

**REPORT AND RECOMMENDATION
OF THE
PRESIDENT
TO THE
BOARD OF DIRECTORS
ON A
PROPOSED LOAN
TO THE
PEOPLE'S REPUBLIC OF CHINA
FOR THE
HUNAN ROADS DEVELOPMENT II PROJECT**

August 2004

CURRENCY EQUIVALENTS

(as of 15 August 2004)

Currency Unit	–	yuan (CNY)
CNY1.00	=	\$0.121
\$1.00	=	CNY8.27

The exchange rate of the yuan is determined under a floating exchange rate system. In this report, a rate of \$1.00 = CNY8.27, the rate prevailing at project appraisal is used.

ABBREVIATIONS

ADB	–	Asian Development Bank
CECC	–	Changji Expressway Construction and Development Company
CSE	–	chief supervision engineer
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
EMDP	–	ethnic minorities development plan
FIRR		financial rate of return
FYP	–	five-year-plan
HCD	–	Hunan Provincial Communications Department
HECC	–	Hunan Expressway Construction and Development Corporation
HEPB	–	Hunan Environmental Protection Bureau
HIV/AIDS	–	human immunodeficiency virus/acquired immunodeficiency syndrome
HPG	–	Hunan provincial government
HPSB	–	Hunan Public Security Bureau
HRI	–	Highway Research Institute, Beijing
ICB	–	international competitive bidding
JBIC	–	Japan Bank for International Cooperation
LCB	–	local competitive bidding
LIBOR	–	London interbank offered rate
MOC	–	Ministry of Communications
NTHS	–	national trunk highway system
OM	–	operation and maintenance
PCR	–	project completion report
PPMS	–	project performance management system
PRC	–	People's Republic of China
RP	–	resettlement plan
TA	–	technical assistance
VOC	–	vehicle operating cost

NOTES

- (i) The fiscal year of the Government ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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- A. Poverty Reduction and Social Assessment
- B. Resettlement Plan
- C. Ethnic Minorities Development Plan
- D. Outline of Terms of References for Consulting Services

LOAN AND PROJECT SUMMARY

Borrower	People's Republic of China (PRC)
Classification	Poverty: Other Sector: Transport and communications Subsector: Roads and highways Themes: Economic growth
Environment Assessment	Category. An environmental impact assessment was undertaken; on 2 April 2004, the summary was published on the web site of the Asian Development Bank (ADB) on 2 April 2004.
Project Description	The Project is located in the western part of Hunan Province, one of the poorest regions of the PRC. The Project will (i) construct a 173 kilometer (km) expressway across hilly to mountainous terrain; (ii) improve 517 km of local roads servicing poor counties and townships; and (iii) provide consulting services and training to enhance construction quality, road safety, and project monitoring and evaluation.
Rationale	The Project will support the Government's Western Region Development Strategy by supplying a link in the vital Changsha–Chongqing corridor—one of the eight prioritized western corridors included in 10th Five-Year Plan. The project area is largely rural and mountainous with limited accessibility. Around 56% of the rural population is defined as poor with an annual income of below CNY900. Road infrastructure is inadequate to support economic growth, a necessary prerequisite to tackle poverty in the project area. Some 86% of the roads in Hunan fall below class III. The national highway (NR319), which runs parallel to the project expressway and currently serves as an outlet to major trading destinations such as Chongqing, is a combination of class III and below roads with pavement in poor condition. Over 65% of the highway's length experiences frequent congestion and interference from nonmotorized traffic. Traffic on NR319 has grown at around 7.3% annually over the past few years and will exceed the highway's capacity at several points by 2008. A better road network in western Hunan is needed to facilitate economic growth and to integrate the poor, isolated western regions with the economic centers. The Project is expected to boost economic activities in western Hunan, encourage interregional trade, thus reducing poverty in the project area. Consistent with ADB's country operational strategy, the Project's approach integrates the construction of the expressway and improvement of local roads so that the benefits of the expressway are spread over a wider cross-section of local poor communities.
Objectives	The Project's principal objective is to increase economic growth and thus reduce poverty in Hunan. The Project will (i) enhance economic efficiency, foster trade, facilitate interregional integration, and improve traffic safety; (ii) provide a link in the Changsha–Chongqing

western corridor; (iii) spread economic and social benefits over a wider cross-section of local communities by improving accessibility for the rural poor in the corridor; and (iv) help improve people's incomes and well-being. The Project comprises (i) constructing a 173 km, 4-lane, access-controlled, toll expressway from Changde to Huaihua, including tunnels and bridges, interchanges, toll stations, and service areas; (ii) upgrading or improving 517 km of local roads, thereby providing improved access to poor, minority areas; (iii) procuring equipment for road maintenance and safety, toll collection, surveillance and communications, tunnel ventilation and lighting, vehicle axle load testing, and environmental protection; (iv) provide for land acquisition and resettlement; and (v) provide consulting services for construction supervision, safety audits, monitoring and evaluation, and capacity building.

Cost Estimates

The total cost of the Project is the equivalent of \$778.1 million, with a foreign exchange cost of \$314.2 million (40%) and a local currency cost equivalent to \$463.9 million (60%). The cost of the local road component is \$81.9 million. Of the \$312.5 million ADB loan, \$12.5 million will finance the local road component.

Financing Plan

Source	(\$ million)		
	Foreign Exchange	Local Currency	Total Cost
ADB loan	312.5	0.0	312.5
Ministry of Communications	0.0	106.4	106.4
Hunan Provincial Government	1.7	38.3	40.0
Domestic loan	0.0	319.2	319.2
Total	314.2	463.9	778.1

Source: Asian Development Bank estimates.

Loan Amount and Terms

A loan of \$312.5 million from ADB's ordinary capital resources will be provided under ADB's London interbank offered rate (LIBOR)-based lending facility. The loan will have a 25-year term, including a grace period of 5 years, an interest rate determined in accordance with ADB's LIBOR-based lending facility, a commitment charge of 0.75% per annum, and such other terms and conditions set forth in the draft loan and project agreements.

Allocation and Relending Terms

The ADB loan proceeds will be relented by the Borrower to Hunan Province, which will onlend \$300 million to the Changji Expressway Construction and Development Company (CECC) with the same financial terms and conditions as those of the ADB loan. CECC will bear the interest rate variation and foreign exchange risks. Hunan Province will keep the balance of \$12.5 million to be used for the local road component and will bear the interest rate variation and foreign exchange risks for this amount.

Period of Utilization

Until 30 June 2010

Estimated Project Completion Date	31 December 2009
Executing Agency	Hunan Provincial Communications Department (HCD)
Implementation Arrangements	CECC will be the implementing agency responsible for planning, implementing, and operating the project expressway. The project implementation unit established within CECC will be responsible for expressway construction. The local road improvement program will be implemented under the overall responsibility of HCD.
Procurement	Goods and services financed by the ADB loan will be procured in accordance with ADB's <i>Guidelines for Procurement</i> . Civil works for the expressway will be procured through international competitive bidding. Procurement for the local roads financed by the \$12.5 million ADB loan will use local competitive bidding, while procurement for the local roads under government financing will follow government procedures acceptable to ADB. Equipment will be procured through international competitive bidding. ADB approved advance action for procurement of civil works in May 2004.
Consulting Services	<p>The Project will provide 49 person-months of international consulting services and about 5,184 person-months of domestic consulting. International consulting services will be provided under the Project to (i) assist in project management during the construction period; (ii) provide expertise in tunnel and bridge construction; (iii) assist in preparing the operation and maintenance concession framework and bidding documents; (iv) enhance the provision of transport services; (v) conduct a safety audit of the project design and make recommendations on improving the safety of completed construction works; (vi) help set up and implement quality control procedures; (vii) assist in formulating a human resource development and training program; and (viii) help establish and implement a project performance management system, including the assessment of the impact on poverty reduction. Of the 5,184 person-months of domestic consulting services, 300 person-months will be allocated to the local road component for ensuring proper design and supervision, project monitoring and evaluation, training of the engineering staff, and managing the Project.</p> <p>Overall project supervision will be the responsibility of the chief supervision engineer's office. The chief supervision engineer (CSE) will be assisted by two deputy CSEs, one of whom will be the team leader of the international consultants. He or she will help the CSE with project and contract management activities, and certify the contractor's progress payments and contract variations prior to their approval by the CSE. The international consultants will be financed from the ADB loan; they will be recruited based on the quality and cost-based selection method in accordance with ADB's <i>Guidelines on the Use of Consultants</i>. The domestic consultants will be financed</p>

from domestic resources and will be recruited in accordance with government procedures acceptable to ADB.

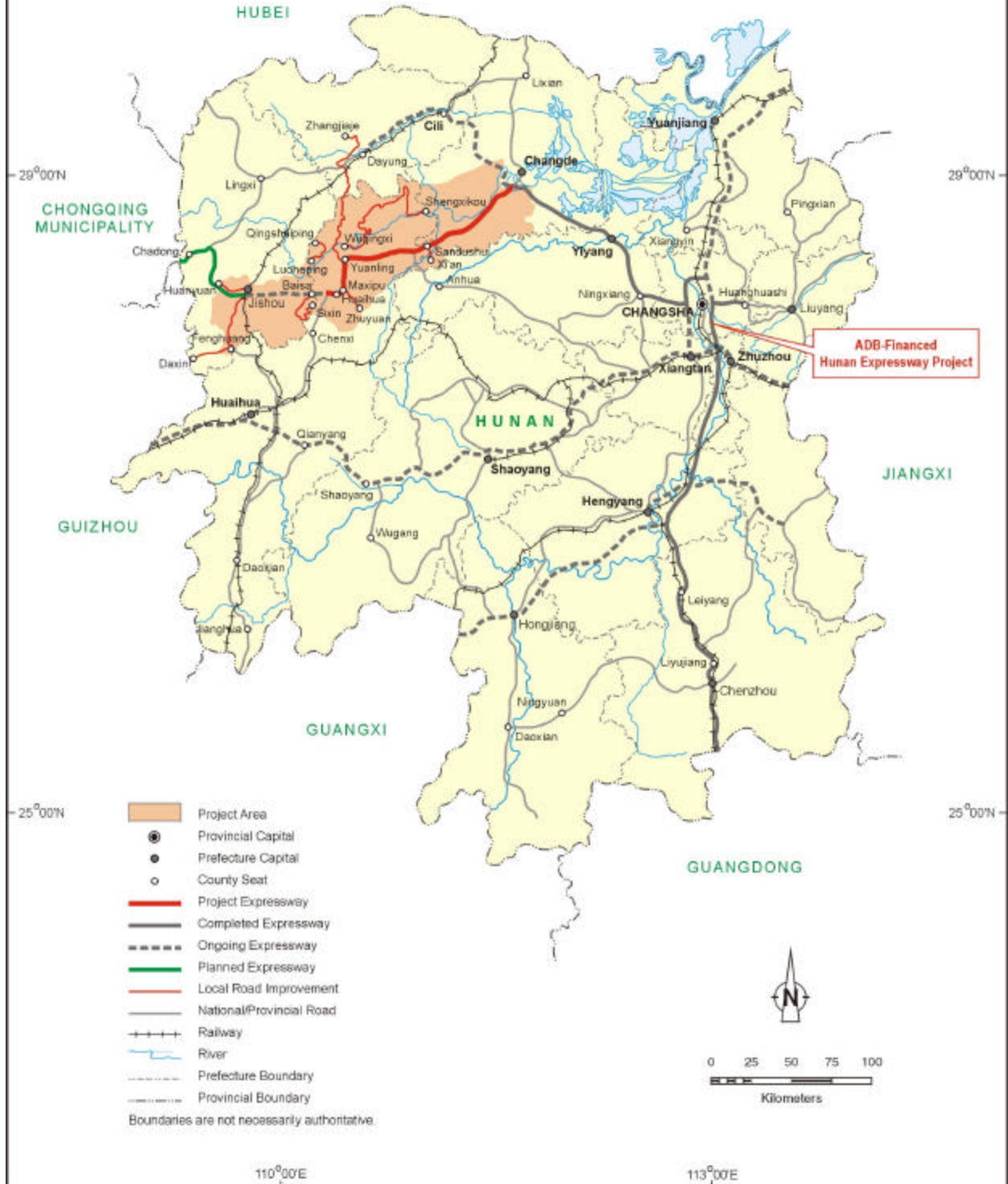
Project Benefits and Beneficiaries

With the new expressway, the travel time between Changde and Huaihua will be reduced by 2–3 hours. The better road conditions will reduce vehicle operating costs, a benefit that is expected to flow down to the townships and villages over time. The project expressway will directly benefit transport providers, bus and truck operators, passengers, and traders. It will speed up transport, provide a comfortable ride, improve road safety, and reduce accidents. Migration, an important source of cash income for most rural households, will also increase with better access to other regions. Poor farmers will benefit from better profit margins gained through lowered transport costs of agricultural inputs and outputs, and higher market competition. The poor in Yuanling and Fenghuang counties will obtain benefits by increased tourism, as the improved roads will help spur the tourism potential in the area. Improved roads will also facilitate the flow of information. Some 1.9 million people (66% of the total population in the project area) will directly benefit from the Project, of whom, around 42% are ethnic minorities. Of the 1.3 million rural beneficiaries, 49% are poor, including the 287,000 poor beneficiaries of the local road component. The economic internal rate of return for the Project is estimated at 18.6% and the financial internal rate of return for the expressway component at 7.6%, higher than the 4.4% real weighted average cost of capital.

Risks and Assumptions

The Project is not expected to be subject to any significant technical risks. Tunnels and deep-cut works will be carefully investigated before construction and monitored to avoid implementation problems. The expected continued economic growth and the ensuing traffic increase limit the risk that potential economic benefits will not materialize. Initial traffic was estimated based on the actual traffic of the ADB-financed expressways in the project corridor. Sensitivity analysis indicates that the economic benefits of the Project are stable. Since the Project will generate revenue in domestic currency, a financial risk is related to changes in the exchange rate. However, sensitivity tests indicate that an adverse change in the exchange rate will have only a minimal effect on the financial internal rate of return. A major environmental risk is possible soil erosion. A soil erosion plan has been developed, and incremental costs have been included in the project cost. The villages in the project area may be at risk of acquiring and transmitting human immunodeficiency virus/acquired immunodeficiency syndrome. Targeted and broad-based advocacy and awareness programs will be carried out in the project area to mitigate this risk.

HUNAN ROADS DEVELOPMENT II PROJECT IN THE PEOPLE'S REPUBLIC OF CHINA



I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the People's Republic of China (PRC) for the Hunan Roads Development II Project.

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

A. Performance Indicators and Analysis

2. The PRC's economic growth since the 1980s has resulted in an unprecedented expansion in intra- and interprovincial traffic. The economy's changing structure and increasing diversification have altered the pattern of transport demand. The demand for road transport has outpaced that of other transport modes. There is a rapidly increasing movement of goods and passengers by road, which is more flexible and responsive than other modes to the needs of a market economy. The shift in transport demand also reflects the loosening of anticompetitive restrictions in the road transport industry itself. Between 1990 and 2003, road traffic grew around 9.6% per annum (p.a.) for passenger traffic, reaching 769.6 billion passenger-kilometers (km); and around 5.7% p.a. for freight, reaching 708 billion ton-km. In 2003, road traffic accounted for 55.7% of the country's total passenger traffic and 13.2% of total freight traffic. With the country's rapid economic growth, low vehicle ownership rates, lower car prices after World Trade Organization accession, increasing access to loans to finance automobile purchases, and investment in automotive manufacturing (\$6 billion provided by the state banks during 2001–2003), the fast expansion in vehicle fleets will continue in the coming years. ADB supports the improvements of road transport efficiency and service quality through its technical assistance (TA) program.¹

3. To meet the growing demand for improved access to markets and services and to build an enabling environment for the private sector, the Government has made major efforts to increase the country's road capacity.² The heart of the road network development is the National Trunk Highway System (NTHS), a 35,000 km system of interprovincial expressways and high-class highways to be constructed over 20 years (target completion: 2007). The NTHS will be complemented by the development of a network of national, provincial, county, and township roads. The Government's road development policies are: (i) constructing expressways to expand the NTHS and link all cities that have a population more than 500,000 and (ii) developing secondary roads, particularly those that will help reduce poverty and promote rural markets. The Government adopted the Western Region Development Strategy (WRDS), a key theme of the 10th Five-Year Plan (FYP) (2001–2005), to enhance economic development in the western part of the country, where most of the poor reside. The WRDS aims to reduce the disparity between the western and coastal regions, and assigns a high priority to road sector development as a means to promote economic growth and poverty reduction in the western region. The proposed Project, a 173 km section of the Changsha-Chongqing corridor, will support the WRDS by building an important link in one of the eight prioritized western corridors included in 10FYP³ and improving access to Changsha and other cities in the poor western region. The project framework is in Appendix 1.

¹ ADB. 2004. *Technical Assistance to the Peoples Republic of China for Policy Reform in Road Transport*. Manila.

² Roads in PRC are classified by design capacity into expressways, and class IV and unclassified roads. The design capacity of class I is 7,500-15,000 medium truck equivalent (MTE), and 1,500-3,750 MTE for class II road. MTE is a standard unit for measuring traffic volume in the PRC. Passenger cars are equal to 0.5 MTE and large articulated trucks, to 2.0 MTE.

³ These include Altai-Hongqilafu, Xi'ning-Korla, Yinchuan-Wuhan, Arongqi-Behai, Lanzhou-Mohan, Xi'an-Hefei, Changsha-Chongqing, and Chengdu-Zhangmu.

4. As a result, the road network grows from 1.16 million km in 1995 to 1.81 million km in 2003, for an average annual increase of 81,300 km.⁴ The length of expressways increases from 2,141 km to 29,800 km.⁵ The density has increased from 12.1 km per 100 square km (km²) in 1995 to 18.6 km per 100 km² in 2003. The new road development program (2003–2020) will increase the road network to over 3 million km, or by 68,000 km annually. Expressways will increase to 70,000 km. In 2003 the Government launched 5,300 rural road projects, covering 78,000 km and costing \$9.1 billion.

B. Analysis of Key Problems and Opportunities

1. Problems

5. Despite the huge investment, the road network is still underdeveloped in both quality and extent, and does not provide access to large parts of the country, particularly in the poorer inland regions. High-standard roads (above class II) account for only 12% of the total network. The remaining 88% are medium- to low-grade paved roads and gravel roads. The road density for every 1 million inhabitants is only 1,100 km. The growing road transport demand has put a strain on the road infrastructure, as manifested by the congestion and bottlenecks in the network. Weaknesses in the road network have resulted in high transport and logistics cost between interior provinces and the coastal ports.⁶ A road sector analysis is included in Appendix 2.

6. Hunan, located in the middle reaches of the Yangtze River, is bordered by Jiangxi to the east, Chongqing to the west, Guangxi to the south, and Hubei to the north. In 2003, the region's per capita GDP was CNY 6,549, 85% of the national average. Agriculture is the mainstay of the economy, employing 69% of the labor force. The major agricultural products—ramie, wheat, rice, corn, tea, and citrus—are grown in the Yuan Valley, through which the Project passes. Hunan has a potential for industrial development. Its industrial output grew over 20% p.a. during 2000–2003. The major sectors include steel, nonferrous metals, coal, chemical processing, machinery, and textiles. The demand for its products from other provinces has sharply increased in recent years. However, weaknesses in road infrastructure lag, failing to adequately support economic growth. Some 86% of the roads in Hunan are below Class III. The national highway (NR319), which runs parallel to the project expressway and currently serves as a link to major trading destinations such as Chongqing, is a combination of Class III and lower roads. The pavement is in poor condition. Two thirds of the road suffers frequent congestion and nonmotorized traffic interfere with fast moving traffic, which frequently lead to accidents. Traffic on NR319 has grown at around 7.3% p.a. in the past few years and will exceed its capacity at several points by 2008.

7. The Project is located in the western part of Hunan—one of the poorest areas in the PRC. The project area is largely rural and mountainous with limited accessibility. About 56% of the rural population is defined as poor with annual per capita incomes of below CNY 900. The poor are concentrated in remote communities in mountains. Due to geographical isolation and the high cost of motorized transport, most farmers in the mountainous poor villages do not have adequate access to markets and have limited mobility beyond their immediate communities. Low-grade farm-to-market roads and collector markets increase handling costs and postharvest losses, further depressing farm-gate returns and the incentive to raise production. Inadequate

⁴ The Government's commitment to improve road infrastructure is reflected in a large investment program, which reach \$44.9 billion in 2003 (source: Ministry of Communications (MOC). 2004. *Transport Statistics*).

⁵ The PRC now ranks second after the United States in terms of length of expressways.

⁶ The shortage of adequate road networks has slowed economic growth and regional development. A World Bank study argued that the annual economic costs of insufficient road infrastructure in the PRC in the 1980s amounted to 1% of its gross national product (*World Development Report*, 1994).

road access is an impediment to higher agricultural productivity and prevents the poor from taking advantage of job opportunities in towns. Better roads in western Hunan is needed to promote economic growth and integrate the poor, isolated regions with the economic centers.

8. The private sector will be the PRC's engine of employment generation and a main mechanism to increase productivity. According to an Asian Development Bank (ADB) survey, infrastructure constraints are among the impediments faced by private companies operating in the PRC.⁷ If private investment is to be attracted to the poor interior provinces, road infrastructure, among other things, needs to be improved. The country's road investment requirements (1996–2010) are estimated at \$504 billion. Available revenues are estimated at \$302 billion from road user charges and \$29 billion from toll collections, leaving a financing gap of \$173 billion. Consistent with ADB's policy dialogue, the Government creates a framework to attract private financing for roads. ADB provided TA to strengthen the institutional capacity for the private sector participation in roads.⁸

2. Opportunities

9. ADB's operational strategy in the PRC's road sector supports (i) the construction of roads that connect major growth centers with hinterland economies; (ii) the integration of the network, so that the NTHS is supported by a system of local roads, particularly those that provide access to poor areas; (iii) the promotion of road safety; (iv) institutional strengthening to increase financial and managerial efficiency in expressway operation; (v) the adoption of appropriate pricing policies to optimize the road transport capacity; and (vi) the use of alternative methods of investment financing. Consistent with this strategy, policy dialogue focuses on key issues, such as strengthening the poverty reduction impact, enhancing the provision of transport services, operation and maintenance concession to the private sector, and improving road safety. These comprise the special features of the Project.

10. The Project, which will support the Government's 10FYP and WRDS, is consistent with ADB's country operational strategy. The 173 km expressway from Changde to Huaihua will supply a link in the Changsha-Chongqing corridor. The expressway will shorten the distance between Changde and Huaihua by 45 km and will reduce the journey time by 2–3 hours, thus offering a considerably faster and safer alternative. By lowering transport costs and improving the frequency and level of transport services, the Project is expected to spur economic activities and interregional trade, and thereby help reduce poverty in the project area. The development of the road network in western Hunan will help transmit the benefits of the eastern region's economic growth to the poor region. The local road improvement has been integrated into the Project to spread the benefits of the expressway over a wider cross-section of poor communities. The integrated approach will improve the rural poor's mobility and road access to economic opportunities, thereby helping raise their incomes in the project area.

11. The impact of road investments on poverty reduction was confirmed in studies that examined the effectiveness of the government's various sectoral expenditures in contributing to

⁷ ADB. 2003. *Private Sector Assessment and Strategy in the People's Republic of China*. Manila. Of 756 domestic firms interviewed, 21% cited poor roads as a major constraint—the second most frequently cited infrastructure constraint.

⁸ ADB. 1997. *Technical Assistance to the People's Republic of China for Corporatization, Leasing, and Securitization in the Road Sector*. Manila.

growth and poverty reduction.⁹ The studies concluded that a significant portion of rural poverty reduction is attributable to nonfarm employment and wage increases. Road investment has a significant impact on the creation of such opportunities in the rural economy. The importance of roads in improving the quality of life is highlighted in an ADB-financed study.¹⁰ A regional TA reviewed the poverty reduction impact of infrastructure projects.¹¹ TA 3900 examined the socioeconomic impact of road investment in the PRC.¹² The findings of TA 3900 reconfirm the contribution of road investments to poverty reduction in the PRC as well as the validity of the geographic focus of the road portfolio on the poorer western interior provinces.¹³ The results also confirm that complimentary investments in local roads strengthen the impact of expressway investments. Well-integrated road investments help ensure that the benefits derived from the expressway filter down to the poor. These results affirm the relevance of ADB's strategy in the road sector. An ADB-financed TA¹⁴ will also help the Government prepare a road network strategy that promotes expressway and local roads to meet communities' needs and support economic growth, and to provide road agencies with cross-disciplinary skills and tools.

12. External assistance to help the Government develop its road sector strategy has been given, mainly by ADB, the Japan Bank for International Cooperation (JBIC), and the World Bank. Since 1991, ADB has provided 27 loans, totaling \$4.8 billion, to finance 3,500 km of road development, together with 5,800 km of associated local road networks. Since 1995, local roads have been included in the scope of road projects to make ADB's interventions in the road sector more pro-poor. Of the ADB-funded projects, 12 have been completed and are open to traffic. ADB also has provided 45 TA packages, totaling \$23.6 million, to the road sector. The advisory TAs have addressed policy and institutional issues, including highway planning, road safety, human resources development, transport pricing, and the mobilization of nongovernment financial resources. The World Bank and JBIC have provided about \$6.1 billion and \$990 million respectively to finance road investments. ADB coordinates with the World Bank and JBIC to ensure the complementarity of aid involvement in the transport sector (Appendix 3).

3. Lessons Learned

13. The Hunan Provincial Communications Department (HCD) has experience as an executing agency (EA) in 4 externally financed road projects,¹⁵ including the Hunan Expressway Project financed by ADB. The operation and maintenance of the ADB-financed expressways, Changtan and Changyong, was awarded a concession to a company in 1998. The lessons learned from this Project¹⁶ suggest that while this experience introduced sound business practices to the Hunan's expressway sector, the concessionaire, was a joint venture between the government and the private sector and consequently the terms of concession were reached through direct negotiation without the transparency in the bidding. Concession with private companies should be awarded through transparent competitive bidding. Other lessons include

⁹ S. Fan, L. Zhang, and X. Zhang. 2001. *Growth, Inequality, and Poverty in Rural China: The Role of Public Investments*. International Food Policy Research Institute. Washington, DC; Eunkyung Kwon. 2000. *Infrastructure, Growth, and Poverty Reduction in Indonesia*. ADB, Manila.

¹⁰ Bloom, D E., H. Craig, and N. Malaney. 2001. *The Quality of Life in Rural Asia*. New York: Oxford University Press.

¹¹ ADB. 2000. *Technical Assistance to the People's Republic of China for Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction*. Manila.

¹² ADB. 2002. *Technical Assistance to the People's Republic of China for the Socioeconomic Assessment of Road Projects*. Manila.

¹³ The poverty reduction effect of road investment appears the largest in less-developed areas (southwest and northwest). For urban poverty, it appears the largest in northeast, southwest, and northwest regions.

¹⁴ ADB. 2003. *Technical Assistance to the People's Republic of China for Poverty Impact of Area-Wide Road Networks*. Manila.

¹⁵ Two World Bank Projects, one JBIC project, and one ADB project.

¹⁶ ADB. 2000. *Project Completion Report on the Hunan Expressway Project*. Manila.

(i) the need for traffic forecast to reflect rapid economic growth, thereby avoiding expensive road widening within a few years of operation; (ii) the benefits of a comprehensive and participatory approach to project preparation; and (iii) the benefits of a planned and well-coordinated resettlement schedule, preceded by consultation with the affected parties before their relocation. Other lessons include (i) the benefits of using Road Safety Audits in designing and constructing expressways;¹⁷ and (ii) the need for careful geological investigation during the design stage to minimize unnecessary contract variations. International consulting inputs for the supervision of civil works were strengthened in the Project.

14. Performance reviews¹⁸ of completed road projects concluded that all loans to the road sector in the PRC have been or are being implemented satisfactorily. Of 7 completed projects, 6 projects were generally successful and 1 was partly successful. The project performance audit reports for 3 road projects¹⁹ concluded that the projects were either highly successful or successful. The lessons learned from previous ADB-financed road projects are reflected in the project design. To avoid delayed loan effectiveness due to delay in the procurement process, a tendering company was recruited to prequalify the civil works contractors. ADB's procurement guidelines and requirements, including the anticorruption provisions, were discussed extensively during appraisal. Emphasis was put on the need to (i) strictly follow ADB's mandatory bidding documents, (ii) evaluate bids according to ADB-approved evaluation criteria, and (iii) substantiate clearly the conclusions of the bid evaluation. The Government has made significant efforts to combat corruption in the road sector. To date, 15 government officials from 10 provinces have been found to be involved corruption. Information related to these corruption cases is in the public domain. There is no evidence that any of the reported corruption was related to ADB funded road projects. During project processing, ADB's anticorruption policy was explained to government officials. The section on fraud and corruption that was added to ADB's Guidelines on Procurement and Guidelines on the Use of Consultants is an efficient mechanism for preventing unethical behavior. ADB's program for the PRC included assistance for improving governance and providing incentives to reduce the incidence of fraudulent practices.²⁰

III. THE PROPOSED PROJECT

A. Objectives

15. The principal objective of the Project is to facilitate efficient, sustainable economic growth and thus contribute to poverty reduction in Hunan. The Project will (i) improve economic efficiency, foster trade, and facilitate interregional integration by alleviating congestion, reducing VOCs, and improving traffic safety; (ii) supply a missing link in the Changsha-Chongqing western corridor; (iii) spread economic and social benefits over a wider cross-section of local communities by improving accessibility for the rural poor in the corridor; and (iv) improve people's incomes and well-being.

¹⁷ During the implementation of the Xiheng expressway, the first World Bank project, handbook for road safety audits was developed. During the implementation of the Changlin expressway, the second World Bank project, the handbook's practical application was enhanced and is now used in all expressway projects in Hunan.

¹⁸ ADB. 2001. *People's Republic of China Procurement Review 2001*. Manila and ADB. 2001. *People's Republic of China Portfolio Performance Review in the Road Sector*. Manila.

¹⁹ ADB. 2000. *Project Performance Audit Report on the Shenyang-Benxi Highway and Jilin Expressway Projects in the People's Republic of China*. Manila; and ADB. 2001. *Project Performance Audit Report on the Heilongjiang Expressway Project in the People's Republic of China*. Manila.

²⁰ ADB. 1998. *Technical Assistance to the People's Republic of China for Strengthening the Government Auditing System*. Manila; and ADB. 2000. *Technical Assistance to the People's Republic of China for Implementation of the Tendering and Bidding Law and Related Regulations*. Manila.

B. Components and Outputs

16. The Project comprises (i) the construction of a 173 km, four-lane access-controlled, toll expressway from Changde to Huaihua, including tunnels and bridges, interchanges and toll stations, and service areas; (ii) the upgrading or improving of 517 km of local roads, thereby providing improved access to 404 villages; (iii) the procurement of equipment for road maintenance and safety, toll collection, surveillance and communications, tunnel ventilation and lighting, vehicle axle road testing, and environmental protection; (iv) land acquisition and resettlement; and (v) consulting services for construction supervision, safety audits, monitoring and evaluation, and capacity building.

C. Special Features

1. Poverty Reduction Impacts—the Local Road Component

17. In line with ADB's policy dialogue, a local road improvement program was integrated into the Project to expand the road network in rural minority villages and to meet their needs.²¹ The integrated approach will help spread the expressway benefits to the poor. Better tie-ins between the expressway and local roads will help rural agricultural products reach markets and allow farmers to upgrade farming practices. As reliable transport to markets becomes more readily available, cash-crop farming in remote or isolated areas will be stimulated and the access to off-farm employment opportunities will be broadened. A set of 9 priority local road sections in the poor area, totaling 517 km, was selected from Hunan's road development plan.

18. Of the ADB loan of \$312.5 million, \$12.5 million will be provided for the local road component, which will finance one section from Zhangjiajie to Yuanling.²² The total cost of the local road component is about \$81.9 million, of which \$12.5 million (15.3%) will be the foreign exchange cost and \$69.4 million equivalent (84.7%) will be the local currency cost. Around 627,000, or 49% of the 1.3 million rural beneficiaries, including the 287,000 poor beneficiaries of the local road component, have an annual per capita income of below CNY900. The nine local road segments will (i) be implemented concurrently with the expressway component, (ii) use Government designs and standards that are acceptable to the ADB, (iii) apply ADB's social safeguard policies, and (iv) be accorded the same degree of attention as the expressway in impact monitoring. The procurement for the ADB-financed section will use LCB, while that for the domestically financed sections will follow government procedures acceptable to ADB. About 300 person-months of domestic consulting services will be allocated to the local road component for ensuring proper design and supervision, project monitoring and evaluation, training the engineering staff, and project management.

2. Transport Services in the Project Area

19. The extent to which the lower transport costs derived from a road investment project are passed on to the rural poor depends on their access to reliable, affordable and competitive transport services. The less the access, the less benefits they will receive compared to other social groups, and thus the lower the poverty impact of the Project. Transport services are well developed in the eastern section of the project area close to Changde, but less so in the western section—mountainous and underdeveloped. Few bus and truck operators ply the

²¹ Since 1995, the scope of the ADB-financed road projects has been expanded to strengthen their impacts on poverty reduction by adding local road improvements to improve the accessibility of poor communities.

²² This 135-km section, of which 29 km is class IV and the rest is unclassified, will be upgraded to class II (11 km) and class 3 (124 km). The upgrading of this section is expected to spur the tourism in the project area.

routes to the poor villages due to bad road conditions or limited road access. The fares and routes of the formal bus system are regulated, which may result in inefficient services. Thus, people in these areas rely more on informal transport services, such as bicycles and motorized tricycles. Despite the crucial role of informal transport services in rural transport, their supply is also insufficient. As a result, the rural poor sell their produce to drive-in traders who have the advantage of a buyer's market. Adequate and affordable transport services provided on a competitive basis are a prerequisite to spreading the Project's benefits to the rural poor, especially those who are beyond the reach of road transport services. Due attention will be given to such services during the Project's implementation so that the Project's benefits reach the rural poor in the project area. Under the ADB loan, an international consultant will be engaged to develop an action plan and associated measures, which would be incorporated into the Project. She/he will examine the following measures: (i) increasing the competition among transport service providers, (ii) deregulating fare and route controls to raise system efficiency and enhance commercial viability, (iii) making more credit available for the purchase of transport vehicles, and (iv) integrating rural transport services into the local roads development (Appendix 4).

3. Operation and Maintenance (OM) Concession to the Private Sector

20. Hunan has actively diversified highway financing and encouraged private sector participation in expressways. The private sector is involved in 5 expressways in Hunan: Changtan, Changyong, Xiheng, Changtan West, and Changyi.²³ In Changtan, Changyong, Xiheng, and Changyi, the private sector has been involved in OM through concession agreements.²⁴ During the Project's initial years of operation, its OM will be entrusted to the Changji Expressway Construction and Development Company (CECC).²⁵ Then HCD will enter into an OM concession after a few years of opening. To this end, HCD will develop the concession agreement framework during the implementation of the Project. In particular, due attention will be given to enhance transparency in the bidding process for the concession, to optimize the gain of the concession to the efficiency in expressway operation. HCD will prepare a bidding document—which specifies the concession period and selection criteria, and ensures adequate pricing and transparent bidding—and submit it to ADB for review by the midterm review in 2006. Under the ADB loan, an international consultant will be engaged for 1 month to help HCD prepare the concession agreement and bidding document. The agreement should include incentives and penalties to ensure expressway maintenance adheres to the agreed standards. HCD will assess a specific schedule of the concession's implementation and advise ADB about it by the midterm review. HCD and ADB will ensure that (i) the concession is adequately priced by awarding it through transparent bidding; and (ii) expressway maintenance will meet the agreed standards (Appendix 5).

4. Road Safety

21. Road safety is a serious concern in Hunan and the PRC. The number of accidents in the project area has increased substantially over the past few years. The 2002 Road Safety Action Plan prepared by the Ministry of Public Security aims to reduce accidents. This goal will be

²³ They are Changsha-Xiangtan, Changsha-Yongtan, Xiangtan-Hengyang, Changsha-Xiangtan West, and Changsha-Yiyang. Changtan and Changyong were funded by ADB (Hunan I Expressway Project [footnote 15]).

²⁴ The OM of Changtan was awarded as a 30-year concession to a company in 1998; in Changyong, the concessionaire was successfully listed in the Ashare section of the Shenzhen Stock Exchange in 1998; and in Xiheng, funded by the World Bank, a 20-year concession was awarded in 2002. See Appendix 5 for details.

²⁵ The CECC was established as a 100% state-owned company in July 2004 for the construction and operation of the project expressway.

achieved through driver training, targeted traffic enforcement, and better traffic management. The Road Traffic Safety Law, effective from May 2004, is enforced nationwide. A Road Safety Committee has been established by Hunan Provincial Government (HPG) to investigate causes of road accidents and identify preventive measures. At least 6 months prior to the opening of the expressway, HCD will (i) develop and implement a road safety action plan acceptable to HPG and ADB—with the help of an international consultant—for the safe operation of the expressway; and (ii) ensure, in collaboration with the Hunan Public Security Bureau (HPSB), that a team of HPSB personnel will patrol the expressway and enforce the new law and regulations in accordance with national and provincial standards. The Project's major contribution to road safety will be the application of a high standard to the expressway's construction to reduce accidents in the corridor. HCD will (i) use its traffic control and surveillance system for the safety of the expressway, (ii) make all facilities of the system available to the agencies concerned to strengthen traffic enforcement and emergency services in the corridor; (iii) promote the use of the *Road Safety Audit Guidelines*, applied to expressways in Hunan, in local roads; and (iv) ensure the enforcement of road safety measures in the expressway and local roads. An international road safety specialist will be engaged for 2 month under the Project to assist HCD in developing the road safety action plan, and check all designs and safety aspects of the expressway during implementation (Appendix 6).

5. Vehicle Emissions

22. The rapid rise in the number of private vehicles has drawn attention the problem of vehicle emissions. Vehicle emissions will have an adverse impact on the environment if no mitigation measures are taken. The Government has taken several measures to control emissions, through regulation on the automobile industry, annual vehicle test, and inspection and maintenance program. The new measures also set emissions and fuel efficiency targets and offer tax incentives to encourage developing more environmentally friendly cars. Hunan has formal vehicle emission standards by which all types of vehicles regularly tested by the Hunan environmental protection bureau (HEPB), in collaboration with the traffic police. At least 6 months prior to the opening of the expressway, HCD will (i) provide ADB with the vehicle emission regulation limits prepared by the HEPB and the penalties for violating emission standards; and (ii) provide ADB with the latest government plan to improve air quality in Hunan, including the cleaner fuel programs (e.g. ethanol and CNG), vehicle testing center facilities, and an inspection and maintenance program. An international vehicle emissions specialist will be employed to develop an action plan to control vehicle emissions in the project area, with the help of the HCD and HEPB. The HCD, in close collaboration with HEPB and other agencies concerned, will implement the vehicle emissions action plan accordingly (Appendix 6).

6. Resettlement Plan

23. The Resettlement Plan (RP) was prepared by the HCD based on the detailed measurement survey (DMS), 56 village surveys, 657 household surveys, local government statistics, and consultations with local officials, village leaders, and affected households. Unless proper mitigation measures are adopted, some 37,000 people could be adversely affected by the Project, which includes 6,414 people to be relocated. The total resettlement cost including contingencies is estimated at CNY434.5 million (\$52.5 million). A resettlement information booklet, with sections on resettlement policy and impacts, compensation rates and entitlements, organizational arrangements, consultation and participation, and grievance procedures, was distributed to the affected villages and publicized in the local media in November 2003. The RP, which has been discussed with county level offices, was submitted to ADB in January 2004 and approved by ADB in May 2004. The final RP, updated based on the DMS, was submitted to

ADB in June 2004, posted on ADB's web site both in English and Chinese in August 2004, and will be distributed to affected county and township offices. For the local roads component, HCD is the responsible agency and the implementing agencies will be the county communications bureaus. There will be some resettlement along the local road section to be financed by the ADB loan; other local roads will only require paving. A summary RP is in Appendix 7.

7. Stakeholder Participation and Consultations

24. During the feasibility study, environmental impact assessment (EIA), and resettlement planning, consultations were conducted with government agencies, villagers, other people likely to be affected by the Project, and local groups to discuss environmental concerns, land acquisition and resettlement issues, and economic development potential. Village investigations and surveys were conducted in the project area to assess the potential adverse effects and benefits of the Project. Over 3,370 people were interviewed in public opinion surveys, social assessment, environmental assessment, and resettlement planning. For the RP, consultation meetings were held with the affected counties, townships, and villages. The Project was well known by the rural people and public support for it was high. The local officials explained the policies and regulations for land compensation and housing removal to those who would be adversely affected by the loss of farmland or housing. These concerns were considered in (i) determining the alignment to reduce adverse social, resettlement, and environmental impacts; (ii) designing connector roads and pedestrian access; and (iii) completing a detailed RP. The consultation process was expanded to finalize the design and formulate appropriate compensation standards and rehabilitation measures for people displaced by land acquisition or house demolition. Villagers participated in the discussions and decisions on village resettlement (Appendix 8).

D. Cost Estimates

25. The total cost of the Project is the equivalent of \$778.1 million, with a foreign exchange cost of \$314.2 million (40%) and a local currency cost amounting to the equivalent of \$463.9 million (60%). The cost of the local road component is \$81.9 million. Of the ADB loan, \$12.5 million is allocated for the local road component, with the remaining costs to be funded by the provincial and county governments. HCD has committed to ensure the appropriate implementation of the local road component during the project period (Appendix 9).

Table 1: Cost Estimates
(\$ million)

Item	Foreign Exchange	Local Currency	Total Cost
A. Base Cost			
1. Civil Works	256.76	239.53	496.30
2. Equipment	8.81	0.00	8.81
3. Land Acquisition and Resettlement	0.00	46.00	46.00
4. Consulting Services and Training	1.69	34.13	35.82
5. Local Road Program	12.50	69.36	81.86
Subtotal	279.76	389.02	668.79
B. Contingencies^a			
1. Physical Contingencies	19.47	23.34	42.81
2. Price Contingencies	5.37	23.91	29.28
Subtotal	24.84	47.25	72.09
C. Interest During Construction	9.56	27.65	37.21
Grand Total	314.17	463.93	778.10

Note: Numbers may not add up due to rounding.

^a Physical contingency is computed at 5.0% and price escalation is at 2.0% per annum.

Source: Asian Development Bank estimates.

E. Financing Plan

26. The Government has requested a loan of \$312.5 million from ADB's ordinary capital resources to help finance the Project. The Borrower of the Loan will be the PRC. The loan will carry a 25-year term, with a grace period of 5 years, an interest rate determined in accordance with ADB's LIBOR-based lending facility, a commitment charge of 0.75% p.a., and other terms and conditions set forth in the draft Loan and Project Agreements. The Government has provided ADB with (i) the reasons for its decision to borrow under ADB's LIBOR-based lending facility on the basis of these terms and conditions; and (ii) an undertaking that these choices were independently made, not influenced by any communication or advice from ADB.

27. Of the total project cost, ADB will finance 40.2%; the Government, 13.7%, on a grant basis; and HPG, 5.1%, using its own funds. The remaining local currency cost of \$319.2 million will be domestically raised by HPG. The ADB loan proceeds will be made available to the Government, which, in turn, will make them available to HPG, on the same financial terms and conditions as those of the ADB loan. HPG will bear the interest rate fluctuation and foreign exchange risks. HPG will onlend a portion of the loan proceeds—\$300 million—to CECC on the same financial terms and conditions as those of the ADB loan. CECC will bear the interest fluctuation and foreign exchange risks. Hunan Province will keep the balance of \$12.5 million and use it for the local road component; it will bear the interest rate variation fluctuation and foreign exchange risks.

Table 2: Financing Plan
(\$ million)

Source	Foreign Exchange	Local Currency	Total Cost
Asian Development Bank	312.5	0.0	312.5
Ministry of Communications	0.0	106.4	106.4
Hunan Provincial Government	1.7	38.3	40.0
Domestic loan	0.0	319.2	319.2
Total	314.2	463.9	778.1

Source: Asian Development Bank estimates.

F. Implementation Arrangements

1. Project Management

28. HCD will be the EA responsible for overall Project implementation and implementation of the local road component of the Project. CECC will be the implementing agency, responsible for coordinating and monitoring all construction activities of the expressway, as well as operating the expressway. CECC's general manager, the project director, will be responsible for overall project management in respect to the expressway, the approval of contracts, and payments. HCD will implement the local road component through the local communications bureaus. A project implementation unit established within CECC will facilitate land acquisition, resettlement, and environmental protection measures, and ensure that local concerns are adequately addressed. The unit is headed by a project manager, who will oversee physical implementation activities day-to-day and prepare progress reports. Apart from its central office, CECC has seven toll stations and four maintenance centers. CECC has sufficient technical capability to handle the Project. However, its institutional capacity needs to be further strengthened; assistance will be provided under the consulting services.

2. Implementation Period

29. Preconstruction activities—detailed design, the preparation of bidding documents, the prequalification of contractors, and the tendering and awarding of contracts—began in April 2003. Preliminary design was completed in March 2003 and detailed design in December 2003. Completion of the preconstruction activities is targeted for 31 October 2004. The construction of the expressway is scheduled to start in March 2005 and the Project will be completed by December 2009. The construction schedule is in Appendix 10.

3. Procurement

30. All ADB-financed procurements will follow ADB's *Guidelines for Procurement*. The main civil works will be divided into 21 packages and the equipment, into 3 packages, all of which are to be procured under international competitive bidding (ICB) procedures (Appendix 11). Ancillary facilities, including the administration building and service areas building under domestic financing, will be procured using local competitive bidding (LCB). The procurement for the local road section financed by the ADB loan will use LCB, while the procurement for the local roads under government financing will follow government procedures acceptable to ADB. The international bidding will be conducted by a qualified tendering company with previous experience in externally funded projects. Only prequalified contractors with adequate technical and financial capacities will be allowed to bid for several packages; they may be awarded more than one contract based on the least-cost combination of contracts. The relevant sections of ADB's anticorruption policy will be included in all documents and contracts related to the bidding and implementation of the Project.

4. Consulting Services

31. The Project will provide 49 person-months of international consultants and approximately 5,184 person-months of domestic consultants. Thirty-six of the 49 person-months of international consultants will be for the supervision of the civil works; 1 person-month each for pavement design, tunnel construction, vehicle emissions and environment, the operation and maintenance concession, and transport services; 2 person-months each for road safety, and socioeconomic and poverty impact monitoring and evaluation; and 4 person-months for additional experts, as needed. Of the total of 5,184 person-months of domestic consulting services, 300 person-months will be allocated to the local road component. HCD will establish 6 resident supervision engineer offices for construction supervision, environmental and resettlement monitoring, and project performance monitoring and evaluation. Overall project supervision will fall under the responsibility of the chief supervision engineer's office. The chief supervision engineer (CSE) will be assisted by 2 deputy CSEs, one of whom will be the team leader of the international consultants. He or she will assist the CSE in project and contract management activities, and certify the contractor's progress payments and contract variations prior to their approval by the CSE. The international consultants will be financed by the ADB loan and will be recruited based on the quality- and cost-based selection method in accordance with ADB's *Guidelines on the Use of Consultants*. Domestic consultants will be funded by domestic financing and recruited in accordance with government procedures acceptable to ADB.

5. Disbursement Arrangements

32. The loan will be disbursed in accordance with ADB's *Loan Disbursement Handbook*.²⁶ Since most of the payments will be made for large contracts (above the equivalent of \$100,000), direct payments, reimbursements, and commitment procedures will be used to withdraw loan funds. If government funds are used first for eligible expenditures, ADB's reimbursement procedure will be followed. To expedite the flow of funds, the statement of expenditures procedure may be used for reimbursement of eligible expenditures for any individual payment not exceeding the equivalent of \$100,000.

6. Advance Procurement Action

33. The Government requested for advance procurement action for civil works,²⁷ which ADB approved in May 2004. This covers the prequalification of contractors, tendering, and bid evaluation for civil works contract packages, but does not include the signing of contracts. The advance actions are being undertaken in accordance with ADB's *Guidelines for Procurement* and *Guidelines on the Use of Consultants*. The Government and HCD have been advised that the approval of the advance action does not commit ADB to finance the Project.

7. Accounting, Auditing, and Reporting

34. HCD and CECC will maintain separate accounts for the Project related financial statements, such as statements of source and application of funds, income statements, and balance sheet. The income statements will start on the commencement of toll operations. CECC and HCD will prepare one set of financial statements each for the expressway and local road component and have them audited annually. The audit will be in accordance with appropriate auditing standards consistently applied by independent external auditors whose qualifications, experience, and terms of reference are acceptable to ADB. HCD and CECC will submit to ADB within 6 months of the end of each related fiscal year, certified copies of audited project accounts and financial statements and an auditor's report for the Project, all in English. To ensure that internal controls and checks on the project construction costs and operations are effective, HCD will establish an internal audit unit and will maintain it during implementation and operation of the Project. The unit, composed of full-time accountants, will undertake independent tests on day-to-day transactions, prior to reference to external auditors. HCD will make satisfactory arrangements for reporting implementation progress through quarterly progress reports. Within 3 months of completion, HCD will submit a project completion report to ADB.

8. Anticorruption

35. During project processing, the mission explained ADB's anticorruption policy to provincial and local government officials, highlighting the section on fraud and corruption that was added to ADB's *Guidelines on Procurement* and *Guidelines on the Use of Consultants*. ADB's program for the PRC includes assistance that will improve governance and provide incentives to reduce the incidence of corruption in the longer term. For the Project, the EA will take the following anticorruption actions: (i) involving full-time officials from HCD's supervision division in bidding, construction, and operations; (ii) introducing a dual-signing system, in which

²⁶ ADB. 2001. *Loan Disbursement Handbook*. Manila.

²⁷ This Project was first listed in ADB *Business Opportunities* (Internet edition) on 11 February 2004.

the civil-works contract winner also signs an anticorruption contract with the employer; and (iii) periodic inspections on the contractor's activities related to fund withdrawals and settlements.

9. Project Performance Monitoring and Evaluation

36. The HCD concurred with the proposed set of indicators for monitoring and evaluating the performance of the Project in relation to its goals and objectives. Based on the results of TA 3900, a set of monitoring indicators for the socioeconomic and poverty reduction impacts was refined, in close consultation with HCD and local government officials. The key indicators and assumptions outlined under goal and purpose in the project framework (Appendix 1) will form the core of the data required for assessment. Prior to project implementation, HCD will establish the necessary baseline values for impact indicators and update them during project implementation. Where relevant, indicators will be disaggregated by gender and ethnic group. HCD will measure the indicators for project evaluation on project inception, completion, and annually for 3 years after completion. The level of effort for the project performance monitoring system (PPMS) tasks will include: 3 person-months of international expertise to design and set up the PPMS and train domestic consultants on monitoring methodology; and 24 person-months of domestic expertise for database management, village-level surveys, analysis, and reporting—for which HCD will recruit an independent local institute. To facilitate the assessment of the Project's socioeconomic impact, the terms of reference to monitor and evaluate project impacts are included in the scope of consulting services to be provided under the Project. Reports summarizing the key findings of monitoring at inception, completion, and annually for 3 years thereafter will be submitted to ADB.

10. Project Review

37. In 2006, ADB and HCD will carry out a midterm review of the Project, focusing on policy, institutional, administrative, organizational, technical, environmental, social, economic, financial, and other relevant aspects that may have an impact on the performance of the Project and its continuing viability. The review will examine the progress in implementing sectoral reforms, policy development, resettlement, and compliance with assurances in the Loan Agreement.

11. Capacity Building and Human Resources Development

38. To cope with increased expressway construction and management activities, a Human Resources Development Plan will be drawn up in time for the start of civil works. The plan will take into account the EA's need for capacity building, and the recruitment and training requirements. One element of the plan, an international training program funded by the loan, will cover expressway operations; accounting, auditing, and reporting of financial statements; commercial development of expressways and business planning; expressway maintenance; road safety; project management; bridge and tunnel design; traffic engineering; and pavement design. HCD staff will undergo about 65 person-months of international training. Assisted by the consultants, HCD will prepare the training programs, their location, and a list of candidates, for ADB's concurrence. The output of the training will be disseminated through HCD and CECC.

IV. PROJECT BENEFITS, IMPACTS, AND RISKS

A. Economic Benefits

39. In 2003, traffic volume on NR319 reached around 3,510 MTE per day between Changde and Huaihua. Traffic has been growing at 7.3% p.a. The traffic on NR319 will reach 5,500 MTE

in 2008, exceeding the road's capacity at several points. Traffic on the expressway is forecast to grow from 5,630 MTE to 10,130 MTE per day between 2008 and 2018, a 6.1% annual increase.²⁸ Thereafter, traffic growth will slow to 5.1% p.a., reaching 16,700 MTE by 2028. Based on the economic forecast in the project area, the traffic projections consider (i) traffic growth for the past 10 years, (ii) a probable generation of traffic due to expanded economic activities, (iii) the likelihood that NR319 traffic will be diverted to the expressway once the latter is operational, and (iv) origin-destination survey results (Appendix 12).

40. The economic internal rate of return (EIRR) of the project expressway was estimated by comparing the project case with a base case involving the continued use and maintenance of NR319. Without the Project, congestion will worsen, causing delays, increasing VOCs and more accident and deaths. The Project, with its shorter distance and travel time, safer design, and better running conditions, will reduce VOCs and accident risks along the corridor. The economic costs of the expressway are: (i) the capital cost, which includes physical contingencies, land acquisition, and resettlement, and (ii) the costs of operating and maintaining the expressway, including the costs of replacing depreciated equipment. The economic benefits include (i) savings in VOC due to the shorter distance and improved road conditions, (ii) time savings for road users, (iii) savings in road accident costs, and (iv) benefits to generated traffic.²⁹ Economic costs and benefits have been valued at 2004 economic prices. The benefits identified for the local road component include (i) VOC savings to current and future traffic on the improved roads, (ii) crop value-added benefits because of higher farm-gate prices and improved access, and (iii) generated benefits from tourism development. However, the last two benefits were excluded in the EIRR calculation since it is hard to quantify them.

41. At 18.6% p.a., the EIRR for the Project demonstrated the Project's economic viability (Appendix 13). The VOC savings from the expressway accounted for most of the benefits (66% of the total), followed by time savings at 14%. The other benefits were comparatively small. The benefits of the local road component, while extremely important to the villages concerned, constituted a minor percentage of the overall project benefits, reflecting the modest traffic levels on the local roads. The results of the sensitivity analysis confirmed the robustness of the Project's economic viability. Changes in the key variables—construction costs, toll rates, and benefits—did not significantly affect its viability, and the EIRR remained above the threshold of 12% p.a. The EIRR for the expressway was 17.7% and for the local road component, 20.1%.

B. Financial Benefits

42. Financial projections have been prepared for the expressway component in accordance with ADB's *Guidelines for the Financial Government and Management of Investment Projects Financed by the ADB* to assess the financial viability and sustainability of the expressway (Appendix 14). The projected financial statements indicate that financial revenues will be sufficient to cover operating and maintenance costs, income taxes, debt service and provide a reasonable rate of return. Based on the financial projections, a debt service coverage rate of 1.0 will be achievable from the third year of full commercial operations. The financial evaluation of the expressway was undertaken in real terms using constant 2004 prices. The project cost estimates and financial projections in nominal terms were converted to real terms by adjusting for the projected effects of foreign and domestic inflation and currency fluctuations. The financial internal rate of return (FIRR) for the project expressway, computed on an after-tax basis, is

²⁸ For the Changtan expressway (ADB funded *Hunan I Expressway Project* [footnote 15]), traffic growth was 12.2% p.a. for the first 3 years of operation (1997–1999), compared with the 3.4% projected at appraisal.

²⁹ Environmental benefits will also come from reduced vehicle emissions and noise, but these have not been included in the analysis because of the lack of a suitable evaluation methodology.

7.6%. This compares favorably with the weighted average cost of capital, also computed on an after tax basis, of 4.4%. The expressway is considered both financial viable and sustainable. Sensitivity analysis indicates that the FIRR is robust under adverse conditions (Appendix 15). Hunan has a toll policy for expressways governed by the Highway Law. The following criteria were used: (i) toll levels on other expressways, (ii) affordability, (iii) benefits to users of the expressway and the alternative roads, (iv) historical and actual traffic flows, and (v) debt service. CECC, in consultation with ADB, will propose the toll rates for the expressway. HCD, the Hunan Finance Department, and Hunan Price Bureau will evaluate the proposal and approve the applicable toll rates. HCD will consult with ADB regarding the proposed initial toll rates 6 months before the opening of the expressway. HCD and CECC will review the toll annually and monitor actual traffic levels and financial performance.

C. Social and Poverty Reduction Impacts

1. Project Beneficiaries

43. The field surveys indicate that the project expressway will directly benefit road users, such as transport providers, bus and truck operators, passengers, traders, government officials, and the private sector in general. Rural households in the project area are also a beneficiary group. Farmers, particularly those living in the area of the local road program and near the expressway interchanges, will be in a position to increase their agricultural incomes through better access to markets, more competitive product and input prices, and cheaper transport costs. They will also have better access to social services, faster information flows, and increased interaction with the outside world. The poor in Yuanling and Fenghuang counties will obtain significant benefits from increase tourism due to improved roads.

2. Social Impacts

44. Better roads help to improve the quality of life due to better access to social services. More qualified teachers and doctors are willing to work in the rural areas. Improved roads cut transport costs and the time it takes to go to seek health care at a health facility. The health impact will be reflected in lower mortality and morbidity rates. Road improvements also increase the mobility of people. The construction of the expressway will also increase the number of truck and bus drivers passing through communities, putting the residents at a higher risk of acquiring and transmitting sexually transmitted infections (STI) and HIV/AIDS.³⁰ The surveys indicated that rural poor households know little about HIV/AIDS prevention, possibly exacerbating the disease's spread to local communities, particularly the minority groups. Through the ethnic minorities development plan (EMDP) and social action plan (SAP), the Project will support HIV/AIDS awareness and prevention programs. Targeted and broadly based advocacy and awareness programs will be carried out in the project area.³¹

45. The minority population in the project area totaled 1.3 million in 2002 (41% of the total population), of whom 96% were Tujia and Miao. Of the total minority people in the area, 60% will benefit from the Project. The major benefits to the minorities include higher income from increased cash-crop farming, more cash income sources due to seasonal migration work, enhanced contract with urban centers, and better access to social services. Minorities comprise

³⁰ Human immunodeficiency virus/acquired immunodeficiency syndrome.

³¹ HCD will ensure that contractors disseminate information on the risks of STIs and HIV/AIDS to their employees during project implementation—a requirement that will be included in the contract. Local public health offices will disseminate similar information to ethnic minorities, transport operators, and women in the project area, in accordance with ongoing HIV/AIDS prevention efforts.

about 38% of the people affected by land acquisition and resettlement. Adverse impacts on minorities are addressed in the RP.³² The EMDP was prepared based on RP, SAP, and ongoing government policies and programs for minority groups. In accordance with PRC regulations and ADB's indigenous peoples policy it provides special mitigation measures for the minority households identified as poor and vulnerable. A summary of EMDP is in Appendix 16.

46. The Project will enhance women's access to information and better contact opportunities with towns (as bus passengers) and jobs (as traders or sellers in local markets). Female migrant workers will benefit from the expressway since they often have to travel to distant provinces to find suitable work. The benefits for farmers will include women, as it is they who handle the majority of farm work. Women will also benefit from increased marketing opportunities (most fruit and vegetable sellers in local markets are women) and from better access to education and health facilities. The Project will enhance women's participation in planning, project monitoring and evaluation, and the implementation of other poverty reduction programs, especially in the villages served by the local road component. Women have an equal opportunity and pay in construction and operation jobs under the PRC Labor Law and will receive preferential treatment in accordance with the ADB's *Policy on Gender and Development*.

3. Impacts on Poverty

47. The improved local roads linked to the major road network will facilitate the spread of the expressway's benefits to the rural economy. By lowering transport costs and travel time along the corridor, the Project will improve the availability of daily necessities in the local markets and villages that are served by its interchanges, and the access to markets and income-generating opportunities. With the expressway, the journey time between Changde and Huaihua will be cut by 2-3 hours. Improved local roads will stimulate the development of the rural economy by spreading the benefits of the expressway into these areas. Poor farmers will get better profit margins because the lower transport costs of agricultural inputs and outputs. Migration to off farm jobs, an important source of cash income for most rural households, will further increase as the expressway improves access to other cities and provinces. The expressway will allow more tourists to visit the project area. The improved roads will help develop the tourism potential in the Golden Tourism Triangle Area. Increased tourist traffic will benefit the poor residing in Yuanling and Fenghuang counties. Some 1.9 million people, around 42% of whom are ethnic minorities, will directly benefit from the Project. About 49% of the 1.3 million rural beneficiaries and 15% of 573,000 urban beneficiaries are poor (Appendix 17).³³

4. Resettlement Impacts

48. The project expressway will directly affect 22 townships, 97 villages, and 465 landowning groups in 3 districts or counties: Dingcheng District, Taoyuan County, and Yuanling County. In the 97 villages, minority nationalities account for 38% of the population. According to the DMS, 1,349 ha of land will be acquired. Of which 38% is farmland, composed of irrigated land (79%) and dryland (21%). The remaining portion permanently acquired land comprises of forestland, housing plots and bush land. About 290 ha of land will be temporarily used during the construction phase. According to the method described in the Administration Land Law, land acquisition will directly affect 30,564 persons who will totally lose their land. Along with land acquisition, about 235,000 m² of houses and other structures will be demolished, which will

³² Minority households affected by the alignment are more integrated and better off than minorities living in the poor mountainous areas.

³³ The urban poverty estimate was based on the per capita monthly income of CNY 180 in municipalities and CNY 130 in counties. The PPTA study concluded that 15% of the urban population in the project area is poor.

affect about 1,414 rural households,³⁴ 5 primary schools, and 1 tree nursery in the Zhengjiayi Forestry Farm. The total number of affected people is estimated at 37,000.³⁵ An RP was formulated in accordance with PRC laws and local regulations, and the ADB's *Policy on Involuntary Resettlement* and *Indigenous People's Policy*. The resettlement strategy, compensation standards, entitlements, and rehabilitation plans were based on impact surveys and consultations with local officials and affected households. Considering that the degree of the impact on villages is modest and most of the affected persons are not poor compared with the average income in their community, the RP will be implemented smoothly. Land acquisition will be completed in 2004 and compensation will be paid prior to the displacement of people or loss of land. Compensation and other allowances will be used to invest in economic and social infrastructure so that farmers' livelihoods and living standards will improve. Economic rehabilitation plans have been prepared for 10 seriously affected villages. Special attention will be paid to the vulnerable groups to prevent their marginalization or impoverishment.

D. Environmental Impacts

49. The Project is classified as environmental category A by ADB. The EIA report was prepared by HCD, under the supervision of HEPB, and approved by the State Environmental Protection Administration in November 2003. The EIA assessed environmental impacts of the selected alignment of the expressway and the local road component, and prescribed environmental protection and mitigation measures costing \$2.4 million.³⁶ The proposed alignment does not cross or impinge on any protected areas. There are no known rare or endangered species in the project area, and no old growth forest, with the exception of one tree near Guanzhuang village. This tree is believed to be more than 400 years old, and has been tagged as a protected item. The alignment was diverted away from this area, thereby increasing its length by about 700 meters. The Project's major environmental impacts include soil and water conservation, erosion control, borrow and disposal site management, and revegetation. Borrow and spoil disposal sites were identified at 10 km intervals. An erosion control and protection plan was prepared separately from the EIA, and approved by the Water Resources Bureau. Environmental mitigating measures will be incorporated in the bidding documents and bills of quantities of the civil work contracts.

E. Project Risks

50. Since the project expressway will pass through hilly and mountainous terrains, tunnels and deep cut works will be carefully evaluated by an international tunnel expert before construction begins, and subsequently monitored to avoid implementation problems. The prequalification of contractors will focus on their technical and financial capacity in handling complex works. During the construction period, monitoring and contract management systems will be set up with the assistance of the international consultants for the timely identification of technical issues and implementation of corrective measures. The expected continued economic growth and the ensuing traffic increase limit the risk that potential economic benefits will not materialize. Based on the actual traffic of the expressways in the project corridor, the estimated

³⁴ Of the people affected, 12% are poor.

³⁵ The final alignment and staking survey was done in close consultation with local officials, village leaders, and people to be affected so as to minimize the loss of high quality land. The local villagers have discussed their requirements for accessibility once the expressway is constructed. Local roads will be rerouted and underpasses or overpasses will be constructed to ensure the unhindered flow of local traffic.

³⁶ A summary EIA was circulated to the ADB Board on 30 March 2004, and placed on the ADB web site on 2 April 2004. The Chinese version of the EIA was sent to the Project's field offices as reference for the public and other interested parties.

initial traffic is probable. The proposed toll level is consistent with the local economy and reflects the trend in tolls for PRC expressways. HCD reviewed the tolls for each expressway to maximize the traffic flow along the corridor. ADB's policy dialogue on private sector participation in expressways will promote the efficiency of the financial and operational management of the expressway. The financial covenants will encourage CECC to exercise improved operating efficiency and better financial management for the market-based financial costs. Since the Project will generate revenue in domestic currency, there is a financial risk from fluctuations in the exchange rate. However, sensitivity tests indicate that an adverse change in the exchange rate will have only a minimal effect on the FIRR. A potential environmental risk is soil erosion due to road construction, which may worsen the natural soil erosion resulting from the removal of vegetation, soil disturbance, and the exposure of the bare soil surface. A comprehensive soil erosion plan was developed and the associated incremental costs were included in the project cost. The Project will improve mobility of people, which may exacerbate the rapid spread of HIV/AIDS to local communities, particularly the minorities. Targeted and broadly based advocacy and awareness programs addressing the associated risks of HIV/AIDS will be carried out in the project area.

V. ASSURANCES

A. Specific Assurances

51. In addition to the standard assurances, the following specific assurances have been incorporated in the legal documents.

52. **Counterpart Financing.** The Government will take, and will cause HPG, through HCD, to take all necessary measures to ensure that (i) CECC can successfully construct the project expressway, and (ii) the local roads construction and improvements are completed prior to the completion of the project expressway.

53. **Construction Quality.** HCD will ensure that (i) the Project is constructed in accordance with MOC's revised technical standards of highway engineering; (ii) the local roads under the Project are upgraded, constructed, and maintained in accordance with national standards; and (iii) project construction supervision, quality control, and contract management are conducted in accordance with national standards and internationally accepted practices.

54. **Road Safety.** (i) At least 6 months prior to the commencement of expressway operations, (a) HCD will, in coordination with the international consultant, develop and implement a plan, acceptable to HPG and ADB, for ensuring safe operation of road infrastructure facilities; and (b) HPG will establish teams of security personnel, in accordance with national and HPG standards, to patrol the project expressway and enforce the national laws and regulations. HCD shall utilize its traffic control and surveillance systems to implement road safety measures for the Project; and (ii) CECC will (a) put in place the road safety signage, emergency communication system, traffic monitoring included in the project design; and (b) take all appropriate measures in order to prevent overloading on the project expressway by installing vehicle axle weighing and weighing scales equipment at expressway tollgates.

55. **Tolls.** At least 6 months prior to the opening of the expressway, HCD will propose the appropriate toll rates for the expressway in accordance with the Highway Law (which requires that toll rates be set at levels sufficient to fulfill the debt service obligations of the Project as well as maintain sound operation, management, and maintenance practices for the Project). For the

first 3 years of full commercial operation, HCD will review the toll structure and levels and report to ADB significant difficulties in meeting the principles established under the Highway Law.

56. **Financial Ratios.** HCD will ensure that CECC maintains a debt service coverage ratio of not less than 1.0 from the third year of full commercial operation.

57. **Operation and Maintenance Concession.** With the help of an international consultant, the EA will prepare the bidding document and the concession framework by 2006, which specifies the concession period and selection criteria, and ensures adequate pricing and transparent auctioning, and submit it to ADB for review by 2006. HCD will assess a specific schedule of the concession's implementation by the midterm review and advise ADB about it.

58. **Nongovernment Financing.** Six months prior to the start of the project expressway operation, HCD will analyze the feasibility of attracting nongovernment investment funds for future road sector investment, including private sector participation in the operation and maintenance of the project expressway, and report its conclusions to ADB.

59. **Change in Operations.** In the event that HPG or CECC plan to make (i) any change in ownership of the Project facilitates; or (ii) make any sale, transfer, or assignment of HPG's or CECC's interest in the Project expressway; or (iii) lease out, or contract out, or otherwise modify CECC's responsibilities for operation and maintenance of the Project expressway, the Government, HPG and CECC shall, at least 6 months prior implementation of such plan, consult ADB and obtain ADB's consent prior to implementation of such plan.

60. **Financial Reporting.** During the construction period and for the first 3 fiscal years of full commercial operation, HCD will submit to ADB annual audited accounts and financial statements for the Project, including the accounts maintained by CECC for the Project. In each case, independent and qualified auditors, appointed by HCD, will review such statements, including the project account, income statement, funds statement, and balance sheet. HCD will submit to ADB certified copies of the audited project accounts and financial statements, and an auditor's report for the Project (all in English) on or before June 30.

61. **Human Resources Development and Training.** Prior to the start of civil works for the Project expressway, CECC, in consultation with HCD, shall develop and implement a human resources development plan, acceptable to ADB, that identifies the managerial, staffing, and investment requirements of CECC in relation to the Project and that includes an international training component to address these needs. For each following year, as an integral part of this human resources development plan, CECC shall prepare an annual training plan including (i) the objectives of the training activities, (ii) number of the training participants, (iii) duration, (iv) cost estimates, and (v) the program of workshops to be given to CECC employees by those who will participate in the international training. On completion of each international training, CECC shall submit to ADB an evaluation of the training. CECC shall require that the persons participating in the international training workshops remain in the employment of the transport sector in Hunan Province, as the case may be, for a minimum period of 5 years after Project completion to ensure skills retention and continued implementation of workshops for other staff members.

62. **Environment.** CECC will ensure that (i) the Project is constructed and operated in accordance with national and local environmental procedures and guidelines, ADB's environmental procedures and guidelines and the EIA; (ii) any adverse environmental impacts arising from the Project are minimized by implementing the mitigating measures and

environmental monitoring program presented in the EIA, and (iii) the implementation of the environmental management plan and any violation of environmental standards are regularly reported to ADB in accordance with the specifications set forth in the EIA.

63. **Vehicle Emissions.** At least 6 months prior to the opening of the expressway, HPG will provide to ADB the HEPB emission standards and the penalties for infringement of such standards. HPG will ensure that through the relevant agencies, the HEPB vehicle emission standards as well as the national vehicle emission standards be enforced.

64. **Land Acquisition and Resettlement.** CECC will (i) implement the RP in accordance with its terms, (ii) ensure that all land and rights-of-way required by the Project are made available in a timely manner, (iii) ensure that the provisions of the RP will be implemented in accordance with all applicable government laws and regulations and ADB's *Policy on Involuntary Resettlement*, (iv) ensure compensation and resettlement assistance are given to the affected people (AP) prior to dispossession and displacement; (v) ensure the timely provision of counterpart funds for land acquisition and resettlement activities, (vi) meet any obligations in excess of the RP budget estimate, and (vii) ensure that the AP will be at least as well off as they would have been in the absence of the Project. CECC will also ensure that (i) adequate staff and resources are committed to supervising and monitoring the implementation of the RP and providing quarterly reports on such implementation to ADB, (ii) an independent agency acceptable to ADB will be contracted to carry out monitoring and evaluation, and forward reports to ADB, (iii) data will be disaggregated by gender and monitoring will focus on gender impacts and vulnerable groups, and (iv) a summary of government audits of resettlement disbursements and expenditures provided to ADB. CECC will ensure that civil works contractor specifications include requirements to comply with the RP and entitlements for permanent and temporary impacts to AP, and will supervise the contractors to ensure compliance with requirements of the RP, applicable law, and ADB policy. CECC ensure that (a) any land acquisition carried out by county communications bureaus for the local roads component of the Project will also be implemented in accordance with the RP and (b) adequate resettlement compensation funds are available and properly utilized.

65. **Poverty Reduction.** HCD will advise the contractors to maximize their employment of local poor people who meet the job and efficiency requirements for the construction of the project facilities. HCD will monitor the impacts of the Project on poverty in accordance with the guidelines set forth in the PPMS.

66. **Ethnic Minority Development.** HCD will implement the EMDP and will ensure that (i) ethnic minorities benefit from the Project in accordance with ADB's *Policy on Indigenous Peoples*; (ii) ethnic minorities in the Project area are consulted and provided with an opportunity to participate in the implementation of the EMDP; (iii) sufficient budget for implementation and monitoring of the EMDP will be made available in a timely manner; (iv) any significant changes to the EMDP will be submitted to ADB for approval; and (v) implementation of the EMDP is monitored and evaluated by an independent agency, and reported annually to ADB.

67. **Transport Services.** Under the loan, with the help of an international consultant, HCD will (i) develop an action plan to enhance the provision of transport services, and (ii) ensure that adequate road transport services will be in place so that the Project's benefits filter down to the rural poor in the area. EA will coordinate with other agencies to implement the plan.

68. **Monitoring and Evaluation.** HCD and CECC will monitor and evaluate project impacts through a PPMS to ensure that the project facilities are managed effectively and the benefits,

particularly to the poor, are maximized. HCD and CECC will collect PPMS data agreed with ADB prior to implementation, at completion, and annually for 3 years thereafter.

69. **Gender and Development.** CECC will follow ADB's policy on gender and development during project implementation and will take necessary steps to encourage women living in the project area to participate in planning and implementing the Project, including advising the contractors on maximizing their employment of women in connection with the Project. HCD will monitor the Project's effects on women during project implementation.

70. **Health Risks.** HCD and CECC, in coordination with the appropriate agencies identified by the Government, will cause the contractors to disseminate information on the risks of socially and sexually transmitted diseases, including HIV/AIDS, to their employees during project implementation. HCD will cause the appropriate agencies to disseminate similar information to transport operators and to local communities living in the project area during project implementation and operation of the project facilities.

71. **Women and Child Labor.** CECC will ensure that all civil works contractors engaged under the Project (i) provide timely payment of wages and safe working conditions to all workers including male and female workers (to be included in civil works contract and monitored by construction supervision consultant); (ii) provide women's employment, where appropriate, with equal pay; (iii) do not employ child labor in project activities, in accordance with the relevant PRC laws and regulations.

B. Condition for Disbursement

72. The following will be a condition to disbursement of the portion of the loan proceeds relating to the project expressway: (i) (a) an onlending agreement between HPG and CECC, in form and substance satisfactory to ADB, has been duly executed and delivered on behalf of, and has become effective and binding upon HPG and CECC; and (b) a legal opinion or opinions are furnished to, and accepted by ADB, showing that the onlending agreement has been duly authorized or ratified by, and executed and delivered on behalf of, and is legally binding upon HPG and CECC, and (ii) the updated RP for the local road component and its disclosure on ADB web site and to the affected villagers will be conditions for the disbursement of the ADB loan for the local road section.

VI. RECOMMENDATION

73. I am satisfied that the proposed loan would comply with the Articles of Agreement of the ADB and recommend that the Board approve the loan of \$312,500,000 to the People's Republic of China for the Hunan Roads Development II Project from ADB's ordinary capital resources with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan and Project Agreements presented to the Board.

TADAO CHINO
President

18 August 2004

PROJECT FRAMEWORK

Design Summary	Performance Indicators/Targets	Monitoring Mechanism	Assumptions and Risks
Goal Economic development and poverty reduction	<ul style="list-style-type: none"> • A 10% increase in gross domestic product over 3 years • A 10% decrease in poverty incidence in the project area over 5 years • Generated employment in the nonfarm sector that is 10% higher than in the control area in 5 years • A 10% growth in the number of rural enterprises within 3 years • A 10% increase in inter and intra provincial trade in the western regions within 3 years. 	<ul style="list-style-type: none"> • Hunan Statistics Yearbook • Socioeconomic and livelihood surveys by the EA • ADB missions to assess project implementation 	
Purpose Increase transport efficiency Provide rural farmers with better access to markets and social services Improve road safety in the transport corridor	<ul style="list-style-type: none"> • A 10% decrease in congestion along NR319, between Changde and Huaihua, within 3 years • A 10% reduction in VOC or transport fares within 3 years • A 10% improvement in input and output prices within 3 years • An annual 10% increase in interprovincial traffic—passengers and tonnage—within 3 years • A 10% reduction in travel time to nearest markets, health services, and schools within 3 years • Traffic from villages to townships and counties that is 10% higher than in the control area • A 25% decrease in accident rate in the project roads during the first 5 years of operation 	<ul style="list-style-type: none"> • Project completion report • Traffic counts survey by the EA along the corridor • Annual reports of transport enterprises in Hunan • Direct measures of cost and travel time by the consultants • Direct measurement of cost and time for small trucks along the corridor, as well as socioeconomic surveys by the consultants • Accident statistics provided by the Hunan Public Security Bureau 	<ul style="list-style-type: none"> • Continued rapid economic growth in the People's Republic of China (PRC) and Hunan Province. • The reduction in VOC is passed on to consumers. • The EA implements the local road improvement program as planned. • Better traffic enforcement and accident reporting procedures are in place.
Outputs Civil Works and Equipment 173 kilometers (km) of expressway, 11 km of class II connector roads, 81 bridges including 3 extra-large bridges, and 7 interchanges Upgrading of 517 km of local roads	<ul style="list-style-type: none"> • Construction completed and open to traffic by 2008 • Works carried out and completed concurrently with expressway works, using Government design and standards acceptable to ADB 	<ul style="list-style-type: none"> • Project administration missions, progress reports, and PCR • Project administration missions, progress reports, international consultant reports, and PCR • Construction supervision by domestic consultants 	<ul style="list-style-type: none"> • Implementation capacity of the EA; good performance of contractors; and strict construction supervision and quality control • Local government will be able to mobilize adequate resources to implement the program.

Continued on next page.

Design Summary	Performance Indicators/Targets	Monitoring Mechanism	Assumptions and Risks
<p>Procurement and installation of equipment for traffic engineering, road safety, traffic monitoring, road maintenance, and tunnel operation</p> <p>High quality construction supervision and monitoring and evaluation; capacity building for Changji Expressway Construction and Development Company (CECC)</p> <p>Adequate resettlement and rehabilitation of all affected people and households (About 37,000 people affected)</p> <p>Operation and Maintenance (OM) Concession awarded to the private sector</p> <p>Enhanced provision of transport services</p>	<ul style="list-style-type: none"> Equipment package contents, procurement schedule, and actual equipment cost Achievements in terms of quality control and timely implementation Improved CECC implementation capacity and expressway operation Implementation of resettlement plan (RP). Compensation levels for permanent loss of farmland, housing and other assets as agreed Welfare of those resettled at least to level prevailing before acquisition OM concession framework and time-specific schedule of the concession award Enhanced transparency in the bidding process. Implementation of the measures to increase the adequate transport services 	<ul style="list-style-type: none"> Progress report, Project review missions, and PCR Progress reports; project administration and completion review missions; training assessment Progress reports, review missions. Baseline household survey. Independent consultants to monitor entitlements, prepare periodic report during resettlement implementation, and evaluate achievement of objectives upon RP completion and one year after OM concession framework and bidding document, review missions Progress reports, review missions 	<ul style="list-style-type: none"> Completion of equipment procurement and installation at project opening Timely selection of experienced and qualified consultants Land acquisition and RP implemented as agreed. Affected population compensated at agreed rates. Off-farm income opportunities increase. Capacity and capability of the provincial government and EA to undertake private sector transactions Enough private investors are interested in the bidding. Adequate coordination among various government offices
<p>Activities/Inputs</p> <p>Inputs</p> <p>Provision of adequate counterpart funds</p> <p>Recruitment of supervision consultant including 49 person-month (pm) of international and 5,184 pm of domestic consulting services for construction supervision; 24 pm of domestic consultants for monitoring and evaluation; About 65 pm of international training.</p>	<ul style="list-style-type: none"> Funds (\$156 million) allocated from the Ministry of Communications and HCD; domestic commercial bank loan (\$319.2 million) Consultants to be recruited by March 2005 Actual international and domestic consultants inputs. Development and implementation of the training program. 	<ul style="list-style-type: none"> Project budget by financing sources Contract documents 	<ul style="list-style-type: none"> Timely provision of adequate counterpart funds

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PROJECT FRAMEWORK—Continued

Design Summary	Performance Indicators/Targets	Monitoring Mechanism	Assumptions and Risks
Award of contracts.	<ul style="list-style-type: none"> • Civil works contracts to be awarded by March 2005 	<ul style="list-style-type: none"> • Contract documents 	<ul style="list-style-type: none"> • Effective project management, activities coordination and planning
Expressway construction and upgrading of selected local roads	<ul style="list-style-type: none"> • Expressway construction including testing and commissioning, and upgrading completed by 2008 	<ul style="list-style-type: none"> • Progress reports, project administration mission, PCR 	<ul style="list-style-type: none"> • Effective project and contract management; timely implementation of remedial actions required by unexpected situations; effective performance of contractors
Construction supervision Training program	<ul style="list-style-type: none"> • Implementation of supervision activities; development and implementation of contract management system and quality control procedures 	<ul style="list-style-type: none"> • Progress reports and review missions; training program and list of candidates; posttraining reports and evaluation 	<ul style="list-style-type: none"> • Qualified and experienced consultants; effective transfer of knowledge from the trainees to CECC
Funding and staff resources for land acquisition and resettlement. Implementation of compensation measures.	<ul style="list-style-type: none"> • \$53 million and compensation measures implemented 	<ul style="list-style-type: none"> • Project review and administration missions, EA and consultant reports, resettlement monitoring program, detailed action plan. 	
Implementation of measures in ethnic minorities development plan (EMDP)	<ul style="list-style-type: none"> • Actions in EMDP implemented during project implementation 	<ul style="list-style-type: none"> • Project review missions • Progress reports by the EA • EMDP monitoring program • Detailed action plan 	<ul style="list-style-type: none"> • Good monitoring and review takes place.
Implementation environmental impact mitigation measures in project design and construction.	<ul style="list-style-type: none"> • Mitigation measures and environmental enhancement measures from the environmental impact assessment and environmental management plan 	<ul style="list-style-type: none"> • Environmental monitoring reports by EA and provincial environmental protection bureau 	<ul style="list-style-type: none"> • Timely provision of funds and provision of additional funds if required.
Monitoring and evaluation of benefits from the road development	<ul style="list-style-type: none"> • Development and implementation of Project performance management system (PPMS) 	<ul style="list-style-type: none"> • PPMS. Consultant reports, progress reports; provincial and county statistics; midterm, completion, and post-evaluation missions 	<ul style="list-style-type: none"> • Timely recruitment of domestic consultants for following up and monitoring socioeconomic impacts; effective consultation and coordination among the agencies involved

ADB = Asian Development Bank, CECC = Changji Expressway Construction and Development Company, EIA = environmental impact assessment, EMDP = ethnic minorities development plan, ha = hectare, HCD = Hunan Provincial Communications Department, km = kilometer, NR = national road, PRA = participatory rural appraisal, PRC = People's Republic of China, PCR = project completion report, PPMS = project performance management system, VOC = vehicle operating cost.

ROAD SECTOR ANALYSIS

A. Road Network

1. In 2003, the highway network of the People's Republic of China (PRC) comprised 1.8 million kilometers (km), an increase of 44,600 km from 2002. Of this, 1.4 million km were classified—class 2 and above roads accounted for 271,600 km, 15% of the total length. Density increased from 12.1 km per 100 square km (km^2) in 1995 to 18.9 km per 100 km^2 in 2003. In 2003, Hunan's road network accounted for 4.8% of the country's total, with a length of 85,233 km. Of this total, 45,544 km (53.4%) were classified: 1,218 km of expressways (1.4%), 468 km of class I roads (0.5%), 5,173 km of class II roads (6.1%), and 32,830 km of class III-IV roads (38.5%). Unclassified roads amounted to 46,376 km (54.7%).

B. Vehicle Fleet and Traffic

2. In 2003, the PRC vehicle fleet totaled 24 million trucks, cars, and buses. The privately owned fleet of motor vehicles increased above 20 times during 1985–2003, from 0.3 million vehicles to 12 million. Despite the rapid increase in total vehicles, there are only about 1.3 vehicles for 100 persons, which is low relative to other Asian countries. In 2003, about 1.0 million vehicles were registered in Hunan, of which 45% are passenger vehicles. Road passenger traffic in Hunan in passenger-km of travel grew at 6.9% per annum (p.a.) between 1990 and 2003, slower than the 9.3% rate for the PRC as a whole. Road freight traffic, in ton-km, grew at 8.1% annually, compared with 5.7% for the country. Privately owned vehicles in Hunan totaled 0.36 million vehicles, of which 53% are passenger cars. The Government issued new rules, which will have impacts on PRC's car industry: by tightening the opening of new car factories, setting a minimum investment for new vehicle factories, and loosening decade-old restrictions on foreign carmakers. Currently, the PRC has more than 100 manufacturers, but most operate on a scale too small to compete with world-class automakers. Cars are also among the sectors where the Government tries to squeeze soaring investment to help ease inflation. The new rules also set emissions and fuel efficiency targets and offer tax incentives to encourage producing more environmentally friendly cars.

C. Road Administration

3. Hunan Provincial Communications Department (HCD) is responsible for regulating the road transport industry in Hunan by licensing drivers, vehicles, and intercity bus services. Freight transport is essentially deregulated; however interprovincial bus routes require Ministry of Communications' (MOC) approval. Through tariff reform in trucking, private operations have increased resulting in improved transport efficiency and quality of services from increased competition. Road administration is decentralized. Road transport tariffs are allowed within a range of plus or minus 20% of advisory tariffs set by provincial and lower administrations on the advice of their communications departments and bureaus. This flexibility, coupled with ease of market entry, will help ensure that cost reductions resulting from improved road conditions are passed on to passengers.

D. Road Sector Revenues and Expenditures

4. Expenditures in highway infrastructure are financed from dedicated user charges, Government grants, domestic bank loans and bonds, and foreign loans and investments. Two dedicated user charges, the road maintenance fee and vehicle purchase fee, have provided much of the financing for the road sector. During the 9th Five-Year-Plan (FYP), the road maintenance and vehicle purchase fee provided 53% and 13% respectively of the total road

investments. Government grants provided 2% mainly to construct or improve rural roads in poor areas. The remaining was financed from domestic loans and bonds (9%), other domestic investments including financing from local governments and state-owned enterprises (12%), foreign loans (8%), and foreign direct investment (3%). In Hunan, investment in highways during the 9FYP was CNY30 billion, of which 78% was for expressways and high-grade highways. Investment in 2002 was CNY11 billion, an annual increase of 12%. Proposed road investment for the 10FYP is CNY65 billion, of which 71% is for expressways and high-grade highways. The funding for rural roads is supplemented by poverty reduction funds. HCD expects debt funding to increase significantly; 55% of the total expenditure during the 10FYP will be new debt.

E. Road Engineering, Construction, and Maintenance

5. Road projects are designed by the planning and design institutes at the provincial, prefecture, and county levels. MOC reviews the designs of expressways, high standard roads, and associated structures. The institutes are staffed with experienced, well-qualified personnel. The city and county highway bureaus have their own construction units to carry out minor projects within their administrative districts. Competitive bidding practices were mandated by the 1999 Tendering and Bidding Law. Many of the largest provincial and urban construction units are being reorganized into financially independent companies and have been awarded contracts individually or as partners in joint ventures on several ADB- and World Bank-financed in-country or overseas projects. Road maintenance is well organized by the expressway companies and the highway administration bureaus and is carried out mainly through labor-intensive operations but with increasing amounts of mechanized works. MOC has established an advanced road maintenance management system, consisting of a road data bank and a pavement management system, which is being introduced in stages to all provinces and autonomous regions, and will become the key tool for programming future maintenance needs and budgets.

F. Government's Rural Road Development Program

6. MOC is drafting a national rural road development plan. Under this plan, rural roads will be developed in three stages. By 2005, total mileage of rural roads will be 1.6 million km; by 2010, 1.85 million km, connecting 100% of townships and administrative villages in the PRC; and by 2020, 2.5 million km and transport services will be provided at the village level.

G. Policy Dialogue

7. ADB has been undertaking policy dialogue on the PRC road sector since 1991. The principal issues addressed include the poverty impact of road projects, highway design standards and construction quality, road safety, vehicle emissions, pricing policies, commercialization and corporatization, and nongovernment financial resources. The status and achievements to date are summarized in the following Road Sector Policy Reform Plan.

Table A2: Road Sector Policy Reform Plan

Initiative	Current Status	Actions	Target Date
1. Poverty impact	All projects financed by the Asian Development Bank (ADB) in the People's Republic of China (PRC) country assistance plan are now located in poorer central and southwest	Project identification and design assisted through technical assistance (TA) 3086-PRC: <i>Regional Road Sector Study</i> .	Recommended investment packages considered for the 10th Five-Year-Plan (10FYP).

Continued on next page.

Table A2: Road Sector Policy Reform Plan—Continued

Initiative	Current Status	Actions	Target Date
	regions Local road components are now included in expressway projects.	Project assistance provided to improve and finance provincial and county roads Assessing the impact of local road construction on poverty reduction through TA 3150-PRC: <i>Study on Ways to Support Rural Poverty Reduction Projects</i> Including village access to roads as a poverty reduction indicator under TA 3610-PRC: <i>Poverty Planning Methodology</i> Consulting with the poor in designing projects under TA 5894-REG: <i>Facilitating Capacity Building and Participatory Activities II</i> Monitoring framework and indicators prepared under TA 3900-PRC: <i>Socio-economic Assessment of Road Projects</i> ADB loans for expressway projects finance the local road component (\$2.0 million for Shanxi II and \$5.0 million for Ningxia Road Development Project).	Being implemented since 2001 Being implemented since 1999 through 2004; short and long term socioeconomic benefits analyzed annually Completed in 2002 Completed in 2003
2. Road design standards and construction quality	Inadequate highway design standards for vehicle mix and road conditions	Ministry of Communications (MOC) engineering standards revised and reissued on 1 January 1998. Assistance in developing appropriate standards including transport efficiency, road safety, and environmental considerations provided through TA 2573-PRC: <i>Review of Highway Design Standards</i> Production of highway design manual to complement MOC standards in areas such as identification of accident black spots, under TA 2573-PRC: <i>Review of Highway Design Standards</i> . TA 2821-PRC: <i>Strengthening of Evaluation Capacity for the Key Projects</i> . Inspectorate of the State Development Reforming Commission via TA 3375-PRC: <i>Project Performance Management Capacity Building</i> .	New design standards applied from 1998. These were updated in 2003 and 2004. Highway design manual being tested and to be modified as required Implemented in 2000–2001
3. Road safety	High accident and fatality rate of almost 106,000 deaths per annum. Poor safety design and attention to safe roads	Assistance provided through TA 2177-PRC: <i>Preparation of a Road Safety Program</i> and TA 5620: <i>Regional Initiatives in Road Safety</i> adopted by PRC.	Recommendations disseminated in 1999–2000 To be implemented in 10FYP

Continued on next page.

Table A2: Road Sector Policy Reform Plan—Continued

Initiative	Current Status	Actions	Target Date
		Public awareness and the Ministry of Public Security's capacity strengthened in traffic safety and planning under TA 3341-PRC: <i>Capacity Building in Traffic Safety, Planning, and Management</i> .	An effective program will be in place in May 2004 to fulfill requirements of the new Traffic Safety Law.
4. Vehicle emissions	Vehicle emission is becoming a primary source of pollution	Leaded fuel banned for motor vehicles. European vehicle emissions standards adopted	Completed in 2002 By vehicle size, implemented in 2001–2005
	Vehicle testing and monitoring program	Vehicle testing and monitoring promoted under TA 5937-REG: <i>Action Plans for Reducing Vehicle Emissions</i> .	Implemented in 2002–2005
		Chongqing municipal vehicle emission reduction guidelines prepared and relevant action plans developed.	6 months prior to the opening of the expressway, the EA will submit monitoring reports in accordance with these guidelines.
5. Road pricing	User pays principle and cost recovery for toll roads in most provinces	Toll levels set for ADB projects to ensure cost recovery. Toll diversion manual disseminated under TA 3102-PRC: <i>Toll Diversion Study</i> .	Annual review of tolls Enactment delayed
6. Corporatization	Weak legal agreement between the provincial communications department and the expressway company	A model concession agreement prepared under TA 2592-PRC: <i>Corporatization, Leasing, and Securitization in the Road Sector</i> .	Adoption of concession agreements considered for the Shanxi Road Development II Project
	Corporate structures for provincial communications departments	Assistance provided through TA 2592-PRC: <i>Corporatization, Leasing, and Securitization in the Road Sector</i> .	Completed in 2003
7. Financial mobilization	Financing requirements for road infrastructure investments are increasing	Results of TA 2409: <i>Appraisal Methodologies and Restructuring Highway Financing in Hebei Province</i> under consideration.	Implementation of recommendations expected to commence during 10FYP
	Refinancing or leasing arrangements for selected road sections in place in several provinces	Assistance provided through TA 2649-PRC: <i>Facilitating the BOT Modality in the Highway Sector</i> and TA 2592-PRC: <i>Corporatization, Leasing, and Securitization in the Road Sector</i> .	A pilot BOT road project being implemented by the Government.
		ADB-financed Jilin expressway company and Changyong Expressway Corporation securitized as part of stock listing.	Stocks listed in 1999

ADB = Asian Development Bank, BOT = build-operate-transfer, EA = executing agency, MOC = Ministry of Communications, PRC = People's Republic of China, TA = technical assistance, 10FYP = 10th Five-Year Plan.

EXTERNAL ASSISTANCE TO THE ROAD SECTOR

A. Asian Development Bank (ADB) Financed Loans

Loan Number	Project Name	Expressway Length (km)	Local Road (km)	Loan Amount (\$ million)	Date Approved
1082-PRC	Shanghai-Nanpu Bridge	—	—	70	28 May 91
1168-PRC	Shenyang-Benxi Highway	75	—	50	02 Jul 92
1188-PRC	Shanghai Yangpu Bridge	—	—	85	17 Nov 92
1261-PRC	Hunan Expressway	52	—	74	09 Nov 93
1262-PRC	Jilin Expressway	133	—	126	09 Nov 93
1324-PRC	Heilongjiang Expressway	350	—	142	29 Sep 94
1325-PRC	Yunnan Expressway	200	—	150	29 Sep 94
1387-PRC	Hebei Expressway	200	179	220	28 Sep 95
1388-PRC	Liaoning Expressway	110	203	100	28 Sep 95
1470-PRC	Chongqing Expressway	89	—	150	27 Sep 96
1483-PRC	Shenyang Jinzhou Expressway	192	291	200	19 Nov 96
1483-PRC	Jiangxi Expressway	134	253	150	19 Nov 96
1617-PRC	Hebei Roads Development Project	140	340	180	18 Jun 97
1638-PRC	Chengdu-Nanchong Expressway	208	300	250	10 Nov 98
1641-PRC	Changchun-Harbin Expressway: Changyu Expressway	161	—	220	27 Nov 98
1642-PRC	Changchun-Harbin Expressway: Hashuang Expressway	101	—	170	27 Nov 98
1691-PRC	Southern Yunnan Road Development Project	147	540	250	24 Jun 99
1701-PRC	Shanxi Road Development Project	176	418	250	30 Sep 99
1783-PRC	Chongqing-Guizhou Roads: Leichong Expressway	50	122	120	21 Nov 00
1784-PRC	Chongqing-Guizhou Roads: Chongzun Expressway	127	704	200	22 Nov 00
1838-PRC	Shaanxi Roads Development	176	627	250	30 Aug 01
1851-PRC	Guangxi Roads Development	136	507	150	30 Oct 01
1918-PRC	Southern Sichuan Roads Development	160	558	300	30 Aug 02
1967-PRC	Shanxi Road Development II Project	65	70	124	12 Dec 02
2004-PRC	Ningxia Roads Development Project	182	400	250	09 Nov 03
2014-PRC	Western Yunnan Roads Development Project	77	294	250	20 Oct 03
2024-PRC	Xi'an Urban Transport Project	71	16	270	30 Nov 03
Total		3,512	5,822	4,751	

B. ADB Financed Technical Assistance

TA Number	Project Name	Type ^a	TA Amount (\$'000)	Date Approved
1049-PRC	Huangpu Bridge	PP	95	24 Oct 88
1152-PRC	Design Review of the Nanpu Bridge	PP	100	26 Apr 89
1509-PRC	Ningguolu Bridge	PP	100	18 Apr 91
1517-PRC	Toll Bridge Operations and Management	AD	760	28 May 91
1533-PRC	Design Review of the Yangpu Bridge	AD	100	10 Jul 91
1664-PRC	Shenyang-Benxi Highway	PP	100	22 Jan 92
1533-PRC	Design Review of the Yangpu Bridge (Supplementary)	AD	416	28 Apr 92
1724-PRC	Institutional Strengthening for Highway Operation and Management Improvement	AD	500	02 Jul 92
1725-PRC	Jilin Province Highway Network Study	PP	600	02 Jul 92
1728-PRC	Changsha-Xiangtan Expressway	PP	100	09 Jul 92
1785-PRC	Comprehensive Toxic and Hazardous Chemicals Transport Management Plan in the Huangpu River Basin	AD	600	17 Nov 92
1940-PRC	Efficiency Improvements in Road Transportation	AD	550	25 Aug 93
1972-PRC	Institutional and Policy Support in the Road Sector	AD	1,200	09 Nov 93
1975-PRC	Policies for Strategic Development of Transport and Communications Infrastructure	AD	100	11 Nov 93
1981-PRC	Heilongjiang and Yunnan Expressways	PP	320	16 Nov 93
2155-PRC	Sichuan Expressway	PP	350	16 Sep 94
2177-PRC	Preparation of a Road Safety Program	AD	600	29 Sep 94
2178-PRC	Provincial Highway Network Planning	AD	600	29 Sep 94

Continued on next page.

EXTERNAL ASSISTANCE TO THE ROAD SUBSECTOR—Continued

TA Number	Technical Assistance	Type ^a	TA	Date
			Amount (\$'000)	Approved
2195-PRC	Hebei and Liaoning Expressways	PP	560	31 Oct 94
2212-PRC	Beijing Urban Transport	AD	715	28 Nov 94
2302-PRC	Symposium on Urban Transport	AD	100	22 Feb 95
2409-PRC	Appraisal Methodologies and Restructuring Highway Financing in Hebei Province	AD	740	28 Sep 95
2482-PRC	Liaoning and Jilin Expressways	PP	400	18 Dec 95
2486-PRC	Jiangxi Highway	PP	250	20 Dec 95
2573-PRC	Review of Highway Design Standards	AD	420	24 May 96
2649-PRC	Facilitating the Build-Operate-Transfer Modality in the Highway Sector	AD	1,100	27 Sep 96
2663-PRC	Hebei Roads Development	PP	600	16 Oct 96
2777-PRC	Chengdu to Nanchong Expressway	PP	600	07 Apr 97
2846-PRC	Changchun-Harbin Expressway	PP	600	22 Aug 97
2952-PRC	Corporatization, Leasing, and Securitization in the Road Sector	AD	1,000	17 Dec 97
3033-PRC	Shanxi Expressway	PP	570	24 Jun 98
3039-PRC	Yunnan Road Environmental and Social Analysis	PP	150	07 Jul 98
3086-PRC	Regional Road Sector Study	AD	1,185	13 Oct 98
3102-PRC	Preparing the Chongqing-Guizhou Expressway	PP	900	26 Nov 98
3220-PRC	Preparing the Guanxi Highway	PP	540	07 Jul 99
3248-PRC	Preparing the Shanxi and Shaanxi Roads	PP	640	30 Aug 99
3341-PRC	Capacity Building in Traffic Safety, Planning, and Management	AD	600	14 Dec 99
3546-PRC	Preparing the Southern Sichuan Roads Development	PP	800	16 Nov 00
3569-PRC	Jiangsu Highway Build-Operate-Transfer Project	AD	555	12 Dec 00
3642-PRC	Preparing the Western Yunnan Roads Development	PP	770	20 Mar 01
3376-PRC	Preparing the Ningxia Roads Development	PP	600	16 Nov 01
3900-PRC	Socioeconomic Assessment of Road Projects	AD	250	12 Aug 02
3907-PRC	Preparing the Xi'an Urban Transport Project	PP	750	27 Aug 02
3929-PRC	Preparing the Hunan Roads Development II	PP	600	23 Sep 02
4119-PRC	Preparing the Guangxi Roads Development II	PP	500	23 May 03
4211-PRC	Preparing the Gansu Road Development	PP	500	05 Nov 03
4274-PRC	Preparing the Central Sichuan Roads Development	PP	700	18 Dec 03
4322-PRC	Poverty Impact of Area Wide Road Networks	AD	1,000	26 Mar 04
4351-PRC	Policy Reform in Road Transport	AD	500	24 Jun 04
Total			26,386	

B. Other Funding Sources

No. of Loans	Institute	Road Length	Loan Amount			Total
			Unit	IBRD	IDA	
33	World Bank Group	6,031 ^a	\$ million	5,750	369.6	6,119
10	Japan Bank for International Cooperation	735	Yen Million			110,650

— = not available.

AD = advisory, IBRD = International Bank for Reconstruction and Development, IDA = International Development Agency,

PP = project preparatory.

^a Includes expressways and highways (class I and II).

Source: Asian Development Bank estimates.

TRANSPORT SERVICES IN THE PROJECT AREA

A. Overview

1. The eastern part of the project area includes fertile river flats, and easier access to major cities, while the central and western part is mountainous terrain with a higher incidence of poverty. The eastern section of the project area is close to Changde where the economy is prosperous and transport services are adequate in both quality and extent. In the middle and western section, including Huaihua Prefecture, however, transport services are limited. The rural population in the area lives in remote, isolated natural villages, of which only two thirds are served by roads—most are of poor quality. The mountainous terrain in the area makes it difficult to develop a good road network; many administrative villages have only one road linking them to a town. An inefficient transport system can serve as a significant constraint on agricultural efforts in rural areas, both by raising the cost and effectiveness of inputs to production and by delaying the sale of harvested crops.

B. Transport Demands and Means in the Western Part of the Project Area

2. In the central and western part of the project area, trucks and buses provide services to villages, but the cost of travel is high. The people in the area mostly rely on informal transport services including bicycles and motorized tricycles to travel to a town. A survey found that the average trip for the poor was longer than that for the non-poor because villages are far away from commercial centers. Such trips are costly for the poor and hence infrequent.¹ As a result, the poor who are often limited to walking to nearby rotating village markets can sell their produce up to the amount that they can carry on their backs, or sell it to four-wheel drive-in traders who benefit through a buyer's market situation. Likewise, the poor are comparatively limited in traveling to buy farming inputs. On the other hand, higher income households trade at larger markets in towns because they have access to affordable transport services.

3. Where there is no road access, all personal trips are made on foot (or at least start on foot). In those villages with road access, a variety of modes is used for journeys. Walking and bicycles are the dominant modes for short journeys, but as the journey length increases, the number of motorized trips increases. Most walking trips are of less than 6 kilometers (km). Even on short journeys, motorized transport, such as motorized tricycles, is often used. The total number of trips per household is low. With each household making 1 trip every 3 days, trips within the township constitute the vast majority of all trips. The traffic volume in a village is quite low. The average volume of grain marketed in a village is below 80 tons per year (equivalent to less than one small truck load per week), with similarly small volumes of fertilizer being brought in. Only small volumes of passenger traffic are generated. The survey found that the rural population is most concerned with availability and quality of local roads. The absence of roads or very poor quality roads limits access to markets and social infrastructure, health, and education. For instance, one village reported difficulty crossing a major river that separates them from important social services, such as hospitals.

4. **Buses.** Two-thirds of the villages in the rural remote area are connected to a bus route. Most roads in the rural villages are unclassified and in poor condition. Bus operators do not normally operate on unclassified roads, or they operate with smaller buses and fares 20% higher than those charged on classified roads. Bus fares depend on the road class, road conditions, daily frequency of bus services, and bus size. For a small bus (15–20 seats), the official fare is CNY0.18 per km. Fares can vary in the range of plus or minus 20%. Long-

¹ ADB. 2002. *Technical Assistance for the People's Republic of China for Hunan Roads Development II Project*. Manila.

distance services are run by companies, while intracounty services are normally run by individuals. Normally several operators provide services on each route, but the extent of competition on fares or on service is limited. The Hunan Provincial Communications Department (HCD) controls the number of operators on each route, to prevent over-supply. The number of trips per day carried out by each operator is also controlled, either through operator associations, or directly by state-owned bus terminal companies, which control the bus schedule and allocate slots to operators. The interviews with operators carried out during the survey found that these restrictive operating practices result in low vehicle utilization and, as a consequence, unnecessarily high operating costs.

5. **Trucks.** Any commercial trucking operation requires a license. The number of large trucks has decreased slightly, while small trucks have increased substantially. Operators must meet basic requirements for financial resources and maintenance. Once licensed, the trucks can operate anywhere in the country. In practice, rates are negotiated between the shipper and the trucker and are normally lower than the Government guidelines. Current freight rates in the project area are CNY0.5 per ton-km. Most trucks are run by small, private operators, although some large state and private companies exist. The state companies are being privatized, and the market appears to be competitive. The restrictions on the granting of licenses are not unreasonable, and trucking capacity is adequate, possibly in excess.

6. **Small trucks: Agricultural Use Vehicles.** The agricultural use vehicle is a registration category, rather than a vehicle type. They are normally small trucks, based on agricultural tractors, with a registered capacity of between 500 kilograms and 1 ton, although in practice loads of up to twice as much can be carried in these vehicles. In addition, normal trucks, with a nominal capacity of less than 2 tons can also be registered for agricultural use. The tractor-based vehicles are common in country towns and villages.

7. **Other Informal Transport Means.** Mini-taxis (7-seat buses) are run by a large numbers of operators, many of whom appear to be unlicensed. They are based in towns and provide services into the rural areas. The vehicles are normally owned by the drivers. They operate a fixed route, pick up and drop off passengers on demand, and are prepared to negotiate variations on the routes. Fares are normally on a per-trip basis and established by custom, but can be negotiated.

8. Motor-tricycles provide short distance passenger services in both urban areas and villages. They are also used to carry small volumes of freight, in addition to, or instead of, passengers. The negotiable fares are on a per-trip basis. Rates for freight are about CNY0.50 per ton-km. However, for short journeys and small volumes, rates are set by custom on a trip-by-trip basis. Drivers operate the motor-tricycles without licences. The large urban areas are gradually prohibiting motor-tricycles services.

9. Twin-cab pickups are used to carry both passengers and freight. The back of a pickup is enclosed and benches are provided for passengers. The benches can be removed when freight is carried.

10. Agricultural tractors equipped with pulling carts carry cargo on occasion.

C. Assessment of Transport Services

1. Adequacy of Transport Services

11. The study survey found that informal transport services, for both passenger and freight, respond to demand in a flexible way. Service provision increases on market days for those who buy or sell at local markets. Informal transport services play a crucial role in meeting the transport demand for rural residents, thereby improving their mobility. However, informal transport supply in rural villages is not sufficient to meet the transport demand. The provision of informal transport services should be increased through an increase in vehicle ownership. There are also safety driver licensing issues that need to be addressed. The formal bus system is regulated on fares, but there is flexibility on route planning, with the initiative for new routes lying with the operators. Although the number of routes operated in the last 5 years has increased substantially, about one third of villages in the rural area still do not have a bus route. Most roads in those rural villages are unclassified or are in poor condition. The survey results indicate that road accessibility is crucial for bus operators to provide services. The market for trucking services is active and fares are market determined. Where larger volumes of cargo have to be moved, traders are able and willing to pick up produce and bring in inputs.

2. Constraints of Accessing Transport Services

12. The rural poor, especially in the rural, mountainous areas, often have difficulty accessing transport services. Regulated transport services often lead to inefficient service, routing, and/or pricing in rural areas. Provision of transport services in the project area, especially the central and western part, is insufficient. This is mainly due to lack of competition in the transport services market, regulations, or government interference. Private operators lack access to credit to purchase vehicles, especially for means of informal transport. Inadequate roads make the provision of transport services to the rural poor difficult. In most rural villages, the poor quality of road access was identified as a major problem in accessing transport services.

3. Interventions to Enhance Provision of Transport Services

13. The extent to which the rural poor benefit from a road investment project depends on their access to reliable and affordable transport services. The less the access, the less benefits they will receive compared with other social groups, and the lower will be the poverty impact of the Project. Due attention will be given to such services during project implementation. The Project includes an action plan to enhance the provision of transport services. Under the loan, an international consultant will be engaged for 1 month to develop an action plan and promote specific measures that will be incorporated into the Project. The consultant, in close coordination with the Executing Agency, will also recommend ways to implement the plan. The report will be submitted to the Asian Development Bank for review by 2006. She/he look will examine the following measures: (i) increasing competition among transport service providers,² (ii) deregulating fare and route controls to raise system efficiency, (iii) making more credit available for the purchase of transport vehicles,³ and (iv) integrating rural transport services into local roads development.

² To construct competitive environment in rural transport, the following regulatory reforms may be considered: (i) regulatory responsibility should be separated from operational responsibility; and (ii) any subsidy should be in the form of service contracts between government authorities and operators, and it should be open to competitive process.

³ New credit schemes should be established, link to existing credit lines, or work with existing credit institutions to broaden their scope of credit services to support private ownership of informal transport means.

OPERATION AND MAINTENANCE CONCESSION TO THE PRIVATE SECTOR

A. Operation and Maintenance Concession

1. An operation and maintenance (OM) concession is an agreement between a government or a state enterprise and a private enterprise whereby a private enterprise: (i) collects tolls from users, to finance the maintenance and reward the concessionaire; (ii) maintains the road to agreed standards; and (iii) pays an agreement amount to the government. Any surplus will accrue to the concessionaire as profit. The bidder who commits the highest canon (or the lowest negative canon, meaning the lowest government support) under a certain toll level will be selected as a concessionaire. The OM concession (i) overcomes public sector budget constraints by securing toll revenues as a maintenance fund without requiring funds to flow through the budgeting process; and (ii) increases efficiency in service provision by bringing in an experienced private sector concessionaire who can operate and maintain the project expressway, at a lower cost than the government.

2. Under an OM concession, the concessionaire assumes the traffic and ultimately the revenue risk. As such, the OM concession is differentiated from a maintenance management contract whereby the private sector maintains an existing road under performance specifications, for which it receives fixed management fees from the government. It is also different from a build-operate-transfer (BOT) scheme where the private sector finances designs, builds, operates, and maintains the expressway, under which significant project risks including construction and finance risk are transferred to the private sector. The OM concession is the promising alternative modality for private sector participation in the road sector as it leads public-private sector partnering in a feasible way by more equally allocating project risks between the government and the private sector.

B. Operation and Maintenance Concession in Hunan Expressways

3. Compared with other provinces, Hunan has actively diversified highway financing and encouraged private sector participation in expressways. The private sector is involved in five expressways in Hunan: Changtan, Changyong, Xiheng, Changtan West, and Changyi.¹ Changtan and Changyong were funded by the Asian Development Bank (ADB) under the Hunan Expressway Project.² Except for Changtan West, which was implemented using a BOT scheme, in the other four expressways the private sector has been involved in operation and maintenance through concession agreements. For the Changtan expressway, the 30-year OM concession was awarded to the Modern Investment Company in 1998; the traffic risk is borne by the company. For Changyong, the concessionaire, the Modern Investment Company, was successfully listed in the A-share section of the Shenzhen Stock Exchange in 1998. For Xiheng, funded by the World Bank, the 20-year OM concession was awarded in 2002 to the Modern Investment Company. For Changyi, a joint venture between the Government (51%) and the Hong Kong Road King Company (49%) was established for construction and operation (Table

¹ The sections are Changsha-Xiangtan, Changsha-Yongtan, Xiangtan-Hengyang, Changsha-Xiangtan West, and Changsha-Yiyang, respectively.

² ADB. 1993. *Report and Recommendation to the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Hunan Expressway Project*. Manila. The Hunan Expressway Construction and Development Corporation, established in 1993 as a 100% state owned enterprise, was initially responsible for the construction and operation of these ADB-funded expressways, and now operates the majority of expressways in Hunan.

A5). The Hunan Provincial Communications Department (HCD) is pursuing OM concessions with the private sector for three more expressways.³

4. These arrangements have introduced sounder business practices to Hunan's expressways and enhanced financial efficiency. However, the full potential of the benefits may not have been achieved, as the concessionaires were merely joint ventures between the government and the private sector; the concessions' terms were set through direct negotiation and with little transparency. To ensure adequate pricing, the concession should be awarded through competitive and transparent bidding.⁴

Table A5: Private Sector Participation in Expressways in Hunan

Expressways	Length	Open to Traffic	Revenue (CNY million)		Form of Private Participation	Initial Setting
			1 st year	2003		
Changtan	52 km	1996.12	123.0 (1998)	136.1	OM concession (30 yrs)	SOE
Changyong	25 km	1994.12	24.5 (1995)	38.9	Initially OM Concession and then securitized in 1998	SOE
Changtan West	28 km				BOT (30 yrs)	Sole venture
Xiheng	117.9 km	2000.12	247.2(2002)	299.2	OM concession (20yrs)	SOE
Changyi	76 km	1998.7	27.1 (1998)	122.8	OM concession	Joint venture

BOT = build-operate-transfer, SOE = state-owned enterprise.

Source: Hunan Provincial Communications Department.

C. Operation and Maintenance Concession for the Project Expressway

5. During the Project's initial years of operation, its OM will be entrusted to the Changji Expressway Construction and Development Company (CECC), a state-owned company.⁵ Then HCD will enter into an OM concession after a few years of opening. To this end, HCD will develop the concession agreement framework during the implementation of the Project. In particular, due attention will be given to enhance transparency in the bidding process for the concession, to optimize the gain of the concession to the efficiency in expressway operation. HCD will prepare a bidding document—which specifies the concession period and selection criteria, and ensures adequate pricing and transparent bidding—and submit it to ADB for review by the midterm review in 2006. Under the ADB loan, an international consultant will be engaged for 1 month to help HCD prepare the concession agreement and bidding document. The concession agreement will set out the rights and responsibilities of the concessionaire and government during the concession period, to maintain the project expressway to agreed standards, and to collect tolls from users. A draft concession agreement will be included in the bidding documents to ensure that all bidders have equal opportunities. HCD will assess a specific schedule of the concession's implementation and advise ADB about it by the midterm review. HCD and ADB will ensure that (i) the concession is adequately priced by awarding it through bidding; and (ii) expressway maintenance will meet the agreed standards.

³ The sections are Yiyang-Changde, Hengyang-Zaomupu, and Xiangtan-Shaoyang—the construction is complete on all.

⁴ ADB. 1997. *Technical Assistance to the People's Republic of China for Corporatization, Leasing, and Securitization in the Road Sector*. Manila.

⁵ The CECC was established in July 2004 for the construction and operation of the project expressway.

D. Key Aspects of the Optimal Operation and Maintenance Concession

1. Environment for Workable Operation and Maintenance Concession

6. Two basic laws should be in effect: (i) a law that permits concessions, whereby government can transfer the right of maintenance to a private party; and (ii) a law that permits tolling for use of public facilities and tolling by the private sector. Other laws and regulations are also essential to address traffic management by the concessionaire, policing the road, advertising control on the road, arrangement for emergency vehicles, etc. Estimates of traffic volumes are crucial in determining the toll road viability. However, any traffic forecast may be uncertain because of the complexity of interaction between economic development, the toll rate, and traffic. This high uncertainty for traffic sometimes discourages the private sector from bidding for concessions. Increasingly, agreement exists that when traffic is particularly uncertain, the traffic risk should be shared by the government and the private sector. The government can provide a downside guarantee for a certain minimum level of traffic, with a complementary scheme put together for sharing super-profits if traffic is higher than expected. Most concession agreements should include a toll escalation formula that is related to the consumer price index and allows for toll increases either every year or every few years. However, the concessionaire is sometimes not permitted to increase the toll as specified in the agreement because of administrative intervention or contract frustration. In this case, a clause should be added in the agreement to prescribe compensation arrangements that can be acted upon when the toll increase is denied.

2. Monitoring of Maintenance Performance

7. The concessionaire is responsible for maintaining the road at performance standards agreed in the concession contract. These standards should be defined to minimize the long-term cost of preserving the road as well as the cost to the road user. Performance-based concessions must have appropriate monitoring procedures, combined with penalties for noncompliance. Concession contracts should include well-defined monitoring procedures. Inspectors may be hired to inspect the road and make regular random checks to verify compliance. A well-documented inventory of the road and daily records of activities undertaken by the concessionaire will help understand the specific behavior of the roads and contribute to better preventive maintenance. To strengthen the monitoring and compliance, road users may also be encouraged to report road deficiencies to the road agency.

3. Bidding Process

8. The guiding principle for bidding processes should be to maximize competition, transparency, and clarity in the process so that the ultimate road users pay a competitive toll. The major aspects that should be considered for ensuring competitive and transparent bidding processes are

- (ii) detailed development of the concession should be set out clearly in the bidding documents, specifying the responsibilities of the concessionaire and government;
- (iii) a draft concession agreement should be prepared by the government and include it in the bidding documents to ensure that all bidders make similar assumptions; and
- (iv) the decision criteria should be clearly set out in the bidding documents. The most transparent approach is to select a single criterion, perhaps the highest level of canon (or the lowest level of government support) for a given toll.

ROAD SAFETY AND VEHICLE EMISSIONS

A. Road Design Standards

1. The Project expressway has been designed and will be constructed in accordance with Ministry of Communications' standards. This will provide a facility of a high standard in keeping with international practice and will ensure a good degree of safety and operational efficiency.¹ The geometric design of the expressway has been selected to ensure that speed limits are chosen to suit the geometric design rather than the design speed. Signs, markings, interchange structure, and crash barriers will be selected carefully prior to the expressway opening. All interchanges of the new expressway are of the trumpet layout to minimize land acquisition. They have low loop radii (50 meters [m] to 60 m) and low design speeds (35 kilometers [km]/hour [hr]). The minimum taper plus deceleration lengths used in the design are 150 m for the 100 km/hr sections and 130 m for the 80 km/hr sections. Current accident statistics show a significant number of tail-end collisions at the exit tapers. It was recommended to review the deceleration lengths to take account of the main line to loop design speed change prior to the commencing civil works. Guardrails will be installed when the consequences of a vehicle impact with the barrier are likely to be less severe than an impact with the feature being shielded. For the new expressway, the median width is 2.0 m and continuous guardrail is proposed on both sides of the median.

2. To maximize benefit from the expressway project, the Hunan Provincial Communications Department (HCD) will undertake all necessary measures to impound and prohibit overloaded vehicles from entering the expressway until the load is reduced to the legal requirements. Maintenance works can have a serious effect on traffic flow and safety, especially as traffic volumes increase. Adequate advanced warnings of maintenance interruptions to normal expressway traffic will be given to the road users to minimize inconvenience and delays. The expressway has 15 tunnels. HCD will implement a pavement management system on the expressway and local roads and develop a complete maintenance management system to provide realistic maintenance budgeting, expenditure control, performance standards, and evaluation. Regarding the safety of tunnels, HCD has developed an emergency plan according to a safety audit. As part of the final design, HCD will prepare a risk management plan to cover areas of safety concern during construction, especially construction of bridges and tunnels.

B. Road Accidents And Traffic Enforcement

3. Accident rates in the PRC are high compared with many other developing countries. Road accidents and their resultant economic losses represent a substantial problem and require urgent attention. The 2002 accident statistics for the PRC were 773,137 accidents, 109,381 fatalities, and 562,074 injuries. This equates to one death every 5 minutes, the highest such rate in the world. The economic cost to the country is significant; between 1-3% of its gross domestic product. Hunan had 28,056 accidents, 3,658 fatalities, and 27,468 injuries in 2002. To address this issue, the Ministry of Public Security prepared the 2002 Road Safety Action Plan, which aims to (i) reduce serious accidents, involving more than 10 fatalities, by 10% compared with 2001; and (ii) eliminate major accidents, involving 30 or more fatalities. This will be achieved by improved vehicle safety, driver training, and improved traffic management. In Hunan, the Traffic Police, under the Hunan Public Security Bureau (HPSB), is responsible for investigating accidents and identifying preventive measures. The Traffic Police also makes

¹ The design speed of the expressway varies along the route with 62 km having a design speed of 100 km/hr and the remaining 111 km having a design speed of 80 km/hr.

substantial efforts to identify accident blackspots, to establish the causes and so to avoid similar accidents in the future. This work is coordinated with HCD when the causes are road related rather than driver or vehicle related. The Hunan Safety Audit for Highway Design was developed during the implementation of a World Bank funded project and has been used for all expressways since 2000. Although the guidelines are comprehensive, it needs to strengthen the end of construction and pre-opening to traffic practice. Such audits should also involve the Traffic Police since this group will have the traffic safety responsibility after opening to traffic and may well spot different safety issues from their practical experience of operating on the expressways. Such guidelines need to be more practical rather than theoretical and the audit staff should be experienced accident or safety personnel or have been involved in accident investigation. The international consultant will review the guidelines during the implementation of the Project expressway.

C. Organization and Action Plan

4. The organizations responsible for road safety and enforcement on the expressways in Hunan are the HPSB and HCD. The Road Safety Committee of HPSB currently implements accident management in Hunan, which is responsible for enforcement of traffic, accident records, accident analysis, and identification of blackspots. An interdepartmental framework will be established under the Project to enhance road safety in the project area. While HCD will concentrate on the engineering, road safety audit, and blackspot improvement, HPSB will undertake traffic law enforcement for safer expressways. A qualified team will be set to manage traffic operations for the expressway. The local traffic police will be responsible for road safety of the local roads. HPSB will assign a senior officer to coordinate the smooth implementation of the Project. HCD will help develop a comprehensive road safety strategy in the project area, with the help of an international road safety specialist. The strategy aims to improve road safety through: (i) institutional strengthening, (ii) capacity building, and (iii) enhanced coordination among various agencies.

D. Vehicle Emissions

5. Motor vehicle emissions are a growing contributor to air pollution. The Government is taking significant measures to control emissions by regulating the automobile industry, enforcing an annual vehicle test and inspection and maintenance program. The new measures also set emissions and fuel efficiency targets and offer tax incentives to encourage development of more environment friendly cars. In the new rule, it targeted that average fuel consumption will be reduced 15% points from 2003 to 2010. Hunan is developing alternative fuels that could help reduce petroleum imports. A 300,000 ton per year ethanol plant has been proposed in Changde; it would use corn and other grains as feedstock. The Sichuan-Hunan gas pipeline project is currently under construction. Natural gas will be provided for power generation, industrial fuel, commercial and residential users, and transport. HCD and Hunan Environmental Protection Bureau (HEPB) will proceed with the planning for a vehicle emissions control implementation plan. Implementing such a program will require the cooperative of a number of agencies, jurisdictions, and the community, as well as Government commitment. An implementation plan will be developed to promote efficient vehicle emission reduction measures in the project area. An integrated approach may be adopted to facilitate the implementation of the action plan. A vehicle emissions specialist will be engaged to develop a comprehensive vehicle emissions action plan, including enforcement management, prevention measures, socioeconomic costs, and major issues for the emission control programs.

SUMMARY RESETTLEMENT PLAN

1. The 173-kilometer (km) project expressway and 3 interconnector roads (12 km) will affect 22 townships and 97 villages in 3 district or counties: Dingcheng, Taoyuan, and Yuanling. Based on the detailed measurement survey (DMS), the Project will permanently occupy about 1,349 hectares (ha) of land, including 509 ha (38%) of cultivated land. About 30,564 people will lose some land. The temporary use of land during construction will amount to 290 ha. The number of rural people whose houses will be demolished is 4,807 people (1,414 households), with a total floor space of 225,139 square meters (m²). Some 1,607 persons in 5 schools and a forestry farm also require relocation. Land acquisition and resettlement impacts were minimized through consultations with local officials, aligning the expressway away from densely populated areas, and avoiding irrigated land and facilities.

A. The Resettlement Plan

2. The Resettlement Plan (RP) was prepared by the Hunan Provincial Communications Department (HCD). The RP includes the project expressway, interconnector roads, and 517 km of existing local roads. The RP is based on the project preliminary study, and Hunan Design Institute detailed design survey data on impacts. The socioeconomic survey covered 657 households from 72 villages, and 56 interviews of village representatives. The draft RP was reviewed by the affected people and the Asian Development Bank (ADB). HCD incorporated comments into the RP. The RP and cost implications were finalized based on the DMS.

B. Policy Framework and Compensation

3. The resettlement objective is to ensure attainment of equal or better livelihoods and living standards for people affected by the Project in line with the Land Administration Law (1998) of the People's Republic of China (PRC) and the ADB's policies on involuntary resettlement (1995) and indigenous people (1998). The RP is also based on the *Implementation Measures for the Land Administration Law of the PRC in Hunan Province* (2000) and the Hunan Provincial Government's *Management Measures on Temporary Land Occupation*. HCD will ensure that any people losing land, housing, other assets, or other means of production will be assisted in restoring their incomes and living standards to at least the levels without the Project's intervention. Lost assets will be replaced or compensated at replacement cost. The RP also stipulates eligibility and entitlement provisions for affected people and provides rehabilitation subsidies. Permanent land losses are compensated either through land reallocation within the villagers' group or through cash payments to the collective at rates of 8 times the average annual output value. Temporary land losses will be directly paid to the individual at a rate stipulated in the RP. House losses will be paid directly in cash at replacement cost, free of demolition expenses and salvaged materials. Crops and tree losses will be directly paid in cash at rates. Each resettled household will also receive an allowance to cover transport costs, work loss, transfer costs, medical expenses, and temporary housing.

C. Relocation Site Development and Rehabilitation Assistance

4. The three options for residential resettlement site selection are (i) new housing sites will be selected in the same village or land owning group for villages where only several households will be relocated (light impact); (ii) a site suitable for clustered buildings will be selected if more households are involved in relocation, but enough land is available for their livelihood (moderate impact); and (iii) relocation to towns with the permission from the township government for households that are engaged in nonfarm business. Along the Changji expressway, no structure loss is expected for enterprises. Five schools and one forestry farm will be affected, and general

relocation plans have been prepared. Since project impacts are spread over many village groups, the degree of income loss is not serious. Most affected people prefer cash compensation for their land loss. Village groups will decide based on villagers' preference. Consequently, no village income rehabilitation plans are needed. But, initial rehabilitation plans have been discussed for the 10 most seriously affected villages, and further consultation will be conducted on compensation disbursements. Relevant training will also be arranged for farmers wishing to expand their skills. Special assistance for vulnerable groups will be provided by the Project to secure their livelihood.

D. Stakeholder Participation, Disclosure of Resettlement Plan, and Grievances

5. At various stages of the project planning, the people affected by the Project have been informed and consulted about the likely project impacts. Stakeholders consulted include (i) heads of households to be affected, (ii) village heads and villagers' representatives, (iii) local government agencies and departments, and (iv) women and other vulnerable groups. Consultations will continue through the project implementation period. HCD prepared the RP, which was discussed with local government and stakeholders for review and comments. HCD also organized consultations in each affected district or county. Consultations revealed full support for the Project. Some concerns raised during consultations have been addressed by adjusting the road design and by improving compensation and resettlement policy measures and entitlements. Resettlement information booklets have been distributed and discussed with affected villages and households. A working organization for resettlement consisting of officials from the Land Administration Bureau and related department will implement the RP. Claims will be reviewed and resolved within 3 weeks.

E. Implementation Arrangements and Budget

6. The HCD is responsible on behalf of the Hunan Provincial Government for the general administration of the project implementation and the monitoring of the work done by project implementation agency to complete the project. The Changji Expressway Construction and Development Company (CECC) is responsible for resettlement implementation and supervision. A resettlement office has been established in CECC, and others have been set up in each affected district or county. This office will be headed by a district leader and have 5–8 members from different government departments, usually 1 from each department of land administration, municipal construction, and environment protection. Each affected township will have a resettlement office and each village committee will appoint at least 1 person. Resettlement and land acquisition costs are estimated at CNY435 million (\$52.5 million). The budget includes land and buildings compensation, income restoration assistance, repair of infrastructure, management costs, monitoring, taxes, and contingencies.

7. CECC will carry out internal monitoring of land acquisition and resettlement to ensure timely activities in accordance with the RP, and to protect the interest of those affected by the Project. The following will be monitored: (i) compensation payments, (ii) house rebuilding or relocation of people affected, (iii) land redistribution, and (iv) grievance redress. CECC will prepare progress reports and submit them to ADB quarterly, until resettlement is completed. CECC will also prepare a resettlement completion report for submission to ADB. Hunan University will carry out the external monitoring every 6 months in the first 2 years, and then annually for 2 years or until resettlement is deemed successful. Tasks include: (i) review and verification of the compensation payments; (ii) determination of the status of land acquisition and payments; (iii) assessment of the disbursement of compensation procedure; (iv) appraisal of the grievance procedure; (v) reaction and satisfaction of affected people with the entitlements and compensation; (vi) assessment of the restoration of livelihoods of affected people; and (vii)

lessons learned for future policy implementation, formulation, and planning. Monitoring reports will be provided in Chinese to CECC and in English to ADB.

Table A7: Resettlement Supervision Milestones

No.	Resettlement Tasks	Target	Agency	Deadline	Status
1.	Disclosure				
1.1	Information booklet - Stage I	81 villages, 375 groups, 1275 AF	CECC	30 Nov 2003	Completed
	Information booklet - Stage II	27 villages, 136 AF	CECC, CROs	2004.06.30	
1.2	RP circulation (draft)	3 counties or district	CECC	2003.11.30	Completed
	RP circulation (final)	3 counties or district, 22 townships	CECC	2004.06.30	
1.3	RP placed on ADB web site	English and Chinese	CECC and ADB	2004.06.30	
2.	Resettlement Plan and Budget				
2.1	Approval of RP and budget (including compensation rates)	173 km + 12 km connector road \$51.6 million	HCD	2003.11.30	Completed
2.2	Submit final RP to ADB based on DMS		CECC	2004.06.15	
2.3	Detailed budget by county or district	3 counties or district	CECC	2003.11.30	Completed
	Detailed budget by county or district based on DMS	3 counties or district	CECC	2004.06.15	
2.4	Resettlement impacts and budget for local roads component (included in RP)	517 km	HCD	2004.05.10	Completed
3.	Compensation Agreements				
3.1	Village agreements	108 villages	3 CROs	2003.12.31	Completed
3.2	Household agreements	1,411 AF	TROs	2004.1.31	Completed
4.	Detailed Measurement Survey		CROs, TROs	2003.10.31	Completed
5.	Detailed Resettlement Plans			2004.1.15	
5.1	Village rehabilitation plans (initial)	10 villages	3 CROs	2003.12.31	Completed
5.2	Land replacement plans	3 counties	County governments	2004.08.30	Submitted to city level
5.3	Plan for supporting vulnerable groups	CNY8.2 million	CECC	2004.06.30	
5.4	Technical training plan for AF	2000 AF	CECC	2004.12.31	
6.	Implementation Capacity				
6.1	3 CROs and CECC	20 staff	CECC	2003.11.30	20 mobilized
6.2	Staff 22 township/ward offices	92 staff	CROs	2003.11.30	92 mobilized
6.3	Designate village representatives	108 staff	TROs	2003.11.30	Completed
6.4	Train staff	200 staff	CECC and CROs	2003.11.30	Completed
7.	Monitoring & Evaluation				
7.1	Baseline survey (480 surveys)	As per RP	Monitor	2004.3.31	Completed
7.2	Set up internal supervision	As per RP	CECC and CROs	2003.12.30	Completed
7.3	Contract external monitor	As per RP	CECC	2003.12.30	Completed
7.4	Internal monitoring reports	Quarterly	CECC	2004.06.30	1 st report due
7.5	External monitoring reports	Semiannual	Monitor	2004.07.20	1 st report due
7.6	Evaluation or completion reports	Annual	Monitor	2005.3.31	1 st report due
7.7	Resettlement completion report		CECC	2007.3.31	
8.	Documentation of Consultation	As per RP	CECC and CROs		To be recorded
9.	Documentation of Grievances	As required	CECC and TROs		To be recorded

AF = affected families, CECC = Changji Expressway Construction and Development Company, CRO = County resettlement office, DMS = detailed measurement survey; HCD = Hunan Provincial Communications Department, HPDI = Hunan Provincial Communications Design Institute, RIB = resettlement information booklet, RP = resettlement plan, TRO = Township Resettlement Office.

Sources: Asian Development Bank and HPDI estimates.

PUBLIC CONSULTATIONS

Agency	Date	Participants	No. of People	Purpose	Responses, Main Issues Discussed or Concerns
HCD, HPDI, prefecture and county officials	January 2000 ~ April, 2001	Farmers, local government/ factories representatives	80+	Project engineering feasibility study Preparation of EIA	<ul style="list-style-type: none"> • Requests for socioeconomic information • Arrangement for field visit for initial socioeconomic survey. • Survey inputs for engineering feasibility study • Avoid villages/buildings if possible and use the existing roads, whenever possible, to minimize farmland occupation in alignment selection • Estimation of project impact • Awareness of the proposed Project • Consultation with local government and enterprises on the future development plans and how the expressway will effectively facilitate their development.
HPDI, No. 2 Highway Design institute	November 2001 ~ November 2002	Farmers, local government, village committee, factories representatives	150+	Project preliminary design Preparation of EIA	<ul style="list-style-type: none"> • Survey inputs for project preliminary design studies • Identification and quantification of impacts: categories of land, structures, infrastructure, trees • Discussion of design issues • Surveys involved engineers staying in the affected villages thereby raising local awareness of proposed expressway and its likely impacts • Discussions on the frequency and suitability of underpasses and overpasses with local government and farmers from affected villages
TA consultants HASS	May ~ July 2003	Farmers, village heads, local officials	1,120.	Socioeconomic survey for preparation of RP	<ul style="list-style-type: none"> • Discussion of local attitudes to Project • Completion of multiple-choice questionnaires on local perceptions and concerns regarding proposed expressway • Group interviews at 55 villages along the alignment • Household interviews at 72 locations along the alignment • Findings indicated overwhelming support for the Project • Consultations with people affected by the Project related to water/ soil conservation issues, need to address compensation and relocation issues
TA consultant HASS	May ~ July 2003	Farmers especially poor and/or minority nationality farmers, village heads, local officials, public	1,860	Preparation of the social and poverty impact assessment	<ul style="list-style-type: none"> • Requests for socioeconomic information, profiling the target population on both spatial and social strata categories. • Each beneficiary group's perceptions of the positive benefits and negative impacts (if any) on them as a result of the Project. Responses were overwhelmingly in favor of the Project. • Examination of the dynamics in the poverty assessment of poverty and the main drivers

Continued on next page.

PUBLIC CONSULTATIONS—Continued

Agency	Date	Participants	No. of People	Purpose	Responses, Main Issues Discussed or Concerns
		transport and freight vehicle drivers, road vehicle passengers, transport vehicle owners, traders and sellers, mining companies and agro-processors, and G319 roadside service providers.			<p>of poverty reduction. Small land holdings, high dependency ratios, no migrant laborer in the household, small household size, and low education were all common features of the very poor. Key poverty reduction drivers were participation in migrant labor, higher skills and education levels, and improved access to markets.</p> <ul style="list-style-type: none"> • Determination of the needs of each beneficiary group. Farmers on average, irrespective of whether they were very poor, poor, or non-poor, rated construction or improvement of township to village roads as their top priority need. Some groups, like passenger transport companies and G319 roadside traders had firm suggestions on how greater benefits could flow to them from the expressway. • Determine from articulated needs and socioeconomic profiling which rural roads should be improved as part of the Project. • Preparation of a realistic social action plan, the implementation of which would enhance the poverty reduction impact of the Project.
TA consultant, HCD, local government officials.	August 2003	Village leader, villagers, school principals	160	Preparation for compensation, income rehabilitation and relocation plans	<ul style="list-style-type: none"> • Village development strategy • Impacts due to the Project and feasible rehabilitation measures • Employment situation and measures to ensure temporary workers and migrants' employment • Village individual household development/training • Village-based economic development plans • Restoration of affected enterprise, businesses, schools, gas stations, marketplace.
Number of people consulted			3,370		

EIA = environmental impact assessment, HASS = Hunan Academic Social Science, HCD = Hunan Provincial Communications Department, HECC = Hunan Expressway Construction and Development Corporation, HPDI = Hunan Provincial Design Institute, RP = Resettlement Plan, TA = technical assistance.
Sources: Hunan Provincial Communications Department and Hunan Provincial Design Institute.

COST ESTIMATES
(\$ million)

Item	Foreign Exchange	Local Currency	Total Cost	ADB Financing
A. Base Cost				
1. Expressway Civil Works ^a	256.76	239.53	496.30	256.76
2. Equipment	8.81	0.00	8.81	8.81
3. Land Acquisition and Resettlement	0.00	46.00	46.00	0.00
4. Consulting Services and Training	1.69	34.13	35.82	1.69
5. Local Road Program ^b	12.50	69.36	81.86	12.50
Subtotal (A)	279.76	389.02	668.79	279.76
B. Contingencies				
1. Physical Contingencies ^c	19.47	23.34	42.81	19.47
2. Price Contingencies ^d	5.37	23.91	29.28	3.71
Subtotal (B)	24.84	47.26	72.09	23.18
C. IDC/Commitment Charge	9.56	27.65	37.21	9.56
Total	314.16	463.93	778.10	312.50

ADB = Asian Development Bank, IDC = interest during construction.

Note: Numbers may not add up due to rounding.

^a Civil works includes the cost of environmental protection and mitigation measures.

^b Local road component includes nine packages.

^c Physical contingency at 7.0% of expressway and local road component.

^d Price contingencies were computed based on ADB rates.

Source: Asian Development Bank estimates.

CONSTRUCTION SCHEDULE

Activity	2004												2005												2006												2007											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
I. Civil Works																																																
1. Preparation Works																																																
2. Earthworks																																																
3. Tunnel																																																
4. Structures and Drainage																																																
5. Culvert and Underpass																																																
6. Pavement																																																
7. Interchange																																																
8. Connection Road																																																
9. Roadside Facilities																																																
Land Acquisition																																																
Resettlement																																																
II. Equipment and Materials																																																
A. Bidding																																																
B. Lighting Equipment																																																
C. Environmental																																																
D. Maintenance																																																
E. Safety																																																
F. Other Equipment																																																
IV. Construction Supervision																																																
1. Shortlist																																																
2. Selection																																																
3. Supervision and Training																																																
V. Environmental Monitoring																																																

Note: Roadside facilities include service and rest areas, toll plazas, maintenance depots, and management offices.

CONTRACT PACKAGES

No.	Start	End	Length (km)	Estimate Cost		Procurement Mode
				CNY (million)	\$ (million)	
Earthworks						
C1	4+117.919	19+000	14.9	150	18.17	ICB
C2	19+000	31+400	12.4	129	15.58	ICB
C3	31+400	46+000	14.6	163	19.73	ICB
C4	46+000	56+000	10.0	133	16.01	ICB
C5	56+000	65+100	9.1	148	17.91	ICB
C6	65+100	75+385.646	10.3	155	18.69	ICB
C7	72+498.5	82+800	10.3	160	19.30	ICB
C8	82+800	90+300	7.5	156	18.87	ICB
C9	90+300	97+000	6.7	147	17.74	ICB
C10	97+300	103+600	6.6	153	18.43	ICB
C11	103+600	109+500	5.9	149	18.00	ICB
C12	109+500	114+200	5.2	147	17.74	ICB
C13	114+200	119+000	4.8	144	17.39	ICB
C14	119+000	123+200	4.2	166	20.08	ICB
C15	123+200	129+500	6.3	150	18.09	ICB
C16	129+500	135+000	5.5	155	18.69	ICB
C17	135+000	141+700	6.7	137	16.53	ICB
C18	141+700	149+500	7.8	201	24.32	ICB
C19	149+500	157+527	8.0	157	18.95	ICB
C20	157+527	166+556	9.0	173	20.94	ICB
C21	166+556	175+384.027	8.8	233	28.13	ICB
Subtotal			174.6	3,306	399.30	
Pavement						
P1	4+117.919	31+400	27.3	97	11.68	ICB
P2	31+400	65+100	33.7	101	12.25	ICB
P3	65+100	90+300	28.1	101	12.15	ICB
P4	90+300	119+000	29.2	103	12.43	ICB
P5	119+000	149+500	30.5	100	12.06	ICB
P6	149+500	175+384.027	25.9	87	10.55	ICB
Subtotal			174.6	589	71.12	
Traffic Engineering						
T1-T6				133	16.06	LCB
T7-T9 Supply and installation of cable ducting				34	4.11	LCB
Subtotal				167	20.17	
Ancilariy Facilities						
B1				24	2.90	Government procedure
B2				23	2.78	Government procedure
Subtotal				47	5.68	
Civil Engineering (Expressway) Total				4,109	496.27	
Local Roads						
ADB Finance Section				230	27.78	LCB
Civil Engineering (Local Roads) Total				678	81.86	
Civil Engineering Total				4,787	578.13	
Equipment						
E1				16	1.93	ICB
E2				4	0.48	ICB
E3				53	6.40	ICB
Equipment Total				73	8.82	
Total				4,860	586.95	

ICB = international competitive bidding, LCB = local competitive bidding, RMB = renminbi.

Source: Asian Development Bank estimates.

TRAFFIC FORECAST

1. The project expressway constitutes a 173 kilometer (km) section in the Changsha-Chongqing corridor. It replaces the existing road, NR319 (class II, III, and IV). The NR319 pavement is in poor condition; 60% of its length suffers from frequent flooding. Traffic on NR319 is congested, due in part to local and nonmotorized traffic. The expressway will pass through Taoyuan in Changde City, Yuanling and Chenxi in Huaihua County, and Louxi and Jishou in Xiangxi Prefecture. It will connect Changde and Huaihua cities and Xiangxi Autonomous Prefecture in the west of Hunan with Changsha, Hubei, Chongqing Municipality, and Sichuan and Guizhou provinces. Traffic surveys were carried out by the Hunan Provincial Design Institute. Sixteen-hour origin-destination surveys and associated 24-hour classified traffic counts were done at 15 key locations along the existing NR319 and linking roads. Trucks make up 62% of all vehicles on NR319, and cars and buses only 38%. The nonmodeled traffic accounted for 10% of total traffic. Over 80% of the vehicles make long distance trips of over 200km, and 16% have both origin and destination within this area.

2. By 2008, the traffic on NR319 will exceed the optimal capacity at several points, particularly near Changde and on the class III and IV sections. By 2018, traffic on NR319 will be well over capacity along its whole route. With the expressway, some additional traffic will be generated as a result of (i) additional trips made by existing users due to cheaper and quicker journeys; and (ii) trips made by others who, in the absence of the Project, were deterred from making them because of the prohibitive cost or time. Based on the feasibility study, additional tourism traffic is estimated at 1,263 medium-truck equivalent per day in 2008, rising to 2,475 in 2028. Other generated traffic occurs due to reduced prices. Price elasticities were minus 0.4 for passengers and minus 0.3 for freight. Estimates were made on the present traffic volume on NR319, and the traffic volume likely to be either generated or diverted from NR319 as a result of the expressway. Based on the economic growth forecast in the project area, the traffic projections consider (i) the traffic growth for the past 10 years, (ii) the probable generation of traffic due to enhanced economic activities resulting from the expressway, (iii) the likelihood that traffic will be diverted from NR319 once the expressway is opened, and (iv) origin-destination survey results. Traffic along the corridor increased at 7.3% per annum over the last 5 years. The factor used to forecast traffic was income elasticity of traffic demand. Gross domestic product growth rates were projected at 8.4%, 7.1%, 6.5%, and 5.6% each for 2000–05, 2005–10, 2010–20, and 2020–25. The demand elasticity was 1.05 for passengers and 0.85 for freight.

Table A12: Forecast Traffic Flows
(medium-truck equivalent)

Section	Base Case			With the Expressway								
				Expressway			NR 319 and Others			Total		
	2008	2018	2028	2008	2018	2028	2008	2018	2028	2008	2018	2028
1	6,984	13,858	25,353	6,613	11,719	19,419	3,291	6,711	12,841	9,904	18,430	32,260
2	5,415	10,745	19,658	5,442	9,618	15,819	2,623	5,387	10,416	8,065	15,005	26,235
3	5,415	10,745	19,658	5,560	9,829	16,174	2,231	4,575	8,853	7,791	14,405	25,027
4	5,415	10,745	19,658	5,684	10,051	16,547	2,109	4,337	8,437	7,793	14,388	24,984
5	5,415	10,745	19,658	5,652	9,995	16,456	2,140	4,397	8,538	7,792	14,392	24,994
6	5,546	11,004	20,132	5,627	9,952	16,387	2,325	4,874	9,327	7,952	14,825	25,714
7	4,314	8,561	15,663	4,799	9,745	16,173	2,167	4,418	8,445	6,966	14,163	24,618
Average	5,501	10,915	19,969	5,625	10,130	16,711	2,412	4,846	9,337	8,037	14,976	26,048
Growth rate (%)	7.3%	7.1%	6.2%		6.1%	5.1%		7.2%	6.7%		6.4%	5.7%

1 = Changde-Taoyuan; 2 = Taoyuan-Zhengjiayi; 3 = Zhengjiayi-Cha'angpu; 4 = Cha'angpu-Guanzhuang; 5 = Guanzhuang-Yuanling; 6 = Yuanling-Shanjiaoping; 7 = Shanjiaoping-Louxi, NR = national road, MTE = medium-truck equivalent.

Source: Asian Development Bank estimates.

ECONOMIC ANALYSIS

1. The Project comprises the expressway that traverses the northwestern part of Hunan and the local roads connected to the expressway through the road network system. The Project will be implemented over 5 years. The economic analysis covers the following 20 years of full operation. The economic internal rate of return (EIRR) of the project expressway was estimated by comparing the project case with a base case involving the continued use and maintenance of the existing road, NR319. Without the Project, congestion levels would increase, causing delays and increasing vehicle operating cost (VOC); accident rates would also rise. The Project, with its shorter distance and travel time, safer design, and better running conditions, will reduce VOC and accident risks along the corridor.

A. Expressway Component

2. Economic evaluation was undertaken using 2004 prices. The project costs and benefits were revalued at economic prices by separating the cost items into tradable materials and equipment, nontradable materials, labor, and land. The prices were expressed in yuan using the domestic price numeraire with a shadow exchange rate factor of 1.01 for foreign exchange effects. A shadow price was used to put an economic value on the wages paid to unskilled labor, but not on wages for skilled labor since no skilled worker surplus existed. A shadow wage rate factor of 0.67 was used to convert the financial wage rate to an economic opportunity cost of labor. The costs of the expressway include (i) the capital cost, including physical contingencies, land acquisition, and resettlement; and (ii) the costs of operating and maintaining the expressway, including the costs of replacing depreciated equipment. In estimating the economic costs of land, the approach described in *The Guidelines for the Economic Analysis of Projects* was followed.¹

3. The economic benefits include (i) VOC savings resulting from the reduced travel distance and improved road conditions, (ii) savings in the value of passenger time and of freight tied up in transit, (iii) savings resulting from fewer accidents, and (iv) benefits to generated traffic.² A reduction of VOC is the main source of economic benefits in new or improved roads. The expressway shortens the route between Changde and the border between Yuanling and Louxi by about 45 kilometers (km). Traffic diverting to the expressway would enjoy higher speeds on a smoother road, with better vertical and horizontal alignment, less congestion, and a shorter journey distance. Traffic remaining on the alternative NR319 route would also benefit from a reduction in traffic volume and congestion. All these changes affect vehicle speeds and VOC, which were estimated for all vehicle types likely to use the corridor. Savings in travel time will occur both on the project expressway and the existing roads. User time savings were valued at the wage rate for crew and 30% of the hourly wage rate for passengers.³ The value of time-for-work or business trips is assumed to be related more to urban incomes for cars and average regional incomes for buses.⁴ The economic cost per fatality was established using 2001 data

¹ The economic opportunity costs of land are assumed to be equivalent to the replacement value of farmland, which was calculated for land compensation. Since these are rural areas, it was assumed that there is no additional opportunity cost for land.

² Environmental benefits will also come from reduced vehicle emissions and noise, but these have not been included in the analysis for lack of a suitable evaluation methodology.

³ This is based on an assumed annual income of CNY14,000 for car passengers and CNY5,000 for bus passengers. For people traveling in leisure time, the preferred method of valuation is willingness-to-pay for time saved. However, in the absence of local information on willingness-to-pay, this study bases the values on annual income.

⁴ This resulted in an economic opportunity cost of CNY0.70 per hour for car passengers and CNY0.25 per hour for bus passengers.

with estimates of the involvement of vehicle occupants and pedestrians at different levels of income in fatalities on different classes of road.⁵

4. The EIRR for the expressway component is estimated at 17.7%, indicating that the Project is economically viable, with a net present value of CNY3.6 billion. Of the total benefits, 73.3% comprise VOC savings; 14.6%, savings in user time costs; 3.8%, accident cost savings; 7.9%, benefits from generated traffic; and 0.5%, savings in freight inventory costs in transit. Sensitivity analyses confirm the robustness of its economic viability—changes in the key variables of construction costs, toll rates, and benefits do not significantly affect the economic viability.

B. Local Road Component

5. The principal benefits of the local road improvements have been identified as (i) VOC savings to existing traffic and normal growth of future traffic on the improved roads, (ii) crop value-added benefits because of higher farm-gate prices and improved access, and (iii) generated benefits from tourism development. Transport cost savings will accrue to normal traffic on the improved roads through VOC. Currently farm-gate prices for fruits are low since only traders with tractors or small trucks can visit the villages to purchase produce. Improved local roads would allow farmers to go to markets to sell their produce at higher prices, thus benefiting the serviced communities with resulting farm-gate price increase. A local road section from Yuanling to Zhangjiajie, which will connect the Zhangjiajie area with Yuanling, thereby spurring tourism in the project area, will benefit the rural people by increasing work opportunities such as catering services to tourists. Despite significant benefits of increased crop values and tourism development, these were not included in the EIRR calculation and only VOC savings were estimated. The nine local roads have a combined EIRR of 20.1% per annum with a net present value of CNY472 million.

C. The Whole Project

6. Based on the combined economic cash flows over the period 2004 to 2027, the Project, as a whole, comprising the 174 km expressway and the 517 km of local road improvement projects, generates an EIRR of 18.6%. This is relatively high, mainly because of the Project's low construction costs and increased levels of traffic volume due to better road conditions. The VOC savings from the expressway tops the list of benefits, accounting for 66%, followed by passenger time savings at 14%. Accident cost savings, savings to generated traffic, and other benefits are all comparatively small. The benefits of the local road component, while critically important to the villages concerned, also account for 10% of the total benefits (Table A13.1). The results of the sensitivity analysis confirm the robustness of the Project's economic viability: changes in the key variables—construction costs, toll rates, and benefits—do not significantly affect its viability, and the EIRR remains above the 12% threshold (Table A13.2). The level of toll also affects the EIRR: the higher the toll, the less attractive is the expressway to users of the parallel road NR319 and hence the lower is the EIRR. The economic viability of the Project was further confirmed by a statistical distribution of the EIRR. With the uncertainties, the statistical distribution of the EIRR concluded that (i) the expected EIRR for the whole Project is 18.6%, (ii) the chance of an internal rate of return exceeding 12% is 98%, and (iii) the chance of an internal rate of return greater than 20% is 2%.

⁵ On the basis of the findings of a study on accidents carried out by Highway Planning and Design Institute of the Ministry of Communications in 1993, savings for reduced accidents were calculated using the national data for 2001. The average direct cost of an accident was estimated at: CNY25,980 on expressways, CNY30,700 on class II roads, CNY29,390 on class III roads, and CNY26,230 on class IV roads.

Table A13.1: Economic Internal Rate of Return of the Project
(constant 2004 economic prices, domestic price numeraire, CNY million)

Year	Costs					Benefits						Net Benefits
	Without Project Costs	With Project Costs			Incremental Cost	VOC Savings	Time Savings	Accident Savings	Others	Local Roads	Total	
		Capital	O&M	Local Roads								
2005	0	811	0	0	811	0	0	0	0	0	0	(811)
2006	0	1,583	0	117	1,700	0	0	0	0	0	0	(1,700)
2007	0	2,161	0	117	2,278	0	0	0	0	0	0	(2,278)
2008	0	1,421	0	220	1,641	0	0	0	0	0	0	(1,641)
2009	25	0	44	9	28	519	63	39	66	70	757	729
2010	32	0	44	6	18	586	76	42	72	77	853	835
2011	34	0	44	7	16	661	91	45	82	85	963	947
2012	36	0	44	7	15	744	110	48	91	94	1,086	1,071
2013	37	0	44	7	13	838	131	51	101	103	1,223	1,211
2014	39	0	43	7	11	942	156	55	112	113	1,378	1,367
2015	41	0	43	7	9	1,059	187	59	124	124	1,553	1,544
2016	43	0	43	7	7	1,189	223	63	138	137	1,750	1,742
2017	45	0	43	7	5	1,335	265	67	153	150	1,971	1,966
2018	47	0	43	7	3	1,498	315	72	171	165	2,221	2,218
2019	49	54	200	7	212	1,680	375	77	190	182	2,503	2,290
2020	50	0	42	7	0	1,860	432	80	205	194	2,771	2,771
2021	50	0	42	8	(1)	2,059	497	83	222	207	3,068	3,069
2022	51	0	42	8	(1)	2,279	572	87	240	221	3,399	3,401
2023	51	0	42	8	(2)	2,523	658	91	260	236	3,767	3,769
2024	52	0	42	8	(2)	2,791	756	95	282	252	4,176	4,178
2025	52	0	41	8	(3)	3,087	869	99	306	269	4,630	4,633
2026	53	0	41	8	(4)	3,415	999	103	332	287	5,136	5,140
2027	54	0	41	8	(5)	3,776	1,148	107	362	306	5,699	5,703
2028	54	4,313	41	(295)	(4,621)	4,175	1,319	112	327	334	6,266	10,887

Economic internal rate of return: 18.6 %
Net present value: 4,248 (CNY million)

CNY = Chinese yuan, EIRR = economic internal rate of return, O&M = operation and maintenance, VOC = vehicle operating cost.

Source: Asian Development Bank estimates.

Table A13.2: Sensitivity to Changes in Economic Benefits and Costs

Scenario	EIRR (%)	NPV (CNY million)	Switching Value (%) ^a
1. Base case	18.6	4,248	
2. Benefits less 10%	17.5	3,334	0.5
3. Benefits less 20%	16.3	2,271	
4. Toll increase 50%	13.5	430	1.8
5. Capital cost up 10%	17.2	3,774	2.1
6. Capital cost up 20%	16.3	3,152	
7. Traffic growth less 20%	13.7	569	
8. Implementation delay 1 year	18.5	4,341	
9. Implementation delay 2 years	16.2	2,849	
10. Benefits minus 20%, capital costs plus 20%	14.0	1,026	

EIRR = economic internal rate of return, NPV = net present value.

^a Factors applied to the best estimate for each cost/benefit item to reduce the EIRR to the 12% per annum threshold.

Source: Asian Development Bank estimates.

FINANCIAL PERFORMANCE AND PROJECTIONS

A. General

1. The projected financial performance is based on the following assumptions and the pro forma financial statements are for 24 years from 2005 to 2028. All projections are in current terms. The domestic inflation rate is assumed at 2% for 2005, 3% for 2006, and 4% for 2007 onward. The international inflation rate used is 2.4% throughout the projection period.

B. Major Assumptions for Financial Projections

2. The project expressway financial projections are based upon the following assumptions:

- (i) Corporate income tax is assessed against the expressway operating entity at 33% of net profit per year.
- (ii) Government grants consist of equity capital of CNY369 million contributed by Hunan Provincial Government and CNY880 million by the Ministry of Communications. Both grants are included in the cost of construction.
- (iii) The toll is based on vehicle size and types (small passenger vehicles, buses, small trucks, medium trucks, and large trucks including containers and trailers) and distance traveled. Toll-exempted vehicles (such as military, emergency, and public security vehicles) are expected to make up about 5% of total traffic. The fee schedule will be updated regularly to reflect real price increase and domestic inflation. Based on the toll rates and the forecast traffic mix, the weighted average expressway toll rate is assumed at CNY0.99 per medium-truck equivalent -kilometer (km) in the first operating year (2008). The analysis shows that toll revenues from the average unit toll should be able to generate sufficient funds to serve the repayment of the loan from the Asian Development Bank (ADB). Traffic revenues will be generated from 2008 with annual traffic growth rates for 2008–2018 and 2019–2028 at 6.1% and 5.1%, respectively. Adequate toll charges are very important for the financial viability of expressway projects. The level of tolls must generate enough revenue to obtain the higher financial rate of return on investment, but not deter potential users and compromise economic objectives. These objectives can be contradictory, because the former requires a higher toll while the latter requires a lower one. The proposed toll charges for the expressway were carefully assessed, reflecting current average tolls in other expressways in Hunan:

Table A14.1: Toll Charges
(CNY per vehicle-km, 2004 prices)

Small Car	Bus	Light Truck	Medium Truck	Heavy Truck
0.45	1.0	0.5	1.0	1.5

Source: Hunan Provincial Communications Department.

- (iv) The operating, management, and maintenance costs, including routine maintenance are CNY47.5 million per year: CNY14 million per year for the operating and management costs and CNY33.5 million per year for the maintenance costs in 2004 prices. The operating and management costs are

based upon the employment of one person per year per km to operate and manage all the sections of the project roads and connector roads. Management costs are estimated at CNY32,000 per year per 6 km for each management staff, at CNY40,000 per per year for each tolling staff, and at CNY40,000 per per km per year for each maintenance staff. For tunnel operations, CNY0.5 million per year for tunnels less than 1 km and CNY2 million per year per km for tunnels longer than 1 km were assumed. The maintenance costs have been estimated on the basis of a unit rate of about CNY81,000 per year per kilometer. Operation and maintenance costs will increase in line with traffic growth and domestic inflation.

- (v) For the life of the ADB loan, the currency is assumed as US dollar, and no conversion of interest, currency, rebate, or surcharge is assumed. ADB loan repayment and domestic loan repayment will begin in 2010. The interest rate charged on the ADB loan was estimated at 5.85% (based on the 2004 London interbank offered rate (LIBOR) in US dollars and the 10-year swap cost for variable to fixed interest rate). The interest rate on the domestic loan is 5.18%. The domestic loan will have a 25-year term including a grace period of 5 years. The commitment fee of 0.75% per year is included.
- (vi) After 10 years of full operation, the expressway will be repaved. The repaving cost is estimated at CNY182 million in 2004 prices. It will be done during 1 year in 2019. Equipment (50%) will be replaced in 2024.

C. Financial Performance

3. The projected financial statements indicate that financial revenues under the assumptions are sufficient to cover operation and maintenance costs, corporate taxes, debt repayments on the ADB loan and the domestic loan, and reasonable profits. Based on the financial project, operational efficiency is satisfactory and the debt service coverage ratio of more than 1.0 is achievable from the third year of operation. The debt-to-equity ratio will be below 70:30 from the beginning year of the project operation.

Table A14.2: Projected Financial Statements For Changde-Huaihua Expressway^a
(Current CNY million)

Project Year	1 2005	2 2006	3 2007	4 2008	5 2009	6 2010	7 2011	8 2012	9 2013	11 2015	16 2020	21 2025	24 2028
Income Statement													
Net Operating Revenue				373	404	436	472	511	552	646	900	1,287	1,594
Operating Expenses				144	145	146	147	148	149	152	157	164	168
Operating Income				229	259	291	325	363	403	495	744	1,123	1,426
Loan Interest ^b					0	291	283	274	265	246	185	106	46
Net Profit Before Corporate Tax				229	259	0	42	88	138	249	558	1,017	1,380
Net Profit After Corporate Tax				154	173	0	28	59	92	167	374	681	924
Cash Flow Statement													
Net Cash from Operations				245	265	91	120	151	184	258	415	772	1,015
Hunan Provincial Government MOC Grant	55	113	154	59									
ADB Loan ^c	132	269	366	140									
Domestic Bank Loan	388	791	1,076	411									
Subtotal Cash Inflows	396	808	1,099	420									
Construction Costs	971	1,981	2,694	1,275	265	91	120	150	184	258	464	772	1,015
Debt Service ^d	971	1,981	2,694	1,030									
Principal Repayment					0	114	122	132	141	163	236	345	435
Subtotal Cash Outflows					0	114	122	132	141	163	236	345	435
Net Cash Flows	971	1,981	2,694	1,030	0	114	122	132	141	163	236	345	435
	0	0	0	245	265	-23	-3	19	43	95	228	427	580
Balance Sheet													
Accumulated Depreciation				91	183	274	366	457	548	731	1,185	1,692	1,963
Total Assets	971	2,952	5,646	6,830	7,003	6,889	6,795	6,722	6,674	6,654	7,070	8,295	9,604
Liabilities													
Bank Loans (SDB and ADB) ^e	784	2,382	4,557	5,388	5,388	5,274	5,152	5,020	4,879	4,565	3,542	2,054	844
Equity Capital	187	569	1,089	1,288	1,288	1,288	1,288	1,288	1,288	1,288	1,288	1,288	1,288
Total Liabilities and Equity	971	2,952	5,646	6,830	7,003	6,889	6,795	6,722	6,674	6,654	7,070	8,295	9,604
Performance Indicators													
Debt to Equity Ratio	80.7	80.7	80.7	78.9	76.9	76.6	75.8	74.7	73.1	68.6	50.1	24.8	8.8
Debt Service Ratio ^f						0.94	0.99	1.05	1.11	1.23	1.54	1.86	2.21
Return on Investment				0.02	0.02	0.00	0.00	0.01	0.01	0.03	0.05	0.08	0.10

ADB = Asian Development Bank, CNY = Chinese yuan, MOC = Ministry of Communications, SDB = State Development Bank.

^a Pertaining only to project account of the Expressway Company.

^b Loan interest includes ADB and domestic loan interests. The loans have a 25-year-term including a grace period of 5 years.

^c A portion of the loan proceeds, \$277.2 million will be onlended to the Expressway Comapnay and the company will repay the whole \$300 million and the interests on the whole proceeds to ADB.

^d Loan principal payments include ADB and Domestic loan principals. Interest payments are not included because net profit in cash inflows excludes loan interests as well.

^e Including current portions of long-term liabilities

^f Operating income plus depreciation divided by interest and principal payments.

Source: Asian Development Bank estimates.

FINANCIAL ANALYSIS

1. The financial rate of return (FIRR) for the Project roads is based on estimated incremental revenues and costs resulting from its operation. The major assumptions include the following.

- (i) The FIRR calculation is in constant 2004 prices. They cover 24 years, comprising about 4 years of construction (2005 to 2008) and 20 years of operation (2009 to 2028).
- (ii) The FIRR was calculated after corporate income tax.
- (iii) Capital costs include all incremental capital expenditures related to the construction and equipment of the project roads, but exclude local roads, price contingency provisions, and interest during construction.
- (iv) Operating costs, including management costs and maintenance costs, are all incremental costs for operation and management of the project expressway, but exclude depreciation provisions.
- (v) Operating revenues were projected based on forecast traffic based on proposed toll rates for the project expressway in real terms. Toll rates are regularly updated, according to domestic inflation. The traffic volumes have taken into account vehicles that are exempt from tolls, such as military, emergency, and public security vehicles.
- (vi) Periodic maintenance is assumed to take place in the tenth year of full operation (2019), at the constant cost of CNY182 million.
- (vii) About a half of equipment will be replaced in the fifteenth year of full operation (2024).

2. The result of the financial evaluation for the project expressway shows an FIRR in real terms of 7.6% after corporate income tax (Table A15.1). This is higher than the real after tax weighted average cost of capital for the Project estimated at 4.4%. Sensitivity analysis of the financial return was carried out to test the effects of several scenarios on key parameters that determine costs and revenues. The Project is shown to be most sensitive to (i) capital costs, (ii) revenue stream, and (iii) delay in completion. An increase of 20% in capital costs will reduce the FIRR to 6.0%; a decrease of 20% in revenues will reduce the FIRR to 4.9%; and a 1 year delay in construction reduces the FIRR to 7.0%. Under the most adverse scenario (capital costs higher by 20%, and revenues lower by 20%), the FIRR would fall to 3.5% (Table A15.2).

3. Adequate toll charges are very important for the financial viability of expressway projects. The level of tolls must generate enough revenue to obtain the higher financial rate of return on investment, but not deter potential users and compromise economic objectives. These objectives can be contradictory, because the former requires a higher toll, while the latter requires a lower one. Sensitivity tests on the level of tolls show that at a toll of CNY0.99 per MTE-km, both the FIRR and economic internal rate of return could be justified. The FIRR reaches its maximum at CNY1.98 per MTE-km.

Table A15.1: Financial Internal Rate of Return
(constant 2004 prices, CNY million)

Project Year	Year	Total Revenues	Capital Costs	Operating Costs	Maintenance Costs	Corporate Tax	Total Costs	Cash Flow
								After Taxes
1	2005		851.9				851.9	(851.9)
2	2006		1,703.8				1,703.8	(1,703.8)
3	2007		2,271.8				2,271.8	(2,271.8)
4	2008		851.9				851.9	(851.9)
5	2009	389.6		33.5	14.0	82.7	130.2	259.4
6	2010	419.7		33.8	14.1	92.5	140.5	279.2
7	2011	452.2		34.2	14.3	26.3	74.7	377.5
8	2012	487.2		34.5	14.4	40.0	88.9	398.2
9	2013	524.8		34.8	14.6	54.7	104.1	420.7
10	2014	565.4		35.2	14.7	70.5	120.5	445.0
11	2015	609.2		35.6	14.9	87.5	137.9	471.2
12	2016	656.3		35.9	15.0	105.7	156.6	499.6
13	2017	707.0		36.3	15.2	65.2	116.7	590.4
14	2018	761.7		36.6	15.3	146.3	198.2	563.5
15	2019	812.9	182.0	37.0	15.5	166.6	401.0	411.8
16	2020	867.5		37.4	15.6	187.9	240.9	626.6
17	2021	925.8		37.7	15.8	210.5	264.0	661.7
18	2022	988.0		38.1	15.9	234.7	288.7	699.3
19	2023	1,054.4		38.5	16.1	260.4	314.9	739.4
20	2024	1,125.2	36.5	38.9	16.3	287.7	379.4	745.8
21	2025	1,200.8		39.3	16.4	316.8	372.5	828.3
22	2026	1,281.5		39.7	16.6	347.9	404.1	877.3
23	2027	1,367.6		40.1	16.7	380.9	437.7	929.8
24	2028	1,459.4	(962.0)	40.5	16.9	416.1	(488.6)	1,948.0
After Corporate Tax								7.63%

Source: Asian Development Bank estimates.

Table A15.2: Sensitivity to Changes in Financial Factors

Case	Changes in FIRR
Base Case	7.6%
1 Capital cost up by 10%	6.7
2 Capital cost up by 20%	6.0
3 Capital cost less by 10%	8.5
4 Revenues decrease by 10%	6.3
5 Revenues decrease by 20%	4.9
6 10% decrease in toll rates	7.2
7 10% increase in toll rates	7.8
8 O&M cost increase by 30%	7.4
9 Project delayed by 1 year	7.0
10 10% capital costs increase and 20% revenues decrease	5.8
11 20% capital costs increase and 20% revenues decrease	3.5

FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Asian Development Bank estimates.

SUMMARY ETHNIC MINORITIES DEVELOPMENT PLAN

A. Introduction

1. An ethnic minorities development plan (EMDP) has been prepared to ensure equitable sharing of project benefits and to propose mitigation measures to adverse effects for ethnic minority communities¹ in the project area. Adequate provisions to enhance the economic conditions of ethnic minorities are integrated in project design. Special mitigation measures are included in the resettlement plan, and will help ensure that ethnic minorities adversely affected by resettlement will also benefit from the Project. Government policies and programs for minorities further help protect and enhance project benefits.

B. Socioeconomic Characteristics of Ethnic Minorities in the Project Area

2. The total minority population in project area is estimated at about 1.3 million. The Project will directly benefit about 774,000 ethnic minorities. They make up 37% of beneficiaries of the expressway and 54% of the local roads. Ethnic minorities have limited access to transport services and own fewer vehicles due to road classification, government regulations, inaccessible credit, or unreliability of transport services. Road access among the surveyed minority villages is as low as 57%, compared with 65% for the Han communities. An improved road network in the project area will enable ethnic minority families to seek both social and economic opportunities. About 8% of resettlement-affected households are poor ethnic minorities. The Bai, Miao, Tujia, and Yao make up 96% of the total minority populations in the western section of the project area. Levels of education and artisan skills differ for minority nationalities within the project area. There is little gender disparity in school enrollment rates at the primary level due to education programs and overall socioeconomic growth. However, few minority women have artisan skills for income-generation activities due to a lack of access to technology services.

C. Legal Framework and Principles

3. The EMDP for the Project is based on regulations of the People's Republic of China (PRC) and Asian Development Bank (ADB) policy for indigenous people. The Government adopted a policy of ethnic equality post-1949 where all groups are legally and constitutionally equal. Since the 1980s governments of autonomous areas have set and implement their own economic policy. Current government policies and programs for minority nationalities further help to enhance project benefits to ethnic minority groups. ADB policy aims to protect ethnic minorities from the adverse impacts of development, and to ensure that ethnic minorities benefit from development projects and programs. The Project fully mainstreams ethnic minorities' concerns into its design, as they are considered one of the primary beneficiaries. Specific activities are incorporated into the proposed transport interventions to ensure that minorities share proportionately in project benefits (Table A16). Local road improvement is a response to the development needs of ethnic minorities. Significant project impacts include expanded tourism development, higher farm-gate prices for agricultural goods, increased access to markets and employment opportunities, and improved social services.

D. Implementation Arrangements

4. Implementation arrangements and associated costs for the EMDP have been integrated into the overall project arrangements, or are part of ongoing government programs.

¹ Ethnic minority groups refer to those groups that are different from the majority ethnic group, e.g., the Han. Post-1949 policy defines nationalities (*minzu*) based on shared language, territory, economic base, and traditions and culture.

Resettlement assistance of CNY8 million is budgeted for vulnerable households in the resettlement plan. Data will be disaggregated by ethnic group and by gender where available. External monitoring will be conducted by an independent domestic agency. The ADB midterm review will pay special attention to the implementation of the EMDP.

Table A16: Ethnic Minorities Action Plan

Proposed Actions	Targets	Agencies Involved	Timing	Funding Requirements	Monitoring Indicators
Improved transport services	Rural poor HHs in 28 townships. More than 50% of the population to be served is ethnic minority in remote mountainous areas.	IA, local government, TAD	2004–2008	Project local government	Investment in local roads Fares for passenger and freight
Construction of local roads	County and township governments, and communities along the roads	IA, local government, TAB	2004–2006	Integrated in project design	Types of local development initiatives
Protection of minority villages from construction disturbances	Over 100,000 population Over 100 villages, including 97 from construction villages affected by land acquisition and resettlement	IA and contractors	2004–2006	Covered by EIA	Number of pedestrian crossings Length of irrigation and drainage canals
Awareness and prevention of HIV/AIDS	In all construction camps and nearby villages Women found to be at higher risk of infection	IA, local public health agency, ethnic affairs bureau, ACWF	2004–2006	Included in EIA—covered by contractors	Number of clinics, patients by sex, HIV/AIDS infection, treatment facilities, posters, of educational programs
Awareness on cultural relics protection	Construction workers and local residents	IA, Contractors, cultural relic authorities	2003–2006	Covered by EIA	Number of cultural relic sites discovered Types of actions taken
Income recovery for resettlement affected people	Resettlement-affected people, especially for 10 seriously affected villages, of which 8 villages have a majority of ethnic minorities	IA, local labor and social security bureaus, ACWF, Ethnic Affairs Bureau	2003–2006	CNY120 million, covered by RP	Number of ethnic minority people affected who require special assistance, of trainees by gender, of jobs obtained by ethnic minorities
Farmland reclamation	Ethnic minority villages (not necessarily the ones that lose land)—15,885 people to benefit	IA, Hunan Land and Resources Bureau, Ethnic Affairs Bureau	2005–2006	CNY105.9 million Financed by the tax paid to the Land and Resources Bureau	Total cultivated land recreated Total people benefited Total ethnic minorities benefited
Afforestation	Ethnic minority villages—18,000 people to benefit	IA, Hunan Forestry Bureau, Ethnic Affairs Bureau	2005–2006	CNY6.0 million Financed by the tax paid to the Forestry Bureau	Total forest land created Total people benefited Total ethnic minorities benefited
Preference to minorities for unskilled construction work	About 33% of afforestation work for ethnic minority women About 33% of unskilled contract work	IA, contractors and ADB	2004–2006	Included in project cost, included in contract documents	Number of vulnerable employed, of local women employed, of local seedlings procured Wages paid
Road and traffic safety	Ethnic minority groups residing in communities and drivers along the corridor	IA, local public security bureau	2004–2008	Integrated into project design	Number of warning signboards Accident statistics
Enhanced poverty reduction programs at local roads sections	Microcredit: 50% to ethnic minority HHs, with about 20% targeted at female borrowers.	ABC, RCC, poverty reduction office, local governments	2004–2008	collaboration between poverty reduction office, and RCC/ABC	Amount of credit for purchasing vehicles Number of agricultural training sessions
Tourism development and promotion	Counties within project area; Tourists and tourism agents	Local government and its tourism bureaus	2005 onward	Collaboration between the Government, and Ethnic Affairs Bureau	Number of local tourism advertisements Investment in tourism sector Type of interchange development

ABC = Agricultural Bank of China, ACWF = All China Women's Federation, ADB = Asian Development Bank, AP = affected people, EIA = environmental impact assessment, HIV/AIDS = acquired immune deficiency syndrome, human immunodeficiency virus, HH = household, IA = implementing agency, RCC = Rural Credit Corporation, RP = resettlement plan, TAB = Transport Administration Bureau.

Sources: Asian Development Bank and Hunan Provincial Communications Department estimates.

SUMMARY OF POVERTY REDUCTION AND SOCIAL STRATEGY

A. Linkages to the Country Poverty Analysis

Is the sector identified as a national priority in country poverty analysis? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the sector identified as a national priority in country poverty partnership agreement? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Contribution of the sector or subsector to reduce poverty in the People's Republic of China (PRC): <p>The Project will contribute through improved access to markets and social services for the poor; lower transport costs of agricultural inputs and products; better access to and interaction with other regions, and employment opportunities during construction and after completion owing to increased economic activities. The expressway will help accelerate economic growth, spur interregional trade, and reduce poverty in the project area. To maximize the benefits of the expressway to the poor, the local road component was integrated into the Project. The integrated approach will improve the rural poor's mobility and road access to economic opportunities, and thereby contribute to poverty reduction. Better tie-ins between the major roads and local roads will help rural agricultural products reach markets and allow farmers to upgrade farming practices. As reliable transport to markets becomes more readily available, cash-crop farming in remote or isolated areas will also be stimulated and the access to off-farm employment opportunities, broadened.</p>	

B. Poverty AnalysisPoverty

Classification: Other

The Project is located in the western part of Hunan—one of the poorest regions in the People's Republic of China (PRC), which has limited accessibility and widespread, severe poverty. It has a total population of 2.8 million, with the per capita annual income of CNY1,660 in 2001. Of 2.3 million rural people, some 56% have annual incomes below CNY900.

C. Participation Process

Is there a stakeholder analysis? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<p>Participation during project preparation: Hunan Provincial Communications Department (HCD) undertook socioeconomic surveys and public meetings, which raised the level of awareness, gained local support, and enabled stakeholders to voice opinions and suggestions for project design and implementation. The participatory approach was initiated during project design, and is an ongoing activity that will continue during project implementation. The poor and women have been carefully considered in the conduct of participatory activities.</p>	
Is there a participation strategy? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<p>For the selection of unskilled labor in the project area, the contractors will discuss opportunities with villagers in the vicinity of the expressway alignment, and train them as necessary. During the selection of the expressway alignment, leaders of the affected villages were consulted in order to minimize the loss of irrigated land and housing. For the local road component, the local villages will provide unskilled labor at market wage rates. Local communities will participate in the project benefit monitoring. Some community-based organizations may be involved in the implementation of the village economic rehabilitation component of the Resettlement Plan (RP), and in activities related to the ethnic minorities development plan (EMDP).</p>	

D. Gender Development

Strategy to maximize impacts on women:
<p>Women will not be adversely affected by the Project, as they will gain many project benefits. Nevertheless, some specific measures are included in the social action plan to enhance the Project's benefits to women.</p>
Has an output been prepared? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

E. Social Safeguards and other Social Risks

Item	Significant/ Not Significant/ None	Strategy to Address Issues	Plan Required
Resettlement	<input checked="" type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None	The RP was prepared, disclosure of information booklet, full RP posted on websites, use of in-house capacity and experience, and implementation monitoring by HCD and an external agency.	<input checked="" type="checkbox"/> Full <input type="checkbox"/> Short <input type="checkbox"/> None
Affordability	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Labor	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	The Project will hire unskilled labor from villages along the alignment.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Indigenous Peoples	<input checked="" type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None	Adverse impact in terms of STI/HIV/AIDS and measures to ensure project benefits accruing to ethnic minorities are addressed in the EMDP. Land acquisition impacts are addressed in the RP.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Other Risks and/or Vulnerabilities	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

EMDP = ethnic minorities development plan, HCD = Hunan Provincial Communications Department, STI = sexually transmitted infections, HIV/AIDS = acquired immune deficiency syndrome, human immunodeficiency virus, RP = resettlement plan.

1. Initial poverty and social analysis undertaken during technical assistance (TA) fact-finding identified key poverty and social issues to be analyzed during project preparation. Based on the findings, a poverty and social analysis was carried out to ensure that the Project meets safeguard policy requirements of the Asian Development Bank (ADB) for involuntary resettlement and indigenous peoples.

2. With the expressway, the journey time between Changde and Huaihua will be cut by 2–3 hours. By lowering transport costs and travel time along the corridor, the Project will improve the availability of daily necessities in the local markets and villages nearby its interchanges, and improve the access to markets and income-generating opportunities. Poor farmers will earn higher profit margins owing to lower transport costs. Migration, an important cash income source for rural people, will increase with the better access to other cities and provinces. Increased tourists to the Golden Tourism Triangle Area with improved roads will bring significant advantages to the poor in Yuanling and Fenghuang counties. Some 1.9 million people (66% of the total population, of whom 42% are ethnic minorities) will directly benefit from the Project. Half of 1.3 million rural beneficiaries are poor, while 15% of 573,000 urban beneficiaries are poor. Some 774,000 ethnic minorities will benefit from the Project—about 33% are urban and 46% are rural (Table A17.1). A social action plan is in Table A17.2.

Table A17.1: Distribution Analysis

Item	Financial Value	Economic Value	Difference	Road Passengers	Goods Vehicles	Construction labor	Gov't.	Local Com'ties.	Total
Benefits									
Toll Revenue	3,914		(3,914)	(1,096)	(2,818)				
VOC Savings		5,929	5,929	1,675	4,254				
Passenger VOT Savings		1,267	1,267	1,267					
Accident Savings		286	286	95	95			95	
Generated Traffic Benefits		614	614	173	441				
Freight Transit Savings		43	43		43				
Benefits from Local Roads		652	652					652	
Total Benefits	3,914	8,791	4,877	2,115	2,014	0	0	747	4,877
Costs									
Capital and O&M	5,871	5,293	(578)				(578)		
Labor	433	290	(143)			(143)			
Tax	337		(337)				(337)		
Total Costs	6,641	5,584	(1,057)	0	0	(143)	(915)	0	
Net Benefits	(2,727)	3,207	5,934	2,115	2,014	143	915	747	5,934
Gains and losses				2,115	2,014	143	915	747	3,207

Com'ties. = communities, Gov't. = government, O&M = operation and maintenance, VOC = vehicle operating cost, VOT = value of time.

Source: Asian Development Bank estimates.

Table A17.2: Social Action Plan (2004–2008)

Proposed Actions	Targets	Agencies Involved	Year	Funding Requirements	Monitoring Indicators
Enhanced transport (e.g., local roads component, enhanced competition between service-providers, credit for vehicle purchase, and improved reliability)	Rural poor households in 28 townships. More than 50% of people to be served are minorities and vulnerable groups in remote areas	IA, local government, TAB	2004–2008	Project, local government. Additional collaboration with other agencies	Investment in local roads Number of competitive service contracts, of vehicles purchased using credit. of improved transport routes Fares for passenger and freight
Construction of local roads (e.g., links with local development initiatives)	County and township governments, and communities	IA, local government, TAB	2004–2006	Integrated in Project design	No of stakeholder meetings Types of local development initiatives
Protection of communities from construction disturbances (prohibiting nighttime construction, building of pedestrian crossings, over/underpasses, etc)	Over 100,000 population Over 100 villages, including 97 villages affected by land acquisition and resettlement	IA and contractors	2004–2006	Covered by EIA	Working hours (records) Number of pedestrian crossings Length of irrigation and drainage canals
Awareness and prevention of HIV/AIDS at local health clinics near construction camps, and for local communities	In all construction camps and nearby villages Women found to be at higher risk of infection	IA, contractors and local public health agency, ACWF	2004–2006	Included in EIA –covered by contractors	Number of clinics and posters, of patients by sex, of HIV/AIDS infections, of treatment facilities, o of educational programs
Awareness of cultural relics protection (e.g., preliminary surveys)	Construction workers, local residents, and tourists	IA Contractors TB, CRA	2003–2006	Included in EIA	Number of cultural relic sites discovered Types of actions taken
Income recovery for resettlement affected people	Resettlement-affected people, especially for 10 seriously affected villages	IA, local labor and social security bureaus, ACWF	2003–2006	CNY120 million, covered by RP	Number of trainees by gender, of courses, of information flowed, of jobs obtained
Preference to local people for construction work, including equal opportunity for work and pay for women	Half of afforestation work for local women Half of unskilled contract work for local laborers (15%, women)	IA, contractors and ADB	2004–2006	Included in contract documents	Number of vulnerable employed, o of local women employed, of local seedlings procured Wages paid
Road and traffic safety	Residents in communities along G319 and local roads Drivers on G319 and local roads	IA, local public security and local transport bureau	2004–2008	Integrated into project design	Number of warning signboards, of education programs Accident statistics
Enhancement of poverty reduction interventions at local road sections (e.g., microcredit for increased vehicle ownership, technical training on fruit production, etc.)	Rural residents in project area (approx. 2.2 million people). Priority to ethnic minority, resettlement-affected, and female borrowers	ABC, RCC, PRO, county and township governments	2004–2008	Additional collaboration among PRO, and RCC/ABC is required.	Amount of credit for purchasing vehicles Number of ethnic minority borrowers, of women borrowers, of agricultural training
Tourism development and promotion	Counties within project area Tourism agents	Local government offices	2005 –	Government, and tourism bureau	Number of local tourism advertisements Investment in tourism sector Type of interchange development

ABC = Agricultural Bank of China, ACWF = All China Women's Federation, ADB = Asian Development Bank, CRA = cultural relic authorities, EIA = environmental impact assessment, NR319=national road 319, IA = implementing agency, PRO = poverty reduction offices, RCC = Rural Credit Corporation, RP = resettlement plan, TAB = Transport Administration Bureau, TB = Tourist Boards .

Source: Asian Development Bank estimates.