

**Document of  
The World Bank**

Report No: 18451-CHA  
CN-PE-50036

PROJECT APPRAISAL DOCUMENT  
ON A  
PROPOSED LOAN  
IN THE AMOUNT OF US\$200 MILLION  
TO THE  
PEOPLE'S REPUBLIC OF CHINA  
FOR A  
ANHUI PROVINCIAL HIGHWAY PROJECT

OCTOBER 30, 1998

Transport Sector Unit  
East Asia and Pacific Region

## CURRENCY EQUIVALENTS

(Exchange Rate Effective August 1998)

Currency Unit = RMB

RMB1 = US\$0.12

US\$1 = RMB8.3

## FISCAL YEAR

January 1 - December 31

## ABBREVIATIONS AND ACRONYMS

ADT	-	Average Daily Traffic	IST	-	Institutional Strengthening and Training
AECL	-	Anhui Expressway Company Limited	MOC	-	Ministry of Communications
AHAB	-	Anhui Highway Administration Bureau	MOF	-	Ministry of Finance
APCD	-	Anhui Provincial Communications Department	MTE	-	Medium Truck Equivalent
CAS	-	Country Assistance Strategy	NCB	-	National Competitive Bidding
E&M	-	Electrical and Mechanical	NTHS	-	National Trunk Highway System
EA	-	Environmental Assessment	PAD	-	Project Appraisal Document
EAP	-	Environmental Action Plan	PEO	-	Project Execution Office
EIA	-	Environmental Impact Assessment	PQI	-	Pavement Quality Index
ENPV	-	Economic Net Present Value	RAP	-	Resettlement Action Plan
EIRR	-	Economic Internal Rate of Return	RMC	-	Resident Mission China
ES	-	Executive Summary (Environmental Report)	SAA	-	State Audit Administration
HAE	-	Hefei-Anqing Expressway	SOE	-	Statement of Expenditures
HMP	-	Highway Maintenance Program	SDPC	-	State Development and Planning Commission
ICB	-	International Competitive Bidding			
IEE	-	Initial Environmental Evaluation			

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**CHINA**  
**Anhui Provincial Highway Project**

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China  
Anhui Provincial Highway Project

## Project Appraisal Document

East Asia and the Pacific Region

<p>Date: October 30, 1998  Country Director: Yukon Huang  Project ID: CN-PE-50036      Sector: Transportation  Lending Instrument: Specific Investment Loan</p>	<p>Task Team Leader/Task Manager: Yasuhiro Kawabata  Acting Sector Manager: Jitendra Bajpai  Program Objective Category:  Program of Targeted Intervention:      <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No</p>
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<b>Project Financing Data</b>	<input checked="" type="checkbox"/> <b>Loan</b>	<input type="checkbox"/> <b>Credit</b>	<input type="checkbox"/> <b>Guarantee</b>	<input type="checkbox"/> <b>Other [Specify]</b>		
<b>For Loans/Credits/Others:</b>						
Amount (US\$M): 200.0						
Proposed terms:	<input type="checkbox"/> Multicurrency	<input checked="" type="checkbox"/> Single currency, specify (US\$) LIBOR-based				
Grace period (years):      5	<input type="checkbox"/> Standard Variable	<input type="checkbox"/> Fixed	<input checked="" type="checkbox"/> LIBOR-based			
Years to maturity:      20						
Commitment fee:      0.75%						
Front-end fee:      1%						
Financing plan (US\$M):						
	<u>Source</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>		
	Government	253.9	0.0	253.9		
	IBRD	2.2	197.8	200.0		
	Total	256.1	197.8	453.9		
Borrower: People's Republic of China						
Guarantor:						
Responsible agency(ies): Anhui Provincial Communications Department (APCD)						
Estimated disbursements (Bank FY/US\$M):	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
Annual	14.9	33.0	35.9	43.7	41.3	31.2
Cumulative	14.9	47.9	83.8	127.5	168.8	200.0
Project implementation period:	5 Years 3 Months (November 1998 – February 2004)					
Expected effectiveness date:	May 1999					
Expected closing date:	August 31, 2004					

## **A: Project Development Objective**

### *1. Project development objective and key performance indicators (see Annex 1):*

The proposed project would have the following objectives: (a) to relieve traffic congestion and improve the mobility and integration of interprovincial trade, commerce and tourism between the low-income province of Anhui and the coastal region with its large potential markets and deep-water ports; (b) to improve and rehabilitate the existing national and provincial highways; (c) to improve the safety of road transport; and (d) to strengthen the institutional capacity of the Anhui Provincial Communications Department and its related sector institutions, through provision of training, technical assistance and equipment, in planning, design, construction, operation and maintenance of Anhui's highway network.

## **B: Strategic Context**

### *1. Sector-related Country Assistance Strategy (CAS) goal supported by the project (see Annex 1):*

*CAS document number: 16321-CHA      Date of latest CAS discussion: March 18, 1997 and  
Progress Report (R98-107), May 28, 1998.*

A major objective of the CAS is to alleviate infrastructure bottlenecks. By implementing the HAE segment of the NTHS, the proposed project would contribute directly to removing infrastructure bottlenecks, facilitating interprovincial trade, and promoting long-distance highway traffic. It would contribute to achieving this goal by improving and rehabilitating the existing national and provincial highway networks through the proposed highway maintenance program.

Alleviation of the income disparity between coastal and interior regions has high priority for the Government. The CAS referred to this issue by stating the need to "assist local governments to develop income generating programs in lagging provinces". The project would contribute to this goal by providing Anhui with direct access to ports and major cities in the coastal provinces, thus stimulating the economic development of this interior province.

### *2. Main sector issues and Government strategy:*

China's strong economic growth has resulted in high growth in transport demand and a shift toward highway transport. However, China has historically underinvested in transport and its road network ranks among the sparsest in the world relative to geographic area and population. As a long term strategy, governments at all levels have embarked on a major highway investment and improvement program.

At the central level, the basic strategy is to develop a National Trunk Highway System (NTHS) totaling some 35,000 km, giving priority to five north-south and seven east-west corridors serving border areas and cross-border trade. The Bank has been heavily involved in the construction of major sections of NTHS. At the provincial/regional level, the strategy is to: concentrate on the maintenance, expansion and improvement of provincial and rural road networks, currently totaling about 1.2 million km; provide better mobility and access; stimulate socioeconomic development, particularly in less-developed regions; allow adequate access to the NTHS; and better enable its potential benefits to be realized.

On the road transport policy agenda, attention is being paid to a redefinition of government's role in the transport sector in light of greater private sector involvement. The Ministry of Communications (MOC) needs to be strengthened to carry out its reformed mandate in matters such as finance, standardization of planning, management and operation of the NTHS. Local (provincial and municipal) governments are expected to continue to mobilize the investment resources required (including access to private investment and capital markets) and to modernize maintenance capacity and improve cost recovery. They are also expected to further the development of road transport services and the road construction industry, through deregulation and promotion of competition, access to modern technology and better management.

The Bank, jointly with MOC, held a high-level highway policy seminar in Beijing during May 6-7, 1997 to discuss the major policy areas to be addressed in the Bank's future highway lending program. These were: (a) planning of the highway network; (b) highway finance (public and private sources); (c) maintenance of highways; (d) highway safety; and (e) operation of the highway network with emphasis on the NTHS. The Bank has recently prepared a report (No. 15959-CHA, April 23, 1998), "China Forward with One Spirit: A Strategy for the Transport Sector", which provides recommendations for action in the transport sector including highways. Furthermore, the Bank in cooperation with the Ministry of Finance (MOF) and MOC is presently reviewing the effectiveness of past technical assistance in the highway sector with a view to establishing a general policy and strategy framework for the Bank's future lending into this sector.

*3. Sector issues to be addressed by the project and strategic choices:*

The key issues to be addressed by the project are: (a) expansion of highway capacity (mainly along NTHS) to alleviate bottlenecks and expedite socio-economic growth; (b) highway maintenance; (c) highway safety; and (d) cost recovery through imposition of tolls on users of the Hefei-Anqing Expressway.

A study will be undertaken on planning, finance and operation of the toll highway network in Anhui, particularly focusing on integration to ensure that once the proposed HAE has been completed, it will be successfully integrated into existing expressway system. Currently, two existing expressway sections are being managed and operated by the newly established Anhui Expressway Company Limited (AECL). Its objective is limited to completing the construction of an on-going expressway (Gaohe-Jiezidan Expressway) and operating all three as a single business. However, there could be a possibility that APCD would transfer HAE to the AECL after completion and opening to traffic and securitize the revenues from all its assets to inject more financial resources to expand its network.

The recently established AECL sold the part of H share on the Hong Kong market, raising about RMB 889 million. In addition to acquiring two existing expressways, AECL spent part of the proceeds to acquire the Gaohe-Jiezidan Expressway (still under construction), which immediately connects with the proposed HAE at its north end. In this sense, the Province is utilizing an innovative combination of private and public funding of its Expressway network.

Road maintenance in Anhui is adequately financed in that sufficient funds are allocated to prevent further deterioration of the network. The project monitoring activities will include maintenance funding and performance to ensure that this situation is sustained or improved.

Traffic accidents are now a major problem in China and by most measures has the world's highest road accident rate. In recent years, the Bank, as well as ADB and other institutions, has become increasingly concerned about growing problems of highway safety. Under the proposed highway safety component, these issues will be addressed both through civil works (improvement of blackspots) and analyses of traffic accidents.

## C: Project Description Summary

1. *Project components (see Annex 2 for a detailed description of each component to be included in the project).*

The proposed project would include:

Component	Category	Cost Incl. Contingencies (US\$M)	% of Total	Bank-financing (US\$M)	% of Bank-financing
(a) Construction of a 152 km expressway connecting Hefei and Anqing	Physical	351.6	77.5	166.4	47.3
(b) Highway Maintenance (Improvement and rehabilitation of existing highways)	Policy-physical	66.8	14.7	27.9	41.8
(c) Highway safety program	Policy-physical	4.1	0.9	2.1	51.2
(d) Program for strengthening of institutions, through training and other means	Institution-building	2.8	0.6	1.6	57.1
(e) Front-end fee		2.0	0.4	2.0	100.0
(f) Land acquisition and resettlement	Implementation support	26.6	5.9	0	0
<b>Total</b>		<b>453.9</b>	<b>100.0</b>	<b>200.0</b>	<b>44.1</b>

2. *Key policy and institutional reforms supported by the project:*

### *Highway Maintenance*

Until recently there has been a decline in maintenance standards for existing roads and highways. There were two principal reasons for this - first, a high percentage of available highway funds were absorbed by new highway construction, especially for high-grade highways and second, the geometric and structural capacity of many older highways was poor. As traffic volumes increased and axle loads became heavier, deterioration of existing highway infrastructure accelerated. Recent increase in expenditure on maintenance have resolved the first of these, but not yet overcome the problems resulting from past underfunding.

The proposed Highway Maintenance Program (HMP) will contribute to removing the backlog by improving and rehabilitating some of the seriously deteriorated sections. Others are being addressed by APCD's own resources. The proposed HMP would include improvement and rehabilitation of about 240 km of existing national and provincial highways. APCD will submit annually a highway maintenance report so that the Bank can monitor the maintenance activities and expenditures made in the past year and the targets and budget funds for the following year.

The highway maintenance component also involves a study, which will analyze how, given the existing institutional structure of planning, maintenance, finance and operation, the most beneficial results for Anhui can be obtained from maintenance activities.

### *Highway Safety*

Cognizant of the seriousness of highway safety situation in China, the proposed project will also address this issue. The main components of this program are: (a) carrying out a pilot program of accident black spot improvements; and (b) undertaking a study of highway traffic accidents on major highways, to determine the main factors contributing to accidents and identify areas needed for future actions to reduce their frequency and severity.



### *Institutional Strengthening/Training (IST)*

The proposed institutional strengthening and training is a part of a broad, longer-term effort to build up the planning, construction, maintenance and overall management capacities of the APCD in light of its rapidly expanding investment and maintenance program. The IST has two specific areas of focus: first, to strengthen the capacity of its two design institutes and second, to strengthen the recently created PEO and the Anhui High-Grade Highway Administration Bureau in the planning, design, construction and supervision as well as the operations, maintenance and toll collection on high-grade highways in Anhui.

#### *3. Benefits and target population:*

Direct benefits: would derive mainly from reductions in vehicle operating costs and savings in time, for both people and freight, reductions in traffic accidents, and stimulating economic activity. The major beneficiaries would be the communities along the Hefei-Anqing corridor as well as intercity traffic between cities in the corridor and beyond. The proposed expressway will also result in generated traffic due to reductions in transport costs and alleviation of traffic congestion. The total affected population in the corridor is estimated at 20.7 million (based on 1995 data).

The highway maintenance component would aim at stabilizing the condition of the existing network at a sustainable level. Benefits would include reduced vehicle operating costs and shorter travel times and would accrue to the population throughout the province.

Other benefits: Would include (a) strengthening the capabilities of the agencies/institutions responsible for the highway sector and (b) improvements in the quality of construction of highways, through the introduction of improved technology and better arrangements for supervision of construction. The project would also foster improved practices in the areas of environment, land acquisition and resettlement of affected people and participatory approaches to project preparation and implementation.

#### *4. Institutional and implementation arrangements:*

APCD has overall responsibility for project preparation and implementation. The Anhui Highway Administration Bureau (AHAB) is responsible for the implementation of the HMP and the Highway Safety Program. APCD has established a World Bank Loans Project Execution Office (PEO) and supplied it with adequate staff, offices, related equipment and operating budget. It will ensure coordination among all the involved agencies and to affect the smooth preparation and implementation of the project. Overall direction of the project at the central level would rest with MOC. Since this would be the first Bank-financed project to be implemented by APCD, MOC would assume a coordinating role and provide more than usual technical support.

The International Tendering Company has been retained as the procurement agency for all aspects of civil and electrical and mechanical works of the project requiring ICB and for equipment to be procured from abroad. The supervision of construction of the HAE would be carried out by a joint foreign/local supervision team.

**On-Lending Arrangements:** The proposed loan of \$200 million will be made to the People's Republic of China. It would be at the Bank's standard interest rate for LIBOR-based US dollar single currency loans, with a maturity of 20 years, including a 5 year grace period. Proceeds of the loan would be onlent to Anhui Province on the same terms and conditions as the Bank loan to PRC.

To facilitate disbursements, a Special Account would be opened, with an authorized allocation of \$15.0 million, the estimated average expenditures for a four-month period. The account would be opened in US dollars in a bank acceptable to the Bank and would be managed by the Provincial Finance Bureau.

**Financial Management:** Similar to the situation in on-going Bank-financed highway projects in China, the Anhui Province has the systems and staff to carry out the financial management of the project. Anhui Province has ongoing Bank-financed projects in other sectors and its Provincial Finance Bureau is familiar with Bank procedures.

**Auditing Arrangements:** The Foreign Investment Audit Bureau of the State Auditing Administration (SAA) would be responsible for auditing of project expenditures. Actual audits would be carried out for SAA by the provincial branch of SAA or the Provincial Audit Administration. APCD will furnish the Bank with the audited accounts and special accounts, including SOEs, within six months of the close of each fiscal year. In the case of the SOEs, the audit report would contain a separate opinion by the auditors as to whether the SOEs submitted, together with the procedures and internal controls involved in their preparation, can be relied upon to support related withdrawals. The Bank Group currently accepts SAA audits for this purpose.

**Monitoring and Evaluation Arrangements:** The project would be supervised through Bank missions which are scheduled for twice a year. Headquarters and resident mission staff would cooperate in this activity. Moreover, the Bank would monitor implementation of all components of the project through quarterly progress reports. Implementation of the main highways would also be followed-up through monthly progress reports to be prepared by the joint local/foreign supervision team.

During implementation, project performance, including the achievement of project outputs and attainment of development objectives, will be monitored through the use of annual monitoring reports. The first annual monitoring reports would be submitted by January 31, 2000 and the last by January 30, 2005. In addition, the project will be reviewed in an Implementation Completion Report, to be submitted to the Bank not later than six months after the closing date of the loan.

## **D. Project Rationale**

### *1. Project alternatives considered and reasons for rejection:*

The existing national highway has been or is being widened to 4-lane Class 1 standard highway. Possibilities of further improvement were investigated in the feasibility study, but found to be prohibitively expensive and to involve unnecessary relocation of many people. The technical standard (number of lanes, and class of highway) and alternative alignments (three major alternatives) were also evaluated in this study.

Taking account of the existing and future socio-economic conditions in its area of influence, and the volume and composition of traffic in the corridor, as well as the capacity of the existing transport infrastructure, the proposed highway was selected as the most cost-effective and strategically appropriate way to meet the need for improved transport infrastructure in the corridor.

2. Major related projects financed by the Bank and/or other development agencies (completed, ongoing and planned):

Sector issue	Project	Latest Supervision (Form 590) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
– Remove Highway Capacity Bottlenecks (1)* – Institutional Strengthening/Training (2) – Rural Roads and Poverty Alleviation (3) – Highway Safety (4) – Operation and Maintenance of High-Grade Highways (5) – Cost Recovery (6)	<b>Bank-financed</b>		
	Highway Project (completed) 1, 2*	S	S
	Beijing-Tianjin-Tanggu Expressway (completed) 1-6	S	S
	Sichuan Provincial Highway (completed) 1, 2, 6	S	S
	Shaanxi Provincial Highway (completed) 1-3, 6	S	S
	Jiangxi Provincial Highway (completed) 1, 2, 6	U	S
	Shandong Provincial Highway (completed) 1, 2, 4, 6	S	S
	Jiangsu Provincial Transport (completed) 1-3, 6	S	S
	Zhejiang Provincial Highway (ongoing) 1-3, 6	S	S
	Guangdong Provincial Highway (ongoing) 1-4, 6	S	S
	Henan Highway (ongoing) 1-3, 6	S	S
	Fujian Highway (ongoing) 1, 2, 6	S	S
	National Highway: Hebei/Henan (ongoing) 1, 2, 5, 6	S	S
	Xinjiang Highway (ongoing) 1, 2, 4, 6	S	S
	Shanghai-Zhejiang Highway (ongoing) 1, 2, 4, 6	S	S
	Second Shaanxi Provincial Highway (ongoing) 1-4, 6	S	S
	Second Henan Provincial Highway (ongoing) 1-5, 6	U	S
	Second Xinjiang Highway (ongoing) 1, 2, 6	S	S
	Second Nat'l Hwy: Guangdong/Hunan (ongoing) 1, 2, 6	S	S
	Third Nat'l Hwy (ongoing): Hubei 1, 2, 5, 6		
Tri-Provincial Highway: Gansu/Ningxia/Inner Mongolia (ongoing) 1, 2, 5, 6			
National Highway IV: Hubei/Hunan (planned) 1, 2, 5, 6			
Fujian Highway II (planned): 1, 2, 6			
	<b>Asian Development Bank</b>		
	Shenyang-Benxi Highway (completed)		
	Hunan Expressway (completed)		
	Jilin Expressway (completed)		
	Heilongjiang Expressway (ongoing)		
	Yunan Expressway (ongoing)		
	Hebei and Liaoning Expressway (ongoing)		
	Chongqing Expressway (ongoing)		
	Liaoning and Jilin Expressway (ongoing)		
	Jiangxi Highway Project (ongoing)		
<b>Overseas Economic Cooperation Fund of Japan</b>			
Hainan Development			
Hefei-Tongling Highway and Tongling Yangtze River Highway Bridge Construction			
Second Chongqing Yangtze River Bridge Construction			
Qiqihar Nenjiang River Highway Bridge Construction			

IP/DO Ratings: HS (Highly Satisfactory), S (Satisfactory), U (Unsatisfactory), HU (Highly Unsatisfactory)

\* The numbers correspond to the sector issues in first column of this tabulation.

### *3. Lessons learned and reflected in the project design:*

The Bank has accumulated substantial experience through the preparation and implementation of 20 highway projects in China, seven of which have been completed. While the overall performance of these projects is by and large satisfactory, a number of problems have occurred, which have been taken into consideration in the design of the proposed project. The problems include: inadequate preliminary engineering designs and bid documents; quality control of construction; late commencement of electrical and mechanical facilities component (which has delayed completion of some projects and necessitated extension of the closing date of several Bank loans); and the need for improved highway management and operation, especially for toll expressways.

The engineering designs and bid documents for the proposed highway, including E&M facilities, have been reviewed by international experts from the early stage of project preparation. The construction will be supervised by a joint foreign/local team which will be properly staffed and equipped. Quality control of construction will also be addressed through increasing the frequency and quality of the Bank's supervision. This will be reflected in the proposed supervision mission plan. Timely completion of the E&M component will be achieved through strict control and early commencement of the design and tendering procedures. Management and operation of the new expressway will be less problematic than in other provinces because of the already functioning expressway company. A study to be completed early in the project will indicate how the operation of the new expressway can best be integrated with that of those already in operation.

There is also a concern that funds for highway maintenance have been insufficient to cover an expanding highway network. During appraisal, agreement was reached on a program to monitor maintenance activities and results, and realistic annual targets for their future maintenance. In the proposed highway maintenance component, about \$20 million of Bank's loan will be allocated to implementing part of the agreed program.

Previous experience with highway safety programs in China has pointed to the difficulty of their implementation due to lack of coordination between the Traffic Police and the Highway Departments. This issue reflects a general difficulty with interdepartmental coordination in China. However, coordination between these agencies is comparatively good in Anhui Province. It has been agreed that the necessary data on traffic accidents would be provided for the proposed traffic accident analysis, and its analysis will benefit from participation of the Traffic Police. APCD has already set up a research team with its Highway Administration Bureau as the lead unit, with participation of the Traffic Police. Improvement to accident blackspots (13 sites) would be included in this component.

Experience in the land acquisition and resettlement activities has generally been satisfactory in previous highway projects. A Bank resettlement specialist has been involved from the beginning of project preparation. Experience in the environmental area in China has also generally been favorable. Special attention would be paid to environmental supervision during construction and to training of personnel.

### *4. Indications of borrower commitment and ownership:*

The task team found that there is strong support for the proposed project from all levels of governments. SDPC, MOF, MOC and Anhui Provincial Government strongly support the project, and a few local governments the team met with expressed enthusiastic support and emphasized the need for the project. APCD has worked hard on the feasibility studies taking into account the Bank's comments and has prepared environmental analyses of the proposed expressway strictly following the Bank's suggestions. The Province as well as MOC, MOF and SDPC are urging the Bank to expedite preparation of the project.

5. Value added of Bank support in this project:

Involvement of the Bank will result in much needed additional financial resources being available to help remove highway bottlenecks and increase traffic capacity in high priority corridor. Bank involvement will accelerate institutional and manpower development in highway planning, design, supervision, construction, operation and maintenance. Bank involvement is also expected to benefit the design and construction quality control of both the new roads to be constructed and existing roads to be improved. Furthermore, the Bank will help APCD to improve maintenance of the whole paved network through development of improved maintenance planning methods, provision of modern maintenance equipment, training of staff and allocation of adequate funds. In addition, it will raise the awareness of the highway safety problem.

**E: Summary Project Analyses** (Detailed assessments are in the project file, see Annex 12)

1. Economic Assessment (supported by Annex 6):

[X] Cost-Benefit Analysis : NPV=US\$ 549.0 million; ERR= 27.1% [ ] Cost Effectiveness Analysis:

This economic evaluation covers two project components that account for about 93% of the total project cost: (a) construction of the HAE, and (b): the HMP for six provincial highways. The principal measured benefits of the project are savings in vehicle operating costs, time savings to vehicle occupants and enhanced road safety. The estimated overall economic internal rate of return (EIRR) for the project is 27.1%, with those for the HAE and HMP being 25.6% and 37.6% respectively. The overall economic net present value (ENPV), based on 12% discount rate is estimated at RMB 4,560.1 million, of which the HAE is estimated to contribute RMB 3,727.7 million and the HMP RMB 828.6 million. An analysis of the evaluation results and a description of the method used to derive them are provided in Annex 6 and summarized as follows:

**Summary of Economic Evaluation Results**

Sections	Best estimate EIRR (%)	ENPV (RMB million, 12%)
<b>Hefei – Anqing Expressway:</b>		
Xiaoxichong (Hefei) – Susanline	30.4	1,724.0
Susanline – Mayan	20.1	336.6
Mayan – Gezidun (Gaohebu)	25.2	1,274.3
Gezidun (Gaohebu) – Wuheng	26.4	340.5
Wuheng – Zongpu (Anqing)	15.4	52.4
Subtotal	25.6	3,727.7
<b>Highway Maintenance Program:</b>		
Subtotal	37.6	828.6
<b>Total</b>	<b>27.1</b>	<b>4,556.3</b>

2. Financial Assessment (see Annex 6): NPV=US\$ 13.4 million; FRR= 12.8 %

Construction of HAE is the main component of the project and the only one that would generate revenue. All the six provincial highways to be reconstructed under the HMP are toll free. The province is planning to use the toll revenue to cover the loan amortization charges. Although the expressway will generate enough total revenue over the loan period, with a standard amortization schedule, there will be deficits in the early years of operation (from 2003 up to 2005). These annual deficits can be met by transferring revenue from other user charges or revising the repayment schedule. The expected financial net present value of excess revenues, once all maintenance, operating and loan repayments have been meet, is positive for the province and equivalent to RMB 111.0 million overall.

### *3. Technical Assessment:*

The HAE and highways included under the HMP were designed by first class reputable Chinese design institutes, taking account of the latest MOC design standards. The engineering designs and the bid documents were reviewed by international consultants and found to be satisfactory. The constructability of the designs was confirmed by these experts. The technologies involved are proven and well mastered by Chinese contractors.

The cost estimate of the project reflects May 1998 prices and is based on the latest available engineering studies and prevailing unit rates for civil works, remuneration of foreign experts assigned in other highway projects in China, and recent price quotations for equipment. The cost estimate includes physical and price contingencies. Physical contingencies are calculated at 10 percent of the base cost of civil works and construction supervision. Price contingencies are calculated for foreign costs, using US annual escalation factors of 4.6% in 1998, 3.2% in 1999, 2.9% in 2000 and 2.5 percent during 2001-2004. Price contingencies for local costs are based on local annual escalation of 4.8% in 1998, 5.0% in 1999 and 5.5 percent during 2000-2004.

### *4. Institutional Assessment:*

#### *a. Executing agencies:*

APCD is capable of successfully implementing the project. It set up a Project Execution Office (PEO), in September, 1997. PEO currently has a staff of about 23 and its main tasks are to coordinate and manage the preparation and implementation of the project. PEO has made extensive use of advisers/experts from completed or ongoing Bank-financed highway projects in other provinces, resulting in better design and smoother preparation of the project than would have been possible otherwise. The structure of PEO and its organizational relationship to the other agencies/institutions in APCD are available in the IST report, which are in turn available in the project files.

#### *b. Project management:*

The two main institutional issues relate to the strength of coordination between the Traffic Police and the highway authorities in the highway safety component, and the integration of operation of the expressway with that of others already functioning. APCD has already established a research team with the enthusiastic participation of the Traffic Police. A study on planning, finance and operation of toll highways would be undertaken to address the issue on integration of highway operations. Successful implementation of the institutional strengthening/training (IST) component would build on the already evident strong commitment and active involvement of APCD.

### *5. Social Assessment (Resettlement):*

Acquisition of land is necessary for the project, as well as its associated relocation and economic rehabilitation of people. About 16,466 mu of land (2,530 households) would need to be acquired and 1,116 residential houses (4,003 persons) will be affected by the project. Out of these, 768 households (2,758 persons) would need to be relocated. The affected farmers will be rehabilitated through land redistribution, and there would be no need to create alternative income generating opportunities. In addition to land acquisition and residential relocation, 24 enterprises will need to be relocated.

Resettlement impacts were identified through a detailed census and socioeconomic survey of the affected people. Based on the survey, a resettlement action plan (RAP) addressing issues related to entitlements of affected people in all categories of impacts has been prepared. The RAP contains an adequate description of the institutions responsible for resettlement implementation, the costs and sources of funding to complete the resettlement program, the mechanism for grievance redress and the arrangements for monitoring and evaluating the progress and results of the process. A detailed implementation schedule, that will require the completion of all compensation and resettlement activities sufficiently before the proposed start of construction on the respective section, has also been prepared.

Since there is no need for changing the occupations of affected people, the resettlement program is not likely to encounter any significant problems. There is an adequate institutional capacity and commitment to complete resettlement successfully. Regular internal and external monitoring of resettlement will ensure timely review of the progress of resettlement implementation.

As at present envisaged, the proposed improvement and rehabilitation works of six road sections to be included in the HMP do not require any additional land and will be undertaken within the existing right-of-way. Should the final design of any of these sections indicate a need for additional land, it would be acquired in accordance with Bank Guidelines on resettlement. The policy framework described in the RAPs for the HAE would also apply to the highways to be included under the HMP. In cases where people need to be resettled, an inventory of resettlement impacts would be prepared as well.

6. *Environmental Assessment:* Environmental Category       A     B     C

An environmental assessment (EA) has been carried out for the HAE. During its preparation and evaluation, national procedures, including those indicated in the Circular on Strengthening Environmental Impact Assessment Management for Construction Projects Financed by International Financial Organizations (June 1993) as well as those required by the Bank, were thoroughly followed. The EA documents such as Environmental Impact Assessment Report (EIA), Environmental Action Plan (EAP) and Executive Summary (ES) have been prepared, incorporating the Bank comments on earlier drafts, and found to be satisfactory.

With respect to the HMP, it was agreed that a Sectoral Environmental Assessment approach would be applied. The Initial Environmental Evaluation Reports (IEE) and EAPs were submitted to the Bank in June 1998. Those documents were reviewed by the Bank and found satisfactory. The major findings and discussions in these documents are summarized below. More detailed information on the EA of HAE as well as HMP components is attached as Annex 9 to this document.

a. *Hefei-Anqing Expressway:*

**Potential Impacts.** Major potential environmental impacts include noise and air pollution during the construction and operation phases, water pollution during the construction phase, and adverse impacts on irrigation system.

**Mitigation Measures.** The EAP specified the appropriate mitigation measures, environmental monitoring plans, institutional arrangements to implement the EAP, training and equipment requirements, and the cost estimate of implementation of EAP. Major mitigation measures include adequate selection of alignment, watering to prevent dust during the construction phase, and noise protection measures including construction of noise barriers, and construction of culverts.

The engineering design and technical specifications for the HAE will incorporate appropriate measures required for environmental protection. The proposed highway would not affect ecologically sensitive areas and their construction and operation should have no adverse impacts on the environment. The APCD would furnish to the Bank by January 31 of each year starting in 2000, an annual environmental monitoring report for the HAE during the construction phase and for each of the first three years following completion of construction.

**Public Consultation and Feedback.** During the EA work, local people have been intensively consulted. The following approaches were used for public consultation : (i) Consultation meetings with local governments/representatives; and (ii) Questionnaire analysis of public opinion, supplemented by interviews. Major concerns from the public are resettlement-related issues. Those other than resettlement-related issues include: i) noise and air pollution during the construction phase and ii) tree planting within the project areas. These feedback has been reflected in the engineering designs and the EAP.

**Information Disclosure.** Final EIA, EAP and ES were submitted to the Bank in June 1998. Those environmental documents were made public locally at Anhui Provincial Communication Department.

*b. Highway Maintenance Component:*

No new construction will be included in the HMP. Since the current environmental conditions are good in quality, the construction works are small in size and the future traffic volumes are relatively small, no significant potential impacts of the projects are envisaged. Appropriate mitigation measures have been integrated in EAPs and found satisfactory to the Bank.

*7. Participatory approach [key stakeholders, how involved, and what they have influenced; if participatory approach not used, describe why not applicable]:*

*a. Primary beneficiaries and other affected groups:*

The major beneficiaries would be the communities along the Hefei-Anqing corridor as well as intercity traffic between cities in the corridor and beyond. Benefits resulting from improving the existing highway condition would accrue to the population throughout the province. The APCD and its related institutions would also benefit through the institutional strengthening and training contained in the project.

*b. Other key stakeholders:*

The affected communities were involved in the formulation and comparison of alternative alignments as well as the location of interchanges, underpasses and grade separations. During the EIA preparation, the local people were intensively consulted through meetings with local government representatives and public opinion questionnaires supplemented by interviews. The environmental documents for the HAE were made public locally.

Special attention was given to the consultation with affected people and their representatives during the preparation of the resettlement action plans. Implementation of the resettlement program is proposed to be a highly participatory exercise. A resettlement information booklet, including detailed entitlements of each household, main contents of the RAPs, compensation and entitlement policies and grievance procedures would be distributed to the affected people prior to resettlement implementation. Both internal and external (by independent monitors) monitoring of the resettlement program would be conducted.

## **F: Sustainability and Risks**

*1. Sustainability:*

Traffic volumes on the proposed HAE are expected to continue to grow rapidly following the "ramp-up" period. Experience from completed and ongoing Bank-financed highway projects in China shows a great commitment for implementation of the physical components of the project, which account for most of the project cost. Generally, counterpart funds are available on time, but lately some provinces have become financially overextended resulting in delays in the availability of these funds and a consequent minor delay in implementation of the project. The level of tolls and the need to review it periodically will be important for the financial viability of the project particularly the ability to repay the Bank loan and provide adequate funds for maintenance. In general, the level of highway maintenance has been adequate for the historic low volumes of heavy traffic, and the maintenance component is intended to extend this experience into the future, with higher intensity of heavy traffic.



2. Critical Risks (reflecting assumptions in the fourth column of Annex 1):

Risk	Risk Rating	Risk Minimization Measure
<b>Annex 1, cell "from Outputs to Objective"</b>		
Government at central, provincial and local levels are not sufficiently committed to project	N	Maintain effective dialogue with the central and provincial governments
Traffic grows at lower than expected rates on toll roads and toll roads attract less than expected traffic volumes from existing parallel roads, resulting in underutilization of toll roads, lower economic benefits and difficulty in repaying Bank loan.	M	(a) critical review of feasibility studies and review of engineering design to minimize project costs. Studies of user reaction to tolls and sensitivity of ERR and loan repayment to different levels of attraction.
Price control committees delay or do not approve proposed toll rates which could impact the ability to repay the Bank loan.	M	(a) Tolls will be set in accordance with a proper study to be reviewed by the Bank. (b) Dialogue with the provincial governments.
Political pressure interfere with implementation plans and thus adversely affect quality of construction	M	(a) Dialogue with provincial government and MOC. Continuous external supervision of construction (b) Prequalification of contractors is properly done and best contractors selected
Traffic Police and APCD are not enthusiastic about cooperative efforts, which could lead to ineffectiveness of safety component and less than expected reductions in traffic accidents	M	(a) Appropriate coordination measures between traffic police and APCD have already been established (b) Dialogue with provincial governments
<b>Annex 1, cell "from Components to Outputs"</b>		
Unfamiliarity with the Bank procedures could delay implementation	M	(a) MOC and Bank (headquarters and RMC) will follow-up project closely and provide timely advice and support (b) Project launch workshop will be held before start-up of implementation. Workshop for procurement has been held.
Counterpart funds not available in sufficient quantity or on time	N	(a) Ensure sufficient financial resources are available through analysis of highway revenues and expenditures (b) Dialogue with the provincial government and MOC
Delays in timely approvals of procurement activities could lead to delay in completion of the project on time, especially the tolling, telecommunications and monitoring systems.	N	(a) Agreement with APCD on detailed procurement arrangement, particularly for E&M contract. (b) Training of pertinent provincial personnel by Bank and central government in the areas of procurement and disbursement (c) Use of experienced procurement agencies. (d) Use of international consultants to review design and bid documents.
Interference of local people in acquisition of land could lead to delays in implementation and resettlement cost overrun	M	(a) Preparation of an executable RAP with assistance from specialists who have worked on Bank-financed projects. (b) Implement most of the RAP before start-up of construction. (c) Increase consultation with local communities, especially regarding number, size and location of underpasses, and culverts, temporary use of roads by contractors; borrow areas, crushers. (d) Provide adequate contingencies for land acquisition and resettlement costs.
<b>Overall project rating</b>	<b>M</b>	

Risk Rating - H (High Risk), S (Substantial Risk), M (Modest Risk), N (Negligible or Low Risk)

### *3. Possible Controversial Aspects:*

The project will include adequate measures to ameliorate potential negative impacts of environment, and land acquisition and resettlement. However, the project will have a positive impact on livelihood improvement and participation practices. Overall, the degree of controversy regarding the project is expected to be low.

## **G: Main Loan Conditions**

### *1. Agreements to be Reached with the Government:*

The borrower will ensure that the proceeds of the loan are onlent to the Beneficiary (Anhui Province) on the same terms and conditions as the Bank loan, with the Beneficiary bearing the foreign exchange risk.

### *2. Agreements to be Reached with the Beneficiary:*

#### *a. Hefei–Anqing Expressway:*

◆ APCD shall undertake, complete and furnish to the Bank for its review and comments, an analysis and recommendation for the toll rates on HAE by March 31, 2002 taking into consideration the results of the similar studies on toll rates conducted under other Bank-financed highway projects in China and the experience with toll rates on major roads in China, and the results of the survey and study of user responses to tolls.

◆ APCD shall undertake, complete and furnish by September 30, 2001 to the Bank for its review and comments, a study of the planning, finance and operation of the toll highway network in Anhui, in accordance with terms of reference satisfactory to the Bank and take appropriate steps to implement the recommendations of the said study, taking into consideration the comments of the Bank.

#### *b. Maintenance of Highway Network:*

◆ APCD shall, by March 31 of each year commencing in 2000 and ending in 2005, furnish an annual highway maintenance report for the Bank's review and comments, which would: (i) indicate the length and condition of each class of road; (ii) establish realistic targets for the current year, including an estimate of the required physical works by class of road and the costs thereof; and (iii) measure the results and the actual expenditures of the past year against the targets and budgeted funds thereof.

#### *c. Highway Safety:*

◆ APCD shall pursuant to terms of reference acceptable to the Bank: (i) by September 30, 2000 complete a study of traffic accident analyses; and (ii) by December 31, 2001 complete the blackspot improvement works.

*d. Institutional Strengthening and Training:*

◆ APCD shall, by July 31 of each year commencing in 1999, furnish the rolling two-year training implementation schedule to the Bank and shall carry out the training program as agreed.

*e. Environment, Land Acquisition and Resettlement:*

◆ APCD shall carry out the EAP and RAP for HAE in a manner satisfactory to the Bank and furnish any proposed revision of these plans to the Bank for its approval.

◆ APCD shall carry out an EAP and RAP in a manner satisfactory to the Bank for any HMP subproject which involves substantial widening, or land acquisition.

◆ APCD shall maintain policies and procedures adequate to enable it to monitor and evaluate on an ongoing basis in accordance with indicators acceptable to the Bank, the carrying out of EAPs and RAPs in respect of the HAE and HMP subprojects.

◆ APCD shall prepare, under terms of reference acceptable to the Bank, and furnish to the Bank: (i) an annual environmental monitoring report starting January 31, 2000 and ending on January 31, 2006; and (ii) by January 31 and July 31 of each year, starting in July 1999 and until two years after the completion of all resettlement under the Project, internal monitoring reports prepared by appropriate agencies of Anhui, and by April 30 and October 31 of each year, starting in October 1999 and until two years after the completion of all resettlement under the Project, external monitoring reports prepared by an independent agency acceptable to the Bank, in each case regarding the implementation and impact of the resettlement activities during the previous six months.

*f. Reporting, Monitoring and Auditing:*

APCD shall prepare on the basis of guidelines acceptable to the Bank and submit to the Bank:

(a) a monthly progress report on the civil works of HAE;

(b) a quarterly progress report on implementation of all components of the project;

(c) by January 31 of each year commencing in 2000 and ending in 2005, an annual monitoring report in a form satisfactory to the Bank covering all components of the Project and assessing the extent to which various implementation and development objectives have been obtained in the course of project execution and operation;

(d) within six months of the closing date of the Bank loan to the project, an implementation completion report in a format acceptable to the Bank; and

(e) the audited accounts for the project, statements of expenditures, and special accounts by independent auditors acceptable to the Bank within six months of the close of each fiscal year.

## H. Readiness for Implementation

The engineering design documents for the first year's activities are complete and ready for the start of project implementation. The preliminary designs are ready and the final designs for the first year activities are also ready.

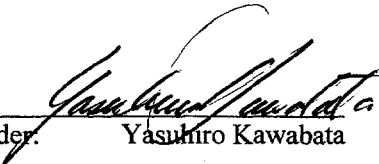
The procurement documents for the first year's activities are complete and ready for the start of project implementation.

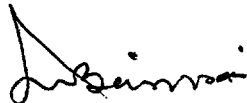
The Project Implementation Plan has been appraised and found to be realistic and of satisfactory quality.

## I. Compliance with Bank Policies

This project complies with all applicable Bank policies.

[The following exceptions to Bank policies are recommended for approval: The project complies with all other applicable Bank policies.]

  
Task Team Leader: Yasuhiro Kawabata

  
Acting Sector Manager: Jitendra Bajpai

  
Country Director: Yukon Huang

## Annex 1

### Project Design Summary

#### China: Anhui Provincial Highway Project

Narrative Summary	Key Performance Indicators	Monitoring and Supervision	Critical Assumptions and Risks
<p>CAS Objective</p> <ul style="list-style-type: none"> <li>•Help alleviate infrastructure bottlenecks</li> <li>•Assist local governments to develop income-generating programs in lagging provinces</li> </ul>			<p>(CAS Objective to Bank Mission)</p>
<p>Project Development Objectives</p> <ul style="list-style-type: none"> <li>•Provide more efficient, safer and productive transport services.</li> </ul>	<p>(See Annex 1-1) *</p> <ul style="list-style-type: none"> <li>•Average Daily Traffic (ADT) on proposed and existing highways.</li> <li>•Average speeds on existing highways.</li> <li>•Traffic accident rates on existing highways.</li> <li>•ADT on highways included in HMP.</li> <li>•Value of goods transported to coastal provinces.</li> </ul>	<ul style="list-style-type: none"> <li>•Traffic counts reports from AHAB.</li> <li>•Reports on traffic speeds along main highways.</li> <li>•Traffic accident reports from Traffic Police.</li> <li>•Provincial annual statistics.</li> </ul>	<ul style="list-style-type: none"> <li>•Maintenance of roads is successfully carried out by APCD</li> <li>•No unexpected natural disasters occur (floods, earthquakes)</li> </ul>
<p>Project Outputs</p> <p>1. Hefei-Anqing Expressway is constructed</p>	<p>(See Annex 1-1) *</p> <p>1.1 A 152 km expressway constructed by 2002.</p>	<p>1.1.1 Monthly progress reports by supervision teams.</p> <p>1.1.2 Quarterly progress reports and annual monitoring reports.</p> <p>1.1.3 Reports by Bank's supervision missions.</p> <p>1.1.4 Disbursements to contractors.</p>	<p>(Outputs to Development Objectives)</p> <ol style="list-style-type: none"> <li>1. Government at Central, Provincial, and local levels remains committed to project.</li> <li>2. Traffic grows at expected rates on toll highways.</li> <li>3. Toll highways attract expected traffic volumes from existing parallel roads.</li> <li>4. Political pressures do not interfere with implementation plans and thus adversely affect quality of construction.</li> </ol>
<p>2. Existing highways improved or rehabilitated (HMP).</p>	<p>2.1 240 km national and provincial highways improved or rehabilitated.</p>	<p>2.1.1 Quarterly progress reports and annual monitoring reports.</p> <p>2.1.2 Reports by Bank's supervision missions.</p>	
<p>3. Accident reduction program established and operational.</p>	<p>3.1 Accident analyses and studies carried out, and a pilot black spot program implemented by 2002.</p>	<p>3.1.1 Progress and final reports for accident analyses and studies.</p> <p>3.1.2 Project quarterly progress reports and annual monitoring reports.</p>	<p>5. Traffic Police and APCD are enthusiastic about cooperative efforts.</p>

Narrative Summary	Key Performance Indicators	Monitoring and Supervision	Critical Assumptions and Risks
4. APCD and its related agencies/staff trained.	4.1 854 persons for 1,119 person/months from APCD and its institutes would be trained within China and abroad by 2003.	4.1.1 Reports for rolling, two-year training programs. 4.1.2 Project quarterly progress reports and annual monitoring reports. 4.1.3 Reports of Bank's supervision missions.	6. Trained staff apply acquired skills in the work place.
5. Equipment and spare parts to be procured under the project.	5.1 Equipment and spare parts delivered by 2002 according to equipment reports.	5.1.1 Quarterly progress reports. 5.1.2 Procurement reviews and disbursements by Bank. 5.1.3 Reports of Bank's supervision missions	
6. Cost recovery mechanism established and operational	6.1 Toll system implemented and operational by 2002. 6.2 Study of tolls to be completed 5 months prior to opening of HAE to traffic.	6.1.1 Quarterly progress reports 6.1.2 Procurement reviews and disbursements by Bank. 6.1.3 Reports of Bank's supervision missions. 6.2.1 Final report on study of tolls.	
<b>Project Components**</b>			(Activity to Output)
1.1 Contract civil works for HAE 1.2 Contract supervision teams	1.1.1 Progress of civil works 1.2.1 Payments to supervision teams.	Bank reviews and clears related design and bid documents or terms of reference and short lists of consultants. Progress reports.	1. Delays in implementation because Anhui is first time borrower from Bank in highway area.
2.1 Contract civil works for HMP highways 2.2 Establish supervision mechanism	2.1.1. Progress of civil works 2.2.2 Supervision teams are operational.	Project progress reports and annual monitoring report.	2. Sufficient counterpart funds available on time.
3.1 Form a study team for accident analyses and studies	3.1.1 Payments to study team	Monthly progress reports and study progress report	3. Cooperation between Traffic Police and APCD
3.2 Contract civil works for black spots improvement	3.2.1 Progress of civil works		
4.1 Develop two-year training rolling programs.	4.1.1 Number of persons trained	Quarterly progress report	4. Delay of approval for the proposed programs from MOF and MOC
5.1 Revise/update lists of equipment. 5.2 Prepare specifications and bid documents 5.3 Sign and execute equipment supply contracts.	5.1 Payments to suppliers	Quarterly Progress Reports	5. Timely approval by Provincial and Central governments
6.1 Contract supply and installation of E&M facilities	6.1 Payments to contractor and progress of works	Progress reports	6. Timely approval by Provincial/Central governments of the E&M contract

\*\* It would be voluminous to list all the project components and inputs. What is shown in this section represents some of the key activities. See Annex 5 for the main steps in procurement and implementation of the main highways (civil works, supply and installation of electrical and mechanical works, and supervision of construction).

## Annex 1-1 Key Performance Indicators

### a) Development Indicators

Attainment of Project Objectives	Monitoring Indicators	1998 Baseline	2001 Benchmark	2003 Benchmark (1st year of operation)	2006 Benchmark
• Provide more efficient, safer and productive transport services	• ADT on HAE (veh./day)				
	Hefei-Susan line			9,730	14,850
	Susan-line-Mayan			6,540	9,950
	Mayan-Gezidun			6,860	10,490
	Gezidun-Wuheng			5,850	8,930
	Wuheng-Zongpu			8,700	13,290
	• ADT on Existing N.R. 206 (veh./day)				
	Hefei-Susan line	12,200	15,120	6,390	7,820
	Susan-line-Mayan	7,600	9,380	3,360	4,100
	Mayan-Gezidun	8,460	10,460	4,260	5,230
	Gezidun-Wuheng	7,720	9,560	4,380	5,360
	Wuheng-Zongpu	11,480	14,220	6,520	7,970
	• ADT Speed on Existing N.R. 206 (km/hr)				
	Hefei-Susan line	54	48	64	62
	Susan-line-Mayan	35	33	40	39
	Mayan-Gezidun	34	33	38	37
	Gezidun-Wuheng	35	33	38	37
	Wuheng-Zongpu	55	50	64	62
	• Accident rates on existing NR 206 (Number of accidents per 100 million vehicles)				
	Hefei-Susan line	73.6	82.4	56.2	60.1
	Susan-line-Mayan	186.2	198.6	156.5	161.2
	Mayan-Gezidun	192.2	206.3	162.8	168.2
	Gezidun-Wuheng	187.0	199.9	163.7	169.9
	Wuheng-Zongpu	71.5	79.7	56.6	60.5
	• ADT on highways included in HMP (veh./day)				
	S203 Luan	3,030	3,240	3,570	4,100
	S202 Shouxian	2,840	3,050	3,360	3,850
	G105 Nanzhou	1,850	2,180	2,410	2,760
	S316 Chaolu	2,330	2,830	3,120	3,570
	S202 Xiaohuai	4,200	4,810	4,910	5,520
	S315 Yangtao	1,640	1,760	2,010	2,310
	• Value of goods transported to coastal provinces ( million yuan/yr)	2,634	3,653	4,418	5,713

Note: HAE = Hefei-Anqing Expressway

**b) Implementation Indicators**

	1999	2000	2001	2002	2003	2004 ICR Year
% of civil works completed on HAE	15	45	80	100	--	100
% of highways improved/rehabilitated under HMP	12	44	74	100	--	100
Highway safety: % of improved black spots	--	25	56	100	--	100
Number of person-months of completed training	550	886	1,040	1,075	1,119	1,119

Note: HAE = Hefei-Anqing Expressway



## Annex 2 Anhui Provincial Highway Project Project Description

### **Project Component 1 - US\$351.6 million (total cost of component)**

#### **Hefei-Anqing Expressway (HAE)**

Construction of a 152 km Hefei-Anqing Expressway (HAE) is the main component of this project. The HAE is divided into two sections, one of 126 km between Hefei and Gaohebu (with a design speed of 120 km/hr) and another of 26 km from Gaohebu to Anqing (with a design speed of 100 km/hr). It would be common to two longer expressways (NTHS) whose construction is partly being supported by the Bank. The total length of the existing road (National Highway No. 206) from Hefei to Anqing is 166 km. The highway standard is basically Class II except some sections with a Class I standard in urban areas. Widening of the existing road from two lanes to four lanes has been implemented or is planned. However, further widening would not be feasible because of the extensive side development within several major townships.

The HAE will be operated as a closed toll highway. It will include 7 interchanges, six toll stations, one service area, and one management office. The pavement structure will be asphalt concrete. In addition to civil works, the HAE component will involve the supply and installation of electrical and mechanical facilities (a tolling, monitoring, telecommunications, and lighting system)

#### **Supervision of Construction**

Based on the experience gained from on-going Bank-financed highway projects in China, a combined team of local engineers, technicians and other personnel and international consultants would be set up to supervise construction of the HAE. The organizational arrangements for construction supervision, as well as the Terms of Reference for the joint supervision team, have been drawn up by PEO and found by the Bank to be adequate. The international supervising engineers would be integrated with operational responsibilities into the supervision organization and would help establish procedures at all levels of the supervisory work, including on-site inspections and laboratory testing. They would also train local staff through formal training sessions and on the job. A total of 5 international experts for a total of about 174 persons-months are envisaged for construction supervision of which 4 person-months are for training and 5 person months are for contingencies, to be used as and when needed.

### **Project Component 2 - US\$66.8 million (total cost of component)**

#### **1. Objective of Highway Maintenance Component (HMP)**

The main objective of the HMP is to promote stabilization of the condition of the existing highway network, by strengthening the seriously deteriorated pavement structures (improvement) and providing overlays on some less seriously deteriorated section (rehabilitation). Given that the level of traffic throughout the network is rapidly increasing, a secondary objective of most periodic maintenance activities is to add to capacity by widening of the pavement.

## **2. Selection of Highway Sections**

The proposed HMP would include a total of about 238 km of national and provincial highways, of which about 162 km would involve rehabilitation and about 76 km would require improvement. All the works would include widening of the road pavement within the existing reservation width. The selection of roads was based on a review of approximately 400 sections of paved road with a total length of about 8,000 km. The review was based on the average value of Pavement Quality Index (PQI), a measure which takes into account pavement roughness and damage, and the ERR, for each road section. The PQI for each of the selected road sections is between 40 and 52, among the lowest (that is worst) values recorded for the whole paved network. The selection also took account of the need for a reasonable uniform standard of road section, geographic location and size of potential contracts.

## **3. Implementation**

The road sections would be packaged into 10 contracts, with an average length of about 24 km and a total cost of about US\$ 50.5 million, of which the Bank loan would finance about 40 %. All the contracts would be procured through National Competitive Bidding (NCB) procedures, and undertaken by contractors. A group would be established within AHAB to supervise implementation of the project component and would be assisted by subgroups at county level. The latter would carry out detailed investigations and supervise road construction within their area.

## **4. Monitoring and Performance Indicators**

The average provincial PQI would be used as the monitoring index for this project component, with higher level (improved quality) being expected each year. Projected monitoring values will be estimated. The Bank and APCD would review maintenance activities throughout the network during each year's supervision mission, and the results would be compared with those agreed in the previous year. On the basis of achievements each year, the maintenance program for the following year would be agreed, as would the projected average PQI. In addition, implementation of that part of the maintenance program to be partly financed with the Bank loan would be monitored through the usual project progress reports.

## **5. Study of Planning, Finance and Operation of Toll Highways**

The objective of the Study would be to make recommendations for improvements to the present methods of planning, financing, managing and operating expressways and other toll highways in the province and for potential improvements to the institutional structure. On the basis of a review of current practices in Anhui, and of experience in other provinces and countries, recommendations would be made for modifications to the system in Anhui, so that the most beneficial results for the people of the Province can be obtained from the development of High-Grade Highways, particularly Expressways.

The proposed study would be completed in a period of about 12 months. It is expected to require about 100 person-months of input, with about 40 person-months being provided by consultants familiar with the Chinese system of highway financing, the recent experiences of securitization of toll road revenues and the use of infrastructure bonds. The remaining man-months are expected to be provided by consultants with a knowledge of how toll roads are planned, financed, managed and operated in other countries. At the conclusion of the study, a seminar would be organized so as to disseminate the experiences of the study team to staff of HGHAB in other provinces. The draft TOR for this study has been prepared and is available in Annex 2-1.

Table 1: Summary of Highway Maintenance Program (Improvement and Rehabilitation)

Highway	Length (km)	Class of Road	Width of Pave- ment (meter)	Cons- truc- tion Type	Total Costs (million RMB)	Disbursement Schedule			Pavement Quality Index	EIRR %	Congestion Degree V/C
						1999	2000	2001			
S203 Luan	40	II (II)	12 (9)	Rehab.	80	27	28	25	50	29.2	0.99
S203 Shouxian	40	II (II)	12 (9)	Rehab.	80	28	27	25	52	28.1	1.17
G105 Nanzhou	30	II (III)	14 (7)	Improv	68		37	31	46	22.1	1.08
S316 Chaolu	46	II (III)	12 (7)	Improv	52	26	26		41	29.8	1.09
S202 Xiaohuai	60	II (II)	14 (9)	Rehab.	115	32	45	38	40	22.5	1.27
S315 Yangtao	22	III (III)	9 (7)	Rehab.	24	12	12		42	26.2	1.55
<b>Total</b>	<b>238</b>	<b>-</b>	<b>-</b>		<b>419</b>	<b>125</b>	<b>175</b>	<b>119</b>			

Note 1: Values in parentheses indicate the current status.

Note 2: Above six highway sections require no additional right-of-way.

Note 3: Rehab. (rehabilitation) involves widening and strengthening of the existing roadway and overlay, while Improv. (improvement) involves widening and strengthening of the existing roadway, modification of gradient, reconstruction of base course and pavement.

Note 4: V/C stand for Volume/Capacity

Table 2: Three-Year Improvement and Rehabilitation Program - Proposed Contract Packages

Road Code	Contract No.	Construction Type	Start Km	End Km	Length Km	Construction period	Cost Y million	EIRR %
S203 Luan	1	Rehabilitation	0	20	20	1999-2001	43	29.2
	2	Rehabilitation	20	40	20	1999-2001	37	29.2
S203 Shouxian	3	Rehabilitation	50	70	20	1999-2001	38	28.1
	4	Rehabilitaion	70	90	20	1999-2001	42	28.1
G105 Nanzhou	5	Improvement	0	15	15	2000-2001	34	22.1
	6	Improvement	15	30	15	2000-2001	34	22.1
G316 Chaolu	7	Improvement	20	66	46	1999-2000	52	29.8
S202 Xiaohuai	8	Rehabilitation	0	30	30	1999-2001	58	22.5
	9	Rehabilitation	30	60	30	1999-2001	57	22.5
S315 Yangtao	10	Rehabilitation	0	22	22	1999-2000	24	26.2
<b>Total</b>					<b>238</b>		<b>419</b>	

### **Project Component 3 - US\$4.1 million (total cost of component)**

#### **General (Highway Safety Component)**

1. The existing highway safety situation is of concern to the Anhui authorities. In 1996, 2,721 people were killed and 5,424 accidents occurred on the Anhui road network. The 9.6 people killed per 100 million vehicle-kilometers is about 2 to 3 times higher than the rate of Western European and North American countries. Taking cognizance of the seriousness of highway safety issues, the Bank engaged the consulting services of an international expert group under Japanese Trust Funds. It defined a modest highway safety component for inclusion in the proposed project.

2. The Traffic Police and APCD are the main institutions involved in highway safety. To tackle safety issues under the proposed project, the Anhui Highway Administration Bureau has established a study team that has started gathering traffic accident data with the assistance of the Traffic Police. The proposed highway safety program is a pilot program, primarily focusing on improvements to highway infrastructure ("blackspots") and an analysis of the causes of traffic accidents.

#### **Proposed Programs**

3. Experience in the highway safety component in the past Bank-financed highway projects has shown the difficulties facing implementation when a joint action is required by the Traffic Police and the Communications Department. Consequently, it was agreed that this project would include a relatively small safety component primarily within the domain of the Provincial Communication Department. The agreed safety component consists of:

- (a) a Study on highway traffic accidents;
- (b) a Pilot program for treatment of black spots; and
- (c) Provision of institutional strengthening and training.

#### **Study on Highway Traffic Accidents**

4. Accident data is gathered and analyzed by the Traffic Police. Although APCD can get the accident information needed from the police, the accident information received has been limited. It was agreed that the Police will grant access to its accident database for the last two years so that the APCD can analyze all the relevant data. TOR for this study have been prepared and are available in the project file. The study activities will include:

- the collection of accident data on highways by class in Anhui;
- analysis of the factors contributing to accidents on highways, including those related to vehicles, drivers, road conditions, pedestrians and the environment;
- determine the relative importance of the various factors contributing to accidents; and
- make practical proposals to reduce accidents on Anhui's highways, including the identification of future studies to be carried out.

5. The proposed study is expected to be completed within 15 months (8 months for data collection and analysis; 4 months for preparation of recommendations; and 3 months for finalization of reports. The person-months required for the study are estimated at about 60 person-months including 15 person-months for Chinese experts and 5 person-months for international experts. The total study cost is estimated at about US\$143,000 and 1,237,000 RMB.

### **Blackspot Treatment Pilot Program**

6. The foreign expert group and AHAB have agreed that priority would be given to “blackspot” actions along National Road No. 206. It was further agreed that a pilot blackspot program would include the following subcomponents;

- improvement of selected intersections;
- improvement of crest sections with insufficient sight distance; and
- segregation of motor vehicle traffic from bicycles and pedestrians in urban areas.

7. Six intersections along National Road No. 206 were identified to be improved. These intersections will be reconstructed with a proper channelization. Four sections with insufficient sight distance were also identified. In these sections, a median with fences would be installed. Furthermore, three sections, where slow-traffic lanes will be provided on both sides, with fences on separating islands, were also identified.

8. The proposed treatment works are estimated at about 23 million RMB or US\$ 2.77 million. The blackspot treatment work is expected to be initiated around mid-1999 and to be completed within three years (around March 2002). After completion of the pilot program, the black spot work will be continued as a part of normal traffic safety work on a permanent basis. The personnel who participated in the pilot black spot work will be responsible for the training of the relevant personnel at the prefecture level as well.

### **Institutional Strengthening and Training**

9. The Institutional Strengthening and Training component is expected to be completed within three years starting mid-1999. In addition to training in the highway safety aspects, it is planned to purchase a rescue vehicle for each branch bureau and to install communication facilities connecting the AHAB headquarters and its branch bureaus. The estimated cost for this IST component is US\$ 206,000 including US\$ 180,000 for purchase of equipment.

### **Project Component 4 - US\$2.8 million (total cost of component)**

IST components by organizations to be strengthened and the training subjects are shown in Table 3 and 4, respectively. The cost for equipment to be procured for IST is covered under the equipment.

## Annex 2-1 Draft Terms of Reference for the Study of Planning, Finance and Operation of Toll Highways

### **Introduction**

Anhui Provincial Communications Department (APCD) is responsible for the planning, construction, operation and maintenance of national and provincial highways, including toll highways, in the province of Anhui. To help in carrying out this responsibility, APCD has created a Highway Planning and Design Institute to undertake planning and design of the provincial highway network, and a High Grade Highway Construction Department, to manage and supervise construction of new High Grade Highways (Expressway and Class 1 highways). In addition, an Anhui Expressway Company Limited (AECL) has been formed to manage the operation of some toll highways within the Province. The articles of association of the AECL could be interpreted to permit it to finance, manage and operate all toll Expressways in the province, although they specifically mention only three Expressways either completed or under construction. One of those presently under construction is the Gaohebu-Jiezidan Expressway, which will be a continuation of the Hefei-Gaohebu Expressway that is being partly financed by a loan from the World Bank.

Other highways in the province are financed and maintained using revenues from the Highway Maintenance Fund, with its revenue coming from the Road Maintenance Charge, other user charges as well as from allocations from MOC/MOF. Revenues of the Fund are used to finance new construction, improvements, and periodic and routine maintenance.

There are several different ways to plan, finance, construct and operate a provincial highway network. It is becoming standard practice in China for toll highways to be managed in a different way to the other classes of road. In some Provinces a High Grade Highway Administration Bureau, with responsibilities for construction, maintenance and operation of all high-grade highways had been created from a previous High-Grade Highway Construction Bureau. In other provinces, including Anhui, an Expressway Company has been created with the function of designing, financing, constructing and operating some, but not necessarily all, toll highways in the province. This second institutional structure has great potential for attracting external finance for the construction of those new highways that can generate sufficient toll revenues to provide an adequate financial return on investment.

### **Scope of Work**

The objective of the study is to analyze how the most beneficial results for the people of the Province can be obtained from the development of High-Grade Highways, particularly Expressways. This study will include reviews and/or analyses of:

- 1) alternative methods of highway planning, and of determining which highway projects should be implemented, and which of these highways should be classified as high grade and/or toll highways. The analysis should take particular account of the proposals included in the revised Study of Prioritization of Highway Investments and Improving Feasibility Study Methodologies, recently completed by Rust PPK/Travers Morgan for the Ministry of Communications, utilizing Australian Trust Funds;
- 2) the present method of financing and constructing new high grade highways in the Province. The analysis should determine what changes should be made with a view to maximizing the length of new high grade highway that can be constructed, without jeopardizing the construction and maintenance of other highways. The review should cover the various methods presently used in China for the financing of High-Grade Highways and urban Expressways, particularly those that make use of private sources of

finance, both domestic and foreign. Financing schemes that have not so far been used for highways in China, including build-operate-transfer (BOT) schemes and their variations, should also be considered. The analysis should also take account of all recently completed studies on the subject of highway financing, and take particular account of the financing needs of highways that are unlikely to generate sufficient toll revenue to attract 100% private finance, whether debt or equity;

3) the projected revenues from all road user charges, including tolls, and taking into account proposed changes in the method of determining and collecting Road Maintenance Fees. The analysis should take account of the possibilities of increasing toll revenues, subject to not significantly reducing the benefits to users of the highway network. The extent to which the Provincial Communications Department can contribute to the financing of HGHS from its own sources, depends to a large extent on the revenues that it can raise from road user charges and the other commitments for the use of these revenues. This study will therefore make projections, in addition to those of revenues, of the potential expenditures that have to be met from them, including but not necessarily limited to: routine and periodic maintenance; road improvement and upgrading; contributions to the maintenance, improvement and expansion of county and municipal highways; new construction of provincial highways; loan amortization; other payments to central government; research; and administration and management costs;

4) the present and alternative ways of operating high grade highways, with a view to maximizing their benefits to the residents of the Province and achieving the highest level of operational efficiency and ensuring adequate maintenance. Account should be taken of the role of the AECL in relation to the operation of new toll highways, and its responsibilities relative to those of the APCD. Included in the review of the role of the AECL, should be an assessment of its performance compared with High Grade Highway Administration Bureaus in other provinces and private tollway companies; and

5) the institutional arrangements for high grade highway administration, with particular reference to the relationship between the administration of toll roads administered by AECL and that of other highways. The analysis should show how operation and administration the proposed Hefei-Gaohebu Expressway would be compatible with the proposed institutional and financial relationship between APCD and the AECL.

### **Outputs**

The principal outputs of the study will be working papers on each of the main topics as listed above, and a final report that provides a summary of their findings and draws conclusions and recommendations taking them as a whole. A draft of the final report should be submitted to APCD and the World Bank for review and comment. All Working Papers and required reports should be written in Chinese and English and be made available to the World Bank during the course of the study.

### **Resources and timing**

The study is expected to require about 100 person-months of input, with about 40 person-months being provided by consultants familiar with the Chinese system of highway financing, the recent experiences of securitization of toll road revenues and the use of infrastructure bonds. The remaining man-months are expected to be provided by consultants with a knowledge of how toll roads are planned, financed, managed and operated in other countries.

The study is expected to be started in the second semester of 2000 and the draft final report to be submitted to APCD by September 2001. Comments by APCD and the World Bank will be provided within thirty days of submission of the draft and the Final version of the report should be submitted within a further thirty days.

Table 3: IST Components by Organizations to be Strengthened  
(US\$1 = 8.3 yuan)

Organizations to be Strengthened	Training						Total Training		Total Equipment		Total IST	
	In China		Abroad		Study Tours		RMB	US\$	RMB	US\$	RMB	US\$
	Person-months	RMB	Person-months	US\$	Person-months	US\$	portion	portion	portion	portion	portion	Portion
Anhui Provincial Communications Department (APCD)	18	90,000	5	40,000	3.5	28,000	90,000	68,000			90,000	68,000
World Bank Loans Project Execution Office (PEO)	45	225,000	18	144,000	3.5	28,000	225,000	172,000	169,800	72,900	394,800	244,900
Anhui High-Grade Highway Administration (AHHAB)	175	875,000	24	192,000	4.2	33,600	875,000	225,600			875,000	225,600
Anhui Highway Administration Bureau (AHAB)	72	360,000	6	48,000	2.8	22,400	360,000	70,400			360,000	70,400
Quality Control Center (QCC)	9	45,000					45,000				45,000	
Quota Management Center (QMC)	3	15,000					15,000				15,000	
Anhui Highway Survey & Design Institute (AHSDI)	76	380,000	39	312,000	4.2	33,600	380,000	345,600	606,800	261,100	986,800	606,700
Anhui Port & Channel Survey and Design Institute (APCSDI)	18	90,000	4	32,000	0.7	5,600	90,000	37,600	448,300	192,900	538,300	230,500
Anhui Transport Science and Research Institute (ATSSRI)	9	45,000					45,000				45,000	
Anhui Communications College (ACC)	13	65,000	6	48,000			65,000	48,000	490,800	225,300	555,800	273,300
Anhui Communications School (ACS)	6	30,000	4	32,000			30,000	32,000	333,200	143,600	363,200	175,600
Subtotal	444	2,220,000	106	848,000	18.9	151,200	2,220,000	999,200	2,048,900	895,800	4,268,900	1,895,000
Seminar	26	344,682					344,682				344,682	
Lecture by International Specialist	4			48,000				48,000				48,000
Construction Supervision	500	4,000,000	20	160,000			4,000,000	160,000			4,000,000	160,000
Administration charges		1,660,000					1,660,000				1,660,000	
<b>Total</b>	<b>974</b>	<b>8,224,682</b>	<b>126</b>	<b>1,056,000</b>	<b>18.9</b>	<b>151,200</b>	<b>8,224,682</b>	<b>1,207,200</b>	<b>2,048,900</b>	<b>895,800</b>	<b>10,273,182</b>	<b>2,103,000</b>
<b>Total in US\$</b>							<b>\$2,198,126</b>		<b>1,142,655</b>		<b>3,340,781</b>	



Table 4: Training by Subject

Subject	Training in China		Training in Abroad		Study Tours	
	P/M	Yuan	P/M	US\$	P/M	US\$
Highway Planning	26	130,000	10	80,000	2.1	16,800
Project Management	84	420,000	20	160,000	2.8	22,400
Traffic Engineering	36	180,000	12	96,000	3.5	28,000
Road & Bridge Designs	52	260,000	30	240,000	2.1	16,800
Highway Maintenance	50	250,000	6	48,000	1.4	11,200
Highway Operational Management	32	160,000	15	120,000	2.1	16,800
Engineering Geology	4	20,000	2	16,000	0.7	5,600
Transport Science & Research	5	25,000				
Highway Construction Equipment	22	110,000				
Financial Management	10	50,000				
English Language	25	125,000				
Environmental Protection & Monitoring	28	140,000			3.5	28,000
Construction Management	9	45,000				
Resettlement	10	50,000				
Engineering Quality Control	3	15,000				
Engineering Testing	3	15,000				
Road & Bridge Engineering	6	30,000				
Training Management	7	35,000	4	32,000		
Teaching of Engineering Subjects	7	35,000	4	32,000		
Teaching of Maintenance Works	5	25,000	2	16,000		
Seminar	26	344,682				
Lecture by International Specialist	4			48,000		
Construction Supervision	500	4,000,000	20	160,000		
Road Safety	20	100,000	1	8,000	0.7	5,600
Administration Charge		1,660,000				
<b>Total</b>	<b>974</b>	<b>8,224,682</b>	<b>127</b>	<b>1,056,000</b>	<b>18.9</b>	<b>151,200</b>

**Annex 3**  
**Anhui Provincial Highway Project**  
**Estimated Project Costs**  
**May 1998 Prices (\$1.00 = Y8.3)**

Project Component	Local	Foreign	Total	Local	Foreign	Total	Foreign Costs % of Total
	Y million			US\$ million			
<b>A. Works</b>							
a) HAE							
i) Civil Works <sup>(1)</sup>	1,072.0	950.6	2,022.6	129.2	114.5	243.7	47%
ii) Supply and Installation (E&M)	25.4	99.6	125.0	3.0	12.0	15.0	80%
iii) Buildings	28.1	12.1	40.2	3.4	1.4	4.8	30%
b) Highway Maintenance	251.4	167.6	419.0	30.3	20.2	50.5	40%
c) Highway Safety (Black spots)	11.5	11.5	23.0	1.4	1.4	2.8	50%
Subtotal	1,388.4	1,241.4	2,629.8	167.3	149.5	316.8	
<b>B. Supervision of Construction</b>	48.0	28.2	76.2	5.8	3.4	9.2	37%
<b>C. Equipment <sup>(2)</sup></b>	11.4	64.7	76.1	1.4	7.8	9.2	85%
<b>D. Training</b>	8.2	9.9	18.1	1.0	1.2	2.2	55%
<b>E. Studies</b>							
(a) Planning, finance and operation of toll highways	0.1	1.5	1.6	0	0.2	0.2	94%
(b) Highway traffic accidents	1.2	1.2	2.4	0.2	0.1	0.3	50%
Subtotal	1.3	2.7	4.0	0.2	0.3	0.5	
<b>F. Fee</b>	0	16.6	16.6	0	2.0	2.0	
<b>Total Base Cost</b>	1,457.3	1,363.5	2,820.8	175.7	164.2	339.9	
Physical Contingencies	143.6	127.0	270.6	17.3	15.3	32.6	
Price Contingencies	303.0	151.8	454.8	36.5	18.3	54.8	
Land Acquisition and Resettlement	221.0	-	221.0	26.6	-	26.6	
<b>Total Project Cost</b>	<b>2,124.8</b>	<b>1,642.4</b>	<b>3,767.2</b>	<b>256.1</b>	<b>197.8</b>	<b>453.9</b>	

(1) Does not include Y77.2 million in taxes and duties.

(2) Does not include Y24.8 million in taxes and duties.

(3) Does not include interest and commitment charges on Bank's Loan during construction, estimated at about Y261.8 million.

**Annex 4**  
**Anhui Provincial Highway Project**  
**Financing Plan**  
**(\$ million)**

	Province	Central Government	World Bank	Total
<b>A. Works</b>				
(a) HAE				
Civil Works	50.1	76.9	116.7	243.7
Supply and Installation (E&M)	3.0	-	12.0	15.0
Buildings	3.4	-	1.4	4.8
(b) Highway Maintenance	30.3	-	20.2	50.5
(c) Highway Safety (Black spots)	1.4	-	1.4	2.8
Subtotal	89.7	76.9	150.2	316.8
<b>B. Supervision of Construction</b>	5.8	-	3.4	9.2
<b>C. Equipment</b>	1.4	-	7.8	9.2
<b>D. Training/Technical Assistance</b>	1.0	-	1.2	2.2
<b>E. Studies</b>	0.2	-	0.3	0.5
<b>F. Fee (Front-end)</b>	-	-	2.0	2.0
Contingencies	53.8	-	33.6	87.4
Land Acquisition and Resettlement	26.6	-	-	26.6
<b>Project Total</b>	<b>177.0</b>	<b>76.9</b>	<b>200.0</b>	<b>453.9</b>
<b>Percent of Total</b>	<b>39.0</b>	<b>16.9</b>	<b>44.1</b>	<b>100.0</b>

## Annex 5

### Anhui Provincial Highway Project Implementation Program

This annex presents the implementation program for the various components of the project. Table 1 summarizes the overall implementation schedule for the project as a whole. Table 2 shows the implementation schedule for HAE; administration and maintenance buildings; and electrical and mechanical works. Table 3 depicts the detailed implementation schedule for the supervision of construction of HAE.

These schedules show the estimated time requirements for construction activities as well as for preconstruction activities such as preparation of designs and bid documents, prequalification process, bidding process, evaluation of bids, negotiations and signing of contracts.

**Annex 5, Table 1: Implementation Schedule**

	1998	1999	2000	2001	2002	2003	2004
<b>GENERAL PROCUREMENT NOTICE (12/16/97)</b>							
<b>Works</b>							
1. Hefei-Anqing Expressway							
- Civil Works	[Solid black bar from 1998 to 2003]						
- Supply and Installation (E & M)	[Solid black bar from 1998 to 2004]						
- Buildings	[Solid black bar from 1999 to 2002]						
2. Highway Maintenance							
- First Package	[Solid black bar from 1998 to 2001]						
- Second Package	[Solid black bar from 1999 to 2002]						
3. Highway Safety							
- (Black Spots)	[Solid black bar from 1998 to 2002]						
<b>Supervision of Construction</b>							
- Hefei-Anqing Expressway	[Solid black bar from 1998 to 2002]						
<b>Procurement of Equipment</b>							
- Operatn & Maint (HAE)	[Solid black bar from 2000 to 2002]						
- Highway Maintenance	[Solid black bar from 1998 to 1999]						
- Others	[Solid black bar from 1998 to 1999], [Solid black bar from 1999 to 2000], [Solid black bar from 2000 to 2001]						
<b>Training</b>	[Solid black bar from 1999 to 2004]						
<b>Studies</b>							
- Planning, finance and operation of toll highways	[Solid black bar from 2000 to 2001]						
- Highway traffic accident	[Solid black bar from 1999 to 2000]						

- [Patterned box] Prequalification/preparation of bidding documents/TOR
- [Patterned box] Bidding process/competition among consultants
- [Solid black box] Construction/supervision/delivery/execution of studies
- [Patterned box] Defects liability period

## Annex 5

**Table 2: Implementation Schedule for Construction of Hefei-Anqing Expressway (HAE)**

### **A. Civil Works (15 Civil Works Contract Sections (ICB))**

General Procurement Notice (UNDB)	December 16, 1997
Specific Procurement Notice and local advertisement	February 16, 1998
Prequalification documents available for sale	April 7, 1998
Last date to submit PQ documents by contractors	June 5, 1998
PQ documents evaluation report and MOC review	July 5, 1998
Bank review and no objection to PQ evaluation report	July 30, 1998
Review bid documents by foreign experts and Bank	June 30, 1998
Sell bidding documents to prequalified bidders	August 1, 1998
Last date to receive bid documents	September 30, 1998
Bid evaluation and government review	October 10, 1998
Bank reviews bid evaluation report and no objection	October 20, 1998
Notify successful bidders	October 25, 1998
Negotiate and sign contracts	November 5, 1998
Start construction	December 5, 1998
Complete construction and start Defect Liability Period	August 30, 2002
End of Defects Liability Period	August 30, 2003

### **B. Administration and Maintenance Buildings**

Complete Preparation of Bid Documents	January 1, 2000
Bank review and No Objection of Bid Documents	February 1, 2000
Invite Bids	February 14, 2000
Last Date to Receive Bids	April 15, 2000
Bid Evaluation Report and Government Review	May 15, 2000
Bank Review and No Objection to Bid Evaluation	June 15, 2000
Negotiate and Sign Contracts	July 15, 2000
Start Construction	September 1, 2000
Complete Construction and Start of Defects Liability Period	February 28, 2002
End of Defects Liability Period	February 28, 2003

### **C. Electrical and Mechanical Works (ICB)**

Finalize bid documents and submit to Bank	January 15, 2000
No Objection to bid documents by Bank	February 15, 2000
Specific Procurement Notice (UNDB)	February 16, 2000
Issue Bid Documents	March 15, 2000
Last Date to Receive Bids (stage 1)	June 15, 2000
Evaluate Bid Documents	September 1, 2000
Contractor Prepare Financial Bids (stage 2)	September 15, 2000
Last Date to Submit Financial Bids	October 15, 2000
Bid Evaluation Report and Government Review	November 15, 2000
Bank Review and No Objection to Bid Evaluation Report	January 31, 2001
Negotiate and Sign Contract	March 15, 2001
Establish Letter of Credit	May 1, 2001
Joint Design	June 30, 2001
Manufacture and Purchase of Equipment	October 1, 2001
Transport of Equipment to Site	January 15, 2002
Installation and Commissioning	October 30, 2002
Trial-Run of Systems	January 31, 2003
Completion and Start of Defects Liability Period	February 28, 2003
End of Defects Liability Period	February 28, 2004

### Annex 5

**Table 3: Implementation Program for Supervision of Construction of HAE**

Specific Procurement Notice (UNDB)	February 16, 1998
No objection of Bank to TOR, LOI and Short List	April 15, 1998
Issue invitations to consultants	April 24, 1998
Last date to receive proposals	June 30, 1998
Evaluation of the Quality (technical proposals)	July 30, 1998
Bank review evaluation report (technical) and no objection	September 7, 1998
Notify consultants on the opening date of the financial proposals	September 8, 1998
Opening of financial proposals	September 22, 1998
Complete combined Quality and Cost Evaluation	September 26, 1998
Bank review proposal evaluation report and no objection	October 6, 1998
Negotiations with consultant and sign contract	October 20, 1998
Prepare training material by consultant	October 20, 1998 – December 20, 1998
Train local staff	November 20, 1998 – January 20, 1999
Start Supervision of construction	January 10, 1999
Complete Supervision of Construction	September 1, 2002

## Annex 6

### Anhui Provincial Highway Project Economic and Financial Evaluation

#### Preface

1. The economic evaluation of the project covers two project components:
  - (a) new construction of a 152 km Hefei-Anqing Expressway (HAE), and
  - (b) rehabilitation of six provincial highways (total 240 km) under Highway Maintenance Program (HMP).
  
2. The analysis is based on updated data and projections of traffic, vehicle operating cost (VOC), economic project cost and transport user benefits. The main inputs to and assumptions for the evaluation are:
  - (a) capital investment and maintenance costs, revised to reflect May 1998 prices;
  - (b) the benefit stream, also measured in May 1998 prices, comprising savings in VOC, travel time savings through reduced congestion on the existing route (for the HAE evaluation), and reduction accident costs;
  - (c) an assumed project life of 20 years, the capital investment period being 1997 - 2005, depending on the road being evaluated; and
  - (d) full benefits start to accrue to the HAE in 2003, HMP 2001 or 2002 (depend on the road being considered).
  
3. This Annex comprises four parts. Part I is the economic evaluation of the HAE; Part II is the economic evaluation of the six provincial highways under the HMP; Part III is the overall economic evaluation of the project, including HAE and HMP, and; Part IV is the financial evaluation of HAE.

#### PART I: HEFEI-ANQING EXPRESSWAY

4. There are two major components of the proposed Hefei-Anqing Expressway (HAE): (a) Hefei-Gaohebu expressway and (b) Gaohebu-Anqing expressway. For purposes of evaluation, the HAE been further divided into five sections:

Sections	Length of the existing road (km)	Length of the expressway (km)
<u>Hefei - Gaohebu expressway:</u>		
Section 1 Xiaoxichong (Hefei)- Susanline	46.00	34.30
Section 2 Susanline- Mayan	27.00	26.70
Section 3 Mayan- Gezidun (Gaohebu)	62.00	64.88
Subtotal	<u>135.00</u>	<u>125.88</u>
<u>Gaohebu - Anqing expressway:</u>		
Section 4 Gezidun (Gaohebu)- Wuheng	22.00	15.50
Section 5 Wuheng- Zongpu (Anqing)	9.00	10.30
Subtotal	<u>31.00</u>	<u>25.80</u>
<b>Total</b>	<b>166.00</b>	<b>151.68</b>



### Justification for Investment - Highway Expansion Plan

5. **Overview.** Anhui is a landlocked province located in east central China, on the west side of the Yangtze delta. Its main outputs are agricultural and light industry products. The terrain in north and east region of the province is plain. Mountains are concentrated on the west and south region. The Yangtze River crosses the province from southwest to east, its flood plain influencing about 50 percent of the province's land area. Downstream from the Yangtze River is the city of Shanghai and the East China Sea. Hefei is the provincial capital city located in the center of the province. Anqing is the former capital city of the province located in the southwest area, and a major port on the Yangtze river. The proposed highway would link these two largest provincial cities (Hefei and Anqing), by passing two local districts, Luan and Caohu, where congestion inhibits traffic on the existing road. The two cities and two districts together represent over one-third of the provincial population, land area and annual GDP output.

6. Currently, China is planning to construct "five vertical and seven horizontal" main trunk highways crossing the nation to promote highway sector as part of the long-term national development strategy. Anhui is an important land transport hub for the eastern part of China, the alignment of one of the vertical trunk highways (Beijing-Fuzhou expressway) and one of horizontal trunk highways (Shanghai-Chengdu expressway) passing through the province. The proposed expressway is an overlap section shared by both these national trunk roads.

#### Construction of Beijing-Fuzhou Expressway

7. The total length of Beijing-Fuzhou (Fujian province) expressway would be about 1,800 km, and it would pass through six provinces (Hebei, Shandong, Henan, Anhui, Jiangxi and Fujian). Construction has already started in four provinces (Hebei, Shandong Henen and Jiangxi), with the planned construction of 400 km in Anhui at a cost of Y 12.2 billion (US\$1.5 billion) to be in three phases, of which the proposed project would include the first:

The Beijing- Fuzhou Expressway Construction Plan in Anhui

Section	Length (km)	Period	Cost (Y billion)	Financing Plan
Hefei- Gaohepu	126	1998-2003	3.9	Domestic/ IBRD
Bengpu- Hefei	104	1998-2001	3.2	Domestic
Xiaoxian (Xuzhou)- Bengpu	170	2000-2003	5.1	Domestic/ OECF
Total	400		12.2	

#### Construction of Shanghai- Chengdu Expressway

8. The total length of Shanghai-Chengdu (Sichuan province) expressway is about 2,500 km, covering four provinces (Jiangsu, Anhui, Hubei and Sichuan). The total cost is expected to be Y7.1 billion (about US\$0.8 billion) of which about 20% has already been spent and the proposed project represents a further 55%. The proposed project would provide the only missing segment in the Shanghai - Wuhan section. The construction plan for the section in Anhui province is being implemented under the three phases and is summarized as follows:

The Shanghai- Chengdu Expressway Construction Plan in Anhui

Section	Length (km)	Period	Cost (Y billion)	Financing Plan
Quanjiao (Nanjing)- Hefei	144	Completed	1.4	Domestic
Hefei- Gaohepu	126	1998-2003	3.9	Domestic/IBRD
Gaohepu- Jiezdun	170	1995-1999	1.8	Domestic
<b>Total</b>	440		7.1	

**Level and Timing of Investment**

9. Given its important role to the provincial economy and in the completion of the two national trunk highways, the proposed project has the highest priority in the provincial highway development plan.

10. The existing highway between Hefei and Anqing is a Class II, mixed traffic, all-purpose road without access control and a design capacity of about 7,000 vehicles per day. Motorized traffic on the road has been increasing about 13 percent per year between 1990-1996 and by 1996 had reached about 6,800-10,000 motorized vehicles per day throughout its length. Non motorized traffic (bicycles, animal carts, small farm tractors etc) adds an equivalent of about another 2,000 motorized vehicles per day. Even with a modest projected 7.5 percent annual growth in the next five years, motorized traffic in this highway corridor would reach between 11,000-17,000 vehicles per day by 2003, the proposed opening year. This would exceed the capacity of the existing road by more than 55 percent. An economic assessment of the optimum opening year of the expressway shows that it is already passed, so the optimum timing is now to construct the road as quickly as possible.

**Highway Corridor Traffic**

11. Estimates of base year traffic were made on the basis of routine traffic counts and a comprehensive origin and destination (O/D) survey that took place in May 1996. Projections of base, generated and diverted traffic were made for 27 zones on the basis of a conventional growth model. A regression analysis was used to derive a relationship between economic growth and road transport demand, that indicated a demand elasticity of 0.60-0.75 for traffic with respect to GDP growth, with an  $r^2$  of more than 0.924. Based on the expected continued but declining local economic growth, it is estimated that traffic growth in the project corridor will be 7.5 per cent per year between 1997-2005, 6.0 percent between 2005- 2015, and 4.5 percent for 2015- 2025. Traffic generated by the new expressway was assumed to increase to 19% of the basic traffic level after ten years, but with no generated traffic for the first two years of operation. This is to allow time for production patterns to adjust to the availability of the new road.

Annual Traffic Growth Rate

	Car	Bus & Truck	Average
<b>Actual</b>			
1990-1996	26.5%	11.1%	12.9%
<b>Projection:</b>			
1997-2005	9.0%	7.0%	7.5%
2005-2015	7.5%	5.5%	6.0%
2015-2025	6.0%	4.0%	4.5%

### Alternative routes and toll levels

12. **Alternatives.** In the feasibility study, three alternative route alignments were considered, i.e. the west alignment, central alignment and east alignment. Each alternative was compared on the basis of costs, benefits, service to local cities and relationship to future economic development. The east alignment was selected on the basis of least overall cost and without having any additional environmental or resettlement consequences compared with the other two routes (details are available in the feasibility study reports).

13. **Level of the tolls.** The proposed expressway will be operated as a toll road. The province already has three existing toll roads in operation, so user acceptance of tolls is not expected to be a problem. The level of toll needs to satisfy two objectives: (a) to generate sufficient revenue to service the amortization payments of the Bank loan, and; (b) not deter potential users from the toll road so that its economic objectives are compromised. Since satisfying these objectives can be in conflict, the first requiring a high toll while the second requires a low toll, during the project an analysis will be made of the optimum toll level. Analyses already made show that a toll that would generate revenue to finance loan amortization would only reduce the economic rate of return of an untolled road by about 15%.

### Traffic on the Expressway

14. The new expressway is planned to become operational in 2003. Based on the information provided by the O/D survey and the feasibility study, the diversion ratios were calculated by using financial VOC for the road users as an independent variable, with the impacts of the level of proposed tolls on the new expressway, the tolls on the existing road, travel distance, and experience from other recently Bank financed expressways in China. The results of the potential diversion of traffic to the new road show that between 60 and 69 percent of the motorized corridor traffic may be diverted to the new expressway, depending on the road section and year of analysis. Sensitivity tests with lower diversion rates show that the HAE would still be justified with an average diversion rate of about 55%, a rate exceeded in all the toll highways so far financed by the Bank in China.

15. Generated traffic is assumed to be 10 percent of the basic traffic. Although there is an existing railway line between Hefei and Anqing (177 km) no diversion of traffic from the railway to the new expressway has been taken into account. The railway is not congested and is not expected to become so, with track utilization presently less than 20 percent. The mostly bulk freight presently carried by the railway would not be attracted by its faster times but higher tariffs of the expressway (rail tariffs are about 11-14 Fen per ton-km compared with about 30 Fen per ton-km for road transport). The highway corridor traffic forecast, by sections, is summarized as follows:

Normal Traffic, by Sections :

	Section 1 Hefei- Susanline	Section 2 Susanline- Mayan	Section 3 Mayan- Gaohepu	Section 4 Gaohepu- Wuheng	Section 5 Wuheng- Anqing
<b>Existing road:</b>					
1995	11,237	5,510	5,721	8,232	12,248
1996	10,244	6,835	6,921	6,751	10,044
1997	11,368	7,081	7,880	7,189	10,695
2003	6,406	3,359	4,261	4,382	6,519
2005	7,400	3,870	6,919	5,059	7,527
2015	13,286	6,861	8,790	9,054	13,471
2025	20,837	10,610	13,715	14,150	21,056
<b>Expressway:</b>					
2003	11,039	7,431	7,802	6,646	9,889
2005	12,729	8,549	8,988	7,665	11,407
2015	22,627	15,001	15,902	13,638	20,297
2025	35,099	22,930	24,535	21,178	31,516

### Economic Costs

16. Financial costs have been converted to economic costs by the elimination of price contingencies, interest payments during construction and taxes and custom duties on imported materials and by the application of shadow prices. The overall average shadow price is 1.02 and the resulting overall economic cost is 68% of the financial cost.

### Economic Benefits

17. The economic analysis includes benefits derived from: (a) VOC ( summarized as below ) savings on the new highway for normal and generated traffic, (b) time savings through relieved congestion on the existing road, and (c) lower accident costs. The benefits resulting from the lower level of congestion were quantified. The value of passenger time savings was estimated at Y 1.0 per passenger-hour, based on updated values from a recent report on feasibility study methodology for highways in China (Rust PPK. Australia Feasibility Study Methodology Report, March 1996). The same source was used for vehicle accident rates on different classes of road. The benefits of generated traffic were calculated using the standard demand curve analysis and an assumed linear relationship between demand and travel cost over the relevant cost range.

Economic Vehicle Operating Costs  
(Yuan per km, May 1998 prices)

	Good			Fair			Poor		
	Flat	Hill	Mount.	Flat	Hill	Mount.	Flat	Hill	Mount.
<b>Hefei- Gaohebu</b>									
Small car	0.576	0.601	0.620	0.667	0.693	0.713	0.863	0.889	0.909
Small bus	0.975	1.157	1.306	1.279	1.486	1.655	1.636	1.824	1.993
Medium bus	1.537	1.785	2.000	2.069	2.370	2.615	2.727	2.990	3.234
Large bus	2.011	2.452	2.844	2.752	3.314	3.776	3.335	3.877	4.339
Small truck	0.980	1.225	1.409	1.086	1.327	1.508	1.327	1.538	1.749
Medium truck	1.223	1.507	1.791	1.445	1.776	2.077	1.746	2.077	2.408
Large truck	1.385	1.697	2.009	1.670	2.029	2.346	1.987	2.346	2.684
Tractor/trailer	2.977	3.927	4.748	3.414	4.444	5.311	4.064	5.039	5.933
<b>Gaohebu- Anqing</b>									
Small car	0.592	0.618	0.638	0.739	0.968	0.790	0.957	0.986	1.008
Small bus	0.995	1.181	1.333	1.107	1.286	1.433	1.417	1.580	1.727
Medium bus	1.569	1.822	2.041	1.791	2.052	2.264	2.362	2.590	2.802
Large bus	2.046	2.495	2.894	2.307	2.779	3.166	2.796	3.251	3.638
Small truck	0.937	1.171	1.347	0.996	1.217	1.383	1.217	1.411	1.605
Medium truck	1.225	1.510	1.795	1.337	1.643	1.921	1.615	1.921	2.227
Large truck	1.364	1.671	1.978	1.560	1.896	2.192	1.856	2.192	2.508
Tractor/trailer	3.007	3.966	4.795	3.204	4.170	4.984	3.814	4.729	5.568

### Economic Evaluation and Sensitivity Analysis

18. Total costs and benefit streams, Economic Internal Rate of Return (EIRR) and Net Present Value (NPV), for each section of the expressway were calculated. The overall EIRR for the HAE is estimated to be 25.6 percent with the following results for each road section. The variation in EIRR is almost proportional to the variation in total traffic in each section of the corridor.

Economic Evaluation of HAE

	EIRR (%)
Whole route	25.6
Hefei–Susanline	30.4
Susanline–Mayan	20.1
Mayan–Gezidun	25.2
Hefei–Gaohebu expressway	26.1
Gezidun–Wuheng	26.4
Wuheng–Anqing	15.4
Gaohebu–Anqing expressway	22.2

19. The sensitivity tests show little change from basic evaluation results. The test with a zero value of travel time shows only a small reduction from the basic value since a low unit value of time has been used in the analysis. Similarly, the test with no generated traffic also shows a small reduction in the EIRR because a low rate of generated traffic was assumed.

Sensitivity Tests on the Economic Evaluation of HAE

	ERR%
Delay the completion by one year	22.7
Zero value of time	23.4
Zero generated traffic	25.3
Lower traffic projection	23.5
Less traffic diverted to new road	24.5
<hr/>	
Switching values	% increase
Cost increase to reduce ERR% to 12%	224%
Benefit reduction to reduce ERR to 12%	31%

20. The basic evaluation of the project, by section and on the whole, indicates that the selected alignment is economically viable, and the sensitivity tests with respect to higher cost, lower transport demand, zero value of time, zero generated traffic benefits and lower diversion rates to the new road, maintain this position. The analysis of the optimum year for opening of the road showed that delaying the completion by one year would reduce the EIRR by about 3 percent. In addition, the sensitivity of the evaluation results to variations in the costs and benefits of the project indicate that the conditions for the project's viability to fall below the minimum acceptable, that is, a NPV of less than zero by using 12 percent discount rate or an EIRR of less than 12 percent, are unlikely to occur. The benefits would have to fall to less than 31 percent of those in base case with no change in costs, the costs would have to increase to more than 2.2 times those of the base costs, or the costs would have to increase by 30 percent and the benefits fall to 40 percent at the same time.

## PART II: HIGHWAY MAINTENANCE PROGRAM

### Selection of Highways and Its Traffic

21. The HMP consists of six provincial highways, classified by APCD as among the worst roads in the province (some roads with a worse classification will be rehabilitated before the project is implemented). The main objective of the rehabilitation program is to upgrade existing provincial roads to Class II or Class III standards where traffic is at least 1,000 ADT (in mte) and the road has not been rehabilitated during the last 5 years. The total length of the six provincial highways is 238 km and listed below:

Section	Name	Length
1.	Lu'an road	40 km
2.	Shouxian road	40 km
3.	Nanzhau road	30 km
4.	Chaolu road	46 km
5.	Xiaohuai road	60 km
6.	Yangtao road	22 km
<b>Total</b>		<b>238 km</b>

22. Since all six highways are located in the same flat or hilly area, the local economic development and traffic pattern are quite similar. Based on the actual traffic levels and projected local economic growth rates, traffic growth rates have been estimated as: 6 percent per year for most of the roads up to the year 2000, 5 percent from 2000-2005, 4 percent between 2005-2010 and 3 percent thereafter.

### Economic Costs and Benefits

23. Financial costs have been converted to economic costs using the same method and factors as for the HAE, with the following results:

Financial and Economic Costs for the HMP  
( million Yuan)

	Financial	Economic
1. Lu'an road	93.92	83.36
2. Shouxian road	93.91	83.36
3. Nanzhau road	79.84	70.86
4. Chaolu road	61.00	54.18
5. Xiaohuai road	135.08	119.83
6. Yangtao road	28.04	25.01
<b>Total</b>	<b>491.79</b>	<b>436.60</b>

24. The principal evaluated benefits of the project would be reduced VOCs through providing a better road surface, but the associated upgrading of road Classes would also result in higher traffic speeds. Together these two effects would result in some generated traffic, assumed to be 5 percent of the normal traffic.

## Economic Evaluation and Sensitivity Analysis

25. The best estimates of EIRRs for the six highways under the HMP range from 31.3 percent to 43.3 percent. The overall EIRR and NPV for the HMP program are 37.6 percent and 828.6 million Yuan respectively.

EIRR and NPV Summary for HMP component

		EIRR (in %)	NPV (12%) (million Yuan)
1.	Lu'an road	39.6	212.8
2.	Shouxian road	36.8	184.9
3.	Nanzhou road	35.0	130.2
4.	Chaolu road	43.3	143.7
5.	Xiaohuai road	36.8	265.3
6.	Yangtao road	31.3	36.8
	<b>Total</b>	<b>37.6</b>	<b>828.6</b>

### Sensitivity tests

26. The risks associated with evaluation of the HMP are that traffic will grow more slowly than projected, that the civil works will be more expensive than projected and that the savings in vehicle operating costs will be less than expected. All these risks were analyzed through sensitivity tests and the evaluation results found to be robust to all of them. For the project component to be non-acceptable (i.e. EIRR of less than 12 % or NPV of zero), traffic growth would have to be negative, or the civil works cost would have to increase by more than 370%, or the vehicle operating cost savings would have to reduce to about 30% of their expected values.

## PART III: THE OVERALL ECONOMIC EVALUATION OF THE PROJECT

### Overall Economic Internal Rate of Return (EIRR)

27. The overall EIRR of the project (including HAE and HMP ) is 27.1 percent and the NPV is 4.56 billion Yuan.

### Project Risks

28. All sections of the HAE and all highways included in the HMP show acceptable and robust economic returns. The province has rich experiences in construction and operation of expressway projects so the technical risks of implementing the project are minimal. Physically, the only remaining tangible risks are that prolonged delays may occur in the course of implementation due to lack of experience in international procurement procedures. This will be addressed through training and technical assistance for the staffs in the early stage of the project.

#### PART IV: FINANCIAL EVALUATION

29. Since construction of HAE is the main component of the project which constitutes about 78% of the total project cost and all six provincial roads under HMP are toll free, the financial evaluation of the project focused only on the HAE. The only project income will come from these tolls, which will be charged on the basis of vehicle size (small passenger car, large bus, small truck, medium truck, large truck and trailer) and distance traveled. The tolls are expected to increase about every five years to take account of inflation, expected to be less than 5 per cent annually. Currently, the three tolled roads in Anhui province use the same toll rates and the HAE would apply the same table. The projected tolls are:

Tolls (Y/Vehicle-km)

	Small Car	Large Bus	Small Truck	Medium Truck	Large Truck	Overall Average	Average Growth p.a.
2003-2010	0.30	0.60	0.30	0.60	0.80	0.52	
2010-2015	0.53	0.95	0.53	0.95	1.24	0.84	7.1%
2015-2020	0.79	1.33	0.79	1.33	1.69	1.19	7.2%
2020 after	1.12	1.81	1.12	1.81	2.26	1.62	6.4%

30. Two financial evaluations were made for the project. The first was to determine the rate of return on equity for the point view of the Highway Agency and Central Government. For this evaluation, equity of the project was understood to be the total investment cost less the debt, as a World Bank loan. The net revenues were determined by subtracting the loan serving costs and road operating and maintenance costs from the total toll revenue. The return on equity was calculated as the net present value of these resulting net annual revenues, expressed as a percentage of the project equity. The second evaluation was of the net cash flows of the project as a whole, taking into account the costs of other project components.

31. The summary of financial evaluation shows that with the medium traffic projection, the return on equity would be 12.8 percent. While the sum of the cash flows would be positive, for the first three years there would be negative cash flows after allowing for operation, maintenance and loan repayments. Both these results are very sensitive to the level of toll revenues and the costs of the project. Although the expressway will generate enough toll revenue over the loan period to cover the loan amortization charges, with a standard amortization schedule there will be deficits in the early years of operation (from 2003 up to 2005). The greatest risk on toll revenue is that the diversion from the existing road will not reach the equilibrium level projected. If this should happen, a 10 percent fall on traffic, the return on equity would be reduced to 11.5 percent. Similarly, if the construction costs increase by 10 percent, the equity would increase by 16.2 percent as the debt (the loan from the Bank) could not be increased, so the rate of return on equity would fall to about 11.3 percent. These results emphasis the importance from a financial point of view of controlling construction costs and maintaining the project's revenue.



## Annex 7

### Anhui Provincial Highway Project Procurement and Disbursement Arrangements

#### Procurement

##### *Procurement methods (Table A)*

Procurement under the project would be carried out as shown in Table A. The procurement arrangements for the project have taken into account the Bank's "Guidelines for Procurement under IBRD Loans and IDA Credit" (January 1995, and revised in January, August 1996 and September 1997) as well as the experience gained from previous Bank-financed highway projects. The documentation, for procurement, which covers the prequalification of contractors, ICB and National Competitive Bidding (NCB) for civil works, ICB for goods, and consultant services contracts has been standardized for Chinese conditions in cooperation between the Chinese government and the Bank on the basis of model documents which would be used for all relevant procurement processes under the project. Where no model documents exists, relevant Bank standard documents would be used.

**Works.** The civil works for the Hefei-Anqing Expressway (HAE) would be divided into 15 contract sections. The electrical and mechanical works for HAE would be bid later during construction as one contract. All of the above 16 contracts with a total cost of about \$326.0 million would be procured under ICB procedures.

The above contracts for the civil works would be bid on a slice and package basis; qualified firms would be allowed to bid for more than one contract so as to attract international contractors and large Chinese contractors. All contractors for all ICB contracts for civil works would be prequalified. The General Procurement Notice (GPN) for the project and the Specific Procurement Notice (SPN) for the civil works and the consulting services required for the supervision of HAE were published in the *UN Development Business* No. 476 on December 16, 1997 and No. 480 on February 16, 1998, respectively. For the contract for the electrical and mechanical works for HAE, invitation to bid would be advertised as specific procurement notices in the *UN Development Business* and/or well-known technical magazines, newspapers, and trade publications of wide international circulation. Domestic contractors are expected to be competitive for all civil works contracts under this project. Each contract for works estimated to cost \$ 50,000,000 equivalent or more shall include the provisions for a dispute review board set forth in the standard bidding documents for works referred to in para. 2.42 of the above-mentioned Guidelines.

Other works including buildings (estimated to cost about \$6.1 million), highway maintenance (with a cost of 64.1 million) and the highway safety program (with a cost of \$3.6 million) would be awarded following NCB procedures acceptable to the Bank. These works would involve contracts estimated to cost less than \$10 million per contract. Since these contracts are small in value and scattered throughout the province and would be implemented over a four-year period, ICB would therefore be neither justified nor practical, but foreign firms would not be precluded from bidding.

**Equipment.** Generally, all contracts for goods and equipment costing more than \$250,000 equivalent would be awarded under ICB. All other items or groups of items covering minor maintenance equipment, laboratories, research and environmental protection purposes estimated to cost less than \$250,000 per contract package, in an aggregate amount not exceeding \$2.1 million would be procured following international shopping procedures on the basis of a comparison of price quotations solicited

from at least three suppliers eligible under the Bank Guidelines for Procurement. These quotations should indicate the description and quantity of goods as well as desired delivery time and place. Domestic manufacturers competing under ICB would be eligible for a margin of preference in the comparison of bids of 15 percent for goods, or the prevailing custom duties, whichever is lower.

**Consultants.** All consulting services will be procured in accordance with the provisions of the Bank's Consultant Guidelines Published by the Bank in January 1997 and revised in September 1997. Consulting services for supervision of construction of HAE (costing \$4.3 million) would be procured on quality and cost basis (QCBS). QCBS would also be used for contracts for training services each costing more than \$100,000. Single source selection would be utilized for contracts related to staff training and studies costing less than \$100,000 per contract in the case of firms and less than \$50,000 per contract in the case of individuals (Table A-1 of this Annex)

*Prior review thresholds (Table B)*

Prior review procedures would be used for : (a) civil works contracts with an estimated cost of \$4 million (Y 33 million) or more; (b) equipment with an estimated cost of more than \$ 250,000 per contract; and (c) consulting services with an estimated contract cost of more than \$100,000 for firms and \$ 50,000 for individuals. In the case of consultancy service contracts, all terms of reference and single-source selections, regardless of the value of the contract, are subject to prior review. Prior review would apply to 98 percent and 85 percent of the total contract values of works and goods financed by the Bank, respectively. For contracts below the above-mentioned limits, *post-review* procedures would be followed. The sampling ratio for contracts not subject to prior review is 25 % for goods contracts.

**Disbursement**

*Allocation of loan proceeds (Table C):* Allocation of loan proceeds is shown in Table C.

*Use of statements of expenses (SOEs):* Withdrawal from the loan account would be made on the basis of SOEs for expenditures for: (a) civil works under contracts costing less than \$4.0 million, (b) goods under contracts costing less than \$250,000, (c) services provide by consulting firms under contracts costing less than \$100,000, and (d) services provided by individual consultants under contracts costing less than \$50,000.

*Authorization, allocation and operation of Special account:* To facilitate disbursements, a Special Account would be opened with an authorized allocation of \$15 million equivalent, the estimated average expenditures for a four-month period.

*Retroactive financing:* Retroactive financing of up to \$20. 0 million would be applied to expenditures made after June 1, 1998 for construction of HAE (\$19.0 million), consultants for supervision of construction of HAE and training of local supervision staff (\$0.5 million); and for purchase of laboratory equipment (\$0.5 million).

**Annex 7**  
**Table A: Project Costs by Procurement Arrangement**  
(in US\$million equivalent)

Expenditure Category	Procurement Method				Total Cost (including Contingencies)
	ICB	NCB	Other	NBF	
<b>1. Works</b>					
HAE Civil Works	306.9 (138.4)				306.9 (138.4)
Supply and Installation (E&M)	19.1 (15.2)				19.1 (15.2)
Buildings		6.1 (1.8)			6.1 (1.8)
Highway Maintenance		64.1 (25.7)			64.1 (25.7)
Highway Safety (Black spots)		3.6 (1.8)			3.6 (1.8)
<b>2. Goods</b>					
Equipment	8.7 (8.7)		2.1 (0.4)		10.8 (9.1)
<b>3. Services</b>					
Supervision of Construction (c)			11.6 (4.3)		11.6 (4.3)
Training			2.6 (1.4)		2.6 (1.4)
<b>4. Studies</b>					
Planning, finance and operation			0.2 (0.2)		0.2 (0.2)
Highway traffic accidents			0.3 (0.1)		0.3 (0.1)
<b>5. Fee (Front-end)</b>			2.0 (2.0)		2.0 (2.0)
<b>6. Land Acquisition and Resettlement</b>				26.6	26.6
<b>Total</b>	334.7 (162.3)	73.8 (29.3)	18.8 (8.4)	26.6 (0)	453.9 (200.0)

(a) Other includes negotiated contract, international shopping, consultants, training and front-end fee.

(b) N.B.F. = Not Bank-financed.

(c) Selection of Consultants according to the Bank's Guidelines for Use of Consultants.

Notes: (1) Figures in parentheses are the amounts to be financed by the Bank loan.

(2) All figures are rounded and include estimated physical and price contingencies but exclude the cost of land acquisition and resettlement which is shown as a separate component.

**Annex 7**  
**Table A-1: Consultant Selection Arrangements**  
**(in US\$million equivalent)**

Selection Method	Total Cost (including contingencies)
<b>A. Firms</b>	
QCBS	11.6 (4.3)
Other	2.6 (1.3)
Subtotal	14.2 (5.6)
<b>B. Individuals</b>	
CQ	0.5 (0.4)
<b>Total Cost Including Contingencies</b>	<b>14.7 (6.0)</b>

Note: QCBS = Quality- and Cost-Based Selection  
QBS = Quality-based Selection  
SFB = Selection under a Fixed Budget  
LCS = Least-Cost Selection  
CQ = Selection Based on Consultants' Qualifications  
Other = Selection of individual consultants (per Section V of Consultants Guidelines/  
Commercial Practices, etc.)

Figures in parenthesis are the amounts to be financed by the Bank loan.

**Annex 7**  
**Table B: Thresholds for Procurement Methods and Prior Review**

Expenditure Category	Contract Value (Threshold)	Procurement Method	Contracts Subject to Prior Review / Estimated Total Value Subject to Prior Review
	US \$ million		US \$ millions
1. <u>Works</u>	More than 4.0	ICB	16 Contracts \$326.0 million subject to prior review
	More than 4.0	NCB	10 Contracts \$66.2 million subject to prior review
2. <u>Goods</u>	More than 0.25	ICB	7 Contracts \$8.8 million subject to prior review
3. <u>Services</u>	More than 0.10 for firms, more than 0.05 for individuals	QCBS	Supervision Contracts \$4.3 million, training \$1.4 million and studies \$0.3 million subject to prior review
<b>Total value of contracts subject to prior review:</b>			<b>\$407.0 million</b>

**Annex 7**  
**Table C: Allocation of Loan Proceeds**

<b>Expenditure Category</b>	<b>Amount in US\$million</b>	<b>Financing Percentage</b>
<b>Civil Works</b>		
Construction of Hefei-Anqing Expressway	116.7	48% of total expenditures
Supply and Installation of E&M	12.0	80% of total expenditures
Buildings	1.4	30% of total expenditures
Highway Maintenance	20.2	40% of total expenditures
Black spots improvement	1.4	50% of total expenditures
<b>Equipment</b>	7.8	100% of foreign expenditures for directly imported equipment or 100% of local expenditures for locally manufactured equipment or 75% of local expenditures for other items procured locally
<b>Consultant Services and Training</b>	4.9	100% of foreign expenditures
<b>Fee (Front-end)</b>	2.0	
<b>Unallocated</b>	33.6	
<b>Total</b>	<b>200.0</b>	

## Annex 8

### Anhui Provincial Highway Project Resettlement Action Plan

1. The Anhui Provincial Highway Project involves construction of a 153 km Hefei - Anqing Expressway and associated structures. Acquisition of land is necessary for the project as well as relocation and economic rehabilitation of people affected by land acquisition. About 16,466 mu of land (2,530 households) would need to be acquired and 1,116 residential households (4,003 persons) will be affected by the project. Out of these, 768 houses (2,758 persons) would need to be relocated. About 27 enterprises will be affected by the project, out of which 18, with a total work force of 434 would need to be relocated. A detailed census and socioeconomic survey of the people affected by the project was conducted in August 1997 by Anhui Provincial Highway Survey and Design Institute (APHSDI). Based on this survey, specific categories of project impact were drawn up and detailed entitlement policy for each category of impact was agreed.
2. Compensation for all affected structure will be paid at the replacement cost of affected structures. Affected houses and enterprises will be provided with alternative plots of land for reconstruction of structures. All affected labor will be reemployed in the same enterprises after reconstruction and will be paid a subsistence allowance for the duration of temporary unemployment. Affected enterprises will also be paid compensation equivalent to the net losses incurred by them for the duration of closure of business. Compensation for land acquisition will be paid to the collectives, who will be responsible for redistribution of land among the affected families. There would be no need to initiate non-agriculture based economic activities since the residual land holdings in affected villages are sufficiently above the minimum prescribed per capita land holdings (0.1 mu for vegetable land and 0.3 mu for crop land). Temporary land acquisition will be compensated at rates equivalent to the productive value of affected land. Allowance will be paid to the affected people for moving to resettlement sites, and for facilitating transition to new houses and jobs.
3. The resettlement program will be coordinated by the Lead Group on land acquisition and resettlement, consisting of representatives from APCD, APHAB and the county magistrates of the five counties affected by the project. Land acquisition and resettlement offices will be established in each of the five counties and for Hefei City. Similarly, agencies responsible for land acquisition and resettlement at the township and village level will be involved in resettlement implementation. Internal monitoring will be carried out by the PEO on behalf of APCD.
4. The total cost of the resettlement program, including physical and price contingencies is RMB221.0 million (about US\$ 26.6 million).
5. The detailed implementation schedule for the resettlement program has been drawn up. The specific compensation and relocation related activities, which need to be completed before construction on a given section of the highway can be initiated, have been clearly listed in the RAP.
6. The entire process of resettlement planning has been participatory. Census and socioeconomic surveys were conducted with the full participation of affected persons. The local township and county governments were fully involved in the process of RAP preparation. Implementation will involve local level institutions and the representatives of the affected people. In order to ensure that each affected household is fully informed about the resettlement program, APCD will distribute resettlement information booklets to them after the project is appraised and the Bank approves the RAP.

## Annex 9

### Anhui Provincial Highway Project Environment Assessment and Action Plan Summary

#### A. Background

1. Environmental Assessment (EA) of Hefei - Anqing Expressway (HAE) was carried out by Highway Research Institute, Ministry of Communication. The draft EA documents were submitted to the Bank in April 1998 and reviewed by the Bank during the Pre-Appraisal Mission in May 1998.
2. The draft final Environmental Impact Assessment Report (EIA), Environmental Action Plan (EAP) and Executive Summary (ES) of HAE were submitted to the Bank in June 1998, and found satisfactory.
3. Regarding the Highway Maintenance Program (HMP), it was agreed that a Sectoral Environment Assessment Approach would be applied. Accordingly, an Initial Environmental Evaluation (IEE) report and an EAP of the HMP component under the project were prepared and submitted to the Bank in June 1998 and found satisfactory.
4. During the EA work, the local people along the project route have been intensively consulted, and their opinions have been reflected in the project design and environmental mitigation measures, as appropriate.
5. The policy and administrative requirements for environmental assessment of development projects in China were followed during preparation and evaluation of the EA, as well as the Bank's policy. Major laws and regulations applied to the EA for the Anhui Provincial Highway Project are presented below.
  - (a) Environmental Protection Law of the Peoples' Republic of China (PRC);
  - (b) Atmospheric Pollution Control Law of PRC;
  - (c) Environmental Noise Control Law of PRC;
  - (d) Water Pollution Control Law of PRC;
  - (e) Cultural Relics Protection Law of PRC;
  - (f) Circular on Strengthening Environmental Impact Assessment Management for Construction Projects Financed by International Financial Organizations (June 1993).
6. The scope of and the criteria for the EIA is presented below.
  - (a) **Noise:** The EA covers areas within 200 m from both sides of the alignment. Class II noise standards (60 dB(A) in daytime and 50 dB(A) at night) are applied to schools and hospitals. Class IV standards (70 dB(A) in daytime and 55 dB(A) at night) are applied to other areas such as residential areas.



- (b) **Air pollution:** The areas covered by EA are the same as those for noise. Class II standards are applied to the project.
- (c) **Ecological conditions (water, soil, etc.):** The EA covers areas within 200 m along the alignment. If there are any sensitive areas, study areas were extended to cover these areas.
- (d) **Target year for the predictions:** In light of the construction schedule of the project, environmental predictions are carried out at three stages: at initial operational stage around 2002, at medium-term around 2010, and long-term around 2020.

## B. Brief Project Description

7. The Anhui Provincial Highway Project includes the following components for which environmental assessments are needed: (i) Construction of Hefei-Anqing Expressway (HAE: 153 km); and (ii) Highway Maintenance Program of about 240 km.

## C. Baseline Environmental Description

8. **Natural Environment:** The project area belongs to the sub-tropical moist monsoon climate zone, with distinct four seasons. The average annual temperature is 15 - 17 °C and the annual precipitation is about 1,000 - 1,500 mm. The proposed alignment mostly goes through hilly areas, where agricultural activities are dominant. There are plenty of ponds and canals within the project area, which are mainly used for agricultural irrigation. The EA ensures that there is no natural habitats and environmentally protected areas along the project area. Also, no protected fauna and flora are observed along the project area.

9. **Socio-Economic Situations:** The proposed alignment goes through Hefei City, Liuan and Chaohu Prefectures, and Anqing City with a population of around 20.7 million in total. These areas are relatively rich in mineral resources such as iron, aluminum and other non-ferrous metals. Also, there are tourist resources in these areas. However, these resources are generally under-utilized and agriculture is major industry. Living conditions along the project area are higher than the provincial average.

10. **Air and Noise Quality:** According to the baseline monitoring, the current air quality (CO, NO<sub>x</sub> and TSP) along the project areas are generally in good condition. Present acoustic environmental conditions are generally good along the proposed alignment.

11. **Water Quality:** The project area is relatively abundant with water resource. According to the baseline monitoring data, water quality along the project area is generally in good conditions.

12. **Cultural Property:** According to the currently available information, there is no cultural property along the project area.

## D. Potential Environmental Impacts and Their Mitigation Measures

13. Major environmental impacts and their mitigation measures are summarized below. The mitigation measures identified are reflected in the project documents, as appropriate.

## Design Phase

14. **Alternatives Analysis:** During the preparation of the project, three options were discussed from an environmental point of view as well. The option 3 (west route) traverses through mountainous areas and would bring potential risks of soil erosion. Affected areas of option 2 (middle route) are largest in size among three options. For these reasons, option 1 (east route) was recommended as a proposed alignment.

15. **Irrigation System:** In order to minimize problems of interference on irrigation system resulting from the project, a large number of culverts were included in the project design.

16. **Soil Erosion:** Mitigation measures to minimize soil erosion were reflected in the engineering designs, such as rational utilization of waste soil, proper design and protection of slopes, and construction of ditches and other drainage structures.

17. **Noise and Air Pollution:** Noise and air pollution mitigation measures are identified and reflected in the engineering design of the project. These include plantation of trees, and installation of surrounding walls. Several buildings will be relocated due to the significant noise impacts.

## Construction Phase

18. Dust and other air pollution, noise pollution, and water pollution have been identified as potential impacts of the project during the construction phase.

19. **Dust and Other Air Pollution:** Fugitive dust and other air pollution have been identified as major environmental impacts during the construction work of HAE. Construction sites will be sprayed with water to minimize fugitive dust. Appropriate measures will be implemented to minimize adverse impacts of transportation of construction materials.

20. **Noise:** Operation of heavy machinery and other construction activities will cause adverse impacts on acoustic environment at the populated project areas, in particular, at environmentally sensitive sites such as schools and hospitals. Strict regulations of schedule of construction works will be implemented to minimize such adverse impacts. Construction works will be prohibited near residential areas and other sensitive sites between 10:00 p.m. and 6:00 a.m.

21. **Soil Erosion and Irrigation System:** In order to minimize soil erosion and vegetation loss, trees and grasses plantation will be carried out, as appropriate. Temporary drainage system will be developed, where necessary, to minimize soil erosion and adverse impacts on irrigation system.

22. **Water Pollution:** Appropriate measure will be undertaken to prevent direct discharges of polluted water from construction activities into rivers and canals. In case of bridge construction, machinery and construction boats will be maintained in a proper manner to prevent accidental oil spills. Hazardous construction materials such as asphalt and oil will be safely stored. Garbage and wastes from construction activities including those from construction camps will be handled in an appropriate manner to avoid water pollution and sanitary problems.

23. **Cultural Property:** Construction works will be stopped in case new cultural relics are discovered as a result of road construction or excavation activities. The local cultural property authorities will be informed and a field survey of the site will be undertaken. Necessary mitigation measures will be implemented, as appropriate.

## **Operation Phase**

24. **Noise and Air Pollution:** According to the noise predictions, the noise levels during the first ten years of the operation phase generally meet the standards. During 2010-2020, the noise levels exceed the standards at limited sensitive sites. In order to mitigate such noise pollution, appropriate measures including construction of noise barriers will be implemented. The predicted air pollution levels generally meet the standards. In order to avoid future noise and air pollution problems, development of residential areas, and construction of sensitive buildings such as schools and hospitals will be prohibited in the vicinity of the highways.

25. **Other Pollution:** In order to prevent water pollution from the service areas, appropriate treatment facilities will be installed. Garbage at the service areas will be regularly collected and disposed in a proper manner.

## **E. Environmental Monitoring**

26. During the construction and operation phases, environmental monitoring will be carried out to verify the actual impacts on the environment, identify unexpected environmental problems at early stage, and adjust environmental measures as appropriate. An annual monitoring report would be furnished to the Bank by January 31 of each year starting in 2000 during the construction phase and for each of the first three years following completion of construction.

## **Construction Phase**

27. Noise and TSP will be regularly measured at major sensitive sites along main highways in each province. Regarding water quality monitoring, SS and oil will be monitored. Detailed information about monitoring activities such as frequencies, sites, methods are included in EAP, respectively.

## **Operation Phase**

28. Monitoring items include noise and NO<sub>x</sub> at major sensitive sites. Waste water quality (COD, BOD and oil) will be monitored at service areas. Detailed information about monitoring activities such as frequencies, sites, methods are included in EAP, respectively.

## **F. Institutional Arrangements and Training**

29. The Environmental Protection Office of APCD is responsible for implementing environmental mitigation measures for the project. Also, in each construction supervision team, one staff will be assigned for environmental supervision at construction on sites. An environmental training will be carried out in a timely manner, which comprises (i) overseas study tour/training for environmental management and administration (3.5 person-months) and (ii) domestic training for environmental engineering and techniques (28 person-months) including those for contractors of each section.

## **G. Environmental Aspects of HMP**

30. In the IEE and EAPs for the HMP, the following items are concisely described: (i) A brief project description; (ii) Overview of environmental conditions of project areas; (iii) Potential impacts and mitigation measures; and (iv) Environmental management.

31. **A Brief Project Description.** The HMP includes 6 road segments with a total length of about 240 km. No new road construction works are included in the HMP. Also, no land acquisition is envisaged under the project.

32. **Baseline Conditions and Potential Impacts.** All six road segments are located in relatively flat areas with small hilly areas. Major industry in the project areas is agriculture. There are no natural protection areas and no cultural property in the project areas. Since all the HMP subprojects are small in size of construction works, no significant environmental pollution is envisaged. Potential impacts would be ordinary issues caused by civil works such as noise and dust pollution during the construction phase. Those impacts are short-term and temporary.

33. **Environmental Mitigation Measures and Management.** All necessary mitigation measures such as strict control of noisy construction machinery and spraying water are identified in EAPs. APCD will be responsible for environmental management for this project.

#### **H. Public Consultation and Information Disclosure**

34. **Public Consultation and Feedback.** During the EA work, the local people have been intensively consulted. The following approaches have been adopted for public consultation under this project: (i) Consultation meetings with local governments/representatives; and (ii) Questionnaire analysis of public opinion supplemented by interviews.

35. Major concerns from the public are all resettlement-related issues. Those other than resettlement-related issues include: (i) noise and air pollution during the construction phase and (ii) tree planting within the project areas. Those comments are reflected in the engineering designs and the EAP.

36. **Information Disclosure:** Final EIA, EAP and ES were submitted to the Bank in June 1998. Those environmental documents were made public locally at Provincial Communication Department. Following receipt of a letter of agreement on release from the APCD, those documents would be sent to the PIC.

## Annex 10 Anhui Provincial Highway Project Financial Management

APCD (the executing agency) will establish financial management acceptable to the Bank as below:

**Accounting.** The executing agency modified their accounting system under the instruction of MOF and maintained the new system since July 1993. The purpose of the modification was to link Chinese accounting system with general international accounting standard. The proposed project will be managed by the new accounting system which has been proven adequate. APCD has its own financial department with the experienced capable financial staff. Their capability has been proven through implementation of similar project to the proposed project.

**Auditing.** APCD will be audited by the Provincial Auditing Bureau under the administration of State Audit Administration (SAA). Anhui Province have been experienced in auditing Bank-financed projects. APCD has an Audit Division which will periodically audit financial situation of APCD. An auditing report will include:

- (a) Project Financial Statements to oversee progress of the project
- (b) Executing Agency Financial Statements to ensure that the project is financially viable and may warrant continued funding
- (c) Statement of Expenditures (SOEs) to verify that claimed expenditures were properly supported
- (d) Special Accounts to verify that funds were properly disbursed for project-related expenditures throughout
- (e) Reports on Internal Control to report outlining any recommendation for improving internal accounting controls identified as a result of a financial statement audit

**Financial Management Reports.** It was agreed that APCD will submit the following reports not later than six months after the end of each fiscal year following the format acceptable to the Bank:

- 1) **Financial Statements** consisting of:
  - (a) Statement of Sources and Uses of Fund;
  - (b) Special Account Reconciliation Statement, which will be the basis for replenishment;
  - (c) Expenditures by disbursement categories; and
  - (d) Project expenditure forecast for six months by activity.
- 2) **Project Progress Report** (project implementation progress)
- 3) **Procurement Management Report** for prior review contracts for goods, works and consultants' services.

Although APCD has no experience in borrowing the Bank loan, Anhui Province has good records in complying the Bank's financial covenants.

**Annex 11**  
**Anhui Provincial Highway Project**  
**Project Processing Budget and Schedule**

	<b>Planned (At draft PAD stage)</b>	<b>Actual (10/30/98)</b>
A. Project Budget (US\$000)	220,000	173,900
B. Project Schedule		
Time taken to prepare the project (months)		
First Bank mission (identification)	10/26/1997	10/26/1997
Appraisal mission departure	08/31/1998	8/31/1998
Negotiations	10/19/1998	10/26/1998
Planned Date of Effectiveness	04/15/1998	/ /19
Prepared by: Anhui Provincial Communications Department		
Preparation assistance: Japanese Trust Funds (review of designs and bid documents for civil works and for E&M works, and Highway Safety)		
Bank staff who worked on the project included:		
Name	Specialty	
Yasuhiro Kawabata	Task Team Leader/Technical, Procurement	
Robin Carruthers	Sector Review/Economic Analysis	
Han-Kang Yen	Financial Analysis	
Claude Salem	Institutional Strengthening/Training	
Takashi Matsumura	Environment	
Soichiro Seko	Environment	
Maninder Gill	Resettlement	
Hoi-Chan Nguyen	Legal	
Philip Daltrop	Legal	
Hyung Min Kim	Disbursement	
Xin Chen	Project Coordination, RMC	
Malou Juico	Task Assistant	
Consultant who worked on the project included:		
Shigeru Iwama	Highway Safety	

## Annex 12 Anhui Provincial Highway Project Documents in the Project File

- A. Project Implementation Plan, July 1998
- B. Feasibility Studies
  - Feasibility Study Report (Hefei-Gaohebu Expressway), August 1997
    - Volume I and II
    - Attachment I (Drawings and Tables)
    - Attachment II (Cost Estimates)
    - Main Text (Anqing Linking Road)
    - Attachment (Anqing Linking Road)
- C. Resettlement Action Plan, May 1998
- D. Environment (EIA, EAP, Summary)
  - Summary of Environmental Impact Assessment Implementation, June 1998
  - Environmental Protection Implementation Plan, June 1998
  - Environmental Assessment Statement, June 1998
- E. Institutional Strengthening and Training, February 1998
- F. Economic and Financial Report
  - Report of Economic/Financial Evaluation and Evaluation of the Project, Dec. 1998
  - Further Information on Economic Evaluation, Dec. 1998
  - Revised Traffic Projections, Dec. 1998
- G. Highway Maintenance Improvement Component, May 1998
- H. Equipment Procurement Report, May 1998
- I. Highway Safety Program, May 1998
- J. Prospectus for Anhui Expressway Company Limited, November 1997
- K. Request for Proposals for Consultant's Services for Supervision of Construction of Hefei-Anqing Expressway, March 1998
- L. Prequalification Document for Civil Works, March 1998
- M. Report on the Preparation of Highway Safety Component, November 1997
- N. Review of Engineering Designs and Bidding Documents, Phase I Final Report, November 1997  
Phase II Final Report, June 1998

## Annex 13 Statement of Loans and Credits

### Status of Bank Group Operations in China IBRD Loans and IDA Credits in the Operations Portfolio

Project ID	Loan or Credit No.	Fiscal Year	Borrower	Purpose	Original Amount in US\$ Millions				Difference Between expected and actual disbursements a/	
					IBRD	IDA	Cancellations	Undisbursed	Orig	Frm Rev'd
Number of Closed Loans/credits: 210										
<u>Active Loans</u>										
CN-PE-3539	IBRD43220	1998	PRC	SUST COAST RES DEV	100.00	0.00	0.00	100.00	.84	0.00
CN-PE-3566	IDA30750	1998		BASIC HLTH SERVICES	0.00	85.00	0.00	83.57	0.00	0.00
CN-PE-35698	IBRD43500	1998	PRC	HUNAN POWER DEVELOP.	300.00	0.00	0.00	300.00	0.00	0.00
CN-PE-3591	IBRD43090	1998	PRC	STATE FARMS COMMERCI	150.00	0.00	0.00	150.00	0.00	0.00
CN-PE-3606	IBRD43040	1998	GOC	ENERGY CONSERVATION	63.00	0.00	0.00	63.00	.64	0.00
CN-PE-3614	IBRD43290	1998	PEOPLE'S REPUBLIC OF CHIN	GUANGZ. CITY CRT.TRP	200.00	0.00	0.00	200.00	3.04	0.00
CN-PE-3619	IBRD43280	1998	MINISTRY OF FINANCE	2ND INLAND WATERWAYS	123.00	0.00	0.00	123.00	8.00	0.00
CN-PE-36414	IBRD43480	1998	CHINA	GUANGXI URBAN ENV.	72.00	0.00	0.00	72.00	0.00	0.00
CN-PE-36414	IDA30970	1998	CHINA	GUANGXI URBAN ENV.	0.00	20.00	0.00	19.76	0.00	0.00
CN-PE-36949	IBRD43270	1998	PEOPLES REPUBLIC OF CHINA	NAT.HWY 3-HUBEI	250.00	0.00	0.00	250.00	5.00	0.00
CN-PE-40185	IBRD42370	1998	PRC	SHANDONG ENVIRONMENT	95.00	0.00	0.00	95.00	12.20	0.00
CN-PE-45788	IBRD43560	1998	PEOPLE'S REPUBLIC OF CHIN	TRI-PROVINCIAL HWY	230.00	0.00	0.00	230.00	9.07	0.00
CN-PE-46563	IBRD43410	1998	PRC	TARIM BASIN II	90.00	0.00	0.00	90.00	0.00	0.00
CN-PE-46563	IDA30930	1998	PRC	TARIM BASIN II	0.00	60.00	0.00	59.16	0.00	0.00
CN-PE-46952	IBRD43250	1998	PRC	FOREST. DEV. POOR AR	100.00	0.00	0.00	100.00	0.00	0.00
CN-PE-46952	IDAN0390	1998	PRC	FOREST. DEV. POOR AR	0.00	100.00	0.00	98.56	0.00	0.00
CN-PE-49700	IBRD43540	1998	PRC	IAIL-2	300.00	0.00	0.00	300.00	0.00	0.00
CN-PE-51736	IBRD43030	1998	GOC	E. CHINA/JIANGSU PWR	250.00	0.00	0.00	250.00	0.00	0.00
CN-PE-56491	IDA30780	1998	PRC	HEBEI EARTHQUAKE	0.00	28.40	0.00	27.99	0.00	0.00
CN-PE-34081	IBRD42000	1997	PRC	XIAOLANGDI MULTI. II	230.00	0.00	0.00	204.83	76.49	0.00
CN-PE-34081	IBRD42001	1997	PRC	XIAOLANGDI MULTI. II	200.00	0.00	0.00	191.78	76.49	0.00
CN-PE-3590	IBRD41870	1997	PRC	QINBA MTS. POVTY RED	30.00	0.00	0.00	30.00	22.39	0.00
CN-PE-3590	IDAN0280	1997	PRC	QINBA MTS. POVTY RED	0.00	150.00	0.00	134.05	22.39	0.00
CN-PE-3635	IBRD4063A	1997	PRC	VOC. ED. REFORM PROJ	10.00	0.00	0.00	10.00	4.73	0.00
CN-PE-3635	IDA28980	1997	PRC	VOC. ED. REFORM PROJ	0.00	20.00	0.00	12.80	4.73	0.00
CN-PE-3637	IDAN0270	1997	PRC	NATL RUR WATER III	0.00	70.00	0.00	65.22	8.06	0.00
CN-PE-36405	IBRD41790	1997	PRC	WANJIAZHAI WATER TRA	400.00	0.00	0.00	344.78	140.77	0.00
CN-PE-3643	IBRD40990	1997	PRC	XINJIANG HIGHWAYS II	300.00	0.00	0.00	250.92	36.26	0.00
CN-PE-3650	IBRD41720	1997	GOC	TUOKETUO POWER/INNER	400.00	0.00	0.00	400.00	77.18	0.00
CN-PE-3654	IBRD41240	1997	PRC	HUNAN/GUANG HWY2-NH2	400.00	0.00	0.00	370.43	63.76	0.00
CN-PE-36952	IDA29540	1997	PRC	BASIC ED. IV	0.00	85.00	0.00	60.12	-14.96	0.00
CN-PE-38988	IBRD41610	1997	PRC	HEILONGJIANG ADP	120.00	0.00	0.00	101.02	2.62	0.00
CN-PE-44485	IBRD41970	1997		SHANGHAI WAIGAOQIAO	400.00	0.00	0.00	400.00	34.97	0.00
CN-PE-34618	IBRD3967A	1996	PRC	LABOR MARKET DEV.	10.00	0.00	0.00	9.49	19.73	0.00
CN-PE-34618	IDA28000	1996	PRC	LABOR MARKET DEV.	0.00	20.00	0.00	15.20	19.73	0.00
CN-PE-3507	IBRD3933A	1996	GOC	ERTAN HYDRO II	177.68	0.00	0.00	39.33	-36.25	0.00
CN-PE-3507	IBRD3933B	1996	GOC	ERTAN HYDRO II	88.84	0.00	0.00	2.32	-36.25	0.00
CN-PE-3563	IBRD40010	1996	PRC	ANIMAL FEED	150.00	0.00	0.00	144.00	84.30	4.00
CN-PE-3569	IBRD39290	1996	P.R.C.	SHANGHAI-ZHEJIANG HI	260.00	0.00	7.75	127.54	17.65	5.31
CN-PE-3589	IDA27940	1996	PRC	DISEASE PREVENTION	0.00	100.00	0.00	74.19	49.10	0.00
CN-PE-3594	IBRD40280	1996	PRC	GANSU HEXI CORRIDOR	60.00	0.00	0.00	60.00	18.67	0.00



Project ID	Loan or Credit No.	Fiscal Year	Borrower	Purpose	Original Amount in US\$ Millions				Difference Between expected and actual disbursements a/		
					IBRD	IDA	Cancellations	Undisbursed	Orig	Frm	Rev'd
CN-PE-3594	IDA28700	1996	PRC	GANSU HEXI CORRIDOR	0.00	90.00	0.00	68.12	18.67	0.00	
CN-PE-3599	IBRD40550	1996	YUNNAN PROV. GOV.	YUNNAN ENVIRONMENT	125.00	0.00	0.00	125.00	6.58	0.00	
CN-PE-3599	IDA28920	1996	YUNNAN PROV. GOV.	YUNNAN ENVIRONMENT	0.00	25.00	0.00	16.02	6.58	0.00	
CN-PE-3602	IBRD39660	1996	PRC	HUBEI URBAN ENV. PRO	125.00	0.00	0.00	125.00	66.37	0.00	
CN-PE-3602	IDA27990	1996	PRC	HUBEI URBAN ENV. PRO	0.00	25.00	0.00	8.20	66.37	0.00	
CN-PE-3638	IBRD40440	1996	PRC	SEEDS SECTOR COMMER.	80.00	0.00	0.00	80.00	25.24	0.00	
CN-PE-3638	IDA28860	1996	PRC	SEEDS SECTOR COMMER.	0.00	20.00	0.00	9.02	25.24	0.00	
CN-PE-3646	IBRD40450	1996	PRC	CHONGQING IND POL CT	170.00	0.00	0.00	169.90	75.90	0.00	
CN-PE-3648	IBRD39870	1996	SHANGHAI MUN. GOVT	SECOND SHANGHAI SEWE	250.00	0.00	0.00	188.55	67.89	0.00	
CN-PE-3649	IDA28340	1996	CHINA	SHANXI POVERTY ALLEV	0.00	100.00	0.00	41.76	-14.88	0.00	
CN-PE-3652	IBRD39860	1996	PRC	2ND SHAAIXI PROV HWY	210.00	0.00	0.00	163.13	52.79	0.00	
CN-PE-36950	IDA28310	1996	PRC	BASIC ED. POOR III	0.00	100.00	0.00	27.34	-21.89	0.00	
CN-PE-40513	IBRD40270	1996	PRC	2ND HENAN PROV HWY	210.00	0.00	0.00	186.11	39.12	0.00	
CN-PE-3493	IBRD39106	1995	PRC	INLAND WATERWAYS	210.00	0.00	0.00	107.00	6.19	0.00	
CN-PE-3571	IBRD38976	1995	PRC	RAILWAYS VII	400.00	0.00	0.00	390.75	142.75	0.00	
CN-PE-3585	IBRD37880	1995	GOC	SHENYANG IND. REFORM	175.00	0.00	0.00	112.30	39.50	0.00	
CN-PE-3596	IBRD3874A	1995	PRC	YANGTZE BASIN WATER	97.26	0.00	0.00	43.62	-21.01	0.00	
CN-PE-3596	IDA27100	1995	PRC	YANGTZE BASIN WATER	0.00	110.00	0.00	8.46	-21.01	0.00	
CN-PE-3598	IBRD37810	1995	PRC	LIAONING ENVIRONMENT	110.00	0.00	0.00	75.09	52.23	0.00	
CN-PE-3600	IBRD3847A	1995	PRC	TECHNOLOGY DEVELOPEME	194.99	0.00	0.00	155.68	40.92	0.00	
CN-PE-3603	IBRD3773A	1995	PRC	ENT. HOUSING SOC. SE	262.51	0.00	0.00	234.92	147.89	0.00	
CN-PE-3603	IDA26420	1995	PRC	ENT. HOUSING SOC. SE	0.00	75.00	0.00	3.89	147.89	0.00	
CN-PE-36041	IBRD38736	1995	MOF	FISCAL & TAX REF. &	25.00	0.00	0.00	25.00	39.14	0.00	
CN-PE-36041	IDA27090	1995	MOF	FISCAL & TAX REF. &	0.00	25.00	0.00	16.61	39.14	0.00	
CN-PE-3612	IBRD37870	1995	PRC	XINJIANG HIGHWAY I	150.00	0.00	0.00	74.93	51.60	0.00	
CN-PE-3634	IDA26550	1995	PRC	MATERNAL CHILD HEALTH	0.00	90.00	0.00	28.13	12.03	0.00	
CN-PE-3636	IDA26510	1995	PRC	BASIC EDUC IN POOR &	0.00	100.00	0.00	6.93	-3.92	0.00	
CN-PE-3639	IBRD39066	1995	PRC	SOUTHWEST POV. REDUC	47.50	0.00	0.00	34.41	22.50	0.00	
CN-PE-3639	IDA27440	1995	PRC	SOUTHWEST POV. REDUC	0.00	200.00	0.00	78.39	22.50	0.00	
CN-PE-3642	IBRD3846A	1995	PRC	ZHEJIANG POWER DEVT	154.15	0.00	0.00	54.96	-16.09	0.00	
CN-PE-3642	IBRD3846B	1995	PRC	ZHEJIANG POWER DEVT	215.67	0.00	0.00	146.55	-16.09	0.00	
CN-PE-3647	IDA26540	1995	PRC	ECONOMIC LAW REFORM	0.00	10.00	0.00	5.92	5.22	0.00	
CN-PE-36947	IBRD3848A	1995	GOC	SICHUAN TRANSMISSION	270.00	0.00	0.00	151.46	115.80	54.32	
CN-PE-37156	IDA27560	1995	PRC	IODINE DEF. DISORDER	0.00	20.00	0.00	4.10	13.89	-4.36	
CN-PE-3502	IDA25390	1994	MOH	RUR HEALTH MANPOWER	0.00	110.00	0.00	33.08	22.75	0.00	
CN-PE-3504	IBRD37480	1994	PRC	HEBEI/HENAN NATIONAL H'WAYS	380.00	0.00	0.00	86.42	16.06	0.00	
CN-PE-3540	IDA26160	1994	PRC	LOESS PLATEAU	0.00	150.00	0.00	32.62	-31.01	0.00	
CN-PE-3557	IDA26230	1994	PRC	FOREST RESOURCE DEV	0.00	200.00	0.00	67.71	27.88	-17.45	
CN-PE-3562	IBRD37270	1994	PRC	XIAOLANGDI MULTIPURPOSE	460.00	0.00	0.00	1.00	-.65	0.00	
CN-PE-3586	IBRD3711S	1994	PRC	SHANGHAI ENVIRONMENT	160.00	0.00	0.00	74.80	63.50	0.00	
CN-PE-3593	IDA25710	1994	PRC	SONGLIAO PLAIN ADP	0.00	205.00	0.00	38.86	-12.45	0.00	
CN-PE-3595	IDA25630	1994	PRC	RED SOILS II DEVELOP	0.00	150.00	0.00	45.07	14.39	0.00	
CN-PE-3609	IBRD3716A	1994	GOC	SICHUAN GAS DEV & CONSERVATION	175.45	0.00	0.00	137.14	67.94	0.00	
CN-PE-3622	IBRD3652S	1994	SHANGHAI MUNICIPAL GOVT	SHANGHAI MTP II	150.00	0.00	0.00	10.39	10.40	0.00	
CN-PE-3626	IBRD3681A	1994	GOC	FUJIAN PROV HIGHWAY	80.33	0.00	0.00	60.53	15.19	0.00	
CN-PE-3633	IBRD3687A	1994	GOVERNMENT OF PRC	TELECOMMUNICATIONS	132.76	0.00	30.00	24.33	53.66	0.00	
CN-PE-3641	IBRD3718A	1994	PRC	YANGZHOU THERMAL POWER	248.16	0.00	0.00	81.24	40.60	0.00	
CN-PE-3644	IDA26050	1994	PRC	XIAOLANGDI RESETTLEMENT	0.00	110.00	0.00	32.80	8.34	0.00	
CN-PE-3473	IDA24750	1993	P.R.C.	ZHEJIANG MULTICITIES	0.00	110.00	0.00	38.07	38.54	0.00	
CN-PE-3509	IDA24570	1993	PRC	CHANGCHUN WAT SUPP &	0.00	120.00	27.55	19.29	43.41	1.84	
CN-PE-3512	IBRD3552S	1993	GOVT OF PEOPLES REP. OF C	SHANGHAI PORT REST.	124.26	0.00	0.00	4.63	22.52	1.28	
CN-PE-3518	IBRD3530S	1993	PRC	GUANGDONG PROV. TRANSPORT	240.00	0.00	0.00	2.08	-7.94	0.00	
CN-PE-3533	IBRD3572A	1993	PRC	TIANJIN IND. II	82.68	0.00	0.00	49.46	49.12	8.29	

Project ID	Loan or Credit No.	Fiscal Year	Borrower	Purpose	Original Amount in US\$ Millions				Difference Between expected and actual disbursements a/		
					IBRD	IDA	Cancellations	Undisbursed	Orig	Frm	Rev'd
CN-PE-3559	IDA24620	1993	PRC	AGRIC. SUPPORT SERVI	0.00	115.00	0.00	10.18	-6.50	0.00	
CN-PE-3561	IDA24110	1993	PRC	SICHUAN ADP	0.00	147.00	0.00	11.05	3.03	0.00	
CN-PE-3567	IDA24710	1993	PRC	EFFECTIVE TEACHING S	0.00	100.00	0.00	41.88	41.52	13.39	
CN-PE-3570	IBRD35810	1993	PRC	RAILWAY VI	420.00	0.00	0.00	103.94	95.95	0.00	
CN-PE-3580	IBRD35820	1993	PRC	SO. JIANGSU ENVIRON. PROTECT.	250.00	0.00	0.00	15.06	4.79	0.00	
CN-PE-3581	IBRD35310	1993	PRC	HENAN PROV. TRANSPORT	120.00	0.00	0.00	11.34	11.36	0.00	
CN-PE-3592	IDA24470	1993	PRC	REF. INST'L.& PREINVEST(CRISP)	0.00	50.00	0.00	21.23	21.83	0.00	
CN-PE-3597	IBRD3560A	1993	PRC	TAIHU BASIN FLOOD CONTROL	88.65	0.00	0.00	56.20	56.80	0.00	
CN-PE-3597	IDA24630	1993	PRC	TAIHU BASIN FLOOD CONTROL	0.00	100.00	0.00	4.74	56.80	0.00	
CN-PE-3616	IBRD3606A	1993	PRC	TIANHUANGPING HYDRO	196.60	0.00	0.00	70.87	46.93	0.00	
CN-PE-3623	IDA24230	1993	PRC	FINANCIAL SECTOR T.A	0.00	60.00	0.00	23.07	15.48	0.00	
CN-PE-3627	IBRD3624A	1993	PRC	GRAIN DISTRIBUTION P	325.00	0.00	0.00	325.00	349.07	-122.27	
CN-PE-3627	IDA25180	1993	PRC	GRAIN DISTRIBUTION P	0.00	165.00	0.00	40.50	349.07	-122.27	
CN-PE-3632	IDA25220	1993	ROC	ENVIRONMENT TECH ASS	0.00	50.00	0.00	11.78	12.44	0.00	
CN-PE-3486	IBRD3406A	1992		RAILWAYS V	33.73	0.00	0.00	29.05	29.07	0.00	
CN-PE-3492	IBRD3412S	1992	GOC	DAGUANGBA-HAINAN	28.88	0.00	0.00	1.13	-72	0.00	
CN-PE-3492	IDA23050	1992	GOC	DAGUANGBA-HAINAN	0.00	37.00	0.00	.42	-72	0.00	
CN-PE-3503	IBRD3462A	1992		ZOUXIAN THERMAL POWE	26.78	0.00	0.00	8.98	5.66	0.00	
CN-PE-3534	IBRD3471A	1992	PRC	ZHEJIANG PROV TRANSP	70.13	0.00	0.00	24.00	24.00	1.80	
CN-PE-3544	IDA23390	1992	PEOPLE'S REPUBLIC OF CHIN	EDUC DEV IN POOR PRO	0.00	130.00	0.00	3.88	-63	0.00	
CN-PE-3555	IDA23070	1992	PRC	GUANGDONG AG. DEVT.	0.00	162.00	0.00	2.94	-8.61	0.00	
CN-PE-3564	IBRD3415A	1992	BEIJING MUNICIPALITY	BEIJING ENVIRONMENT	32.90	0.00	0.00	26.30	24.76	0.00	
CN-PE-3564	IDA23120	1992	BEIJING MUNICIPALITY	BEIJING ENVIRONMENT	0.00	80.00	0.00	3.63	24.76	0.00	
CN-PE-3565	IDA22960	1992		SHANGHAI METRO TRANS	0.00	60.00	0.00	3.69	.68	0.00	
CN-PE-3568	IDA23870	1992	R.O.C.	TIANJIN URB DEV & EN	0.00	100.00	0.00	24.30	21.93	0.00	
CN-PE-3587	IDA23360	1992	PRC	RURAL WAT SUPP & SAN	0.00	110.00	0.00	.25	-2.23	-7.12	
CN-PE-3624	IDA23170	1992	MIN. OF PUBL.HEALTH	INFECTIOUS DISEASES	0.00	129.60	0.00	38.88	32.61	30.10	
CN-PE-3478	IDA22100	1991	PRC	KEY STUDIES DEVELOPM	0.00	131.20	0.00	.73	-8.7	0.00	
CN-PE-3560	IDA22420	1991	PRC	HENAN AGRIC. DEVT.	0.00	110.00	0.00	1.73	-4.96	0.00	
CN-PE-3582	IBRD3337T	1991	PRC	IRRIG. AGRIC. INTENS	45.05	0.00	0.00	2.37	-5.15	0.00	
Total					12,912.96	4,720.20	65.30	10,385.95	3,606.80	-153.14	
					<u>Active Loans</u>		<u>Closed Loans</u>		<u>Total</u>		
Total Disbursed (IBRD and IDA):					7,111.13	12,795.51		19,906.64			
of which has been repaid:					17.33	2,312.86		2,330.19			
Total now held by IBRD and IDA:					17,550.52	10,140.40		27,690.92			
Amount sold :					0.00	0.00		0.00			
Of which repaid :					0.00	0.00		0.00			
Total Undisbursed :					10,385.95	15.77		10,401.72			

a. Intended disbursements to date minus actual disbursements to date as projected at appraisal.

b. Rating of 1-4: see OD 13.05, Annex D2. Preparation of Implementation Summary (Form 590). Following the FY94 Annual Review of Portfolio performance (ARPP), a letter based system will be used (HS = highly Satisfactory, S = satisfactory, U = unsatisfactory, HU = highly unsatisfactory): see proposed Improvements in Project and Portfolio Performance Rating Methodology (SecM94-901), August 23, 1994.

Note: Disbursement data is updated at the end of the first week of the month.

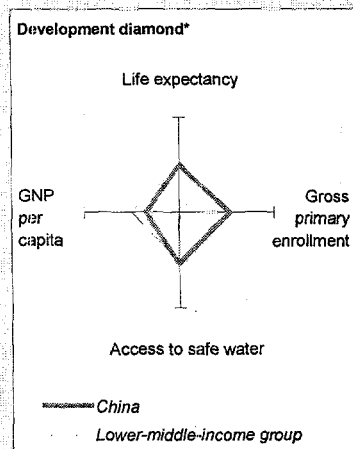
Annex 14

# China at a glance

8/28/98

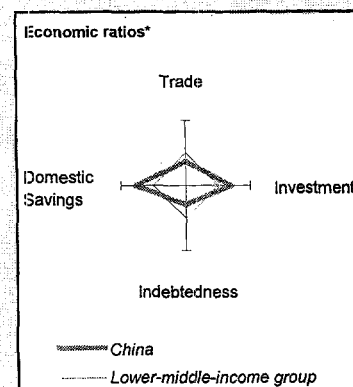
## POVERTY and SOCIAL

	China	East Asia & Pacific	Lower-middle-income
<b>1997</b>			
Population, mid-year (millions)	1,227.2	1,753	2,285
GNP per capita (Atlas method, US\$)	860	970	1,230
GNP (Atlas method, US\$ billions)	1,055.4	1,707	2,818
<b>Average annual growth, 1991-97</b>			
Population (%)	1.1	1.3	1.2
Labor force (%)	1.1	1.4	1.3
<b>Most recent estimate (latest year available, 1991-97)</b>			
Poverty (% of population below national poverty line)	7	..	..
Urban population (% of total population)	32	32	42
Life expectancy at birth (years)	70	69	69
Infant mortality (per 1,000 live births)	32	38	36
Child malnutrition (% of children under 5)	16	16	..
Access to safe water (% of population)	90	84	84
Illiteracy (% of population age 15+)	19	17	19
Gross primary enrollment (% of school-age population)	118	115	111
Male	119	118	116
Female	117	116	113



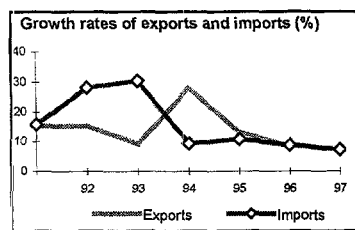
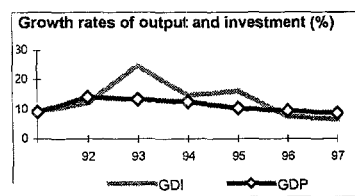
## KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1976	1986	1996	1997
GDP (US\$ billions)	148.8	295.7	825.0	935.0
Gross domestic investment/GDP	28.4	37.7	39.2	38.2
Exports of goods and services/GDP	5.1	12.2	19.3	22.3
Gross domestic savings/GDP	29.0	35.2	41.3	42.2
Gross national savings/GDP	29.0	35.3	40.0	42.2
Current account balance/GDP	0.2	-2.5	1.1	4.3
Interest payments/GDP	0.0	0.2	0.6	0.6
Total debt/GDP	0.0	8.0	15.6	14.8
Total debt service/exports	0.0	9.6	8.8	9.2
Present value of debt/GDP	..	..	14.1	..
Present value of debt/exports	..	..	65.1	..
<b>(average annual growth)</b>				
GDP	9.3	10.1	9.6	8.8
GNP per capita	8.3	8.5	8.6	7.2
Exports of goods and services	18.8	14.0	8.3	..



## STRUCTURE of the ECONOMY

	1976	1986	1996	1997
<b>(% of GDP)</b>				
Agriculture	33.2	27.1	20.2	19.7
Industry	42.3	44.0	49.0	50.8
Manufacturing	30.1	35.5	38.1	39.5
Services	24.5	28.9	30.8	29.5
Private consumption	63.3	51.4	47.6	47.2
General government consumption	7.7	13.4	11.1	10.5
Imports of goods and services	4.5	14.7	17.1	18.2
<b>(average annual growth)</b>				
Agriculture	6.0	4.4	5.1	3.9
Industry	11.0	13.9	12.1	10.5
Manufacturing	12.8	13.3	11.7	10.5
Services	12.0	8.7	7.9	9.4
Private consumption	9.3	8.8	11.9	..
General government consumption	9.4	9.6	8.3	..
Gross domestic investment	10.8	11.3	7.6	6.6
Imports of goods and services	22.5	12.8	8.8	7.2
Gross national product	9.8	9.9	9.7	8.2



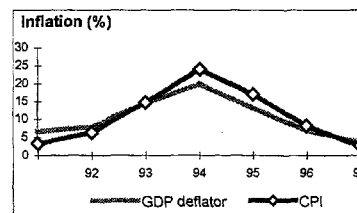
Note: 1997 data are preliminary estimates.

\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

China

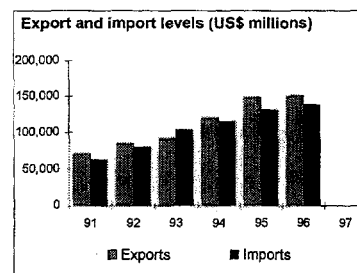
**PRICES and GOVERNMENT FINANCE**

	1976	1986	1996	1997
<b>Domestic prices</b>				
(% change)				
Consumer prices	..	6.6	8.3	2.8
Implicit GDP deflator	2.6	4.6	7.0	3.9
<b>Government finance</b>				
(% of GDP, includes current grants)				
Current revenue	..	24.0	11.3	11.6
Current budget balance	..	5.6	0.6	0.6
Overall surplus/deficit	..	-1.8	-1.5	-1.5



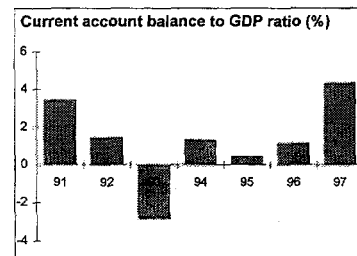
**TRADE**

	1976	1986	1996	1997
(US\$ millions)				
Total exports (fob)	..	30,942	151,073	..
Food	..	4,448	10,232	..
Fuel	..	3,683	5,929	..
Manufactures	..	19,670	129,141	..
Total imports (cif)	..	42,904	138,828	..
Food	..	2,002	..	..
Fuel and energy	..	504	6,877	..
Capital goods	..	20,415	..	..
Export price index (1995=100)	..	66	..	..
Import price index (1995=100)	..	69	..	..
Terms of trade (1995=100)	..	96	..	..



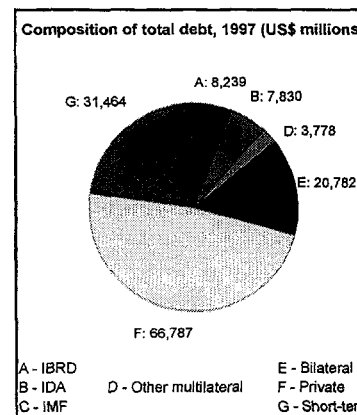
**BALANCE of PAYMENTS**

	1976	1986	1996	1997
(US\$ millions)				
Exports of goods and services	7,383	29,583	171,700	207,800
Imports of goods and services	7,125	37,472	154,100	167,200
Resource balance	258	-7,889	17,600	40,600
Net income	0	176	-12,500	-10,200
Net current transfers	0	255	4,200	10,200
Current account balance	258	-7,458	9,300	40,600
Financing items (net)	..	5,410	22,340	-4,900
Changes in net reserves	..	2,048	-31,640	-35,700
<b>Memo:</b>				
Reserves including gold (US\$ millions)	..	..	..	..
Conversion rate (DEC, local/US\$)	1.9	3.5	8.3	8.3

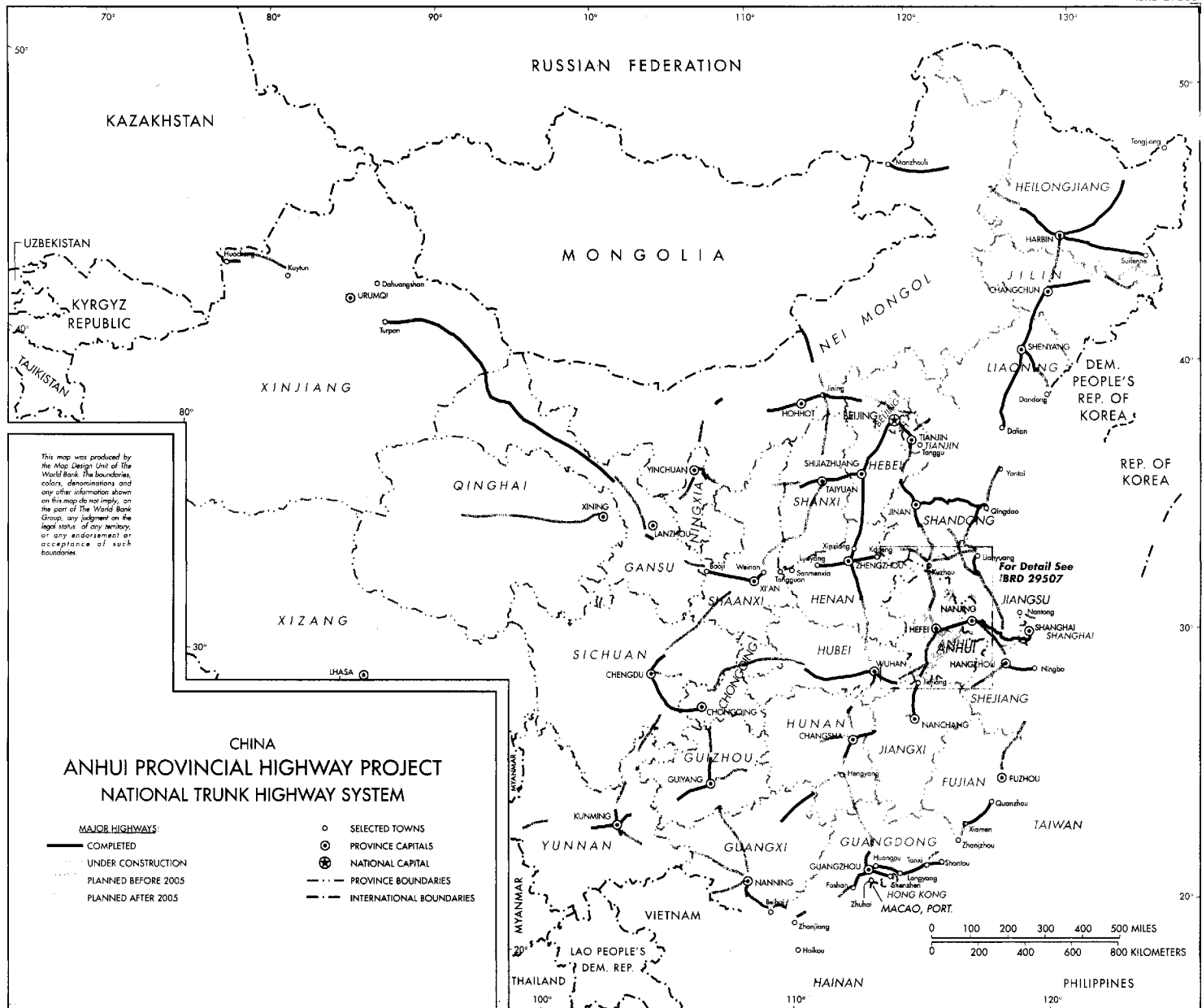


**EXTERNAL DEBT and RESOURCE FLOWS**

	1976	1986	1996	1997
(US\$ millions)				
Total debt outstanding and disbursed	..	23,719	128,817	138,006
IBRD	..	965	7,616	8,239
IDA	..	774	7,579	7,830
Total debt service	..	2,973	15,756	19,933
IBRD	..	66	840	858
IDA	..	8	73	81
Composition of net resource flows				
Official grants	..	155	248	255
Official creditors	..	1,165	4,359	2,315
Private creditors	..	3,693	6,454	3,835
Foreign direct investment	..	1,875	40,180	37,000
Portfolio equity	..	0	3,466	0
World Bank program				
Commitments	..	1,120	1,900	2,425
Disbursements	..	607	2,097	2,275
Principal repayments	..	0	364	377
Net flows	..	607	1,734	1,898
Interest payments	..	75	549	562
Net transfers	..	532	1,185	1,335



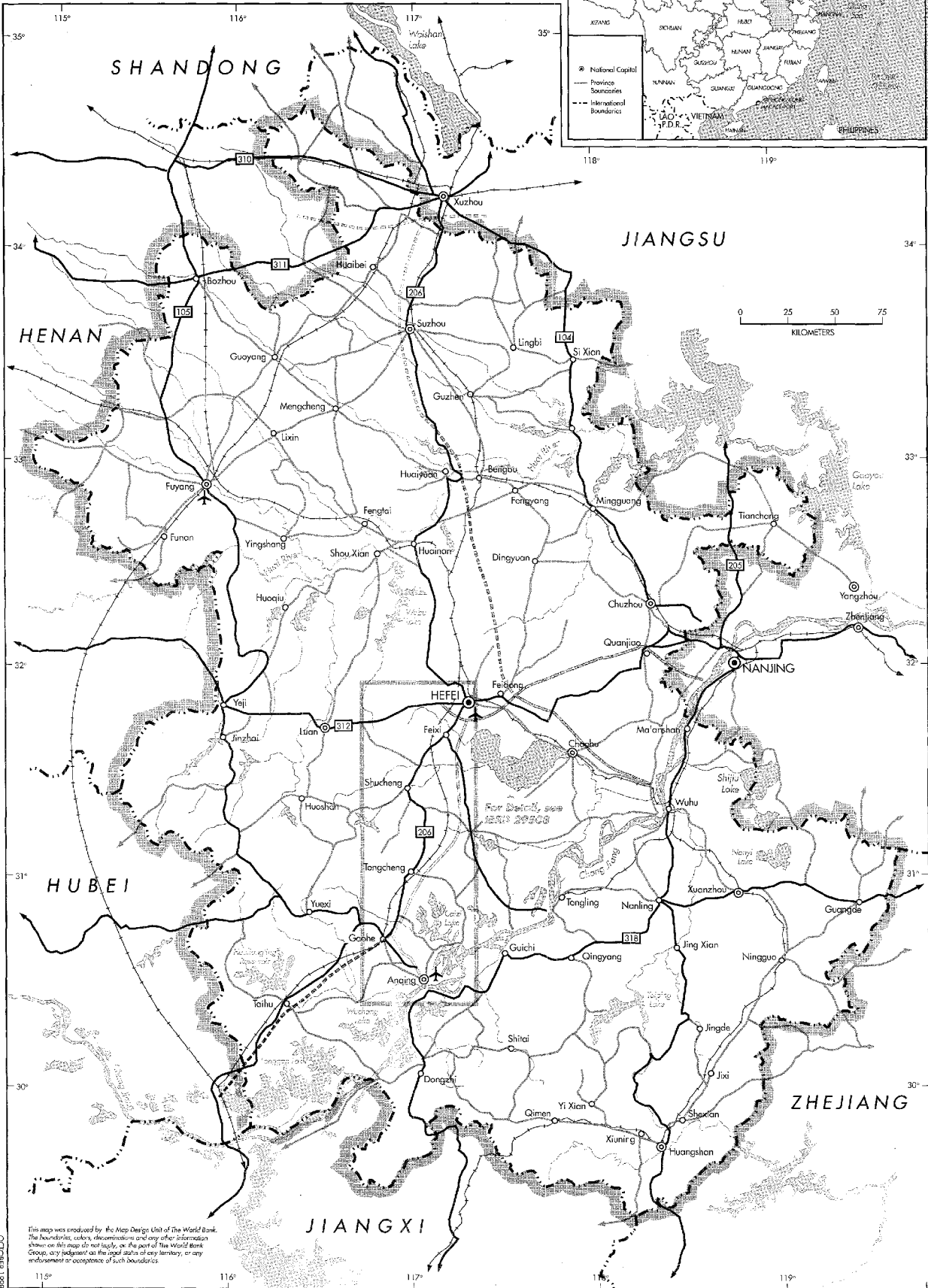
**MAP SECTION**



**CHINA**  
**ANHUI PROVINCIAL HIGHWAY PROJECT**  
**ANHUI TRANSPORT SYSTEM**

- NATIONAL ROADS
- PROVINCIAL ROADS
- RAILROADS
- SELECTED CITIES
- PREFECTURE CAPITALS
- PROVINCE CAPITALS
- AIRPORTS
- RIVERS
- PROVINCE BOUNDARIES

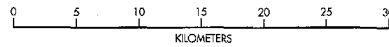
- PROPOSED HEFEI - ANQING EXPRESSWAY
- EXPRESSWAY UNDER PLANNING
- EXPRESSWAY CONSTRUCTED WITH GOVERNMENT FUNDS
- EXPRESSWAY UNDER CONSTRUCTION WITH GOVERNMENT FUNDS



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# CHINA ANHUI PROVINCIAL HIGHWAY PROJECT HEFEI - ANQING EXPRESSWAY

- PROPOSED HEFEI - ANQING EXPRESSWAY (HAE)
- EXTENSION TO HUBEI BORDER (UNDER CONSTRUCTION)
- INTERCHANGES
- SERVICE AREA
- TOLL STATIONS
- EXPRESSWAYS
- NATIONAL ROADS
- PROVINCIAL ROADS
- RAILROADS
- AIRPORT
- RIVERS
- LAKES



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