents. However, due to delays in high-level government approval, the Bank had moved this component to the Fourth National

Highway (NH4) Project. In mid-1998, the State Council decided to fund the bridge as a traditional public sector project. Through sponsorship of model BOT prequalification and bidding document preparation and development of a competitive and transparent procurement procedure, the Bank was able to play an important formative role in the establishment of a BOT concession framework, conducive to the attention of private financing for China's highway program.

3.46 Over the last three years (1998 to 2000), almost 50% of road development has been financed with domestic bank loans and central Government bonds. This mode of financing roads is obviously not sustainable as the debt burden will soon become too large and banks will not be able to continue expanding their exposure to the sector. The potential role of the market has also been overplayed. The issue of toll road shares in the Hong Kong market has reached its limits also in terms of what the market can absorb from a single sector. As mentioned, traffic levels in the west are about only one third of those in the east and roads there are unlikely to attract private equity financing. It is therefore time to review ways to mobilize private financing for roads and to review the toll road policy, as already mentioned.

New Directions

3.47 There is no question that a massive investment in highway capacity will be required for many decades to come. The bulk of this financing will have to come from public sources, either through taxation or issuance of public debt. It will also have to come largely from domestic savings; the requirements are too large to rely on foreign savings. The recent focus on attracting private capital, particularly foreign private capital has been helpful in generating some funds in the short run but in the long run it has been a distraction from the need to mobilize greater domestic resources. Highways are almost a pure public good where the benefits of road use are widely dispersed and do not necessarily occur to those physically using the network. Many of the benefits, for example, show up in higher land values. Attempting to capture these benefits through road user charges, particularly tolls can introduce a major distortion in road use and result in the loss of substantial benefits.

3.48 China and the Bank need to look beyond the immediate gains offered by the limited financial engineering solutions now being utilized to finance a limited set of roads to broader financial measures that will inevitably involve better use of the public purse. At a minimum, there is a need to understand the impact of present taxes on road users both in terms of their contribution to capital needs as well as their impact on road use, vehicle use, and safety. A road user charge study for China that considers the impacts on users and other beneficiaries is long overdue.

THE RAILWAYS SECTOR

3.49 The Bank has, from the outset, approached railways lending in China from the project specific point of view with the idea of evolving into sector lending, the opposite strategy to the India experience.[1] China is almost the only country where the Bank has shown the long-term patience and continuity to get something done. The early project specific approach has been responsible for the rapid development of

Phase I *1984-1992*	Support of capacity expansion in high-priority corridors and introduction of new technology for improving operating efficiency	**Railways I – Railways V**
Phase II *1993-present*	Support of capacity expansion plus studies and TA for institutional restructuring, policy initiatives, and system wide modernization	**Railways VI-National Railways**

[1] The approach used with India Railways was abandoned after thirty years and thirteen lending operations when it was determined that little progress was being made with measurable improvements in Indian Rail performance.

knowledge of the detailed problems and potential of China Railways.[2] Railways I (1984) was prepared with the idea that it was to be an "initial learning experience for the Bank and the Ministry of Railways that would lead to increased cooperation in subsequent lending operations" which started in 1993 with Railways VI and will accelerate under the recently approved National Railways Project. Even though discussions on the railways reform started in the mid-1990s in cooperation with the Bank (i.e. the Railway Strategy Paper 1993, see 3.51), reform initiatives only occurred in 1999. As noted in the last ICR, "discussions held in the mid-90s did not suggest that even then there was significant ownership of the reform elements of the project agenda. However, appetite for reform grew significantly during the latter half of the decade, because of pressure from the highest levels of government".

3.50 In total, the Bank approved 1 local and 8 national railways projects in China for a total of US$2.5 billion (with project costs in the amount of US$8.6 billion), making it the Bank's largest borrower in this sector. In particular since 1993, most projects included substantial funds for institutional components (training, studies, and consulting services).

3.51 The Bank Group's strategy for the railways sector, outlined in the Railway Strategy (1993) is to support the Government in increasing the capacity and improving operations and efficiency of its railways and in further developing MR´s technical and management capabilities. The first part of the strategy is to be responsible to the material needs of China's railway system as they arise; the second part is to help better equip the sector with the expertise it needs to meet the increasing and more complex demands being placed upon it. Thus, the strategy is a balance between helping to provide sufficient transport capacity to match economic growth and to improve MR´s ability to manage future developments of the railway system.

3.52 Bankwide experience shows that railway reform throughout the world has been slowed by the railway's lack of authority to set rates, the absence of a sufficiently commercial approach to transport markets, and resistance to change in both the railway and other governmental institutions. Further the process of railway reform in China is expected to be difficult, lengthy and uneven because of the size and complexity of the railway system, the ramifications to the entire economy of major changes to the railway's structure, staffing and pricing.

3.53 For these reasons, the Government and MR are following a very cautious, gradual approach in testing reforms in pilot experiments, which the Bank considers appropriate. Examples of these pilot experiments are: Application of the costing model in the Fuzhou Sub administration and in container companies; Housing Reform (in respect to SOE reform); Passenger congestion pricing in selected provinces; Passenger reservation system in one administration. These pilot experiments have had less of an impact on a system-wide approach.

3.54 The costing study, for example which was initiated under the First Railway Project with the idea of phasing this new costing system in throughout the railway over time was tested and introduced in one sub-region, Fuzhou. However, the model has been used to

[2] However, when Railway IV became effective, the Bank expressed its management's increasing uneasiness about lending for railways to China. A letter[2] to the Ministry of Railways explained that, unlike in other countries, railway projects in China had been prepared in a narrow and restrictive way. All non-study components in the past projects had dealt with upgrading, expanding and modernizing of individual physical plants of the railways. Although there was nothing wrong with these "plant-specific" components themselves, the problem was that the Bank had had to appraise these components not only with limited information, but also in isolation from the rest of the railways. As a result, the Bank knew too little about the railway system and the economic priorities of the component appraised relative to other investments.

underpin requests in tariff increases to SPC in 1994 and 1995 and the use of the costing model has been mandated throughout the railway.

3.55 Comparable to the highway sector's experience, the physical objectives of the projects have been successfully accomplished. Bank lending has played a great role in all construction projects in terms of improved signaling, improved construction technology, and upgraded equipment. Land acquisition and resettlement issues are impacting construction projects.

3.56 In addition, technological improvements components, as the Traffic Management Information System (TMIS) and the Railway Investment Study (RIS) have had positive impacts. The TMIS is providing a key tool for railway restructuring and reform. The RIS which was initiated in 1989 provided the Chinese Government with a powerful tool to evaluate trade-offs between capacity expansion and operational improvements. Phase I of RIS was completed in 1992 and used to evaluate all projects in Railway VI with the results that two line construction projects, out of a total of 16 proposals were selected for implementation. In 1994, RIS was used to evaluate the Wuhan-Guangzhou line under Railway VIII, as well as the analysis of the Shanghai-Kowloon line. This system achieved its objectives by developing a decision support system of traffic forecasting, performance, network optimization, benefit/cost, and geographic information system models. The results are feeding into the "tools" for restructuring component of the National Railways II project.

3.57 The reform program of China's railways is broadly consistent with lessons learned from railway reform in developed market economies. First, there should be a clear separation between the Government's role and that of the railway, and between market-driven and public service activities. Second, railways should be organized along lines of business, with clear financial goals (rather the physical output targets), adequate compensation for public services and sufficient authority to set tariffs. Third, major barriers such as redundant labor and employee welfare obligations should be removed. These lessons are reflected in the Railways VII project's policy reform and institutional development initiatives.

3.58 Including components in a project to which the client is not fully committed but to which they agree because such a component is on the Bank's "hot list" delays implementation and may ultimately lead to restructuring a project, as was the case with Railways VIII. Components of National Railway project are MOR driven. Undertaking too much initiative in a project (VI and VII) affects implementation negatively, as commented in an internal evaluation report: "Christmas trees are expensive when too well decorated!" This reflects the impatience of the Bank to "change" China as quickly as possible.

Next Steps

3.59 The reform process for Chinese railways will be a long and daunting task. China, Russia and India are the only countries in the world with a ministry of railways. What is notable about the Chinese railways is that they are expected to cover their operating costs and most of their capital costs from their revenues – and they do so. This has been the case in recent years. In the other two countries (and most of the rest of the world) railways receive substantial transfers from general public revenues or in many cases their deficits cause them to continually erode the condition of their assets.

3.60 This has both positive and negative effects. The strong directive to cover costs means that CR is able to maintain considerable independence from the rest of the government. It has avoided the trap of large debts and the necessity of relying on fiscal transfers. It also means, as long as they are able to cover their costs and meet (usually self determined) investment

targets, pressures for improved efficiencies and administrative reforms are muted. As a monopoly with a strong demand for its outputs, CR has the ability to 'live' with a lot of inefficiencies and indifference to customer concerns.

3.61 The overall efficiency of CR is the result of a curious mixture of highly efficient physical operations taking place within an inefficient administrative structure (typical of Russia as well). The figures on track usage, freight and passenger carriage, and wagon turnaround times are some of the best in the world. This takes place within an administrative structure that is still firmly rooted in an old fashioned central planning framework within which the railways provide a wide range of social services and manufacture most of their own inputs. It operates within a set of geographic administrative divisions with considerable independence; locomotives and crews, for example, change when an administrative boundary is crossed.

3.62 The tariff structure is unrelated to costs. Uniform ton-kilometer and passenger kilometer tariffs prevail throughout the country. These are raised in response to overall revenue needs and there is little information on how these tariffs are related to costs in any particular segment of the system or relationship to the type of cargo carried. The only way to ration limited capacity is through administrative measures.

The Reform Path

3.63 Until recent years pressures for reform have been muted. Almost all of the pressures have been for quick increases in capacity. The Bank strategy has been to support these increases in capacity while at the same time introducing CR to modern railway management and technologies. Better track laying technologies, modern communications, axles designed to take heavier loads, etc. have all been part of the Bank's contribution to improving the efficiency and capacity utilization of the railways. CR, mostly on its own initiative and with some encouragement from the Bank has moved away from the 'iron rice bowl' concept of public enterprises and is in the process of divesting itself from ancillary assets only indirectly related to the operation of a railway.

3.64 The Bank has also made a significant contribution to improving the social and environmental side of railway investments. Although initially resisted, the Bank's insistence on the application of its various safeguard requirements appears to have taken root and become an integral part of investment planning.

3.65 More subtle has been the Bank's attempts to introduce modern accounting, management, and financial practices into the overall structure of railway administration. Although initially introduced as requirements for individual projects, they have spread to become an important element in initiating administrative reform in all parts of CR. In particular, the application of modern administrative tools has brought home the fact that CR knew very little of the real costs of many of its operations.

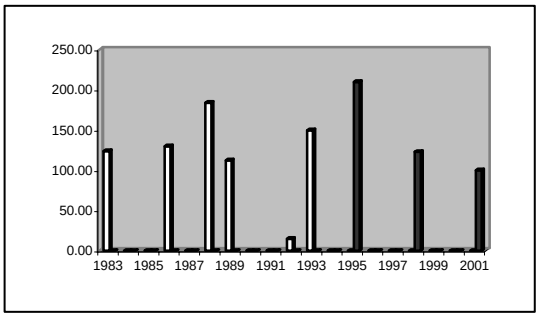
3.66 The impact of these gradual changes can be seen in the latest Bank Project (Dec. 2001) where for the first time China has been willing to accept Bank financing for a series of studies related to identifying appropriate cost and revenue structures that will have profound implications for future reforms. These studies address separation of wagon ownership, infrastructure from operating costs, passenger services as a separate administrative unit, and the possible gains from reorganizing freight carriage into separate administrative units. Information from these studies will provide a data base from which to consider further reforms and represents the very cautious approach taken by China to the reform process.

3.67 The issue for the Bank at this point in time is how to support a reform process that is likely to take several decades. There is much still to be done. The relationship between the role of government as a regulator and the Ministry of Railways as an operator or enterprise remains a subject of contention. The extent to which the private sector has a place is only at the initial discussion stage. Economic tariffs designed to reflect costs will become increasingly important as the railways face more and more competition. The debate has only begun on the extent to which CR should remain a monolithic structure or a set of more independent units designed to meet new competitive pressures.

3.68 The choices for the Bank are to what extent it should continue investing in infrastructure and to what extent it should provide only AAA services. It is unlikely there can be a sharp separation. The Chinese appear to be well started on the reform path but it will be a slow process that will try the patience of the Bank. There is still a large need for further infrastructure and by carefully picking its investments the Bank can make a significant contribution to the overall process. The Bank's advice appears to be highly valued and will continue to be sought as long as the Bank remains an active player in financing the railways.

THE PORTS & INLAND WATERWAYS SECTOR

3.69 The Bank lent to China's ports sector from 1983 to 1996, during which period it has made 6 ports projects with a total of US$715, 4 million in loans and credits. Since 1995 (see Chart), the Bank is as well involved in the waterways sector and approved in 2001 its third Inland Waterways Project. All three waterways loans (totaling an amount of US$433 million) were primarily targeted to expand the IWW capacity, provide more efficient and economic inland waterway transport, as well as enhance the capabilities of the IWT entities.



3.70 The Bank's ports sector lending has followed a path familiar to the other transport modes: physical projects designed to relieve the major shortcomings or supply constraints, coupled with policy and institutional development and studies to guide port policy. All Bank supported port projects in China have been successful and achieved their development objectives. The ERRs of the completed projects were positive, ranging from 19.2 percent to 42.5 percent, while the ERRs were higher than appraisal estimates.

3.71 Since 1996, the Bank is no longer supporting standalone port projects in China. In retrospect, the Bank has played an important role in China's port improvement, "with new management styles, operating systems and equipment, and through effective Bank supervision, China's ports have learned how to do business and substantially improve port performance in an environmentally sound way" as noted in the OED Transport Sector Evaluation (1999). The Bank played a tremendous role in decentralizing the ports sector in the 1980s. Moreover, the first joint ventures in port operations have been built with the experience and guideline of the Bank. The case of the ports sector shows that the Bank learned its lessons to work itself out of a job when no longer needed. The private sector took the ports sector over. In the case of the ports sector, it is of evidence to note that it can be quite successful when the Bank works itself out of a job. Chinese ports have learned how to do business and improved ports performance under the guidance of the Bank.

3.72 Generally, Bank experience in the Inland Waterways Transport (IWT) is very limited, its experience in China is concentrated to three projects, one recently completed (IWT I) and two ongoing projects (IWW II and III). Overall, the first Bank-financed IWW project in China has been a success. The two ongoing projects are progressing satisfactorily both in physical and institutional terms. The major institutional reform has been achieved by establishing SOEs for dam/shiplock operation and by separating these SOEs form the Provincial Communication Departments (in Hunan and Guangxi Provinces). Introduction of the Bank's various safeguard policies, particularly with respect to resettlement, have followed a similar path to that of railway lending; begrudging actions followed by acceptance.

3.73 Bank involvement in the IWW projects will provide further policy reform. Through preparation of the IWW projects, the Bank is assisting MOC in developing and implementing national policy guidelines for modernizing the Inland Waterway Transport (IWT) fleet. The Bank under the ongoing IWW II and III is assisting the project provinces in drawing up a policy for modernizing the IWT fleet. It is expected that the ongoing projects will integrate China's policy guidelines on fleet modernization.

Future Directions

3.74 The major issue with respect to IWW transport projects is the extent to which they should be separated from overall water management projects. Given the close interrelationships between water use in agriculture, flood control, power, and transport there is a strong case for making sure all investments take place within a comprehensive framework.

URBAN TRANSPORT DEVELOPMENT

3.75 Cities of China have undergone breathtaking growth and transformation over the last two decades, economically and physically. The rate of urbanization and motorization in China make the country's urban transport challenges enormous; infrastructure and services, and the relevant institutions, are stretched beyond their limits and outdated.

3.76 Increasing traffic congestion is a symptom of several underlying trends in China's cities. The main causes appear to be the rapid pace of motorization (for both person and freight movements) and the increasingly intensive use of bicycles in city centers. While all traffic suffers from the effects of congestion, the main victims are bus public transport services, which are now deteriorating in several cities at a time when demand for travel is generally rising with increasing affluence. Increased traffic noise and air pollution, and increased community severance, are other undesirable manifestations of the urban transport problem.

3.77 A serious obstacle to tackling these issues is the fragmented nature of urban transport administration and regulation. As a result, cities tend to focus on expensive building solutions, new highways and urban rail systems, which appear to be more straightforward to administer and receive priority from the city leaders. While there is a need for new infrastructure, much can be done by better management in several areas: better traffic management of the existing street system, greater autonomy and incentives to bus operators with Government restricting itself to a regulatory role, and effective control of the demand for transport through consisting pricing policies. There are opportunities for the private sector to contribute, particularly in the rejuvenation of bus operations, but cities need to create the right legal and regulatory environment for these to flourish. All these issues are now being examined in greater depth.

ProjectId	Project Name	Project Status
P003565	Shanghai Metropolitan Transport I	Closed
P003622	Shanghai Metropolitan Transport II	Closed
P003614	Guangzhou City Center Transport	Active
P041890	Liaoning Urban Transport	Active
P045915	Urumqi Urban Transport Improvement	Active
P056596	Shijiazhuang Urban Transport	Active

3.78 The Bank's lending to China's urban transport sector only started in 1991 with the First Shanghai Metropolitan Transport Project. The urban transport portfolio consists of 2 closed and 4 active projects.

3.79 The Bank cosponsored a 1995 symposium in Beijing on China's urban transport development strategy, which recognized that a comprehensive approach to urban transport that balanced transport infrastructure construction with transport policy measures was required. The Concluding Statement summarized this consensus, and set out principles, criteria, and actions to underpin China ' s urban transport strategy, and to guide future assistance from the IBRD and the ADB.

3.80 The Bank has two objectives in China's urban transport sector. First, it seeks to enhance urban economic productivity by improving the operational and economic efficiency of the urban transport system. Second, it aims to strengthen public sector management by improving the planning and management of urban transport. In areas of urban planning, finance, and management, China was looking to the Bank for transfer of knowledge gained in other countries.

3.81 The two metropolitan transport projects (Shanghai Metropolitan Transport Project I and II, SMTP) provided the basis for developing an efficient transport system in the Shanghai Metropolitan Region[3] by:

(a) Increasing capacity, reducing congestion, and improving efficiency in the Shanghai urban transport network, and

(b) Improving the planning, programming, financing, and management of the urban transport system in Shanghai.

3.82 Lessons learned from past operations can be drawn from the experience of the two completed and four ongoing Bank urban transport projects in China: two projects in Shanghai. These can be summarized as follows: There is a need for more than roads. When the Bank begins to work with a new client, there is always limited recognition of the fact that the solution to a city's urban transport problems will be multi-faceted.

Future Directions

3.83 Transport investments, by lowering costs, increase mobility of both goods and people. One of the inevitable consequences of improving the road system will be a large movement of people out of agriculture and rural areas. China has begun the transition to an urban economy but it still has a long way to go. Labor intensive, subsistence agriculture will not produce competitive income levels with the rest of the economy and once improvements in transportation are in place, production functions will change and large parts of the population

[3] In 1990, with Bank assistance, a process was begun to articulate Shanghai's comprehensive reform policies, establish detailed action plans for implementation of reforms, and link the future expenditure program and institutional development of Shanghai to the reform program (the Shanghai Economic Reform Action Program, SERAP).

will shift to higher value activities, mostly in urban areas. The problems of rural poverty will then become the problems of urban poverty.

3.84 Assistance in addressing the problems of the growing urban areas with their growing concentration of lower income groups is an area where the Bank can provide a high level of value added services, particularly in infrastructure. The rapidity of the urban transition usually catches most countries by surprise – and China is no exception. The lessons the Bank has learned in dealing with the urban transition problems in the rest of the world can be usefully applied to China.

3.85 The challenge will be to find an efficient transfer mechanism. The present focus on a few of the larger cities is a good way for the Bank to gain experience in the Chinese context. Given the large and growing number of major cities, the Bank will have to shift to a more 'wholesale' mode if it is to have a significant overall impact. Of particular concern will be the growth of the medium size cities. The urban transition usually results in faster growth in the smaller towns and cities than in the megalopolises. These towns do not have the resources or the experience to manage the rapid growth they are experiencing and often receive inadequate attention from central and provincial institutions. Experience in other countries has shown that early interventions in these cities can have a significant impact on the efficiency and equity of their growth. In urban transport, for example, reservation of road rights of way ahead of the market can lay the basis for improved future mobility and efficient land use.

ANNEX TABLE 1: LIST OF CHINA PROJECTS IN THE TRANSPORT SECTOR, SORTED BY FISCAL YEAR (1983-2001)

Approval FY	ProjectId	Project Name	Project Status	Closing FY	IBRD Commitment At Board	IDA Commitment At Board	Total (IBRD+ IDA) Commitment at Board	Total Project Cost
1983	P003417	**Three Ports**	Closed	1988	124	0	124.00	427.4
1984	P003426	**Railway I**	Closed	1991	220	0	220.00	793.1
1985	P003447	**Highway I**	Closed	1991	42.6	30	72.60	650
1985	P003437	**Railway II**	Closed	1994	235	0	235.00	569.1
1986	P003458	**Tianjin Port**	Closed	1995	130	0	130.00	282
1986	P003459	**Railway III**	Closed	1995	160	70	230.00	577.5
1987	P003448	**Highway II**	Closed	1996	25	133.5	158.50	465.17
1988	P003524	**Sichuan Provincial Highway Development**	Closed	1997	75	50	50.00	399.8
1988	P003530	**Shaanxi Provincial Highway I**	Closed	1995	50	0	88.00	117.8
1988	P003491	**Dalian Port**	Closed	1994	71	25	96.00	230.6
1988	P003494	**Huangpu Port**	Closed	1995	63	25	125.00	239
1988	P003472	**Railway IV**	Closed	1998	200	0	200.00	526.9
1989	P003485	**Jiangxi Provincial Highway Development**	Closed	1996	0	61	61.00	109
1989	P003523	**Shandong Provincial Highway**	Closed	1997	60	50	36.00	423.5
1989	P003515	**Xiamen Port**	Closed	1995	36	0	110.00	90.3
1989	P003542	**Ningbo and Shanghai Ports**	Closed	1996	76.4	0	150.00	339.3
1989	P003543	**Inner Mongolia Local Railway**	Closed	1997	70	80	76.40	349.9
1991	P003572	**Jiangsu Provincial Transport Project**	Closed	1996	100	53.6	153.60	312.8
1992	P003534	**Zhejiang Provincial Highway**	Closed	2000	220	0	15.00	558.8
1992	P003630	**Ship Waste Disposal Project**	Closed	1997	0	15	60.00	64.8
1992	P003486	**Railway V**	Closed	1999	330	0	220.00	1530
1992	P003565	**Shanghai Metropolitan Transport**	Closed	1999	0	60	330.00	148.3
1993	P003518	**Guangdong Provincial Highway**	Closed	2000	240	0	120.00	240
1993	P003581	**Henan Highway**	Closed	2000	120	0	150.00	300.7
1993	P003512	**Shanghai Port Restructuring and Development**	Closed	1999	150	0	240.00	424.3
1993	P003570	**Railway VI**	Closed	2001	420	0	420.00	1183
1994	P003504	**National Highway I**	Closed	2000	380	0	140.00	894.7
1994	P003626	**Fujian Highway I**	Active	2004	140	0	150.00	528.8
1994	P003622	**Shanghai Metropolitan Transport II**	Closed	2001	150	0	380.00	657.1

1995	P003612	**Xinjiang Provincial Highway**	Closed	2001	150	0	150.00	317.5
1995	P003493	**Inland Waterways I**	Closed	2001	210	0	210.00	556.8
1995	P003571	**Railway VII**	Active	2003	400	0	400.00	1749
1996	P003569	**Shanghai-Zhejiang Highway**	Closed	2002	260	0	210.00	729.2
1996	P003652	**Shaanxi Provincial Highway II**	Active	2003	210	0	210.00	586.5
1996	P040513	**Henan Provincial Highway II**	Active	2005	210	0	260.00	605.7
1997	P003643	**Xinjiang Highway II**	Active	2003	300	0	300.00	658.1
1997	P003654	**National Highway II**	Active	2003	400	0	400.00	1150
1998	P036949	**National Highway III**	Active	2005	250	0	123.00	800
1998	P045788	**Tri-Provincial Highway**	Active	2005	230	0	200.00	658.7
1998	P003619	**Inland Waterways II**	Active	2005	123	0	230.00	289.26
1998	P003614	**Guangzhou City Center Transport**	Active	2004	200	0	250.00	550
1999	P041268	**National Highway IV**	Active	2005	350	0	71.00	952
1999	P050036	**Anhui Provincial Transport**	Active	2005	200	0	150.00	453.9
1999	P051705	**Fujiang Highway II**	Active	2005	200	0	200.00	595.6
1999	P003653	**Container Transport**	Active	2005	71	0	200.00	159
1999	P041890	**Liaoning Urban Transport**	Active	2005	150	0	350.00	384
2000	P058843	**Guangxi Highway**	Active	2006	200	0	150.00	566.8
2000	P058844	**Henan Provincial Highway III**	Active	2006	150	0	200.00	342.2
2001	P058845	**Jiangxi Highway II**	Active	2007	200	0	100.00	535.7
2001	P056199	**Inland Waterways III**	Active	2008	100	0	100.00	220.22
2001	P045915	**Urumqi Urban Transport Improvement**	Active	2006	100	0	100.00	270
2001	P056596	**Shijiazhuang Urban Transport**	Active	2007	100	0	200.00	286.2
2002	P058846	**National Railway**	Active	2007	160	0	160.00	1302.24
2003	P076714	**Anhui Highway II**	Pipeline		250		250.00	
2003	P069852	**Wuhan Urban Transport**	Pipeline				0.00	
N/A	P058847	**Xinjiang Provincial Highway III**	Pipeline		150	0	100.00	338.44
N/A	P070441	**Hubei Highway**	Pipeline		250	0	150.00	823
N/A	P070459	**Inner Mongolia Highway**	Pipeline		100	0	250.00	268.73
Grand Total					**9062.00**	**653.1**	**10515.10**	**25537.93 (1983-00)**

ANNEX TABLE 2: SUMMARY TABLE OF CHINA PROJECTS IN THE TRANSPORT SECTOR

Five Year Plan Period	Number of Projects	IBRD commitment at Board	IDA commitment at Board	Total (IBRD+IDA) commitment at Board	Total Project Costs	World Bank share of Total Project Costs (%)
1983-90	17	1638.00	524.50	2162.50	6590.37	33%
1991-95	16	3010.00	128.60	3138.60	9466.60	25%
1996-00	16	3504.00	0.00	3504.00	9480.96	27%
2001-	7	910	0.00	1710.00	Not sufficient data	Not sufficient data
TOTAL	**56**	**9062.00**	**653.1**	**10515.10**	**25537.93 (1983-00)**	**28.33 (1983-00)**

ANNEX TABLE 3: HIGHWAY SECTOR PROJECTS AND RATINGS

(US$ MILL.)

ProjectId	*Project Name	Project Status	Approval FY	Closing FY	IBRD Commitment At Board	IDA Commitment At Board	Outcome	Sustainability	Institutional dev impact
P003447	Highway I	Closed	1985	1991	42.6	30	S	L	Sub
P003448	Highway II	Closed	1987	1996	25	133.5	S	L	M
P003524	Sichuan Provincial Highway Development	Closed	1988	1997	75	50	S	L	Sub
P003530	Shaanxi Provincial Highway I	Closed	1988	1995	50	0	S	L	M
P003485	Jiangxi Provincial Highway Development	Closed	1989	1996	0	61	S	L	M
P003523	Shandong Provincial Highway	Closed	1989	1997	60	50	S	L	Sub
P003572	Jiangsu Provincial Transport	Closed	1991	1996	100	53.6	S	L	M
P003534	Zhejiang Provincial Highway	Closed	1992	2000	220	0	S	L	Sub
P003518	Guangdong Provincial Highway	Closed	1993	2000	240	0	S	Highly L	Sub
P003581	Henan Highway	Closed	1993	2000	120	0	S	L	Sub
P003504	National Highway I	Closed	1994	2000	380	0	S	L	Sub
P003626	Fujian Highway I	Active	1994	2004	140	0			
P003612	Xinjiang Provincial Highway	Closed	1995	2001	150	0	S	Highly L	Sub
P003569	Shanghai-Zhejiang Highway	Closed	1996	2002	260	0			
P003652	Shaanxi Provincial Highway II	Active	1996	2003	210	0			
P040513	Henan Provincial Highway II	Active	1996	2005	210	0			
P003643	Xinjiang Highway II	Active	1997	2003	300	0			
P003654	National Highway II	Active	1997	2003	400	0			
P036949	National Highway III	Active	1998	2005	250	0			
P045788	Tri-Provincial Highway	Active	1998	2005	230	0			
P041268	National Highway IV	Active	1999	2005	350	0			
P050036	Anhui Provincial Transport	Active	1999	2005	200	0			
P051705	Fujian Highway II	Active	1999	2005	200	0			
P003653	Container Transport	Active	1999	2005	71	0			
P058843	Guangxi Highway	Active	2000	2006	200	0			
P058844	Henan Provincial Highway III	Active	2000	2006	150	0			
P058845	Jiangxi Highway II	Active	2001	2007	200	0			
P076714	Anhui Highway II	Pipeline	2003		250				
P058847	Xinjiang Provincial Highway III	Pipeline	N/A		150	0			
P070441	Hubei Highway	Pipeline	N/A		250	0			
P070459	Inner Mongolia Highway	Pipeline	N/A		100	0			
	Grand Total				**5583.6**	**378.1**			

ANNEX TABLE 4: PORTS & INLAND WATERWAYS SECTOR PROJECTS AND RATINGS

ProjectId	Project Name	Project Status	Approval FY	Closing FY	IBRD Commitment At Board	IDA Commitment At Board	Total (IBRD+ IDA) Commitment at Board	Total Project Cost	Outcome	Sustainability	Institutional dev impact
P003417	Three Ports	Closed	1983	1988	124.00	0.00	124.00	427.40	S	L	Sub
P003458	Tianjin Port	Closed	1986	1995	130.00	0.00	130.00	282.00	S	L	Sub
P003494	Huangpu Port	Closed	1988	1995	63.00	25.00	88.00	239.00	S	L	M
P003491	Dalian Port	Closed	1988	1994	71.00	25.00	96.00	230.60	S	L	M
P003515	Xiamen Port	Closed	1989	1995	36.00	0.00	36.00	90.30	S	L	Sub
P003542	Ningbo and Shanghai Ports	Closed	1989	1996	76.40	0.00	76.40	339.30	HS	L	Sub
P003630	Ship Waste Disposal Project	Closed	1992	1997	0.00	15.00	15.00	64.80	HS	L	Sub
P003512	Shanghai Port Restructuring and Development	Closed	1993	1999	150.00	0.00	150.00	424.30	S	L	Sub
P003493	Inland Waterways I	Closed	1995	2001	210.00	0.00	210.00	556.80			
P003619	Inland Waterways II	Active	1998	2005	123.00	0.00	123.00	289.26			
P056199	Inland Waterways III	Active	2001	2008	100.00	0.00	100.00	220.22			
	Grand Total				**1083.40**	**65.00**	**1148.40**	**3163.98**			

ANNEX TABLE 5: RAILWAYS SECTOR PROJECTS AND RATINGS
(US$ Mill.)

ProjectId	Project Name	Project Status	Approval FY	Closing FY	IBRD Commitment At Board	IDA Commitment At Board	Total (IBRD+ IDA) Commitment at Board	Total Project Cost	Outcome	Sustainability	Institutional dev impact
P003426	Railway I	Closed	1984	1991	220.00	0.00	220.00	793.10	S	L	M
P003437	Railway II	Closed	1985	1994	235.00	0.00	235.00	569.10	S	L	Neg
P003459	Railway III	Closed	1986	1995	160.00	70.00	230.00	577.50	S	L	M
P003472	Railway IV	Closed	1988	1998	200.00	0.00	200.00	526.90	S	L	Sub
P003543	Inner Mongolia Local Railway	Closed	1989	1997	70.00	80.00	150.00	349.90	S	L	Sub
P003486	Railway V	Closed	1992	1999	330.00	0.00	330.00	1530.00	S	L	Sub
P003570	Railway VI	Closed	1993	2001	420.00	0.00	420.00	1183.00			
P003571	Railway VII	Active	1995	2003	400.00	0.00	400.00	1749.00			
P058846	National Railway	Active	2002	2007	160.00	0.00	160.00	1302.24			
Grand Total					**2195.00**	**150.00**	**2345.00**	**8580.74**			

ANNEX TABLE 6: URBAN TRANSPORT SECTOR PROJECTS AND RATINGS
(US$ Mill.)

ProjectId	Project Name	Project Status	Approval FY	Closing FY	IBRD Commitment At Board	IDA Commitment At Board	Total (IBRD+ IDA) Commitment at Board	Total Project Cost	Outcome	Sustainability	Institutional dev impact
P003565	Shanghai Metropolitan Transport I	Closed	1992	1999	0.00	60.00	60.00	148.30	S	L	Sub
P003622	Shanghai Metropolitan Transport II	Closed	1994	2001	150.00	0.00	150.00	657.10	S	L	Sub
P003614	Guangzhou City Center Transport	Active	1998	2004	200.00	0.00	200.00	550.00	S	L	Sub
P041890	Liaoning Urban Transport	Active	1999	2005	150.00	0.00	150.00	384.00			
P045915	Urumqi Urban Transport Improvement	Active	2001	2006	100.00	0.00	100.00	270.00			
P056596	Shijiazhuang Urban Transport	Active	2001	2007	100.00	0.00	100.00	286.20			
	Grand Total				**700.00**	**60.00**	**760.00**	**2295.60**			