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Report No: 27681-CHA

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$200 MILLION

TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR A

HUBEI SHIMAN HIGHWAY PROJECT

May 25, 2004

Transport Sector Unit
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective May 2004)

Currency Unit = RMB
RMB 1.00 = US$0.12
US$1.00 = RMB 8.28

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AAA	Analytical and Advisory Services
CAS	Country Assistance Strategy
CITC	China International Tendering Company
EIA	Environmental Impact Assessment
EMDP	Ethnic Minorities Development Plan
EMP	Environmental Management Plan
E&M	Electrical and Mechanical
FMS	Financial Management Specialist
FSL	Fixed-Spread Loan
GDP	Gross Domestic Product
GOC	Government of China
HCTC	Hubei Communication Technical College
HERO	Hubei Expressway Resettlement Office
HPCD	Hubei Provincial Communications Department
HPFD	Hubei Provincial Financial Department
HPHAB	Hubei Provincial Highway Administration Bureau
HPHDI	Hubei Provincial Highway Design Institute
HPSEC	Hubei Provincial Shiman Expressway Company Ltd
HPSECH	Hubei Provincial Shiman Expressway Construction Headquarter
ICB	International Competitive Bidding
LRIP	Local Roads Improvement Program
LIBOR	London Interbank Offerer Rate
MOC	Ministry of Communications
MOF	Ministry of Finance
NDRC	National Development and Reform Commission
NTHS	National Trunk Highway System
OED	Operations Evaluation Department
RAP	Resettlement Action Plan
SCCB	Shiyan City Communications Bureau
SME	Shiyan-Manchuangan Expressway
TBL	Tendering and Ridding Law of China
TOR	Terms of Reference
VSL	Variable-Spread Loan
WBFPO	World Bank Financed Project Office

Vice President:	Jemal-ud-din Kassum
Country Manager/Director:	Yukon Huang
Sector Manager:	Jitendra N. Bajpai
Task Team Leader:	Michel Bellier

CHINA
Hubei Shiman Highway Project

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MAPS

CHINA

HUBEI SHIMAN HIGHWAY PROJECT

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC

EASTR

Date: May 25, 2004	Team Leader: Michel Bellier
Country Director: Yukon Huang	Sectors: Roads and highways (97%);Sub-national government administration (3%)
Sector Manager/Director: Jitendra N. Bajpai	Themes: Infrastructure services for private sector development (P);Rural services and infrastructure (P);Administrative and civil service reform (P);Trade facilitation and market access (S);Injuries and non-communicable diseases (S)
Project ID: P081749	Environmental screening category: Full Assessment
Lending Instrument: Specific Investment Loan	Safeguard screening category: Limited impact

Project Financing Data

[X] Loan [ ] Credit [ ] Grant [ ] Guarantee [ ] Other:

For Loans/Credits/Others:
Total Bank financing (US$m.): 200.00
Proposed terms: VSL

Financing Plan (US$m)

Source	Local	Foreign	Total
BORROWER	329.00	0.00	329.00
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT	0.00	200.00	200.00
Total:	329.00	200.00	529.00

Borrower:
People's Republic of China
China

Responsible Agency:
Hubei Provincial Communications Department
No. 428, JianShe Ave.
Hankou
Wuhan
Hubei

China
430030
Tel: (027) 8346-0753 Fax: (027) 8386-0754
projectoffice@hbjt.gov.cnn

Estimated disbursements (Bank FY/US$m)									
FY	5	6	7	8	9	0	0	0	0
Annual	60.00	60.00	40.00	30.00	10.00	0.00	0.00	0.00	0.00
Cumulative	60.00	120.00	160.00	190.00	200.00	200.00	200.00	200.00	200.00

Project implementation period: Start July 1, 2004 End: December 31, 2008
Expected effectiveness date: October 29, 2004
Expected closing date: June 30, 2009

Does the project depart from the CAS in content or other significant respects? ***Ref. PAD A.3***	[ ]Yes [X] No
Does the project require any exceptions from Bank policies? ***Ref. PAD D.7***	[ ]Yes [X] No
Have these been approved by Bank management?	[ ]Yes [ ] No
Is approval for any policy exception sought from the Board?	**[ ]Yes [X] No**
Does the project include any critical risks rated "substantial" or "high"? ***Ref. PAD C.5***	**[ ]Yes [X] No**
Does the project meet the Regional criteria for readiness for implementation? ***Ref. PAD D.7***	**[X]Yes [ ] No**

Project development objective ***Ref. PAD B.2, Technical Annex 3***
The main objective of the project is to support socioeconomic development of Hubei province by enhancing its access to other provinces, particularly the western region of China, improving local mobility within poor, remote western parts of the province, and strengthening governance of the provincial road sector.

Project description *[one-sentence summary of each component]* ***Ref. PAD B.3.a, Technical Annex 4***
The project has three components: highway capacity investment (the SME), the Local Road Improvement Program (the LRIP), and institutional strengthening, policy development and road safety initiatives. These activities aim to strengthen HPCD's capacity to manage the provincial highway network efficiently and improve the sustainability of provincial highway sector financing. Expected improvements in the quality of roads will lead to lower transport costs throughout the province and lower life-cycle costs for road maintenance. Adopting more efficient practices for managing road will promote effective use of public funds, thereby enhancing the contribution of the highway network to economic development and its responsiveness to social needs. Finally, road traffic safety initiatives will reduce accident rates, thereby saving lives and addressing negative road impacts.

Which safeguard policies are triggered, if any? ***Ref. PAD D.6, Technical Annex 10***
Environmental Assessment (OP/BP/GP 4.01)
Cultural Property (OPN 11.03, being revised as OP 4.11)Involuntary Resettlement (OP/BP 4.12)

Significant, non-standard conditions, **if any**, for:
Ref. PAD C.7
Board presentation:

Loan/credit effectiveness:
Issuance of acceptable legal opinions

Covenants applicable to project implementation:
- Quarterly reports on the progress of SME and LRIP works and highlighting any environmental issues.
- Annual report on results of monitoring and evaluation activities and progress of the project.
- Semi-annual and annual environment monitoring reports.
- Semi-annual and annual internal resettlement monitoring reports, and semi annual and annual external resettlement monitoring reports.
- Analysis and recommendations on the structure of toll rates on the SME by June 30, 2007.
- Operations risk management plan on the SME by December 31, 2007.
- Social assessment and if necessary Resettlement Action Plan and Ethnic Minorities Development Plan on each LRIP road section.
- Annual report on training activities by January 31 of each year commencing in January 2005.
- Study on group management of projects by January 31, 2006.
- Study on new technologies in maintenance by June 30, 2007.
- Study on capital mobilization by December 31, 2007.
- Pilot study on expressway asset management by December 31, 2007.
- Study on the safety of commercial transport operations by December 31, 2007.
- Highway safety management plan by December 31, 2007.

A. STRATEGIC CONTEXT AND RATIONALE

1. Country and sector issues

Despite the significant expansion of China's National Trunk Highway System (NTHS) in support of domestic market integration since the 1980s, the road network is sparse and logistics costs are high compared to developed countries because of inadequate modal integration and service sector response. Furthermore, western and central regions continue to suffer from poor accessibility, causing isolation and income inequality. Finally, sector governance at both national and provincial levels needs strengthening to make institutions responsive to market needs for transport services, able to better manage road assets, develop a sustainable financing mechanism, and address externalities of the sector such as safety and environment.

The length of Chinese highway has doubled since 1980, reaching 1.76 million km in 2002. Yet the highway network remains one of the sparsest in the world (0.19 km per square km) and does not meet trade and transport needs. Logistics costs in China, at 18 percent of GDP (2000), are high in comparison to developed countries like the United States (9.5 percent in the mid-1990s), and transport costs make up about 50 percent of logistics costs—twice the percentage of those in developed economies.

Despite China's accomplishments in reducing poverty in the past 20 years, more than 200 million people still live on less than $1 a day. In addition, economic growth has not been equally distributed among China's regions—the per capita income in the 12 western and central provinces is less than half that in the coastal provinces. Many people in the lagging regions lack access to basic health and education services because transport infrastructure is inadequate.

China has increased road sector funding significantly in recent years—to approximately $167 billion during 1997–2002. However, current funding sources—taxation and issuance of public debt—cannot meet demand for the highway network, and these modes of financing are not sustainable.

China is likely to face major reconstruction costs in the future if funding for periodic maintenance continues at the current low level. Provincial communication departments need to transform themselves into managers of road assets providing more cost-effective construction and operation services to road users.

Finally, the combination of fast expansion of the highway system, increasing traffic, and a lack of coordinated safety efforts led to almost 110,000 traffic fatalities in 2002, three times the U.S. figure but with a fraction of the number of vehicles. Without improved safety measures, fatalities are estimated to increase by more than 90 percent in the next 20 years.

2. Rationale for Bank involvement

The Bank's involvement in the highway sector at the provincial level aims at:

- sharing global knowledge and improving provincial road sector governance in resource management, project selection, design and quality of execution, asset management, externality management (safety and environment), and sector regulations to better serve emerging market needs; and
- supporting the government's effort to develop western and central provinces by further integrating these economies with the rest of the country.

The Bank's steady involvement over time is essential for improving the province understanding of highway management issues and building institutional capacity and ownership for change, so that best practices can have demonstration effect on other provinces. This project builds on the results of the three previous Bank projects in the Hubei highway sector.

3. Higher level objectives to which the project contributes

The Bank's Country Assistance Strategy for China calls for:

- improving the business environment and helping accelerate the transition to a market economy;
- addressing the needs of poorer and disadvantaged people and regions; and
- facilitating an environmentally sustainable development process.

Furthermore, the Country Assistance Strategy identifies the strengthening of regional integration and competitiveness through a well-functioning multimodal transport system as a key objective, entailing the facilitation of trade and support to the development of lagging western regions. Within that framework, the Bank's highway strategy is to help the government meet its transport sector objectives and at the same time support the achievement of the Millennium Development Goals. The project will facilitate trade, support China's transition to a market economy, address the transport needs of less-developed areas, and help open up western provinces by increasing road capacity to meet demand for road transport and enhancing the efficiency of the highway sector.

B. PROJECT DESCRIPTION

1. Lending instrument

The Bank will finance the project through a specific investment loan. The Borrower has selected the variable-spread loan (VSL) option in which the spread over LIBOR is reset every semester. The Borrower's main reason for selecting a VSL rather than a fixed-spread loan (FSL) is because FSL charges are slightly higher than VSL charges and because the Borrower does not foresee using the conversion options of the FSL. VSL repayment terms are governed by standard country terms.

2. Program objective and phases

Not applicable

3. Project development objective and key indicators

The main objective of the project is to support socioeconomic development of Hubei province by enhancing its access to other provinces, particularly the western region of China, improving local mobility within poor, remote western parts of the province, and strengthening governance of the provincial road sector. The project will produce the following outputs:

- The construction of Shiyan–Manchuangan Expressway (SME), which will increase transportation capacity in a corridor connecting Hubei to western provinces.
- A program of local road improvements (LRIP) in the poor northwestern part of Hubei.
- A series of institutional strengthening and policy development activities for road management and improvements in road safety in Hubei.

The following key results indicators have been selected:

- SME: traffic levels on the expressway and on the parallel national highway (NH316); percentage of long distance traffic and breakdown by users category on SME.
- LRIP: average daily traffic, transport costs and daily bus-services on improved local roads, numbers of days they are closed, GDP per capita, employment rate and population under poverty threshold in areas served by LRIP road sections.
- Institutional activities:
  - Increased skills of Hubei Provincial Communication Department (HPCD) staff through skills assessment
  - Adoption of asset management principles ensuring better management of Hubei expressway network
  - Sustainable model for financing the HPCD road network
  - Adopting new technologies to improve the efficiency and effectiveness of highway management and operations
  - Improved management of new highway projects through institutional changes
  - Percentage of Class 1 and Class 2 roads systematically treated in accordance with the HPCD safety management plan
  - Percentage of road freight and passenger transport enterprises systematically screened in accordance with the safety review processes.

4. Project components

The project has three components: highway capacity investment (the Shiyan – Manchuangan expressway), the Local Road Improvement Program, and institutional strengthening and policy development and road safety initiatives. These activities aim to strengthen HPCD's capacity to manage the provincial highway network efficiently and improve the sustainability of provincial highway sector financing. Expected improvements in the quality of roads will lead to lower transport costs throughout the province and lower life-cycle costs for road maintenance. Improved sustainability of financing will promote effective use of public funds, thereby enhancing the contribution of the highway network to economic development and its responsiveness to social needs. Finally, road traffic safety initiatives will reduce accident rates, thereby saving lives and addressing negative road impacts.

Highway Capacity Investment (US$414.88 million)

The project will improve highway capacity in northwestern Hubei province with the construction of the 105.1 km long Shiyan – Manchuangan expressway (SME) between Shiyan in northwestern Hubei and the border with Shaanxi province. In Shiyan, SME will link to the Xiangfan–Shiyan (Xianshi) Expressway, which opened for traffic in December 2003, thereby completing the corridor between Hubei capital, Wuhan, and Shaanxi. There SME will connect to an expressway section planned to reach Xi'an, the Shaanxi capital, and eventually Yinchuan in Ningxia province farther north.

SME will support and integrate urban and rural economic activities in Hubei. Moreover, SME will facilitate interregional trade and passenger movement to and from western provinces by making shorter itineraries possible, thus reducing transport costs for long-distance traffic.

Local Road Improvement Program (US$50.70 million)

The LRIP aims to improve the competitiveness of the local economy and bring socioeconomic benefits to roadside communities by enhancing people's mobility and ability to access education, health, and other social service. A series of Class III, Class IV and unclassified roads will be rehabilitated or upgraded in Shiyan City, which is comprised of several poor counties, in a remote area in the mountainous northwest of Hubei province. That area was selected because of the low-income (in 2002 GDP per capita was RMB 2,201 [US$266] outside urbanized zones in 2002, 26 percent of the provincial average), the condition of local roads, the high priority the province gives to improving accessibility in this area, and the potential for leveraging the benefits of the SME, which will traverse Shiyan City.

The LRIP component will have two phases. The first phase, estimated to cost $21.3 million, has been identified: the upgrading of Baoxia–Zhushan road (85 km) to Class III standard and the construction of the Jiangjunhe bridge over the Han River. Additional local road sections comprised into a second phase will be identified during project implementation.

Institutional strengthening, policy development and road safety (US$6.36 million)

The Bank has supported a number of institutional strengthening and road management initiatives in its ongoing highway projects in Hubei province, and this project will build on that work. It will assist HPCD in adopting more efficient practices for managing the road network. The following activities will be undertaken:

- *Training program.* The project will finance a program of domestic and overseas training for staff from HPCD, dependent organisms, and entities involved in the project, in areas identified during a training-needs assessment review, with the support of the Hubei Communications Technical College (HCTC).
- *Pilot study on expressway asset management.* HPCD will pilot-test total asset management for an expressway. This study will cover the complete range of asset management issues, address the applicability of asset management in Hubei Province, and identify the steps necessary to implement that approach on the entire HPCD road network.
- *Capital mobilization study.* This study will determine a strategy for mobilizing capital for meeting highway sector needs for construction, maintenance, and management at 5-, 10-, and 20-year horizons.
- *Study on new technologies for road maintenance.* This study will identify and test technologies that offer possibilities for improving the quality and efficiency of road maintenance.
- *Study on Expressway Project Group Management.* This study will investigate ways for the HPCD to improve the efficiency of executing large projects by consolidating activities, streamlining operations, or using new IT solution.
- *HPCD safety management plan for Class 1 and Class 2 roads.* The project will prepare an HPCD safety management plan that sets out its road safety goals, objectives, policies, and priorities for Class I and Class II roads and the organizational processes and measures that it is taking to effectively implement them.

- *Safety review process for road freight and passenger transport enterprises.* The project will develop a safety review process for road freight and passenger transport enterprises in Hubei Province, specifying mandatory safety requirements, procedures and monitoring arrangements for the granting, continuation and removal of freight and passenger transport operating licenses.
- *Procurement of equipment.* The project will procure equipment for (i) construction quality control and environmental monitoring, (ii) operation and maintenance of SME after opening and the highway network, (iii) strengthening the institutional capacity of HPCD.

5. Lessons learned and reflected in the project design

Operation Evaluation Department (OED)'s assessments of the Bank's highway portfolio in China highlight a high level of client satisfaction with investment components that have contributed to the fulfillment of many of the sector and macroeconomic objectives of the Bank's assistance strategy. Nevertheless institutional initiatives of projects undertaken with provinces have had less impact. Issues with coordination among ministries and levels of governments, such as for road safety matters, have been found especially detrimental to the policy agenda. OED's evaluation and the Bank's earlier road projects also have found issues with the design of some projects. The following lessons are reflected in the design of the current project.

Develop innovations in project design. The development and testing of an asset management approach on part of the provincial expressway network could introduce a way for road agencies to transform themselves into policymakers and regulators.

Ensure client ownership of institutional components. HPCD has built on its experience under the ongoing highway projects to determine the priorities of the institutional strengthening, policy development, and road safety component. For example, the asset management study draws on the results of a road maintenance study and the development of road information systems funded by the Bank.

Avoid giving sole priority to the construction of expressways because that affects provinces' financial capacity to improve road accessibility in poor areas and the condition of existing roads. SME will serve a remote and less-developed area of Hubei province and the LRIP will rehabilitate and upgrade lower-class local roads in one of the poorest areas of Hubei.

Avoid design changes and variations during construction. In many past projects in China, the technical complexity of highway construction and operation was underestimated, which led to substantial cost overruns and construction delays. To address technical risks, especially high for SME, which will cross a mountainous area, HPCD has followed a highly interactive process in designing alignment alternatives, assessing technical, environmental, and social impacts, and cross-validating design results by engineering firms and other experts.

Implement resettlement operations on time. HPCD established the project resettlement organization at the beginning of feasibility studies and carried out comprehensive field surveys to prepare the resettlement action plan (RAP), and resettlement operations have started.

Avoid setting toll rate levels too high. High toll rates deter would-be users from diverting from other roads to the toll expressway and affect the economic and financial viability of the project. During preparation, an economic and financial evaluation of the impact of toll rates on the

project's economic return concluded that the rate considered by HPCD, US cents 6.02 per km, is in the range of similar projects in China (see Section D.1 and Annex 9 for more details).

Internalize and disseminate study recommendations. HPCD and the Bank held an in-depth dialogue during project preparation that led to a good understanding of issues and of how to tailor the scopes of institutional studies. The studies are a compromise between improved approaches with potential for scaling up (asset management study and road safety management plan) and pragmatism aiming to take the local situation and institutional constraints into consideration.

6. Alternatives considered and reasons for rejection

Project objectives. To enhance development impact, the scope of the project includes a local mobility component for poor areas and a program of institutional strengthening and road safety initiatives along with the originally proposed expressway construction.

SME design. At the request of the Bank, HPCD compared a Class I or II highway alternative to the expressway option. HPCD retained the expressway standards for the following reasons:

- Maintain consistency with sections already built or planned on the rest of the Wuhan–Yinchuangan corridor, which serves provincial capitals;
- Meet the medium- to long-term demand forecast by HPCD (and confirmed by a Bank study), although lower standards may be sufficient in the first years of operation;
- Avoid revisiting the long-term need for an expressway, when building a Class I or II road instead of an expressway saves relatively little compared to overall construction costs because of the mountainous terrain and other topographic constraints;
- Maintain the project's economic benefits, which will be achieved only with higher (expressway) vehicle speeds.

HPCD also assessed the feasibility of a phased construction of SME. However, doubling the numerous tunnels and bridges in the mountainous terrain and organizing civil works with traffic on the completed carriageway would pose technical challenges and raise costs. Furthermore, attempts to phase works in other provinces have increased road accidents significantly.

SME alignment. In the feasibility study, HPCD compared two main corridors: one along the valleys where the existing provincial Class II highway runs, and a more direct alignment across remote and less-populated areas more to the south. The first alternative was found to be a better compromise in terms of servicing urban areas and reducing environmental impact and investment costs. Furthermore, HPCD and its design institutes have progressively refined the alignment of the SME through several rounds of identifying and comparing alternatives according to economic, technical, financial, environmental, and social criteria.

Private financing. SME will be a toll facility and will generate income from users. HPCD discarded the private financing alternative at the feasibility study stage because the financial assessment showed that the project could not be viable without a large government contribution to investment costs; the level of traffic expected at opening and during the early years of operation is too low to make project returns high enough to attract private investors. Thus, HPCD made the decision to provide the infrastructure from public funds, establish a

government-owned company to operate the expressway, and pursue the possibility of commercializing the asset when income increases.

Area for the LRIP. HPCD decided to improve rural road sections in Shiyan City, a poor and remote area in western Hubei Province because the other area where development lags—Ens'hi prefecture—has benefited in the past three years from significant highway investments under national programs to support western regions.

Institutional strengthening, policy development and road safety. The main institutional alternative considered was to apply asset management to the full HPCD network and use the results to prepare a business plan for HPCD. Although this is a desirable outcome, the Bank and HPCD decided it was too difficult for HPCD to undertake in a single step. Pilot-testing asset management while conducting complementary studies will bring together efforts and greatly improve HPCD's management of the network. As for road safety, the following alternative components drawing on outputs of ongoing projects were appraised, taking into account the acknowledged need for a long-term vision and strategic objectives for safety improvements in the province: safety at road-works sites, safety audit procedures for improved road management, road safety villages, speed monitoring tools for expressways, and truck and bus safety. The first three were rejected as duplicative of previous projects' objectives, and the fourth because it did not fit comfortably within the scope of HPCD's responsibilities and spheres of influence. Furthermore, a highway safety management plan component was added to integrate and optimize the safety components of previous and ongoing projects and bring the necessary long-term vision and strategic focus to HPCD road safety initiatives.

C. IMPLEMENTATION

1. Partnership arrangements (if applicable)

Not applicable.

2. Institutional and implementation arrangements

HPCD, the provincial agency responsible for road management in Hubei will implement the project. The Bank-Financed Project Office (WBFPO), an HPCD department that has worked on three ongoing Bank-financed highway projects, is responsible for coordinating project preparation and will remain the Bank's main counterpart during implementation. Similar arrangements have proven effective under the previous projects.

HPCD has created a dedicated project headquarter, the Hubei Provincial Shiman Expressway Construction Headquarter (HPSECH), to implement and manage the SME. HPCD has also established the Hubei Provincial Shiman Expressway Company Ltd. (HPSEC) to operate the expressway after its opens; HPSEC will assist HPSECH during the project implementation. HPCD has hired experienced domestic design institutes to carry out SME design studies. HPSECH, as the client and project management office, will manage construction works with the assistance of a supervision organization made up of domestic firms and an international consultant. HPSEC will take over the operations of SME after it opens.

With respect to resettlement, a dedicated Hubei Expressway Resettlement Office (HERO) has been established and will lead resettlement operations under the oversight of the provincial resettlement leading group. The HERO has prepared the Resettlement Action Plan (RAP). The resettlement organization also comprises resettlement local units established along the alignment with local governments at City, county/banner, and township levels, whose staff will receive

training under the project. Other provincial agencies will also be involved according to their responsibilities. HPCD will issue regulations for the approval and use of resettlement funds and streamline the payment process to avoid the allocation of funds to other purposes.

On environment, the Environmental Management Plan (EMP) includes the practical and cost-effective measures necessary to mitigate project-related impacts and specifies monitoring plans, training, institutional arrangements, implementation schedule, and budget needs. An environmental unit of HPCD will supervise the implementation of the EMPs with the cooperation of environmental protection agencies during construction. The Borrower has developed ample in-house capacity to address environmental issues under previous projects.

With respect to the LRIP, the Hubei Provincial Highway Administration Bureau (HPHAB), the HPCD agency in charge of managing the provincial highway network, is responsible for identifying and preparing specific projects with the assistance of a design institute selected on SME for design issues and WBFPO for safeguard issues. HPHAB has designated the Shiyan City Communications Bureau (SCCB) as the implementing entity for the LRIP. For the procurement of contractors this bureau will report directly to HPSEC which is preparing tender documents. SCCB will be assisted by domestic firms for the supervision of works. The implementation of EMPs prepared on each road section will also be supervised by the environmental unit of HPCD under the oversight of the WBFPO.

Finally, the WBFPO is preparing the institutional strengthening, policy development, and road safety component and will coordinate the implementation of these activities. Other HPCD units may contribute to some of them.

The Bank loan will be signed between the People's Republic of China and the Bank through the Ministry of Finance (MOF), and on-lending arrangements will be signed between MOF and the Government of Hubei Province. Hubei Provincial Finance Department (HPFD) will make funds available to HPCD and one special account will be established at HPFD.

The Bank's financial management assessment concluded that the project will have in place an adequate project financial management system.

3. Monitoring and evaluation of outcomes/results

Under the coordination of WBFPO, monitoring and evaluation data will be collected by HPCD or other project agencies during project implementation, with the assistance of firms hired specifically for some instances. Baseline information and target values were agreed with HPCD during preparation (see Annex 3). Result indicators and their evaluation, when required, will be provided to the Bank in the annual progress reports that HPCD will prepare. No task will entail specific costs to be financed by the project

SME

HPSEC will provide information about the progress of SME works. The WBFPO will coordinate the collection of traffic data, to be provided by HPHAB for counting stations on highways and by HPSEC for SME after it opens to traffic. Environmental monitoring will be entrusted to the environment unit reporting to WBFPO, which is also responsible for coordinating the preparation of information on resettlement required by the RAP; in addition, HPCD will hire an external resettlement monitoring entity.

LRIP

Indicator data will come from three sources:

- WBPFO for overall implementation indicators and civil works progress reports
- Stations managed by HPHAB or local communications authorities for traffic count
- Provincial statistics bureau or county statistics bureau for social indicators.

Institutional strengthening, policy development, and road safety

WBFPO will provide monitoring results for all activities.

4. Sustainability

The sustainability of project financing is ensured by the strong support from both Hubei provincial government and central government agencies, including the Ministry of Communications (MOC), National Development and Reform Commission, and MOF. The project is specified in Hubei province's Tenth Five-year Plan and has been approved by the provincial government. SME is also included in one of the eight high-priority expressway corridors planned by MOC to foster the development of western provinces and therefore will benefit from an MOC grant. Finally, the State Council approved the project feasibility study in February 2004.

HPCD has assembled a strong team to prepare and implement the project. HPSECH, responsible for SME and overseeing the procurement of LRIP works, is managed by experienced staff transferred from the Xiangfan – Shiyan Expressway headquarters. Finally, the WBFPO, responsible for institutional activities, has very good experience with Bank-financed projects.

Toll revenues are expected to reimburse the debt incurred to finance SME, which represents the bulk of project costs. In general, the level of maintenance of toll highways financed by the Bank at opening has been adequate for initial volumes of traffic, and increasing operating expenses can be financed easily from toll income when traffic grows. Furthermore, the financial assessment has concluded that toll income will be sufficient to service SME debt.

5. Critical risks and possible controversial aspects

Events may adversely affect Hubei province's ability to meet project financial commitments. Nevertheless, experience from completed and ongoing Bank-financed highway projects indicates that counterpart funds for capital investment components are generally available on time. In addition, the Bank conducted a comprehensive financial analysis of the project and reviewed HPCD's budget forecasts during project preparation.

The risk that the expressway section in Shaanxi province reaching the border with Hubei is not constructed on time is mitigated by the province's confirmation that it plans to open that section at the same time as SME, as well as by MOC support.

Special attention has been given to traffic risks on SME, of special concern for this project because another expressway between Xi'an and Hefei through Henan is planned and will run about 150 km north of SME. Many feasibility studies from other expressway projects have made optimistic traffic forecasts and overestimated diversion rates from alternative roads. However, HPCD traffic forecasts were thorough and based traffic projections on the current situation, past development, best estimates of future provincial and national economic trends, and planned network capacity investments. In addition, a Bank-hired consultant assessed traffic studies

prepared by Hubei and Henan provinces for the Xi'an–Wuhan–Hefei corridor and concluded that Hubei's assumptions for traffic growth and diversion rates to SME are acceptable.

To address the risk that design standards and cost estimates of SME are not relevant, HPCD conducted the preliminary design on a larger scale than usual on the basis of detailed geotechnical investigations. Specific traffic safety risks, due to the long, steep and curvy slopes found in mountainous sections, will be addressed by emergency facilities, like parking bays or emergency deceleration gravel bed and reinforced signaling. Fire risks in the long tunnels will be mitigated by a series of design features, specific equipment and through operating procedures agreed with fire fighters. To identify resources required for managing the expressway and address operating risks, HPCD will prepare an operations risk management plan. Experts hired by HPCD and the Bank successively reviewed the engineering design before appraisal and confirmed the relevance of design options, and tendering documentation is based on the completed detailed engineering design.

The financial evaluation confirmed that toll income will generate enough revenue to finance SME operation and maintenance and allow HPCD to repay the loan. Furthermore, HPCD has confirmed its full financial support to the expressway company.

On institutional activities encompassing policy development, especially the expressway asset management initiative and road safety management plan, the risk of ineffective implementation is reduced as study goals have been determined by HPCD and discussions with the Bank have identified realistic objectives.

6. Loan/credit conditions and covenants

The effectiveness condition is the issuance of acceptable legal opinions.

The legal covenants specify the following stipulations:

- The proceeds of the loan will be on-lent to Hubei Province on the same terms and conditions as the Bank loan, with the province bearing the foreign exchange risk.
- The following reports will be submitted to the Bank for its approval and comment:
  - For SME
    - EMP and RAP on SME and connecting roads.
    - Quarterly reports on the progress of works and any environmental issue.
    - Analysis and recommendation on the structure of toll rates on SME by June 30, 2007.
    - Operations risk management plan by December 31, 2007.
  - For LRIP
    - Before commencing works on any rural road section
      - An EIA and EMP
      - In case land acquisition is required, a resettlement action plan
      - A social assessment to determine the necessity of a Ethnic Minority Development Plan (EMDP), and if necessary, the EMDP.
    - Quarterly concise reports on the progress of works and any environment issues.
    - Assessment of the social impacts of the LRIP by December 31, 2008.
  - For institutional strengthening, policy development, and road safety component
    - Annual training report.

- Study on expressway group management of projects by January 31, 2006.
- Study on new technologies in maintenance by June 30, 2007.
- Study on capital mobilization by December 31, 2007.
- Pilot study on expressway asset management by December 31, 2007.
- Study on the safety of commercial transport operations by December 31, 2007.
- Highway safety management plan by December 31, 2007.

— Reporting and monitoring
- Semiannual environmental monitoring report
- Semiannual and annual internal and independent monitoring reports of the resettlement activities
- Semiannual progress reports on the implementation of all project components.
- Annual monitoring and evaluation report of project implementation.

- Hubei Province must maintain a financial management system and provide semiannual unaudited project consolidated financial statements in accordance with accounting standards acceptable to the Bank. Hubei Province also must meet standard annual auditing requirements.

D. APPRAISAL SUMMARY

1. Economic and financial analyses

Economic (Cost benefit)

EIRR = 16.9%; NPV = US$222.6 million

The economic evaluation covered two project components: the 105.1 km SME and the first phase of the LRIP. The principal measured benefits of the project are savings in vehicle operating costs (VOC), time savings for vehicle occupants, and enhanced road safety. The estimated overall economic internal rate of return (EIRR) for the project is 16.9 percent. The EIRR for the SME is 16.5 percent and for the LRIP, 24.3 percent. The overall economic net present value (NPV), based on a 12 percent discount rate, is estimated at RMB 1,847.5 million, of which the SME is estimated to contribute RMB 1,795.7 million and the LRIP, RMB 244.2 million. The expected traffic on the SME in 2009 ranges from AADT 3,674 to 6,329 assuming an annual growth rate of five percent until 2009. The evaluation results are summarized in the following table.

Summary of Economic Evaluation Results

	EIRR (%)	NPV (RMB million, 12%)
SME		
Section 1: Shiyan–Yunxian	14.4	211.3
Section 2: Yunxian–Yunxi	16.5	767.2
Section 3: Yunxi–Manchuanguan	17.5	755.9
Subtotal	**16.5**	**1,795.7**
LRIP	24.3	244.2
Total	**16.9**	**1,847.5**

A detailed assessment and a description of the method used are provided in Annex 9.

Financial

FIRR = 1.1%; NPV = US$ -152.3 million
SME construction constitutes about 91 percent of total project cost. HPCD is planning to use the toll revenue from SME to cover amortization charges of the Bank and domestic loans. Although the highway will generate enough total revenue over the loan period to finance operations, maintenance, and debt service, profits will be low in the early years of operation. The traffic levels at project opening combined with high construction costs (because of the mountainous terrain) affect the financial rate of return of the investment, expected to be about 1.1 percent. As the proposed toll rate is in the upper range in China and its affordability rate[1] compares unfavorably to other countries, increasing it further would adversely impact traffic diversion to SME. For the non-revenue-earning LRIP, the financial evaluation confirmed the availability of sufficient counterpart funds and the capacity of HPCD to finance operating expenses. All indicators show that financial risks are modest. A detailed assessment is provided in Annex 9.

2. Technical

SME design and standards are the result of in-depth technical and traffic studies reviewed by the Bank; standards have taken into consideration the difficult mountainous terrain of the project area. The following issues need special attention from a technical point of view:

- proper review of traffic safety and fire hazards introduced in the final design and development of an operations risk management plan, especially given the long steep slopes and numerous tunnels;
- sufficient geological investigations on technically challenging locations to minimize the risk of encountering major problems at the construction stage, given the mountainous terrain; and
- fully operational electrical and mechanical works at the opening of the highway to traffic, especially given the length of tunnels.

The design was reviewed by an international consulting firm under a Spanish Trust Fund grant and was found satisfactory. Cost estimates reflect December 2003 prices and are based on the latest available engineering studies, prevailing unit rates for civil works checked against effective rates in similar works under Bank-financed projects in Hubei and other provinces in China, recent costs of foreign experts from highway projects, and recent price quotations for equipment. Costs also include physical contingencies, calculated at 8 percent of the baseline cost of civil works, and price contingencies at 4.9 percent of all baseline costs (excluding land acquisition) on the basis of forecasts of domestic and foreign inflation rates during project implementation.

3. Fiduciary

Financial Management

The Bank concluded, on the basis of guidelines issued by the Financial Management Sector Board June 30, 2001, that the project meets minimum Bank financial management requirements (stipulated in BP/OP 10.02). The assessment found that the project will have in place a project

[1]To assess toll rates and quantify toll affordability for road users, the Bank has developed an affordability indicator. The rate is the cost for a private car to travel 1,600 km on toll roads as a percentage of the average annual income per person. A higher value means that the toll level is less affordable and will discourage use of the road.

financial management system that can provide, with reasonable assurance, accurate and timely information on the status of the project in the reporting format agreed with the Bank (see Annex 7).

Procurement

A procurement capacity assessment of the implementing agencies was carried out during appraisal (Annex 8). The assessment concluded that the overall risk of the procurement process is average.

HPCD and dependent involved entities have allocated adequate resources, including experienced staff, to implement the project. These agencies are familiar with Bank procurement procedures. An action plan to strengthen the procurement capacity of the implementing agencies has been discussed with HPCD and agreed on. The plan calls for the preparation and dissemination of a project-specific procurement manual, training workshops, and measures to avoid excessive cost overruns and improve procurement economy and efficiency. Ways in which the Tendering and Bidding Law (TBL) of China differs from Bank guidelines were addressed in the assessment, and clarifications for the procedures to be followed for Bank-financed NCB procurement have been included into the Loan Agreement.

4. Social

The major social impacts of the project stem from land acquisition and residential demolition associated with SME construction. The project will affect 46 villages and 9 townships in 4 counties or districts, through (i) the permanent acquisition of 12,605 mu (840 hectares) of land. In addition, structural demolition of private residential housing is expected to total 41,256 square meters, with 1,619 households (6,699 individuals) affected. A total of 3,683 households with 14,477 individuals will be affected only by land acquisition. A detailed land reclamation plan has been designed. It calls for the use of construction waste materials to create new land equaling 43 percent of the required farmland. HPCD prepared the RAP to mitigate resettlement impacts. It summarizes applicable policy principles and regulations, determines measures for restoring the income of affected people when necessary, compensation rates, and the resettlement budget; it also identifies institutional and monitoring arrangements.

The upgrading of the LRIP road sections is not expected to involve land acquisition or house demolition. Nevertheless, HPCD has prepared a resettlement policy framework, and a RAP would be developed for any road section that might end up requiring land acquisition

A social assessment has been conducted by Beijing University on the SME and first phase of the LRIP. It has not found any minority community affected by the expressway, and therefore no Ethnic Minorities Development Plan (EMDP) is required.. Social assessments will be carried out on the second-phase road sections for LRIP when they have been selected. If an assessment finds that national minority communities are affected, EMDPs will be prepared.

Information dissemination. The RAP, social assessment, and resettlement policy framework were advertised in the major local newspaper, *Changjiang Daily*, on January 13, 2004. Information is also available at the Hubei provincial library, in local counties served by the project and at Shiyan county public library. Project information has been provided to the affected villages through newspaper reports, posters, and public meetings. A resettlement information booklet will be distributed to affected people before resettlement operations.

Participation strategy. During project preparation, village committees and farmer groups were consulted about the planning of resettlement operations, among other things. Local views on resettlement impacts and preferred mitigation measures were taken into account in the RAP, and the majority of potentially affected persons agree that rehabilitation measures will be adequate.

Local banks in each county will be involved in the implementation of resettlement operations and will supervise the use of land compensation funds. The resettlement program will be monitored regularly, and the living standards of project-affected people will be evaluated during the course of project implementation. Internal and independent monitoring reports will be prepared twice a year.

5. Environment

The project involves major expressway construction on a new alignment, at-grade connecting roads to be upgraded partially on a new alignment and partially on existing ones, and the rehabilitation of local roads. The environmental impacts will involve occupation of both fertile and barren land by the expressway; an increase in dust, noise, and motor vehicle emissions; disposal of excess waste material; community severance; soil erosion; resettlement; and safety.

Alignment selection. During SME design, three long distance corridors were evaluated to select the most environmentally and socially benign alignment in Hubei. The selected corridor had the least land occupation and resettlement; relatively stable geology with lower soil erosion; and the least cuts and fills, resulting in minimal disturbance and lower disposal requirements. The corridor had also received the widest support from local people and governments.

Within the selected corridor, two alignments were selected and compared according to technical, economic, environmental, cultural property, political and social factors. The preferred alignment was selected considering less soil erosion, land requirement, biodiversity impact, biomass disturbed, river crossing and in-water construction, cuts and fills, and tunnels resulting in less disposal material, and low impact on cultural relics.

Nonetheless, the alignment has a higher number of sensitive receptors to noise and higher numbers of housing relocation and displaced persons. However, it will result in less community severance and social impact during construction and operation and has received more support from local governments. To further minimize environmental and social impacts, nine sub-alignments were identified, analyzed, and compared with their corresponding main-line sections. In the final analysis, some sub-alignments were selected because they: (i) minimized disturbance to the existing highway (G209); (ii) shifted the alignment away from the Qinglongshan dinosaur egg reserve; (iii) accommodated the growth needs of Qingqi township while reducing resettlement; and (iv) reduced spoils, avoided unstable geological condition, and reduced land occupation.

As regards the LRIP, rehabilitation works will involve strengthening and minor widening and realignment of existing roads.

Public consultation. A first round of public consultation followed the preparation of the terms of reference for the environmental assessment (EIA), and a second round took place during the preparation of the draft of the EIA. The public participated either through filling in one of the 2,759 questionnaires or by attending one of the 21 public meetings or 85 group interviews. Appropriate compensation for land acquisition, resettlement and relocation; timely rehabilitation and/or restoration of damaged irrigation systems; construction safety; noise at schools; better

access to and exits from SME; and sufficient passageways to cross the expressway were some of the main environmental and social concerns that the public had. The rural public was concerned about road blocks and access to services during road works, as well as the safety of students and convenient links with access to SME.

Project design responded to these concerns by: (i) developing plans for irrigation system restoration; (ii) conducting public education programs and erecting warning signs for construction safety; (iii) constructing passageways and crossings for pedestrians and farm vehicles at about every 740 m to mitigate community severance; (iv) installing safety barriers at selected locations along the rural road to provide protection to students, residents, and livestock; (v) installing noise insulation windows and planting trees to minimize the impacts of noise; and (vi) situating access ramps and interchanges in the most practical places.

To mitigate environmental concerns, the stand-alone Environmental Management Plan (EMP) on SME includes environmental standards, mitigation measures, monitoring plans for the construction and operation phases, health and safety measures including to detect and control possible diseases (SARS, HIV...) on the construction field, and an environmental training and institutional building and strengthening plan. The implementation of the EMP will be supervised by the Environmental Office of the Ministry of Communications, HPCD, the WBPFO, and HPSEC. The State Environmental Protection Administration and the local Environmental Protection Bureaus in the project area will also monitor EMP implementation. EMPs prepared on each local road also include mitigation measures on noise, soil erosion, surface water and air pollution, health and safety, and monitoring plans.

6. Safeguard policies

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP/GP 4.01)	[X]	[ ]
Natural Habitats (OP/BP 4.04)	[ ]	[X]
Pest Management (OP 4.09)	[ ]	[X]
Cultural Property (OPN 11.03, being revised as OP 4.11)	[X]	[ ]
Involuntary Resettlement (OP/BP 4.12)	[X]	[ ]
Indigenous Peoples (OD 4.20, being revised as OP 4.10)	[ ]	[X]
Forests (OP/BP 4.36)	[ ]	[X]
Safety of Dams (OP/BP 4.37)	[ ]	[X]
Projects in Disputed Areas (OP/BP/GP 7.60)*	[ ]	[X]
Projects on International Waterways (OP/BP/GP 7.50)	[ ]	[X]

7. Policy Exceptions and Readiness

The project will comply fully with Bank policies. The project meets regional criteria for implementation.

* *By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas.*

Annex 1: Country and Sector or Program Background

CHINA: Hubei Shiman Highway Project

Country and sector issues

Studies undertaken by the East Asia and Pacific Region and Operations Evaluation Department of the Bank in the past five years have highlighted several issues in the highway sector in China: capacity bottlenecks in the highway network affecting its ability to meet increasing transport demand; difficulties created by geography hindering the provision of basic road access, particularly in poor inland areas and western provinces; the prospect of insufficient funding of the highway sector; necessity of maintaining the assets of a rapidly growing road network ; and the need to strengthen sector governance, especially by developing the role of the market and improving road traffic safety.

Highway Capacity Expansion to Sustain Development, Trade, and Regional Integration

For the past 20 years, the Chinese economy has grown remarkably fast, averaging 8 to 10 percent per year, which enabled the country to join the WTO in 2001. As a result of that growth, increases in the number of motorized vehicles and traffic have put a heavy demand on infrastructure. The number of registered vehicles, currently 20.5 million, is expected to reach 34 million by 2010, and both passenger and freight traffic have grown rapidly—7.1 percent (in passenger-km) and 5.5 percent (in ton-km) respectively per year in the past five years.

Such rapid economic development has created a need for an appropriate road network. The length of highways has doubled since 1980 to 1.76 million km, including a 25,130 km expressway network located mainly in the coastal areas and on the heavily traveled north–south corridors in eastern and central-eastern China. During the past five years, the length of expressways has tripled, the length of Class I roads has almost doubled, and the length of Class II roads has increased by more than half. At the core of the government highway policy is the construction of the $150 billion NTHS, a 35,000 km expressway network connecting China's 100 major cities to be completed by 2007.

Despite China's massive investment in the construction of new highways (an average of 2.8 percent of GDP per year during the 1997–2002 period), funding resources are still insufficient to meet increasing demand. The road network still ranks among the sparsest in the world in terms of both geographic area and population (0.19 km per square kilometer and 1.38 km per 1,000 population). Furthermore, expressways and Class I and II roads account for only 14.1 percent of the whole network, yet carry most of the traffic.

Bottleneck for Trade, and Regional Integration

The road transport sector constitutes a serious obstacle to sustainable economic growth, and domestic and international trade. In China, logistics costs, at 18 percent of GDP (2000), are high in comparison to those in developed countries like the United States (9.5 percent in the mid-1990s), and transport costs are higher, about 50 percent of total logistics costs in China—twice the percentage of those in developed economies. Reducing logistics costs to 15 percent of GDP, a feasible target for a five-year period, would generate more than $30 billion annually in direct savings.

In the coming years, economic growth and the rising modal share of road transport will continue to place heavy demands on the highway network and intensify the need for capacity expansion. Furthermore, and especially for western and central provinces, highway networks have to connect large urban centers and rapidly developing areas to coastal regions to integrate lagging provinces into the mainstream economy.

Therefore, China intends to maintain heavy investments in the road sector. By 2010, the length of the entire Chinese road network should exceed 2.1 million km; in the following decade the length of the highway network is extended to reach 2.6 million km and the expressway, 70,000 km, to link all cities with populations of 200,000 or more.

Road Sector Bottleneck in Hubei Province

Hubei province, with a population of 59.9 million people, is located in central China. Hubei is a communication node for north–south and east–west traffic, and a gateway to the less-developed western provinces. Since 2000, passenger traffic (in passenger-km) has increased by 3.2 percent per year. Road transportation accounts for 94 percent of passenger traffic (in passengers) and 74 percent of freight volume (in tons).

The length of the highway network in Hubei has increased by 62 percent since 1998, reaching 86,000 km in 2002. The provincial network includes a total length of 943 km of expressways, 822 km of Class I roads, and 11,105 km of Class II roads (2002). The total length of expressways and Class I and II roads has increased by 71 percent since 1998 and accounted for 14.9 percent of the provincial road network in 2002, a figure close to the national average.

Despite significant investment in the construction of new highways (an average of 2.3 percent of Hubei's GDP per year for the past two years), funding is still insufficient to meet demand for both construction and maintenance. Road density by population is comparable to the national average, although road density by area (0.46 km per square kilometer) is more than twice that of the whole country because the large western provinces are significantly under-equipped in comparison to eastern and central provinces.

HUBEI						
		1998	1999	2000	2001	2002
Basic Provincial Data						
Total population	1,000 people	59,072	59,380	59,600	59,746	59,880
As proportion of China's population	%	4.8%	4.7%	4.7%	4.7%	4.7%
Rural population	1,000 people	42,817	42,935	42,927	42,850	42,946
Rural population as proportion of total population	%	72%	72%	72%	72%	72%
Urban population	1,000 people	16,256	16,446	16,673	16,896	16,934
Urban population as proportion of total population	%	28%	28%	28%	28%	28%
GDP	million US$	44,742	46,604	51,656	56,376	60,165
As proportion of China's GDP	%	4.7%	4.7%	4.8%	4.8%	4.7%
GDP per capita	US$	757	785	867	944	1,005
As proportion of China's GDP per capita	%	99%	99%	101%	102%	102%
Road Length						
Length of roads	km	52,989	55,389	57,850	85,757	86,098
As proportion of China's road network	%	4.1%	4.1%	3.4%	5.1%	4.9%
Length of Expressways	km	428	538	569	805	943
Length of Class I roads	km	502	557	611	812	822
Length of Class II roads	km	6,580	7,326	7,911	9,152	11,105
Length of Class III & IV roads	km	31,027	35,699	38,971	55,279	54,420
Length of Other roads (<Class IV)	km	14,452	11,269	9,788	19,709	18,808
Expressways as proportion of total road network	%	0.8%	1.0%	1.0%	0.9%	1.1%
Class I roads as proportion of total road network	%	0.9%	1.0%	1.1%	0.9%	1.0%
Class II roads as proportion of total road network	%	12.4%	13.2%	13.7%	10.7%	12.9%
Class III & IV roads as proportion of total road network	%	58.6%	64.5%	67.4%	64.5%	63.2%
Other roads (<Class IV) as proportion of total road network	%	27.3%	20.3%	16.9%	23.0%	21.8%
Road Density						
Road density in terms of land area	km/ 1,000 km2	285	298	311	461	463
As proportion of China's road density in terms of land area	%	208%	206%	173%	253%	245%
Road density in terms of total population	km/ 1,000 people	0.9	0.9	1.0	1.4	1.4
As proportion of China's road density in terms of total population	%	88%	87%	73%	108%	105%
Road density in terms of rural population	km/ 1,000 people	1.2	1.3	1.3	2.0	2.0
As proportion of China's road density in terms of rural population	%	79%	78%	65%	95%	91%

Sources: China Statistical Yearbooks, and China Transport & Communication Yearbooks

Improving Road Accessibility in Low-Income Areas

The benefits of rapid economic growth have not been distributed equally among eastern, central, and western areas of China. In the 12 underdeveloped western and inland provinces, the per capita income is less than half that of the more developed coastal provinces. One reason for the disparity is the lack of capacity on a series of major interprovincial trade corridors linking western provinces to the more economically dynamic central and eastern areas. The government gives high priority to accelerating development in lagging regions: by 2010 the expressway network should include a grid of five north–south and seven east–west trunk lines meant to

encourage economic growth, reduce disparities between rural and urban areas, and accelerate the opening up of western regions.

Despite the impressive accomplishments China has made in reducing poverty in the past 20 years—accomplishments that have lifted hundreds of millions of people out of absolute poverty—more than 200 million people still live on less than $1 a day. Many of these people live in remote and resource-poor areas in the western and interior regions and often lack basic access to health and education services because transport conditions are inadequate. Many remote areas are too far from the main highway network to benefit from feeder roads that connect to the main provincial and national networks. In 2002, 99.5 percent of townships and 92.3 percent of villages in China were made accessible by road, but still more than half of townships and villages without access to rural highways are located in the west.

Road transport contributes directly to reducing poverty by improving poor people's basic access to education, health, and social services and to markets and employment opportunities. It also indirectly contributes to alleviating poverty by improving the efficiency of resource allocation, enhancing the performance of markets, and fostering economic growth. In China, central and local governments recognize the roles that providing basic transport access in remote areas plays in stimulating growth and meeting the mobility needs of the poor. But ensuring that access is an enormous task that requires significant public resources.

Improving Accessibility in Hubei Province

Hubei has experienced sustained economic development during the past 10 years, and its GDP per capita ($1,005 in 2002) is comparable to the national average ($989). However within the province, significant differences remain between the developed eastern area near Wuhan, the provincial capital, and the western areas where GDP per capita is still less than RMB 2,000 ($242), and as little as RMB 1,000 in some counties.

Among the 71 counties in Hubei, 38 are classified as poor on the provincial scale, and 25 on the national scale. All but one of these counties are in the mountainous western part of the province. The lack of infrastructure has been identified as a major constraint to their development: 2,500 villages in these counties were without highway access in 1995. There is a strong demand for improvements in communication infrastructure to ensure all-weather access, which is a challenge in many places because of the mountainous terrain.

Resource Mobilization

Sector funding has increased significantly during the past few years in response to financial stimulus. Cumulated investments in the construction of new highways for the 1997–2002 period reached $167 billion, with an annual budget of $39 billion in 2002, more than twice the annual budget in 1997. About 60 percent went to high-grade highways (including 30 percent for the NTHS), 25 percent to the improvement of existing roads and 15 percent to rural roads. In the coming years, investment levels in the road sector are expected to be maintained; road expenditures have been estimated at $205 billion for the Tenth Five-Year Plan (2001–2005) and $260 billion for the subsequent five years.

Although private sector participation in the growth of China's highway system is advanced in terms of development models and private capital flows, it contributed less than 10 percent of

China's total commitment to new construction during the 1980s and 1990s. More significant private investment will require that several conditions be met: further development of the legal and regulatory framework for private participation; development of the domestic bond market, which would open long-term funding sources to commercialized toll-road entities; and a wide range of public–private partnership models. As a consequence, the bulk of financing for the coming years will have to come from public funds, either through taxation or issuance of public debt.

However, traditional funding resources are insufficient to meet increasing demand, and this mode of financing is not sustainable. In China, road user charges include the vehicle purchase tax ($4.5 billion in 2002), the road maintenance fee ($10 billion in 2002), and the highway transport management fee ($2.5 billion in 2002). Only 60 percent of the road maintenance fee is actually used for road maintenance ($6 billion in 2002), with the rest ($4 billion in 2002) being spent on new construction. This fee is inefficient, expensive to administer, easy to evade, and generates less than 40 percent of its potential. As a result, road user charges contributed only 28 percent of new construction expenditures in 2002 ($11 billion for a total of $38.9 billion). Consequently, the government needs to develop new sources of funding and build a reliable and stable financing scheme of road activities based on user fees. China has been discussing the introduction of a fuel tax for years, but no implementation has been decided yet, although the National Congress approved the tax in 1999, because of the difficult technical and political issues associated with it.

Resource Mobilization in Hubei Province

Hubei's road sector funding has increased significantly in recent years, although at a rate slightly lower than in China as a whole (2.3 percent of Hubei's GDP in the past two years compared to 2.8 percent of China's GDP). Annual investment in the construction of new highways in 2001 and 2002 reached $1.3 billion and $1.4 billion respectively. In the coming years, the investment effort in the road sector should be maintained.

Institutional Reforms and Efficiency of Road Management

Transforming the government into a market-supporting institution remains one of the largest transition issues facing China. In the highway sector, the government's role in providing infrastructure (construction and maintenance) and transport services is shifting gradually from that of owner, investor, and manager to that of policymaker and regulator. Provincial communication departments need to adapt to the change in their institutional role while providing more cost-effective construction and operation services to infrastructure users.

Institutional Reforms

The capacity of provincial and local road agencies must be strengthened to enable them to expand the network and meet the challenge of maintaining the quality standards of existing roads. Therefore, maintenance works undertaken previously by those agencies through force account are being contracted out progressively. The Bank has supported new ways of carrying out maintenance under various projects, mainly with a view to introducing competition, encouraging the use of better equipment, and improving the efficiency of manpower and the overall quality of work. The transition to contract work entails far-ranging institutional reforms with social impacts. In addition, the transition has to be fostered by strengthening road agencies'

capacity and by developing contractual relationships between the employer and contractors that focus on the provision of services.

Road Maintenance

Lessons learned in developing countries about the detrimental impact of neglecting road maintenance and the costs of restoring infrastructure are fully relevant to China. Countries undergoing rapid economic development traditionally underinvest in road maintenance. In Forward with One Spirit, a Bank study carried on in China in 1998, experts recommended allocating 1 percent of GDP to maintenance expenditures, a theoretic total of $12 billion in 2002, but this objective was frustrated both by the shortage of funds and by political intervention. Only $6 billion were actually spent on road maintenance.

Management of Toll Roads

The introduction of toll roads in China ($7 billion of toll revenues in 2002) has been characterized by a proliferation of highway companies, each managing a relatively short section of road. This situation is inefficient in a number of ways, and studies carried out under institutional components of Bank-financed projects have suggested setting up commercialized corporations for the construction, operation, and maintenance of toll roads. Economies of scale would result from consolidating management and maintenance facilities at the provincial level and possibly on a wider scale. Furthermore, the question remains—how to regulate toll road companies?

A broader question is whether the current tolling policy is relevant. The average toll in China (U.S, cents 4.53 per car-km) is about the same as in developed countries, but the affordability rate (2.06 percent on average) is very high in comparison to rates in developed and other developing countries (see the following table). (The affordability rate is the cost for a private car to travel 1,600 km on toll roads, expressed as a percentage of the average annual income per person.) Toll levels therefore deter potential users and reduce overall economic returns of toll roads.

Toll Level and Toll Affordability Comparisons

	Developed countries	US	Developing countries	China	SME
Toll (US cents/ km)	11.14	4.45	3.11	4.53	6.02
Toll affordability rate	0.69%	0.02%	0.65%	2.06%	2.34%

Sources: World Bank Research, November 2003

Improving Road Traffic Safety

The combination of the expansion, uneven road construction quality, increasing traffic, and a lack of coordinated safety efforts in China led in 2002 to 773,000 accidents, 562,000 injuries, and 109,000 traffic fatalities, a direct economic loss conservatively estimated at more than $3 billion[2]. An Asian Development Bank estimate puts the total economic loss from road crashes at $12 billion per year. Road accidents are the leading cause of death for Chinese people under 45

[2] Productivity losses from injury in China, Y. Zhou, T.D. Baker, G. Li, 2003

years of age. These alarming figures probably understate the reality. Still, the official data make China's annual number of road accident fatalities the world's highest—at least three times the U.S. figure, with a fraction of the number of vehicles. World Bank global projections indicate that if present road safety policies and practices continue, traffic fatalities will rise from about 10 per 100,000 people (2000) to more than 16 per 100,000 people in 2020[3].

Road safety management practices in China are characterized by their lack of overall goal orientation and performance evaluation, absence of strong leadership and inter-agency coordination, and fragmented safety interventions. In terms of a best-practice safety management system (targets, interventions and implementation arrangements), current practices in China can be considerably improved: China has no official safety targets, monitoring and analysis are limited, and there is no long-term national vision for success. With the possible exception of emergency medical services, basic safety interventions are evident in China, but they lack integration and purposeful direction. There is also considerable room for improvement in the delivery of road safety enforcement interventions using modern general deterrence techniques. Dialogue with traffic police on strategic directions for the future would be highly beneficial, and road safety education initiatives would be a necessary topic in such a dialogue.

MOC and provincial communication departments, working in partnership with the Bank, have elaborated a road safety strategy for China that has embraced a philosophy of gradualism and safety promotion by pilot demonstration projects. Experience gained in a series of provinces have demonstrated the effectiveness of:

- focusing efforts on blackspots analysis and treatment;
- building institutional capacity early on in the process by creating a focused and well-supported team of road safety professionals;
- reaching out to the wider community; and
- using local technical expertise to develop safety audit procedures.

MOC sees the safety projects as having enriched the experience of its staff, brought agencies closer together, improved safety-engineering practices, created access to high-quality advice, and raised community awareness. The key question to consider is how to sustain and build on the momentum and innovation achieved over the past decade?

Institutional Reforms and Efficiency of Road Management in Hubei

Previous Bank projects in Hubei (Third National Highway, Fourth National Highway and Hubei Xiaogan-Xiangfan Highway) have begun to address key institutional and policy issues for the road sector by initiating the preparation of a multi-year institutional development plan; strengthening the role and capacity of HPCD; establishing road traffic safety, quality control and quality management units; improving the management of the road network; and developing expertise, tools, and processes to address road traffic safety issues.

HPCD is responsible for maintaining national, provincial and county roads. Efforts under previous projects have been aimed at strengthening HPCD's institutional capacity to improve

[3] Traffic fatalities and economic growth; Kopits E, Cropper M; World Bank Policy Research Working Paper 3035, April 2003

maintenance effectiveness and increase funding. The implementation of a road management system was initiated and a maintenance study was completed. A maintenance quality control system was started, and projects focused on the commercialization and use of market contracts for maintenance.

While much progress has been made on the institutional side, the key constraint is funding allocation: there is a major shortage of funds for maintenance in Hubei Province. In 2003 only RMB 235 million was spent on periodic maintenance, compared with RMB 778 million on routine maintenance and an estimated RMB 1,103 million on rehabilitation. Although since 2001 HPCD has increased its maintenance expenditures by approximately 3.5 percent per year (faster than the 2.5 percent annually that the road network has expanded), the recent Highway Maintenance Study in Hubei Province[4] estimated that periodic maintenance funding is only about 25 percent of the level needed to maintain the network adequately. A significant portion of the HPCD network needs to be improved, which places additional demands on the limited funds. A large number of Hubei's bridges are substandard and in need of maintenance or renewal. The Highway Maintenance Study found that in 2000 only 43 percent of pavement had adequate design, so it is critical that maintenance be performed when required. With the bulk of the HPCD budget spent on new road construction (see Annex 9, Appendix D), the road maintenance fee too low, and budget constraints HPCD has adopted the rational approach of emphasizing maintenance on the more heavily traveled Class I and Class II roads, which constitute approximately 14 percent of the road network. However, because of inadequate periodic maintenance funding, there more expensive and heavier maintenance is needed, and HPCD spends five to six times as much on rehabilitation than on periodic maintenance. The net result is a decrease in the condition of the Hubei network over time.

In terms of road safety, Hubei Province reflects the overall situation in China and follows the national trend. HPCD has developed and implemented processes for road safety under World Bank-financed projects. These projects have been supported by other agencies, mainly provincial traffic police departments, for specific activities such as accident information systems and blackspot treatment programs. However, HPCD and other government agencies must strengthen their coordination on road and traffic safety enforcement issues and develop public awareness and education campaigns.

[4] Final Report – Highway Maintenance Study in Hubei, Third National Highway Project.

Annex 2: Major Related Projects Financed by the Bank and/or other Agencies

CHINA: Hubei Shiman Highway Project

Sector Issue	Ongoing Projects	Latest Supervision (PSR) Ratings	
		Implementation Progress (IP)	**Development Objective (DO)**
Bank-financed			
1. Remove highway capacity bottlenecks 2. Institutional Strengthening and training 3. Rural roads and poverty alleviation 4. Highway safety 5. Operation and maintenance of high-grade highways 6. Cost recovery	Anhui Provincial Highway (ongoing)(sector issues 1-5) Second Henan Provincial Highway (ongoing)(sector issues 1-6) Second National Highway (ongoing)(sector issues 1, 2, 4-6) Third National Highway (ongoing)(sector issues 1,2, 4-6) Third Henan Provincial Highway (ongoing)(sector issues 1-6) Tri-Provincial Highway (ongoing)(sector issues 1-6) Fourth National Highway (ongoing)(sector issues 1-5) Second Fujian Highway (ongoing)(sector issues 1, 2, 4-6) Guangxi Highway (ongoing)(sector issues 1-6) Second Jiangxi Highway (ongoing)(sector issues 1-6) Inner Mongolia Highway (ongoing)(sector issues 1-6) Xinjiang III Highway (ongoing)(sector issues 1-6) Hubei Xiaogan-Xiangfan Highway (ongoing)(sector issues 1-6)	S S S S S S S S S S S S S	S S S S S S S S S S S S S
Other development agencies			
Asian Development Bank	Southern Sichuan Roads Dev. Guangxi Roads Development Shaanxi Roads Development Chongqing-Guizhou Roads Dev. (Leichong Expressway) Southern Yunnan Road Dev. Shanxi Roads Development Changchun-Harbin Expressway: Changyu Expressway Changchun-Harbin Expressway: Hashuang Expressway Chengdu-Nanchong Expressway		

Sector Issue	Ongoing Projects	Latest Supervision (PSR) Ratings	
		Implementation Progress (IP)	**Development Objective (DO)**
Japan Bank for International Cooperation	Hangzhou-Quzhou Expressway Wanxian-Liangping Expressway Liangping-Changshou Expressway Hainan East Expressway Xinxiang-Zhengxhou Highway Heilongjiang Heife-Beian Road		

Annex 3: Results Framework and Monitoring
CHINA: Hubei Shiman Highway Project

Results Framework

PDO	Outcome Indicators	Use of Outcome Information
Support socio-economic development of Hubei province by: • enhancing its access to other provinces particularly the western region of China, • improving local mobility within poor, remote western parts of province, and • strengthening governance of the provincial road sector.	SME • Traffic levels on SME and the parallel highways. • Percentage of long distance traffic on SME (total traffic and breakdown between cars/buses and trucks). LRIP • Average daily traffic, transportation costs, daily bus services on improved local roads, and number of days these roads are closed to traffic. • GDP per capita in served areas. • Employment rate. • Population under poverty threshold (daily income <US$ 1). • School enrollment and access to medical care in served areas. Institutional • Increased skills of HPCD staff through skills assessment. • Adoption of asset management principles ensuring better management of Hubei expressway network. • Sustainable model for financing the HPCD road network. • Adopting new technologies improving efficiency and effectiveness of highway management and operations. • Improved management of new highway projects through institutional changes. • Percentage of Class 1 and Class 2 roads systematically treated in accordance with the HPCD Safety Management Plan. • Percentage of road freight and passenger transport enterprises systematically screened in accordance with the Safety Review Process.	Feeds into MOC program to further inter-provincial integration through the construction of the arterial expressway. Feeds into Hubei policy and programs for improving road accessibility in poor areas. Feeds into Hubei highway management policy and program.

Intermediate Results One per Component	Results Indicators for Each Component	Use of Results Monitoring
Component One (SME): Construction of SME.	**Component One:** Progress rate of works.	**Component One:** Monitoring of implementation progress and action plan to address possible delays.
Component Two (LRIP): Rehabilitation of local road sections included in the LRIP.	**Component Two :** Progress rate of works.	**Component Two:** Monitoring of implementation progress and action plan to address possible delays.
Component Three: Institutional Development and road Safety	**Component Three:**	**Component Three:**
HPCD staff trained.	Number of staff trained Skill assessments.	Monitoring of implementation progress and action plan to address possible delays.
Pilot study to implement an asset management system on the expressway network.	Annual 10 year management plan for the pilot expressway. Final report on the system applicability to HPCD network.	
Study on group management of expressway projects.	Study report completed and adopted by HPCD.	
Strategy for mobilizing capital to highway management.	Study report completed and adopted by HPCD.	
Study on new technologies for road maintenance.	Study report completed. Adoption of new technologies or techniques for maintenance by HPCD.	
Acquisition of monitoring and maintenance equipment.	Procurement expenditure rate.	
Road map for implementing a comprehensive highway safety management plan.	HPCD Safety Management Plan finalized, specifying safety goals, objectives, policies; priorities for Class 1 and Class 2 roads set and organizational processes and measures to achieve them.	
Action plan to improve the safety of commercial transport companies.	Safety Review Process for road freight and passenger transport enterprises finalized, specifying mandatory safety requirements, procedures and monitoring arrangements for the granting, continuation and removal of operating licenses	

Arrangements for results monitoring

Outcome Indicators For Each Component	Target Values						Data Collection and Reporting		
	Baseline 2004	YR1 2005	YR2 2006	YR3 2007	YR4 2008	YR5 2009	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
I. SME							Annual Project progress reports	Traffic counts and surveys	
Daily average traffic volume on Shiman Expressway in vehicles/day per section: • A—B Shiyan-Yunxian • B—C Yunxian-Yunxi • C—D Yunxi-Manchuanguan						 7955 8986 8851			HPSEC
Daily average traffic volume on NH316 in vehicles/day per section: • A—B Shiyan-Yunxian • B—C Yunxian-Yunxi • C—D Yunxi-Manchuanguan	 9270 8936 7024	 10120 9756 7668	 10970 10576 8312	 11891 11463 9010	 12680 12085 9359	 3828 3973 4535			HPHAB
Interprovincial traffic crossing Manchuangan toll gate and percentage driving through the whole SME - Cars and buses • Number of vehicles • Percentage traveling through SME - Trucks • Number of vehicles • Percentage traveling through SME						 8851 79% 25792 34%			HPSEC
Accident rate on NH316 & SME (Number per 100,000 Vehicle x .km)	3.4	3.5	3.6	3.7	3.8	2.9		HPCD & Traffic Police data	HPHAB and HPSEC
II. LRIP (A: Baoxia - Zhushan road, B: Jiangjunhe bridge)	**Baseline 2001**	**YR1 2005**	**YR2 2006**	**YR3 2007**	**YR4 2008**	**YR5 2009**	Annual Project progress reports		
Daily average traffic volume on L RIP in vehicles/day per section: • A: • B:	 614 575			 1292 1116		 1217 1521			HPHAB

Outcome Indicators For Each Component	Target Values						Data Collection and Reporting		
	Baseline 2004	YR1 2005	YR2 2006	YR3 2007	YR4 2008	YR5 2009	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
Number of days LRIP road / bridge are closed to traffic: • A • B	 95 45			 25 5		 25 5			HPHAB
Transport costs (RMBY/Per 100 medium truck km) • A: • B: Daily Bus services • A: • B:	 188 157 21 13			 160 133 45 50		 159 136 50 57			The Provincial Statistics Bureau-County Statistics Bureau
GDP per capita (RMB): • A: • B:	2211 2260			3806 3972		4101 4231			HPCD
School enrollment (Annual growth): • A: • B:	1.54% 1.58%			4.0% 4.06%		4.7% 4.9%			The Social Survey & Study Center of the University of Beijing
Access to medical care.(Annual Growth): • A: • B:	1.44% 1.38%			5.0% 5.2%		5.5% 5.3%			The Social Survey & Study Center of the University of Beijing
Employment rate: • A: • B:	47.06% 45.19%			59.40% 58.92%		64.3% 63.9%			
Population below poverty threshold (daily income <US$ 1): • A: • B:	60,260 31,980			52,147 25,286		46,016 20,513			
III. Institutional Development and Road Safety									
Total 5/10/20 year capital requirements for road construction, maintenance and management along with mobilization options and recommended policy.				X			Final report		HPCD

Outcome Indicators For Each Component	Target Values						Data Collection and Reporting		
	Baseline 2004	YR1 2005	YR2 2006	YR3 2007	YR4 2008	YR5 2009	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
Improved efficiency and effectiveness of management and operations through adopting new technologies: • Surveys by pavement detection vehicle • Implementation of weigh-in-motion equipment for monitoring overloading • Implementation of new technologies for road maintenance.			X	X X	X X	X	• Annual summary survey report. • Annual summary report on vehicle weights and overloading. • Plan for full implementation.	• Pavement detection vehicle (profilometer) to be procured on project. • Weigh-in-motion equipment to be procured on project. • New technologies to be procured on the project	HPSEC HPCD HPSEC HPHAB
Adopting new technologies improving efficiency and effectiveness of management and operations through: • Annual asset management plans for expressway in pilot study • Recommendations on applicability of asset management to HPCD network			X	X	X		Annual asset management plan. Final report		HPSEC HPSEC HPCD
Improved management of new projects through group project management; implementation of strategy by HPCD.				X			Implementation report		HPCD
Increased skills of HPCD staff through skills assessment after completion of training courses: • post-training skills assessment				X			Final report with skills assessment		HPCD Road Training Center

Outcome Indicators For Each Component	Target Values						Data Collection and Reporting		
	Baseline 2004	YR1 2005	YR2 2006	YR3 2007	YR4 2008	YR5 2009	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
HPCD safety management plan for Class 1 and Class 2 Roads: • Percentage of existing Class 1 and Class 2 roads systematically treated in accordance with the goals, objectives, policies and priorities of the HPCD Safety Management Plan.					50%	75% (100% in 2010)	Annual reports		HPCD
Safety Review Process for Road Freight and Passenger Transport Enterprises: • Percentage of existing road freight and passenger transport enterprises systematically screened in accordance with the safety requirements, procedures and monitoring arrangements of the Safety Review Process.					25%	50% (75% in 2010)	Annual reports		HPCD

Results Indicators for Each Component	Target Values						Data Collection and Reporting		
	Baseline 2004	YR1 2005	YR2 2006	YR3 2007	YR4 2008	YR5 2009	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
I. SME									HPCD (WBFPO)
% of civil works completed of expressway section.	25	50	75	100					
% of civil works completed of Linking roads.	20	60	100						
% of civil works completed of annex areas.			50	100					
% of civil works completed of E&M works.			20	100					
II. LRIP (A: Baoxia - Zhushan road, B: Jingjunhe bridge) % of civil works completed: • A: • B:		 20 20	 60 60	 100 100			 Annual project progress reports		
III. Institutional Development and Road Safety									
Better management of the Hubei expressway network through adoption of asset management principles:									
• Implement pilot study IT planning systems		50%	100%				Summary annual progress report		HPSEC
• Asset management expressway pilot study data collection			100%	100%	100%	100%	Full inventory in 2006 and annual condition surveys	Manual surveys Pavement detection vehicle surveys	HPSEC
• Prepare 10 year asset management plan for pilot expressway		75%	100%				Asset management plan with 10 year horizon		HPSEC
• Annual update to asset management plan				100%	100%		Annual update to plan		HPSEC
• Final report with recommendations on applicability to HPCD networks.					100%		Final report		HPSEC HPCD

Results Indicators for Each Component	Target Values						Data Collection and Reporting		
	Baseline 2004	YR1 2005	YR2 2006	YR3 2007	YR4 2008	YR5 2009	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
Identification of sustainable model for financing the HPCD road network • Study on capital mobilization.		33%	66%	100%			Final report		
Improved efficiency and effectiveness of management and operations through adopting new technologies: • Surveys by pavement detection vehicle (km/year) • Expressways • Class I/II Roads • TOTAL • Study on the implementation of new technologies for road maintenance • Average number of days of operation of weigh-in-motion equipment for all locations.		33%	2,000 8,000 10,000 66%	2,000 8,000 10,000 100%	2,000 8,000 10,000 350	2,000 8,000 10,000 350	Annual summary survey report Class I/II data input by HPHAB to CPMS Report of new technologies identified for testing Final report on results of testing and plan for full implementation Annual summary report on vehicle weights and overloading	Pavement detection vehicle (profilometer) to be procured on project New technologies to be procured on the project Weigh-in-motion equipment to be procured on project	HPSEC HPCD HAB HPSEC
Improved management of new projects through group project management: • Study into group project management.		50%	100%						
Increased skills of HPCD staff through skills assessment after completion of training courses: • Domestic training program • Overseas training program.		70% 40%	90% 65%	100% 100%			Annual progress reports. Final report with skills assessment.		HPCD Road Training Center
Acquisition of equipment: • Percent acquired.	30%	60%	80%	100%			Annual procurement report		HPCD
HPCD safety management plan for Class 1 and Class 2 Roads.	10%	25%	75%	100%			Safety Management Plan 2007 – 2012 and annual updates.		HPCD

	Target Values						Data Collection and Reporting		
Results Indicators for Each Component	**Baseline 2004**	**YR1 2005**	**YR2 2006**	**YR3 2007**	**YR4 2008**	**YR5 2009**	**Frequency and Reports**	**Data Collection Instruments**	**Responsibility for Data Collection**
Safety Review Process for Road Freight and Passenger Transport Enterprises.	10%	25%	75%	100%			Year 1 report on safety of road freight and passenger transport enterprises. Final report on safety review of road freight and passenger transport enterprises and mandatory safety requirements, procedures and monitoring arrangements for the granting, continuation and removal of operating licenses.	Review Process for Road Freight and Passenger Transport Enterprises.	

Annex 4: Detailed Project Description

CHINA: Hubei Shiman Highway Project

I. Highway Capacity Investment ($414.88 million)

The project will finance the construction of the 105.1 km Hubei section of the Shiyan Manchuangan Expressway (SME), a 106.8 km highway linking Shiyan City in northwestern Hubei province to Manchuangan in Shaanxi province. At the Shaanxi border SME connects to the planned Manchuangan– Shangluo expressway, that will complete the Hubei - Xi'an corridor. In Hubei, the project will be the final section of the Wuhan–Shaanxi border expressway corridor that includes two other sections: the Xianshi Expressway, which opened for traffic in December 2003 and the Bank-financed Xiaoxian Expressway further east, which is under construction (the Hubei Xioagan-Xiangfan Highway project).

At its eastern end, SME will serve Shiyan city, which is at the edge of a mountainous, low-income area. The urban agglomeration of Shiyan has a population of 3.4 million. It is an industrial center with a strong automobile industry, mineral resources, and tourism attractions. Shiyan's economic development depends on good transport connections—on one side, to Wuhan, the provincial capital and the portal to the north–south arterial highway corridor, and on the other side to western provinces through Shaanxi. From Shiyan, SME runs northwest, to Yunchian city (population 500,000), following essentially the alignment of NH209 along a valley crossing low mountains. In Yunchian, SME turns west and crosses the Hanjiang River at the lowest point of the alignment (140 m). From there, SME enters a mountainous area and climbs a narrow valley along Yunman provincial road (Class II or III) until it reaches Erdoya mountain, with gradients reaching 4 percent. This section includes a series of bridges and tunnels and high slopes and retaining walls; the 3,100 m tunnel crossing Erdoya mountain is 14 km from the end of SME and is the highest point of the road alignment (at an altitude of 700 m). From that point, the highway descends similarly steep slopes to the border with Shaanxi, which it reaches in the middle of a 2,200 m tunnel, to link to the Manchuangan – Shangluo expressway. HPCD will manage the construction of the entire tunnel, including a 1.7 km section in Shaanxi.

The project is designed as a four-lane expressway (two lanes in each direction) with an 80 km per hour speed. The long, steep, curvy slopes in the mountainous sections pose special traffic safety risks. These risks will be addressed through the construction of emergency facilities such as parking bays and emergency deceleration gravel beds and the placement of reinforced markings and road signs. Fire risks in long tunnels will be mitigated through design features and equipment as well as operating procedures established after consultation with firefighters.

The project also includes a 6 km connecting road in the Shiyan city area, six interchanges, one monitoring center, one monitoring sub-center one service area, two rest areas, two maintenance areas, and electrical and mechanical equipment (E&M) for maintenance operations and management. E&M equipment includes toll, telecommunications, and traffic monitoring systems, and safety and fire emergency facilities in tunnels. Because of the mountainous terrain, earthworks and stoneworks are estimated at 17.22 million m^3 of cuts and 16 million m^3 of fill. The total length of the 89 bridges is estimated at 28.32 km and that of the 30 tunnels at 13.69 km. SME construction should last 48 months; the opening to traffic is planned for March 2008.

A joint foreign–local team will carry out the supervision of SME civil works and E&M works. Contracts with domestic firms will be funded from domestic sources, and the contract with the

international supervising firm will be financed by the Bank loan. The supervision office will be staffed by domestic firms (56 at the general office and 129 in local offices along the alignment). International experts will assist the chief supervision officer and support domestic firms in managing and supervising project contracts, subgrade works, pavement works, bridge building, tunnel works, and E&M works. They should be in place before civil works start. The tasks of domestic supervision firms are estimated to require 6,192 persons per month and the tasks of the international supervision firm are estimated at 95 persons per month.

The Hubei Provincial Shiman Expressway Company (HPSEC), under HPCD, will operate and maintain the infrastructure after it opens to traffic. Highway users will pay tolls. HPCD will carry out a toll rate study before the end of construction to determine toll levels and structure.

HPSEC will prepare an operations risk management plan before the road opens to traffic, paying special attention to safety and fire hazards. Truck weight will be checked at tollgates, and overloaded trucks will not be allowed on the expressway. Drivers will receive information about the risks of driving on the steep slopes of the expressway. Finally, the dialogue established by HPCD with firefighters will continue during construction to ensure that fire equipment and operational procedures are appropriate.

The project will involve land acquisition and resettlement, which will be financed from domestic sources.

II. Local Road Improvement Program ($50.70 million)

The Local Road Improvement Program (LRIP) addresses the lack of accessibility in remote, low-income areas of Hubei province. Under this program, the project will rehabilitate and upgrade a series of low-class local roads in Shiyan City. The LRIP will be completed in two phases. The first phase consists of upgrading a bridge (355 m) with a 700 m long connecting road and a road (82 km).

In 2002, Class IV and nonclassified roads account for 75 percent of total road mileage in Hubei (85,757 km). The high proportion of low-class roads and the fact that most are not all-weather roads highlight the need to increase investment in this sector. Most counties and cities classified as poor (24 of 25) are in the western mountainous areas. The economic disparity between these western mountainous areas and other areas has increased despite the impressive growth in GDP in western areas (15-fold during the past 20 years).

Shiyan City and Enshi Prefecture in the western mountainous part of Hubei include 14 counties classified as poor on the national poverty scale. The lack of transport infrastructure is one of the main constraints to economic and social development in these areas. HPCD proposed Shiyan City for the LRIP because Enshi Prefecture has enjoyed the benefits of the national Go West policy in the past three years and of a rural road improvement program under the ongoing Hubei Xiaogan-Xiangfan Highway project. In Shiyan City, the LRIP road sections will be selected according to the following criteria:

- Current road conditions;
- Lack of alternative transport infrastructure;
- Current minimum daily traffic volumes of 400 medium truck equivalent (MTE) for Class IV roads, 500 MTE for Class III roads, and 600 MTE for Class II roads;
- Potential impact of the project on population's access to education, health, and other social activities, and on economic development, including facilitation of production and commercialization of local products;

- Contribution to Hubei province's plan to improve the functional responsiveness of the highway network;
- Strong support by local government and residents; and
- Expected EIRR higher than 12 percent.

HPCD used these criteria to identify 11 road sections and two bridges as candidates for improvement under the LRIP. A first phase of two of these projects was fully identified before project appraisal: Baoxia–Zhushan road (85 km) and Jiangjunhe bridge (355 m), both in Shiyan city and included in the provincial Three-Year Highway Program (2003–2005). The first phase is estimated to cost US$24.87million, of which US$21.29 million in civil works will be financed by the Bank. Baozhu road passes through Yunxian, Zhushan, and Yunxi counties, and Jiangjunhe bridge is in Shiyan City. All three counties are poor counties according to the national poverty scale; their GDP per capita was about RMB 2,000 in 2001, approximately 25 percent of the Hubei province average.

Baozhu road is in very poor condition, below even Class IV standards, and has become a transport bottleneck between NH316 and Zhushan County, impeding local people's access to the provincial road network. Upgrading Baozhu road to Class III is expected to promote local economic and social development significantly. In general, the proposed upgrading will retain the existing alignment, with some improvement on sharp curves (both horizontal and vertical). Two tunnels will be built (total length of 230 m). The total rehabilitation cost is estimated at RMB 168.46 million (US$20.30 million), and civil works financed by the Bank (excluding one tunnel) amount to RMB 146.89 million (US$17.7 million). The estimated EIRR is 14 percent.

Jiangjunhe bridge crosses the Han River in the corridor connecting Yunxi County to NH316 and Yunxian County. The existing bridge is only 5.6 m wide, and the structure is no longer safe. Only single trucks and cars at a limited speed and with a limited load can pass. Consequently, a new bridge is critical for keeping traffic flowing smoothly in this important provincial transport corridor. The construction cost of a new Class II bridge is estimated at RMB 39.97 million (US$4.57 million). Civil works are estimated at RMB 29.76 million (US$3.59 million). The EIRR is estimated at 16.64 percent. The construction of the Jiangjunhe bridge will be completed on December, 2006.

The characteristics of subprojects in phase 1 of the LRIP are shown in the following table.

County	Pop. in directly influenced areas	County GDP per capita (RMB, 2001)	Highway Characteristics				Cost (US$ million)		
			Project	Length (km)	Class	Construc -tion period	Total	Civil works	Bank loan
Yunxian Zhushan	131,000	2,238	Baoxia–Zhushan	85 km	III	2004–2006	20.30	17.70	3.54
Yunxi, Yunxian	78,000	2,163	Jiangjunhe Bridge	355 m	II	2004–2006	4.57	3.59	0.72

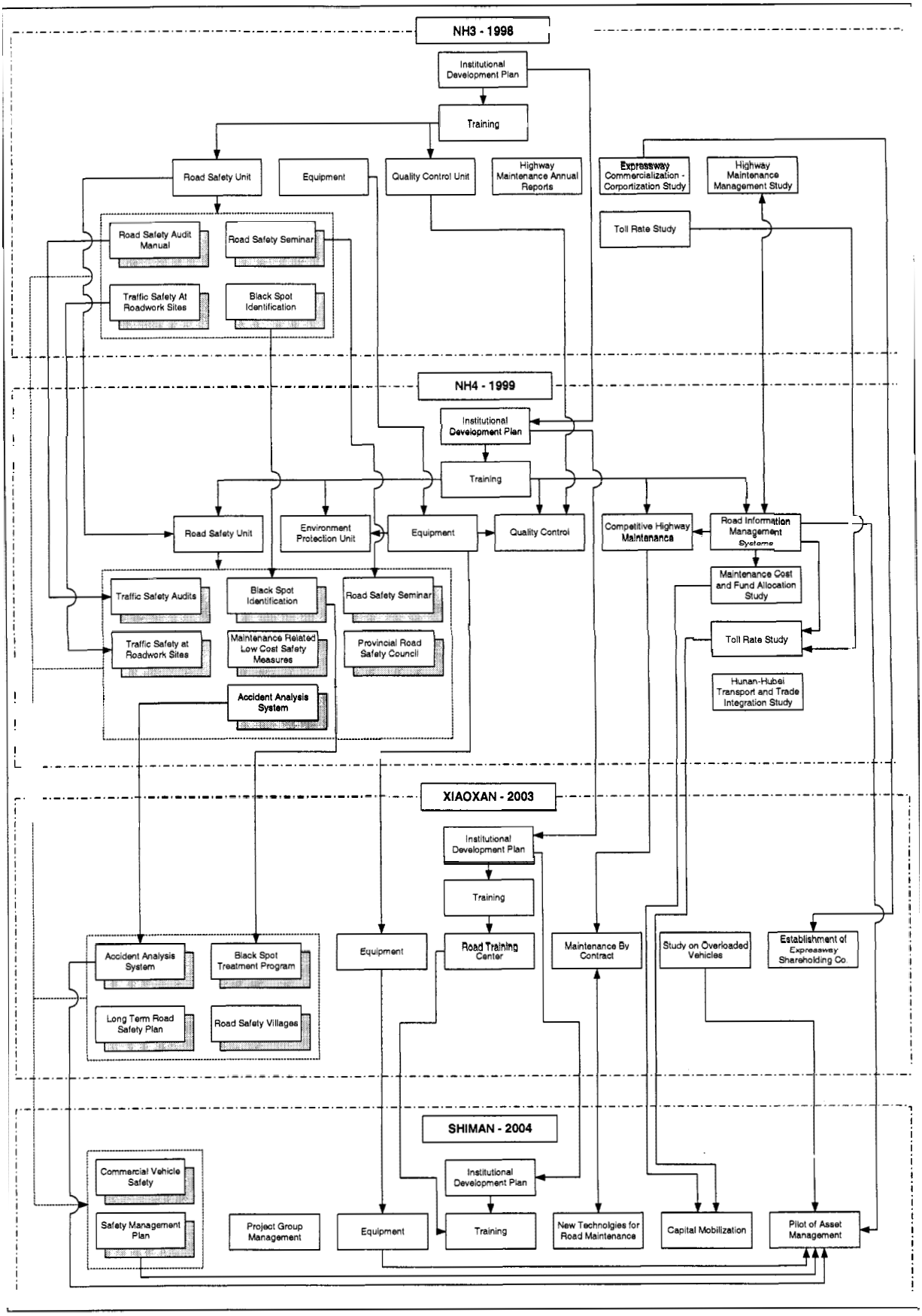
The Environmental Impact Assessments and Environmental Monitoring Plans for the first phase projects follow Bank guidelines. A social assessment was also prepared in accordance with Bank requirements. No resettlement is expected; however, HPCD has prepared a resettlement policy framework that will be applied if detailed design studies identify locations where resettlement is

needed. No ethnic community is affected by the project; therefore, the Bank has confirmed that no Ethnic Minorities Development Plan (EMDP) needs to be prepared.

During project implementation HPCD will select additional road sections for the second phase of LRIP according to the same criteria as for the first phase, and the Bank will review them. For each subproject, HPCD will prepare an EIA and EMP as well as a resettlement action plan (RAP) consistent with the resettlement policy framework if works entail involuntary resettlement, in compliance with Bank safeguard policies. A social assessment will be prepared for each project, and if ethnic minorities will be affected, an EMDP will be prepared.

III. Institutional Strengthening, Policy Development and Road Safety ($6.36 million)

As shown in the following figure, the Bank has undertaken a range of institutional strengthening activities under the NH3, NH4, and Xiaoxiang projects. The activities under this project build on this work and focus on assisting HPCD in developing more proactive management of the highway network and therefore in meeting its objective of transitioning towards more efficient road management practices.


NH3 - 1998
Institutional Development Plan
Training
Road Safety Unit
Equipment
Quality Control Unit
Highway Maintenance Annual Reports
Expressway Commercialization - Corportization Study
Highway Maintenance Management Study
Toll Rate Study
Road Safety Audit Manual
Road Safety Seminar
Traffic Safety At Roadwork Sites
Black Spot Identification
NH4 - 1999
Institutional Development Plan
Training
Road Safety Unit
Environment Protection Unit
Equipment
Quality Control
Competitive Highway Maintenance
Road Information Management Systems
Maintenance Cost and Fund Allocation Study
Traffic Safety Audits
Black Spot Identification
Road Safety Seminar
Traffic Safety at Roadwork Sites
Maintenance Related Low Cost Safety Measures
Provincial Road Safety Council
Toll Rate Study
Accident Analysis System
Hunan-Hubei Transport and Trade Integration Study
XIAOXAN - 2003
Institutional Development Plan
Training
Accident Analysis System
Black Spot Treatment Program
Equipment
Road Training Center
Maintenance By Contract
Study on Overloaded Vehicles
Establishment of Expressway Shareholding Co.
Long Term Road Safety Plan
Road Safety Villages
SHIMAN - 2004
Institutional Development Plan
Commercial Vehicle Safety
Safety Management Plan
Project Group Management
Equipment
Training
New Technolgies for Road Maintenance
Capital Mobilization
Pilot of Asset Management

The project will introduce a total asset management approach through a pilot study, investigate improvements in highway financing and maintenance processes, streamline operations by implementing group project management, enhance safety planning and the safety of the road transport industry, and support training activities and equipment procurement.

Training Program ($550,000)

A major training program will be undertaken with the support of Hubei Communications Technical College (HCTC), which is the principal trainer under the Hubei Xiaogan-Xiangfan Highway project. The HPCD undertook a training-needs assessment review for the project. The review considered a range of factors, including (a) who needs training; (b) the levels of training required; (c) availability of training resources; (d) training methods and locations; and (e) training budget requirements. The training needs data were collected through a comprehensive survey conducted throughout HPCD and reflect the feedback from 438 questionnaires.

The review also identified a need to enhance the professionalism of highway technicians and managers and improve specialized construction, maintenance, and management skills. The training program will strengthen staffers' skills and introduce new concepts.

The proposed training program calls for domestic training ($200,000) in topics such as environmental protection, supervision and quality control, resettlement, procurement, and project management. Overseas study tours and training ($327,500) in more specialized skills such as road management, road finance, and expressway operations are also recommended. The following table summarizes the training program; it will be updated periodically during project implementation.

Scope	Domestic training		Overseas training			Overseas Tour			Total cost ($US)
	No. of person	Cost ($US)	No. of person	Person-month	Cost ($US)	No. of person	Person-month	Cost ($US)	
Project preparation and management									
Project construction management						5	2.5	25,000	25,000
Project planning and design in mountainous areas			5	5	37,500	5	2.5	25,000	62,500
Quality control and management			6	6	45,000				45,000
Engineering supervision	110								
Environment Protection	35		5	5	37,500				37,500
Resettlement	50								
Highway sector management									
Highway sector management						5	2.5	25,000	25,000
Maintenance new technology						5	2.5	25,000	25,000
Highway sectors funds usage and resources			5	5	37,500	5	2.5	25,000	62,500
Expressway operation models			6	6	45,000				45,000
Institutional Activities									
Disbursement procedures of the Bank	8								
Procurement procedures of the Bank	8								
Project Management	10								
Effect Evaluation									20,000
Total	242.5	200,000	27	27	202,500	25	12.5	125,000	547,500

Intermediate results:	- Number of people trained on the project.
Outcome:	- Improved skills in construction, maintenance and management, which will result in greater efficiency and effectiveness in HPCD operations.
Indicators:	- HCTC staff trained and offering courses to meet HPCD's needs. - Percentage of trained personnel able to use new skills in their work. - Annual progress reports. - Training effectiveness report based on post-training evaluations.

Pilot Study on Expressway Asset Management ($160,000)

Under the NH3, NH4 and Xiaogan-Xiangfan Expressway projects, HPCD has been developing expertise in infrastructure asset management. It has prepared annual condition survey reports and a highway maintenance management study, developed an accident information system, road data bank, and pavement and bridge management systems. The objective of this study is to build on this work and pilot test the application of full infrastructure management on an expressway.

The study will prepare an asset management plan for an expressway company to be selected by HPCD and will last the duration of the project.

An annual life-cycle asset management report will be produced, including: (a) a summary of physical assets; (b) a summary of asset condition; (c) valuation of assets, including depreciation; (d) a routine maintenance plan; (e) a periodic maintenance plan; (f) an improvement plan; and (g) a disposal plan. Annual financial statements showing the projected financial performance of the expressway during the next 10 years will be prepared, including: (a) cash flow forecasts; (b) expenditure breakdown by asset and activity; (c) valuation forecasts; and (d) time trends.

The final report will review the effectiveness of the pilot study and make recommendations for how the asset management approach could be applied to the provincial road network.

Intermediate results:	- An asset management plan for the expressway network that is regularly updated through the various support systems. - Report recommending how asset management can be applied to other roads in the province.
Outcome:	- Successful application of total asset management principles to Hubei and foundation for applying throughout HPCD.
Indicators:	- Implementation of asset management systems. - Inventory and annual data collection surveys. - Annual asset management reports. - Annual financial statements. - Recommendations on how to implement throughout Hubei.

Capital Mobilization Study ($150,000)

Hubei province already suffers from a severe shortfall in road maintenance funding (see Annex 1) that will be exacerbated as more roads are constructed.

This study will build on the maintenance cost and fund allocation study conducted under NH4. For 5-, 10- and 20-year horizons, total capital demand for road construction, maintenance, and management will be estimated along with likely income. From this the capital deficit will be established. The various mechanisms that can be mobilized to provide capital for road construction, maintenance, and management will be identified along with those that are most suitable for Hubei.

The study will be conducted by HPCD and will take 2.5 years.

Intermediate results:	- Strategy for mobilizing capital for meeting 5-, 10-, and 20-year construction, maintenance, and management needs.
Outcome:	- HPCD will have sufficient capital to ensure that the road network continues to develop and existing roads are properly maintained.
Indicators:	- Identification of total capital demands for construction, maintenance, and management for 5-, 10-, and 20-year horizons. - Recommendation on mechanism for meeting capital demands. - Implementation strategy.

New Technologies for Road Maintenance ($100,000)

The shortage of funds for road maintenance in Hubei has led HPCD to consider innovations in the way it delivers road maintenance. Under the NH4 and Hubei Xiaogan-Xiangfan Highway projects HPCD is testing the delivery of maintenance by contract rather than by force account. Another avenue for innovation is new technologies for road maintenance. These offer the potential of improved quality and/or efficiencies.

The study will review road maintenance performance issues in Hubei. An investigation will be made into domestic and foreign technologies that have the potential to improve the delivery of maintenance. A small number of technologies that hold potential for practical adoption in Hubei will be procured and tested in pilot studies to be conducted in different regions. The results of the pilot studies will be used to determine the economic benefits gained by adopting the different technologies and to prepare a plan for wide-scale implementation.

The study will be done by the Hubei Highway Administration Bureau of HPCD and will take 3.5 years.

Intermediate results:	- Report on technologies offering potential to improve maintenance quality and/or efficiency. - Report describing results of pilot testing of selected technologies. - Plan for wide-scale implementation.
Outcome:	- Improved quality and/or efficiency of road maintenance.
Indicators:	- Assessment of technologies. - Procurement and pilot testing of selected technologies. - Progress reports.

Group Management of Projects ($100,000)

HPCD is facing major institutional challenges in completing all the projects identified in the Tenth Five-year Plan. Given staffing and resource levels, the current practice of assigning one team to each project to carry out the many project preparation tasks (prefeasibility studies, feasibility studies, design, environment and social monitoring, bid documents, etc.) will no longer be viable. This technical study will identify opportunities for adopting group project management principles and new IT solutions to streamline the operations and delivery of projects.

Intermediate results:	- Report on group management methods and how they can be applied to Hubei.
Outcome:	- Improved efficiency of expressway construction and management.
Indicators:	- Consolidation of activities for expressway construction and management.

HPCD Safety Management Plan for Class I and Class II Roads ($100,000)

HPCD agreed to develop a comprehensive highway safety management plan that sets out its road safety goals, objectives, policies, and priorities for Class I and Class II roads and the organizational processes and measures that it is taking to implement them. It will draw together all past, ongoing, and future road safety components, including a long-term road safety action plan coordinated by the multi-agency Hubei Provincial Safety Council.

Specifically, the Highway Safety Management Plan will optimize safety resource allocation by establishing priorities and systematic processes for the medium term, including regular safety performance monitoring, according to an annual timetable.

The Bank and Hubei Province agreed that future road safety projects would be in accordance with a clear vision for improved road safety outcomes, well-specified objectives to achieve this vision, and robust arrangements for inter-agency coordination and cooperation, taking into account the progress made under previous projects, the needs revealed by accident data, opportunities for innovation, anticipated impacts of traffic growth and the requirement to maximize quality and safety performance within capital and personnel constraints. It was also agreed that the project focus should be on safety measures that fall clearly within the scope of HPCD responsibilities and spheres of influence.

The potential scope of HPCD safety measures is extensive and includes the design of safe roads, setting of speed limits, safe construction of roads, safe maintenance of roads, undertaking regular safety reviews, adding new safety facilities, removal of roadside safety hazards, identification

and treatment of blackspots, safety screening of commercial operators, safety training for staff, and safety research and development.

The HPCD Safety Management Plan project will:

- Survey a representative sample of Class I and II roads to compile and analyze data on safety-related features (surface quality, shoulders, roadside hazards, signs, markings, blackspots, etc.) and relevant vehicle performance measures (overloading, etc).
- Collect and analyze data from previous and ongoing road safety project components and other sources on road user and vehicle performance that affects safety outcomes on Class I and II roads.
- Review all potential HPCD safety measures (including those developed in previous, ongoing and future road safety project components) to assess the scope of their application.
- Prepare a highway safety management plan that sets out HPCD safety goals, objectives, policies, and priorities for Class I and II roads and the organizational processes and measures it is taking to implement them.

HPCD will implement the project over three years. It will be assisted by domestic consultants and will use the findings of domestic and international study tours to be completed in June 2007.

Intermediate results:	- HPCD Safety Management Plan finalized, specifying safety goals, objectives, policies and priorities for Class I and II roads and organizational processes and measures to achieve them.
Outcome:	- Improved safety performance of Class I and II roads, resulting in reduced deaths and injuries.
Indicators:	- Percentage of Class I and II roads systematically treated in accordance with the goals, objectives, policies and priorities of the Highway Safety Management Plan.

Safety Review Process for Road Freight and Passenger Transport Enterprises ($100,000)

The road transport industry is experiencing rapid development in Hubei Province, reflecting national economic growth trends. However, this escalating activity is generating a high rate of road crash deaths and injuries. Safety management capacity in the road transport industry is weak, and measures taken by industry to improve the safety performance of vehicles and drivers are poor. Regulatory arrangements in Hubei Province need to be strengthened. HPCD agreed to review the safety performance of the road transport industry in the province and develop better safety criteria for enterprises seeking approval to operate freight and passenger services. This project subcomponent will:

- Review the safety of road freight and passenger transport enterprises in Hubei Province and develop safety performance measures.
- Conduct three intensive pilot studies with selected enterprises – covering passenger transport, freight transport and the transport of dangerous goods – to further develop and improve procedures to ensure safe operations and compliance with safety regulations.

- Develop a safety screening and appraisal process for road and passenger transport enterprises in Hubei Province, specifying mandatory safety requirements, procedures, and monitoring arrangements for granting, renewing, and revoking operating licenses.
- Design and conduct training courses for management and operational staff of transport enterprises and HPCD staff to ensure compliance with safety requirements, procedures, and monitoring arrangements.

HPCD will implement this activity over three years. It will be assisted by domestic consultants and will use the findings of domestic and international study tours to be completed in October 2007.

Intermediate results:	- Safety review process for road freight and passenger transport enterprises finalized, specifying mandatory safety requirements, procedures and monitoring arrangements for granting, renewal, and revoking operating licenses.
Outcome:	- Improved safety performance of road freight and passenger transport enterprises, resulting in fewer deaths and injuries.
Indicators:	- Percentage of road freight and passenger transport enterprises systematically screened in accordance with the safety requirements, procedures, and monitoring arrangements of the Safety Review Process.

Procurement of Equipment ($5.10 million)

The equipment procurement program takes into account the equipment procured under the previous Bank-financed highway projects or by HPCD during the past few years for strengthening the road agency's capability and operating new expressways. The new project includes equipment for (a) construction quality control and monitoring, including laboratory equipment and environment control and monitoring equipment; (b) operation and maintenance of SME after it opens for traffic; (c) institutional strengthening of HPCD, including office and information technology equipment.

Among the equipment to be procured is a vehicle for measuring road conditions at high speed. This vehicle will be used primarily on the expressway but also for monitoring at least 7,500 km per year of other HPCD roads. Weigh-in-motion equipment will be procured for installation on SME. This will be used to gather data on the magnitude and extent of truck overloading. Both of these will enable HPCD to monitor the network in a more detailed manner, thereby improving its ability to make good investment decisions.

Annex 5: Project Costs

CHINA: Hubei Shiman Highway Project

Project Cost By Component and/or Activity	Local US $million	Foreign US $million	Total US $million
I. Shiman Expressway			
- Civil works	192.66	163.99	356.65
- Buildings and annex areas	7.13	1.78	8.91
- E&M equipment works	2.95	11.82	14.77
- Connecting roads	1.88	0.47	2.35
- Construction supervision	5.88	1.82	7.70
- Land Acquisition	24.50	0.00	24.50
II. Rural Road Improvement Program			
- Civil works	40.00	10.00	50.00
- Construction supervision	0.7	0	0.70
III. Institutional Development and Road Sector Management			
- Institutional studies	0.51	0.00	0.51
- Road safety studies	0.20	0.00	0.20
- Training program	0.22	0.33	0.55
- Equipment	2.31	2.79	5.10
Total Baseline Cost	278.94	193.00	471.94
Physical Contingencies	28.43	5.00	33.43
Price Contingencies	21.99	0.00	21.99
Total Project Costs (1)	329.36	198.00	527.36
Front-end fee		2.00	2.00
Total Financing Required	329.36	200.00	529.36

[1] Identifiable taxes and duties are US$m 13.49, and the total project cost, net of taxes, is US$m 515.86. Therefore, the share of project cost net of taxes is 38.29%.

Annex 6: Implementation Arrangements

CHINA: Hubei Shiman Highway Project

The project will be implemented by HPCD, the provincial agency responsible for road management in Hubei province. The World Bank-Financed Project Office (WBFPO) in that department has coordinated project preparation and will remain the Bank's main counterpart during implementation. Similar arrangements have been made on the three previous Bank-financed highway projects in Hubei and have proved very effective.

HPCD has established a dedicated project headquarter, the newly created Hubei Provincial Shiman Expressway Construction Headquarter (HPSECH), to implement the SME, and the Hubei Provincial Shiman Expressway Company Ltd. (HPSEC) to operate and maintain it after it opens to traffic. HPCD has staffed the headquarter by transferring people from the Xiangfan–Shiyan Expressway headquarter after this infrastructure opened to traffic. HPCD has hired the Hubei Provincial Highway Design Institute (HPHDI) and the Second National Survey and Design Institute from MOC to carry out design studies of SME. The HPSECH will manage construction works as the "Client" with the assistance of HPSEC and a supervision organization made of domestic firms and an international consultant. The HPSEC will operate SME after the infrastructure opens for traffic.

With respect to resettlement, the dedicated Hubei Expressway Resettlement Office (HERO) has prepared the RAP. That office will lead resettlement operations under the oversight of the provincial resettlement leading group led by the Vice-Governor, and manage multi-level resettlement units established along the alignment with local governments at City, county/banner, and township. This organization has been staffed with experienced experts, their responsibilities have been specified in the RAP and training programs will be organized. Other relevant government agencies responsible for planning, financing, communications and land administration will also be involved at different levels. HPCD has prepared and included in the RAP a detailed training program for the capacity building of project offices. Moreover, HPCD will issue a specific regulation for the approval and usage of resettlement funds. The payment process to beneficiaries will be streamlined to avoid possible fund deductions during disbursement, and each affected village will have a specific account with a local Bank. The appointed bank will report daily on the usage of resettlement funds items to the project office for internal monitoring. HPCD will also strengthen the capacity of township-level and county-level to manage resettlement funds.

On environment, HPCD has prepared an EMP on SME that includes practical and cost effective measures necessary to mitigate the project related impacts by incorporating them in the design and by implementing them during the construction and operation phases. The EMP also specifies the appropriate monitoring plans, training, institutional arrangements, implementation schedule, budget needs, etc. necessary to implement the mitigation measures and strengthen the borrowers capacity. Since the project would be the fourth Bank project to be implemented by Hubei province, HPCD has developed ample in-house capacity in its environment unit to implement, supervise and monitor the EMP.

With respect to the LRIP, the Hubei Provincial Highway Administration Bureau (HPHAB) has identified and prepared projects as it is in charge within HPCD of managing the provincial highway network. The experienced HPHDI has undertaken the design of road improvement,

whereas respective county offices of HPHAB will carry out procurement activities under the oversight of the HPSECH, and manage works with the assistance of domestic firms for supervision. The implementation of the EMPs prepared on each road section will be supervised by the WBFPO.

Finally, the WBFPO is preparing the institutional strengthening and policy development component and will coordinate the implementation of activities. Depending upon activities, other units from HPCD will contribute.

Procurement

HPCD will be responsible to carry out the procurement under the project. The HPSECH will handle the day-to-day management of the project including the procurement process with the assistance of the HPSEC. Staff who have been familiarized with Bank-financed procurement in previous highway projects have been transferred to HPSEC. To obtain necessary professional assistance for ICB procurement, HPCD has selected China International Tendering Company (CITC) as procurement agent for the proposed project. This agent has 16 years of handling Bank-financed ICB procurement.

The LRIP will be separately implemented by Project Management organizations (PMO) of Yunxi and Yunxian counties of Shiyan City. The PMOs will carry out NCB procedures with close oversight by HPSEC, who will conduct prior review of the critical steps of the procurement process. Such arrangement has been adopted in the ongoing Hubei Xiaogan-Xiangfan Highway Project and found to be generally satisfactory.

The above implementing agencies have been assessed to have adequate capacity to carry out the procurement under the project.

Annex 7: Financial Management and Disbursement Arrangements

CHINA: Hubei Shiman Highway Project

I. Executive Summary and Conclusion

The Financial Management Specialist (FMS) has conducted an assessment of the adequacy of the project financial management system of the Hubei Shiman Highway Project. The assessment, based on guidelines issued by the Financial Management Sector Board on June 30, 2001, has concluded that the project meets minimum Bank financial management requirements as stipulated in BP/OP 10.02. In the FMS' opinion, the project will have in place an adequate project financial management system that can provide, with reasonable assurance, accurate and timely information on the status of the project in the reporting format agreed with the project and as required by the Bank.

Funding sources for the project include Bank loan and counterpart funds. Bank loan funds will flow from the Bank to the project's special account to be established at and managed by the Hubei Provincial Finance Department (HPFD) to the project implementing agency, the HPCD, and finally to contractors or suppliers. The Bank loan will be signed between the Bank and the People's Republic of China through its Ministry of Finance (MOF), and a on-lending arrangement for the Bank loan will be signed between MOF and the Government of Hubei through HPFD, and between HPFD and HPCD. In accordance with the agreement between the Bank and MOF, the project will use traditional disbursement techniques.

Counterpart funds will be loans from local banks (28%) and appropriations from MOC and provincial government (35%).

No outstanding audits or audit issues exist with the implementing agency involved in the proposed project. However, the Financial Management team will continue to be attentive to financial management matters and audit covenants during project supervisions.

II. Summary Project Description

The main objective of the project is to support socioeconomic development of Hubei province by enhancing its access to other provinces, particularly the western region of China, improving local mobility within poor, remote western parts of the province, and strengthening governance of the provincial road sector. The project will produce the following outputs:

- The construction of Shiyan–Manchuangan Expressway (SME), which will increase transportation capacity in a corridor connecting Hubei to western provinces.
- A program of local road improvements (LRIP) in the poor northwestern part of Hubei.
- A series of institutional strengthening and policy development activities for road management and improvements in road safety in Hubei.

Total project cost is estimated at US$529.36 million, of which US$200 million would be from a IBRD loan. Counterpart funds would make up the remaining US$329.36 million balance.

III. Country Issues

To date, no CFAA (Country Financial Accountability Assessment) has been performed for China, though dialogue with the Government of China in respect of the CFAA exercise has been initiated and currently underway. The Bank has relied on a similar exercise carried out by the Asian Development Bank in 2000 for reference.

However, based on observations of developments in the areas of public expenditures, accounting and auditing, and Bank experience with China projects for the past few years, we noted that substantial achievement in the aforementioned areas has been made and further improvement is expected in the next few years. As economic reform program further unfolds, the Government of China has come to realize the importance of establishing and maintaining an efficient and effective market mechanism to ensure transparency and accountability, and minimize potential fraud or corruption.

Due to rather unique arrangement by the Government of China, funding (in particular Bank loan) of Bank projects is controlled and monitored by the MOF and its extension, (i.e. finance bureaus at provincial, municipal/prefecture and county level). However, project activities are usually carried out by implementing agencies of a specific industry or sector due to the level and complexity of expertise involved. The above arrangement then usually requires more coordination on the project, as the multi-level management of the funding and implementation mechanism sometimes works to the detriment of smooth project implementation.

IV. Risk Analysis

The following risks with corresponding mitigating measures have been identified during assessment:

Risk	Risk Rating	Mitigating Measures
I. Inherent Project Risk	Moderate	Close monitoring by project management, regular supervision mission by Bank task team, and implementing agency has experience with prior Bank project.
II. Control Risk		
a. Implementing Entity	Low	The project implementing entity, HPCD, has previous experience with Bank project. They are currently involved with 3 other projects.
b. Funds Flow	Low	HPCD and HPFB have worked together on previous Bank projects and are very knowledgeable of the process and Bank requirements.
c. Staffing	Moderate	Periodic verification on accounting work by the PMO and the task team should be performed. Accounting staff have already been identified and their qualifications are in-line with their expected responsibilities.
d. Accounting Policies and Procedures	Low	Accounting policies and procedures are already in place.
e. Internal Audit	Moderate	Although an internal audit department exist at HPCD, we will not be relying on their work. Supervision visits by the task team along with annual audits by the external auditors will be utilized.
f. External Audit	Low	The external auditors, the Hubei Provincial Audit Office, has extensive experience with previous Bank-financed projects.
g. Reporting and Monitoring	Low	Format and content of financial statements and frequency of submission have been clearly defined by the Bank and MOF.
h. . Information Systems	Moderate	The PMO proposes to use the Golden Butterfly financial management software for this project. This software is one of the MOF approved software. FMS will evaluate the effectiveness of this system during implementation.

V. Strengths and Weaknesses

Strengths. This will be the fourth Bank project to be implemented by HPCD. Project personnel identified to assume financial or accounting position have relevant adequate work experience and educational background. HPCD has accumulated extensive experience from prior projects. HPCD has established a construction headquarter, HPSECH, to be the PMO responsible for the overall management of this project with the assistance of the future operator of SME (HPSEC). HPSECH will comprise some employees from previous expressway projects managed by HPCD. Additionally, HPCD will also benefit from the experience of HPFD, whom are familiar with Bank requirements. Management structure and funds flow arrangement are similar to those of the previous projects. Prior records indicate that HPFD capacity has been found satisfactory in respect of project financial management and processing of withdrawal applications.

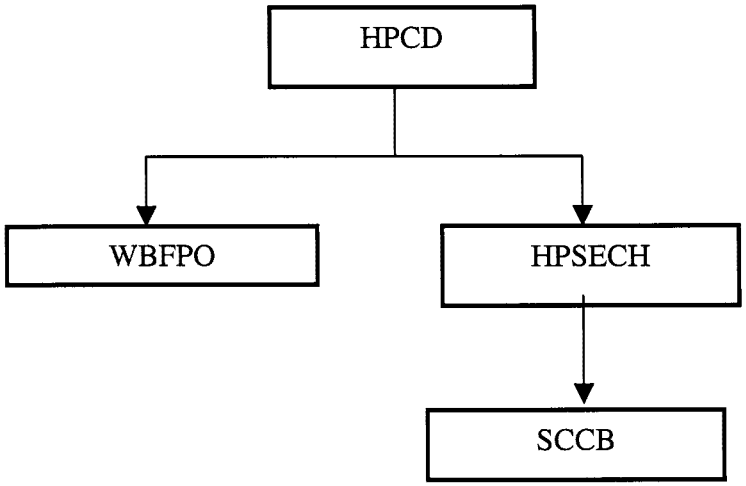
Weaknesses. The local road improvements portion of this project is to be implemented by PMOs established within the Shiyan City Communications Bureau (SCCB) from the HPHAB, responsible for managing the Hubei highway network. SCCB has no experience with previous Bank projects but will operate under the oversight of the HPSECH.

VI. Implementing Entity

HPCD is the implementing agency responsible for this project. HPSECH is the PMO responsible for the overall management of this project. In addition, HPCD will utilize the World Bank-Financed Project Office (WBFPO), a department established within HPCD, as the entity responsible for coordinating project preparation. WBFPO has been involved with the previous three Bank projects and continues to be the Bank's main contact in coordinating the various projects.

The separate implementing entity, SCCB, will be responsible for the local roads improvement portion of this project and will report directly to HPSEC.

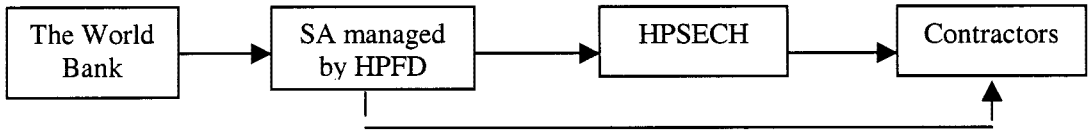
The organization chart is as follows:



HPCD - Hubei Provincial Communications Department
WBFPO - World Bank-Financed Project Office
HPSECH- Hubei Provincial Shiman Expressway Construction Headquarter
SCCB - Shiyan City Communications Bureau

VII. Funds Flow

Funding for the project includes Bank loan and counterpart funds. One special account will be established at the Hubei Provincial Finance Department. Bank loan will be signed between the People's Republic of China and the Bank, and on-lending agreements will be signed between MOF and HPFD and between HPFD and HPCD. The funds flow is as follows:



VIII. STAFFING

Adequate project accounting staff with educational background and work experience commensurate with the work they are expected to perform is one of the factors critical to successful implementation of project financial management. For the financial/accounting staff already identified for the project, the FM Specialist notes that, based on discussions, observation and review of the background and work experience, they are qualified and appropriate for the positions and work they are expected to perform.

To strengthen financial management capacity and achieve consistent quality of accounting work, the task team has suggested that a project financial management manual (the Manual) be prepared. The Manual will provide detailed guidelines on financial management, internal controls, accounting procedures, fund and asset management and withdrawal application procedures.

A draft of the Manual has been prepared by HPSECH and provided to the Bank by WBFPO. The FMS has reviewed it and provided WBFPO with feedback on necessary changes. The FMS anticipates that a Manual would be finalized by the end of January 2004 and distributed to all the financial staff before project effectiveness.

As some financial staff maybe new to the Bank's project, a well-designed and focused training program in project financial management should be provided prior to project effectiveness by WBFPO and HPSECH to all financial and accounting staff to ensure a good understanding and knowledge of the following:

- Bank's financial management policy and disbursement procedures
- Fund/asset/contract management
- Format and content of project financial statements
- Audit requirement

IX. Accounting Policies and Procedures

The administration, accounting and reporting of the project will be set up in accordance with the following regulations/circulars issued by MOF: Circular #13 - "Accounting Regulations for World Bank Financed Projects" issued in January 2000 by MOF.

HPSECH will manage, monitor and maintain project accounting records. Original supporting documents for project activities will be retained by them. In addition, HPSECH will prepare project financial statements and submit them to the Bank for reviews and comments on a regular basis. Additionally, WBFPO will provide coordination support throughout the project.

X. Internal Audit

Although HPCD has its own internal audit department, we have not and will not assess the competency of the internal audit department due to the cost/benefit of doing such work. As such, reliance will not be placed on work performed by them.

XI. External Audit

In line with other Bank financed projects in China, the project will be audited in accordance with both International Auditing Standards and the Government Auditing Standards of the People's Republic of China. The Hubei Provincial Audit Office (HPAO) has been identified as the auditor for this project. Annual audit reports will be issued in the name of HPAO and subject to

reviews by the China National Audit Office (CNAO). The Bank currently accepts audit reports issued by CNAO or provincial/regional audit bureaus/offices for which CNAO is ultimately responsible.

Audit reports on annual project financial statements will be due to the Bank within 6 months of the end of each calendar year.

XII. Reporting and Monitoring and Format of Financial Statements

The format and content of the following project financial statements represent the standard project reporting package agreed to between the Bank and MOF, and have been discussed and agreed with all parties concerned. In line with the newly issued Financial Monitoring Report (FMR) guidelines, the unaudited project consolidated financial statements will be submitted as part of FMR to the Bank on a semi-annual basis (prior to August 15 and February 15 of the following year), and include the following four statements:

- Balance Sheet;
- Summary of Sources and Uses of Funds by Project Component;
- Statement of Implementation of Loan Agreement; and
- Statement of Special Account.

XIII. Information Systems

A computerized financial management system will be utilized by the PMO. "Golden Butterfly", a well-established accounting software package approved by MOF, will be used for this project. The task team will closely monitor accounting work to ensure proper recording and reporting in order to determine the effectiveness of this system.

XIV. Impact of Procurement Arrangements

Thresholds set for procurement post-review will be consistent with that set for SOE for disbursement purpose. To have maximum effectiveness and efficiency, financial management specialist and procurement staff should jointly participate in supervision missions to ensure the following:

- Contracts awarded are in line with the Bank's procurement guidelines; and
- Contract payments made are in accordance with the terms of the contract and well supported.

XV. Disbursement Arrangements

The project will be disbursing on the traditional disbursement techniques and will not be using PMR-based disbursements, in accordance with the agreement between the Bank and MOF.

Bank loan proceeds would be disbursed against eligible expenditures as follows (i) works – 46% of expenditures on SME civil works, 80% on SME E&M, 20% on SME annex areas, buildings and connecting roads and LRIP, (ii) Goods – 100% of foreign expenditures, 100% of local expenditures (ex-factory) and 75% of other items procured locally, (iii) consultant services- 91% of expenditures, and (iv) training – 100% of foreign expenditures.

Disbursement methods, such as replenishment, direct payment and special commitment, are available for the project. The SOE limits will be set up in line with procurement post-review threshold, as follows:

- Works under contracts costing less than US$5 million equivalent each;
- Goods under contracts costing less than US$250,000 equivalent each;
- Consulting services under contracts awarded to consulting firms costing less than US$100,000 equivalent each;
- Consulting services under contracts awarded to individual consultants costing less than US$50,000 equivalent each;
- All trainings.

One special account (SA) will be established at and maintained by HPFD for this project. The SA for the project will be in US dollar, with an authorized allocation at US$14 million equivalent to about 4 months of eligible expenses reimbursable via special account. The initial authorized allocation from the Bank would be US$11 million until the aggregate withdrawals and outstanding Special Commitments will be equal to or exceed US$60 million equivalent. From the SA, the Bank funds would be disbursed to project implementing entities and/or supplier and contractors.

HPFD will be directly responsible for the management, monitoring, maintenance and reconciliation of the SA activities of the project in the province. Supporting documents required for Bank disbursements will be prepared and submitted by the PMO to HPFD for verification and approval before submission to the Bank for disbursement processing.

XVI. Action Plan

The following proposed time-bound actions that have no major impact on project preparation or Board presentation, but should be adequately addressed by the project:

Action	Responsible person	Completion Date
1. Financial management manual finalized and issued.	WBFPO and HPSECH	Before effectiveness
2. Adequate financial and accounting staff should be in position.	HPSECH	Before effectiveness

XVII. Financial Covenants

In addition to the standard financial covenants (e.g. maintaining project accounts in accordance with sound accounting practices, audit requirement and SOE), as described in the legal document, specific financial covenants applicable to project will be detailed in section C of the PAD.

XVIII. Supervision Plan

A detailed supervision plan for this project will be included as part of the China Audit Strategy document which is currently in process. This document will take into consideration of the size of the project and the risks identified.

Annex 8: Procurement

CHINA: Hubei Shiman Highway Project

Summary of the Assessment of Agencies' Procurement Capacity

1. A procurement capacity assessment of the implementing agencies was carried out during the appraisal of the proposed project. Report of such assessment was archived in the project files and the following summarizes the assessment.

2. HPCD will be responsible for all project related procurement activities. It has accumulated relevant experience in Bank-financed projects as the implementing agency for NH3, NH4 and Hubei Xiaogan-Xiangfan Highway Project. HPCD has established a dedicated work unit (HPSECH) to handle the day-to-day management of the project including the procurement process with the project shareholding company (HPSEC) assistance. HPSEC has allocated adequate human and other resources for the same. HPSECH and HPSEC staff are quite familiar with Bank-financed procurement procedures. To avoid excessive cost overruns and improve the procurement economy, HPCD has agreed to take measures to ensure that the procurement is carried out based on adequate geological investigations and complete detail engineering design.

3. The LRIP will be implemented by PMOs established in Yunxi and Yunxian counties of Shiyan City that report to HPHAB. Bidding documents are being prepared by the HPCDI and all the contracts under this component will be procured following NCB procedures with close oversight by the HPSECH, who will conduct prior review of the critical steps of the procurement process. Such arrangement has been adopted in the ongoing Hubei Xiaogan-Xiangfan Highway Project and found to be generally satisfactory.

4. HPCD has selected China International Tendering Company (CITC) as procurement agent for ICB procurement for the proposed project. CITC has 16 years experience in ICB procurement under Bank financed projects.

5. The procurement capacity assessment has assessed the overall risk of the procurement process as average and confirmed the capacity and capability of HPCD and involved agencies to satisfactorily manage the project procurement activities.

6. Comparing with the Bank Guidelines, the assessment has also identified the major deviations of the Tendering and Bidding Law (TBL) of China as follows:

(a) Advertisement: the TBL requires open bidding to be advertised in state-designated media, which sometimes accept advertising in radio broadcasting, notices displayed at tendering centers, TV and websites, etc.;

(b) Time for bid preparation and submission: the TBL sets 20 days as the minimum time for bid preparation and submission;

(c) The TBL does not require provisions to be included in BD that sufficient performance security be provided to protect the purchaser for works contracts;

(d) Minimum number of bids: the TBL requires mandatory re-bidding in case less than three bids are received.

(e) The TBL allows that bids be evaluated by a comprehensive bracketing and scoring method, and a bid offering price lower than cost be rejected. However, it does not provide provisions for determining the cost.

The TBL has been effective since January 1, 2000 and governing all tendering activities of investment projects in China except foreign funded projects. To ensure that the Bank-financed NCB procurement follows the procedures which are acceptable to the Bank and in broad consistency with the Bank Guidelines, clarifications on procedures to be followed have been incorporated into the procurement schedule of the Project Agreement of the proposed project.

Procurement Methods (Table A)

7. Procurement arrangements are outlined in Table A. Procurement of Goods/Works and services will be carried out in compliance with the Bank Guidelines Procurement under IBRD Loans and IDA Credits(January 1995, revised January and August 1996, September 1997, January 1999, and May 2004) and the Guidelines Selection and Employment of Consultants by World Bank Borrowers(January 1997, revised September 1997, January 1999, May 2002, and May 2004). The Chinese MBDs, as issued by Ministry of Finance in May 1997 with the Bank's agreement will be used with further modifications to reflect the latest changes of the Bank's standard bidding documents. Where no MBD exists, Bank SBDs will be used. Bank standard Request for Proposals will be used for consultant assignments above US$200,000. The General Procurement Notice (GPN) for the project was published in UN Development Business in paper form (Issue 617 dated 31 October 2003).

8. **Works *(US$487.38 million, including contingencies).*** Civil works for Shiman Expressway (SME) estimated to cost US$402.71 million (including contingencies) would be divided into 14 contracts, with an average size of about US$28.8 million. There would be essentially two types of contracts: earthworks and bridge construction, and pavement works. The civil works were sliced into contracts in view of the site constraints, the nature of works and efficiency gains achievable by putting together pavement works in only three contracts. 11 of the 14 civil works contracts, each estimated to cost more than US$15 million, will be procured by one tender call under ICB procedures. Contracts for pavement works will be procured by another tender call under ICB procedures, regardless of the estimated cost of each contract, in order to attract qualified bidders for multiple awards. Bidders for the ICB civil works will be prequalified.

Electro-mechanical works on SME (E&M) would be handled as a single contract for supply and installation of about US$15.5 million equivalent. This contract will be awarded under ICB procedures. The Specific Procurement Notice (SPN) for the civil works and M&E works will be published in the UN *Development Business online version*. Each contract for works estimated to cost US$15 million or more but less than US$50 million will provide for a dispute review expert set forth in the standard bidding documents; for each contract estimated to cost US$50 million or more a dispute review board will be adopted. Domestic contractors are no longer eligible for domestic preference under ICB works procurement.

9. Other works for an amount of about US$69.17 million financed by the Bank include (i) SME buildings, annex and maintenance areas, and connecting roads estimated at $12.71 million, and (ii) rural road improvements under the LRIP estimated at $56.46 million. As all contracts are estimated to cost less than US$15 million each, they will be awarded following NCB procedures acceptable to the Bank. Since such amounts will be relatively small in the Chinese context, and scattered throughout the province and implemented over four years, ICB will not be justifiable or practical. However, foreign firms will not be precluded from participation. NCB procurement of works will be published in a relevant newspaper of national circulation, except the contracts each estimated to cost less than US$2 million, which may be advertised in a provincial newspaper.

10. **Goods *(US$5.35 million).*** Contracts for road maintenance equipment, each estimated to cost US$250,000 or more and up to a total amount of US$2.79 million, will be awarded under ICB. Domestically manufactured goods under ICB will be eligible for domestic preference in accordance with Appendix 2 of the Bank Guidelines. Although the current procurement plan does not include contracts awarded under NCB and shopping procedures, these two methods would be provided in the Loan Agreement, i.e. NCB for contracts each estimated to cost between US$100,000 and US$250,000, and shopping for contracts each estimated to cost less than US$100,000.

11. **Consultants' services and training *(US$10.13 million).*** This component includes both consultant services and training financed by the Bank for an amount estimated at $2.33 million and consultant services and training financed from domestic sources only for an amount estimated at $7.80 million and procured through domestic procedures. The Bank-financed contracts for construction supervision (international firm), staff training, technical assistance and studies will be awarded following Quality-and Cost-Based Selection(QCBS) and Selection Based on Consultants' Qualifications(CQ) procedures. Contracts with firms estimated to cost US$100,000 or more, up to a total value of US$2 million will be procured through QCBS; contracts estimated to cost less than US$100,000, up to a total value of US$0.33 million will be procured through CQ. All contracts financed by the Bank shall be advertised in a national newspaper, and the contracts above US$200,000 shall be advertised in the UN Development Business. Shortlist of consultants for services, estimated to cost less than $300,000 equivalent per contract may comprise entirely of national consultants in accordance with the provisions of paragraph 2.7 of the consultant Guidelines.

Prior Review Thresholds (Table B)

12. Prior review procedures will be followed for: (a) works contracts each estimated to cost US$5 million or more; (b) goods contracts each estimated to cost US$250,000 or more; and (c) consultant service contracts each estimated to cost US$100,000 ore more for firms and US$50,000 or more for individuals. This will apply to respectively 86 percent and 100 percent of the total contract values of works and goods financed by the Bank. For contracts below these thresholds, post-review procedures will be followed (sample ratio at 1/4). Terms of reference for consultant assignments, regardless of the value of the contract, will be subject to Bank's prior review.

Procurement Plan

13. A detail procurement plan has been agreed with HPCD. The plan has covered more than 80% of the Bank-financed procurement under the project. Since most of the contracts in the plan will be awarded in the first one year of the project implementation, the plan may not be updated annually. However, any changes to the plan during the project implementation shall be subject to the Bank's prior approval. Since only the Phase I of the LRIP component has been included in the plan, and a procurement plan for the subsequent phases of the component shall be prepared and submitted by HPCD for the Bank's prior approval.

Retroactive Financing

14. Retroactive financing of up to US$10.40 million may be applied to expenditures incurred after March 15, 2004 for the procurement of works, goods and services.

(a) consultants for construction supervision of SME. This would allow for the training of local staff, setting up of the supervision offices, and start-up of construction supervision by the time contracts are signed with contractors. Expenses to be incurred by the

implementing agency are estimated at US$439,560, and loan withdrawals on account of such payments estimated at US$400,000;

(b) construction of SME. Early start of construction of SME would help meet the planned schedule for opening the expressway to traffic. The expenses to be incurred by the implementing agency are estimated at US$22.2 million, and the amount subject to retroactive financing at US$ 10 million.

Table A: Project Costs by Procurement Arrangements
(US$ million equivalent)

	Procurement Method[1]				
Expenditure Category	ICB	NCB	Other[2]	N.B.F.	Total Cost
1. Works	418.21	69.17	0	0	487.38
	(180.46)	(12.60)	(0.00)	(0.00)	(193.06)
2. Goods	2.79	0.00	0.00	2.56	5.35
	(2.79)	(0.00)	(0.00)	(0.00)	(2.79)
3. Consultants' services and training	0	0	2.33	7.80	10.13
	(0.00)	(0.00)	(2.15)	(0.00)	(2.15)
4. Miscellaneous	0	0	0	24.50	24.50
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
5. Front-end fee	0	0	2	0	2
	(0.00)	(0.00)	(2.00)	(0.00)	(2.00)
Total	421.00	69.17	4.33	34.86	529.36
	(183.25)	(12.60)	(4.15)	(0.00)	(200.00)

[1]Figures in parentheses are the amounts to be financed by the {Loan/Credit/Trust Fund}. All costs include contingencies.

[2]Includes civil works and goods to be procured through national shopping, consulting services, services of contracted staff of the project management office, training, technical assistance services, and incremental operating costs related to (i) managing the project, and (ii) re-lending project funds to local government units.

Table A1: Consultant Selection Arrangements (optional)
(US$ million equivalent)

Consultant Services Expenditure Category	Selection Method							
	QCBS	QBS	SFB	LCS	CQ	Other	N.B.F.	Total Cost[1]
A. Firms	2.00	0	0	0	0.33	0.00	7.80	10.13
	(1.82)	(0.00)	(0.00)	(0.00)	(0.33)	(0.00)	(0.00)	(2.15)
B. Individuals	0	0	0	0	0	0	0	0
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Total	2.00	0.00	0.00	0.00	0.33	0.00	7.80	10.13
	(1.82)	(0.00)	(0.00)	(0.00)	(0.33)	(0.00)	(0.00)	(2.15)

Table B: Thresholds for Procurement Methods and Prior Review

Expenditure Category	Contract Value Threshold (US$ thousands)	Procurement Method	Contracts Subject to Prior Review (US$ millions)
1. Works	>15,000	ICB, prior review	418.21
	5,000-15,000	NCB, prior review	0
	<5,000	NCB, post review	69.17
2. Goods	>250	ICB, prior review	2.79
	100-250	NCB, post review	0.00
	<100	Shopping, post review	0.00
3. Consultant's services and training	>100 firms	QCBS, prior review	2.00
	<100	CQ, post review	0.33

Total value of contracts subject to prior review: $423.00 million

Overall Procurement Risk Assessment: Average

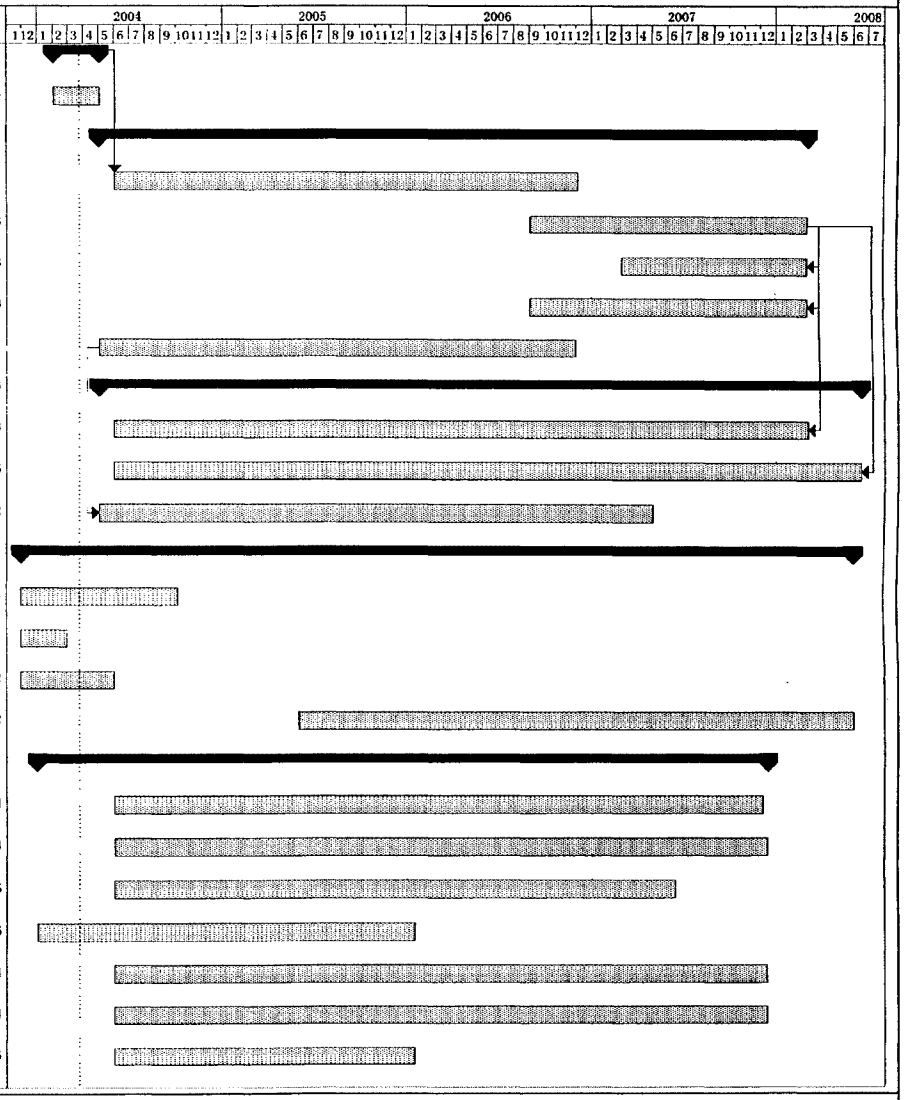
Frequency of procurement supervision missions proposed: One every six months (includes special procurement supervision for post-review/audits)

Table C: Allocation of Loan Proceeds

Expenditure Category	Amount in US$ million	Financing Percentage
Works		
-SME civil works	163.99	46%
-SME buildings and annex areas	1.78	20%
- SME E&M	11.82	80%
- SME Connecting roads	0.47	20%
- LRIP	10.00	20%
Goods	2.79	100% of foreign expenditures, 100% of local expenditures (ex-factory costs) and 75% of local expenditures for other items procured locally
Consultant's Services	1.82	91% of foreign expenditures
Training	0.33	100% of foreign expenditures
Unallocated	5.00	
Front-end Fee	2.00	100%
Total	200.00	

Shiman Expressway Project Implementation Plan

No.	Task	Duration	Starting time	completing time
1	**resettlement and acquisition**	**65 days**	**2004 February 3**	**2004 May 3**
2	Shiman expressway	65 days	2004 February 3	2004 May 3
3	**Civil works**	**1001 days**	**2004 May 3**	**2008 March 3**
4	Subgrade, structure works	655 days	2004 June 1	2006 December 4
5	Pavement works	392 days	2006 September 1	2008 March 3
6	E&M works	262 days	2007 March 2	2008 March 3
7	Annex area	392 days	2006 September 1	2008 March 3
8	LRIP	675 days	2004 May 3	2006 December 1
9	**Construction supervision**	**1076 days**	**2004 May 3**	**2008 June 16**
10	Forerign supervision	980 days	2004 June 1	2008 March 3
11	Domestic supervision	1055 days	2004 June 1	2008 June 16
12	LRIP	783 days	2004 May 3	2007 May 2
13	**Equipment procurement**	**1176 days**	**2003 December 1**	**2008 June 2**
14	Central lab equipments	221 days	2003 December 1	2004 October 4
15	Environment monitoring equipments	66 days	2003 December 1	2004 March 1
16	Institutional strengthen equipments	133 days	2003 December 1	2004 June 2
17	Operation, maintenance equipments	784 days	2005 June 1	2008 June 2
18	**Institutional strengthen and road safety**	**1031 days**	**2004 January 2**	**2007 December 14**
19	Financing study	916 days	2004 June 1	2007 December 4
20	Expressway asset management	924 days	2004 June 1	2007 December 14
21	New technologies for road maintenance	794 days	2004 June 1	2007 June 15
22	Training program	532 days	2004 January 2	2006 January 16
23	Developing freight and passenger enterprises safet	924 days	2004 June 1	2007 December 14
24	Safety management plan in Hubei province	924 days	2004 June 1	2007 December 14
25	Expressway project group management	425 days	2004 June 1	2006 January 16



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Annex 9: Economic and Financial Analysis

CHINA: Hubei Shiman Highway Project

I. Economic Analysis

Preface

1. The economic evaluation of the project covers the following two project components:

   a) construction of the 105.1 km SME; and

   b) upgrading of one rural road (85.8km) and construction of one bridge (355 m) under the first phase of the LRIP.

2. The analysis is based on the actual traffic volume and forecasts, vehicle operating costs (VOC), cost and time savings for users, reduction in accident costs and economic project costs. The main inputs for the evaluation are:

   a) capital investment and maintenance costs, reflecting March 2004 prices;

   b) the benefit stream, also reflecting March 2004 prices, that comprises savings in VOC, travel time savings, and reduction in accident costs;

   c) implementation of investments during 2005-2008 and an evaluation of benefits over a 20 years long period; and

   d) benefits accruing as from 2009 for SME, and 2007 for the LRIP.

3. This Annex is comprised of three parts: the economic evaluation of SME; the economic evaluation of the LRIP; and the overall economic evaluation of the project, including a probabilistic risk analysis.

SHIYAN - MANCHUANGUAN EXPRESSWAY (SME)

4. For the purpose of the evaluation, SME has been divided into three sections:

	Length of the existing roads (km)	Length of the new expressway (km)
Section 1: Shiyan – Yunxian	42.6	24.1
Section 2: Yunxia – Yunxi	89.2	45.0
Section 3: Yunxi – Manchuanguang	80.0	36.0
TOTAL	**211.8**	**105.1**

Highway Expansion Plan -Justification for the Investment

Overview

5. Hubei province is a large inland basin (185,900 sq. km) located in the South central region of China. The Yangtze River flows from West to East across Hubei and the confluence with the Hanshui River (the largest tributary of the Yangtze River) is at Wuhan- the provincial capital - in the eastern part of the province. That central inland location and the Yangtze River make the Hubei province a major transport hub for both the East - West and North - South bound transport

influxes in South Central China. All major long distance transport modes (highways, railways, inland waterways and air transport) in South central China converge at Wuhan. Hubei's major economic activities are located in an East-NorthWest corridor, that starts from Wuhan (East), crosses the province and reaches Shiyan (the major metropolitan city in the Northwest region of the province Northwest). The proposed SME is the last section of the entire Wuhan- Shaanxi border expressway corridor in Hubei province. Given the important role of the SME corridor in the economy and the role of this expressway in Hubei road network, the proposed project has the highest priority in Hubei's regional highway development plan.

6. SME will link Shiyan with two smaller cities further West (Yunxian and Yunxi) and the border with Shaanxi province, and be the only high grade highway crossing cross one of the poorest areas in the province. Thus, SME will improve the accessibility for remote areas well and help balance the economic development within the province. Current traffic is this mountainous area is essentially long distance (90% in 2001).

Level and Timing of Investment

7. There are seven major local roads in the highway corridor, but only three roads (G209, G316 and Yunman road) would be significantly affected by the proposed SME. The pavement condition of the existing Yunman road is very poor, resulting in a low speeds and high safety risks. Motorized traffic on that highway was at about 5,600 - 9,600 motorized vehicles per day in 2003, and has increased on average 5.1 percent per year between 1995 and 2005. Non motorized traffic add about 300-500 vehicles per day. Even with a modest projected 5 percent future annual growth, motorized traffic would reach between 7,200 – 12,500 vehicles per day by 2009, the planned opening year of the SME. As the total capacity for the existing roads is 10,000 to 12,000 vehicles each day, it is relevant to plan the construction of SME right now.

Situation on Existing Highways

	Section 1 Shiyan – Yunxian	Section 2 Yunxian – Yunxi	Section 3 Yunxi – Manchuanguan
Road Class (old roads / new road)	II / Exp.	III / Exp.	III /Exp.
Road Condition (old roads / new road)	Fair / Good	Poor / Good	Poor / Good
Terrain (old roads / new road)	Mountains	Mountains	Mountains
Capacity (AADT/day) (old roads / new road)	12,000/ 25,000	10,000 / 25,000	10,000 / 25,000
Motorized Traffic – 2003 (AADT / day)	9,600	5,800	5,600
Projected Traffic – 2009 (AADT / day)	12,489	7,480	7,180
Proposed Opening Year	2009	2010	2010

Sources: HPCD and the Bank staff.

Highway Corridor Traffic

8. HPCD has estimated future traffic on SME from results of routine traffic counts and a comprehensive origin and destination (O/D) survey that took place on November 2001 (updated on April 2003). Its forecasts were further assessed and confirmed by an independent transport institute hired by the Bank to review regional transport demand and traffic on highways in the wider Shiyan – Wuhan – Hefei corridor. The traffic growth rate in the project corridor has been estimated at 5.0 percent per year between 2001 - 2009, 3.5 percent between 2009-2019, and 2.7 percent between 2019-2029, given the historical trend of economic growth during 1995-2001 in Shiyan area (6.1 percent per year) and in other areas of the province served by expressways (9.9 percent per year), the estimated elasticity of passenger and freight traffic to economic growth, and

forecasts for the economic growth in China in coming years. Traffic growth rates are summarized as follows:

Annual Traffic Growth Rate in SME Corridor

		Car	Bus & Truck	Average
Actual:	1995-2001	13.6%	2.2%	5.1%
Projection:	2001-2009	5.7%	4.7%	5.0%
	2009-2019	4.4%	3.0%	3.5%
	2019-2029	3.8%	2.0%	2.7%

Traffic on SME

9. The SME should open for traffic in late 2008. Diversion ratios were calculated by using financial the VOC for the road users and taking into account estimated impacts of the level of proposed toll rates on SME, reduction in travel distances, and the experience from other recently Bank financed highways in China. That analysis indicates that between 51 - 54 percent of motorized vehicles in 2009, depending on the road section, may be diverted to the new highway. Traffic diversion is expected to increase linearly in the first ten years of operations to reach 56 – 62 percent by the year 2019 and stabilize thereafter.

10. Traffic generated by the new highway has been estimated at 10 percent of the normal traffic. This assumption is consistent with the Bank experience on recent expressway projects in China. Although Shiyan is linked by rail to Xi'an, with a single track in Hubei province, no rail traffic is expected to be diverted to the new highway. Actually, the rail corridor does not run parallel to SME alignment and railways essentially carry low value bulk freight over long distances (the average transport distance for the railway in 2001 in Hubei was 1,116 km compared with 47.5 km for road transport). In addition, transport costs on highway tariff are significantly higher than railway tariffs (about RMB 0.40 per ton-km compared with RMB 0.10 per ton-km for railway). Traffic forecasts on existing highways and SME, in scenarios without and with the project are as follows:

Normal Traffic, by Sections (AADT)

		Section 1 Shiyan – Yunxian	Section 2 Yunxian – Yunxi	Section 3 Yunxi - Manchuanguan
Traffic on the existing roads	1995	8,892	2,390	2,345
	2000	6,435	4,223	3,992
	2001	8,360	5,099	4,887
	2002	8,965	5,446	5,225
	2003	9,623	5,823	5,592
Traffic without the project				
	2009	12,489	7,480	7,180
	2019	17,961	10,467	9,905
	2029	24,178	13,566	12,421
Traffic with the project				
a. Traffic on the existing roads	2009	6,160	3,448	3,506
	2019	7,340	3,938	4,329
	2029	9,892	5,112	5,420
b. Traffic on SME	2009	6,329	4,032	3,674
	2019	10,621	6,529	5,576
	2029	14,286	8,454	7,001
c. Traffic diversion (in %)	2009	50.7	53.9	51.2%
	2019	59.1	62.4	56.3%
	2029	59.1	62.3	56.4%

Sources: HPCD and the Bank staff.

Economic Costs

11. Investment costs have been converted into economic costs by eliminating price contingencies, taxes, custom duties on imported materials and applying shadow price factors. The resulting overall economic cost is about 1.5 percent higher than the financial cost, since eliminating price contingencies more than compensates for the other factors.

Economic Benefits

12. Project benefits were estimated from the VOC by using the Highway Design and Maintenance Model (HDM-III). The economic analysis takes into consideration benefits derived from: (a) VOC savings on the new highway for normal and generated traffic, (b) time savings from reduced congestion on existing roads, and (c) lower accident costs. Benefits resulting from the lower level of congestion were quantified. The value of passenger time savings was estimated at RMB 1.50 per passenger-hour, by using updated figures from a report on feasibility study methodology for highways in China (Rust PPK. Australia Feasibility Study Methodology Report, May 1996). The same sources were used for vehicle accident rates on different classes of roads. Major assumptions and formulas used in this analysis are summarized as follows:

ECONOMIC VEHICLE OPERATING COSTS

(RMB per km)

		The Existing Roads	
	The New Expressway	Section 1	Section 2 & 3
Car	0.915	0.842	1.074
Medium bus	2.078	2.139	2.646
Large bus	3.454	3.919	4.502
Small truck	1.618	1.714	1.988
Medium truck	2.106	2.172	2.518
Large truck	3.234	3.373	3.858
Tractor/trailer	5.393	5.676	6.343

Accident Rates and Costs in China

Road class	Accidents per 100 million vehicle km	Damage (RMB/ accident)
Expressway	-40 + 0.005 AADT	12,000
Motorway Class I	37 + 0.003 AADT	9,000
Motorway Class II	83 + 0.0065 AADT	7,000
Highway Class II	133 + 0.007 AADT	6,000
Highway Class III	140 + 0.03 AADT	4,000

Source: Table E4.1, page E21, Rust PPK. Australia Feasibility Study Methodology Report, May 1996

Economic Evaluation

13. The overall EIRR of SME is estimated at 16.4 percent, with the following results for each road section:

Economic Evaluation of SME

	EIRR (in %)	NPV (12%, RMB million)
Shiyan – Yunxian	14.4	211.3
Yunxian – Yunxi	16.5	767.2
Yunxi – Manchuanguan	17.5	755.9
WHOLE ROUTE	**16.5**	**1,795.7**

14. The distribution of the estimated benefits shows that

(a) road users on this highway corridor are the main beneficiaries;

(b) trucks will receive 52.3 percent of the project benefits, while cars will receive 38.1 percent, and buses passengers 8.6 percent (these proportions are proximately the same as the proportion of traffic). Those latter benefits are more likely to accrue to lower income people; and

(c) about 90 percent of total benefits will accrue to the long distance traffic (par. 8).

The breakdown of benefits is as follows:

Distribution of the Net Benefits (RMB million)

	Road user	Road agency	Society	
Total benefits	5,452.7	(3,657.0) /_1	1,795.7	
By vehicles:			Truck-	
Cars	Buses	Trucks	Trailers	Total
2,075.9	470.7	2,851.9	54.2	5,452.7
38.1%	8.6%	52.3%	1.0%	100.0%

/_1: Road agency is negative because it bear the investment cost.

Sensitivity and Switching Values Analysis

15. The basic evaluation of the project, whole infrastructure and for each section, shows that the investment is economically viable. Sensitivity tests with respect to a two-year delay in project completion, zero value of time, no generated traffic and lower traffic projections on the new highway confirm that result.

Sensitivity Tests on the Economic Evaluation of SME

	EIRR (%)	NPV (12%, RMB million)
Delay in completion by two years	14.2	926.1
Zero value of time	16.0	1,594.5
Zero generated traffic	15.7	1,472.3
Lower traffic projection (20%)	14.9	1,096.5
Switching values		**% increase**
Cost increase to reduce EIRR to 12%		149 %
Benefit reduction to reduce EIRR to 12%		67 %

16. The results of sensitivity tests (EIRR in %) to cost and benefit variations are summarized below:

SENSITIVITY OF EVALUATION RESULTS (EIRR IN %) TO COST AND BENEFIT VARIATION

Variation in cost	Variation in benefits							
	-50%	-40%	-30%	-20%	-10%	0%	10%	-20%
-40%	14.3%	16.5%	18.4%	20.1%	21.8%	23.3%	24.8%	26.2%
-30%	12.7%	14.7%	16.5%	18.1%	19.6%	21.1%	22.5%	23.8%
-20%	11.3%	13.2%	14.9%	16.5%	17.9%	19.3%	20.6%	21.8%
-10%	10.1%	11.9%	13.6%	15.1%	16.5%	17.8%	19.0%	20.1%
0%	9.1%	10.9%	12.4%	13.9%	15.2%	**16.5%**	17.6%	18.7%
10%	8.2%	9.9%	11.5%	12.8%	14.1%	15.3%	16.5%	17.5%
20%	7.5%	9.1%	10.6%	11.9%	13.2%	14.3%	15.4%	16.5%
30%	6.8%	8.4%	9.8%	11.1%	12.3%	13.5%	14.5%	15.5%

LOCAL ROADS IMPROVEMENT PROGRAM (LRIP)

Main Features of the LRIP and Traffic

17. Only the first phase of the LRIP (upgrading of Baozhu road and reconstruction of Jiangjunhe bridge) has been identified during preparation and is evaluated in this annex. Further phases of the LRIP, that will bring total investment to $50 million) will be finalized during the project implementation. That first phase involves three counties (Yunxian, Yunxi and Zhushan) of Shiyan City, that are mountainous areas among the poorest in Hubei province. Baozhu road is in very poor condition with rough surfaces and steep slopes. In addition, the existing Jiangjunhe bridge as a maximum useful life of less than three years, is classified as dangerous and can only accommodate one way traffic with limited vehicle load. The road and the bridge are often inaccessible during rainy days or the snow season, which affects travel distance and time for road users. The main design characteristics are listed below:

Local Roads Improvement Program (LRIP)

		Length (km)	Traffic (AADT 2000)	Road class (Old/new)	Speed (km/hr.) (Old/new)	Maxi. Slope (Old/new)
1	Baozhu road	85.8	500	IV / III	15 / 30	12% / 8%
2	Jiangjunhe bridge	0.355	170	III / II	10 / 40	8% / 6%

Sources: HPCD and the Bank staff.

18. Current traffic level is in the range of 170 ~ 500 AADT. Since the road and the bridge are located in the same district, the local economic development and traffic patterns are quite similar. Based on the actual traffic levels and local economic growth rates, traffic growth rates have been conservatively estimated to be 4.0 percent during 2000-2005, reduced by 1 percent for each of the 5 years from 2005-2025. No attempt has been made to quantify generated traffic.

Economic Costs and Benefits

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

FINANCIAL AND ECONOMIC COST FOR LRIP (RMB MILLION)

		Financial	Economic	Construction period
1	Baozhu road	177.40	180.08	2004 – 2006
2	Jiangjunhe bridge	39.97	40.57	2004 – 2006
	Total	**217.37**	**220.65**	

20. Like on SME, the HDM III model were used to quantify economic costs and analyze benefits on the road and the bridge. Main benefits would accrue from reduced VOCs, because of a better road pavement, and the associated class upgrading and all-weather conditions would

allow higher traffic speed, improve the road roughness index and shorten the average transport distance.

Economic Evaluation and Sensitivity Analysis

21. Best estimates of the road and bridge EIRRs range from 14.3 percent to 26.2 percent. The overall EIRR and NPV (with a 12 percent discount rate) for the whole first phase of the LRIP are at 24.3 percent and RMB 244.2 million respectively.

EIRR AND NPV SUMMARY FOR LRIP

		EIRR (in %)	NPV (12%, RMB million)
1	Baozhu road	26.2	237.0
2	Jiangjunhe bridge	14.3	7.2
	Total	**24.3**	**244.2**

22. Risks considered for economic evaluation are: (a) a slower than projected growth of traffic; (b) higher than project cost of civil works; and (c) lower than expected VOC savings. All those risks were analyzed through sensitivity tests and the evaluation results were found to be robust for all of them. For the project component to be non-acceptable (i.e. an EIRR lower than 12 percent or a nil NPV at 12 discount rate), the benefits would have to fall to less than 53.4 percent of those in the base case with no change in costs, or costs would have to increase to more than 1.88 times the base costs, or costs would have to increase by 30.5 percent and the benefits fall to 69.5 percent at the same time.

23. Additional benefits, not included in the EIRR calculation, are expected from the project, as follows:

a) increased income of local farmers who live along the road and the bridge because of better access to town markets and jobs;

b) increased accessibility to schools. It is estimated that about 13,800 extra children would attend school (about 5.2% percent of total 266,496 children in the served areas); and

c) increased accessibility to hospitals. It is estimated that 21,500 extra people would benefit from health services (1 percent of 2,147,000 people living in served areas).

Based on normal observations derived from previous research, benefits can be summarized as below:

THE EXTRA BENEFITS FOR LRIP

		Extra children attending school/ year	Extra people attending health services/ year
1	Baozhu road	6,600	10,500
2	Jiangjunhe bridge	7,200	11,000
	Total	**13,800**	**21,500**

THE OVERALL ECONOMIC EVALUATION OF THE PROJECT

Overall Economic Internal Rate of Return (EIRR)

24. The overall EIRR of the project (including SME and the LRIP) is at 16.8 percent and the NPV (12 percent discount rate) at RMB 1,821.8 million.

Project Risks

25. All sections of the SME and LRIP show acceptable economic returns. HPCD has extensive experience in the construction and operation of expressways and rural road projects, which minimizes technical risks associated with the implementation of the project. The main tangible risk of prolonged delays affecting the construction schedule has been tested in the probabilistic risk analysis.

Probabilistic Risk Analysis for Economic Evaluation of SME

26. To determine the degree of uncertainty on the project, a probabilistic risk analysis using Monte Carlo techniques was carried out. In a Monte Carlo analysis, each uncertainty factor is allowed to vary at random between set limits and all uncertainty factors are allowed to change simultaneously. Monte Carlo simulation provides probability distributions of the potential outcomes of decisions. By analyzing these distributions, one can assess risks associated with making various decisions (or probabilistic risk analysis). The outcome of the analysis is a judgment on the possible range of the decision variable, and on the likelihood of each value within that range.

27. As the total cost of LRIP constitutes only about 9 percent of total capital investment and the respective EIRR is higher than that of SME, the probabilistic risk analysis for the project is focused on the construction of SME. The following highest uncertainty factors associated with the economic evaluation of SME have been identified: (a) traffic growth rate, (b) traffic diversion ratio to SME, (c) value of vehicle operating costs, and (d) changes in capital investment. The results of probabilistic risk analysis show that the EIRR is at 16.5 percent for the most likely scenario, 9.1 percent in the low scenario and 24.4 percent in the high scenario. The standard error of the mean is 0.4 percent. The detailed results of the Monte Carlo test and probabilistic risk analyses are shown in **Table 1** and summarized as follows:

SUMMARY OF SME PROBABILISTIC RISK ANALYSES

	Range of EIRR	Most likely EIRR	Standard error of the mean
Section 1: Shiyan – Yunxian	10.4% ~ 24.1%	16.9%	0.4%
Section 2: Yunxian – Yunxi	9.5% ~ 24.1%	16.5%	0.4%
Section 3: Yunxi – Manchuanguan	10.3% ~ 25.4%	17.5%	0.4%
Total SME	**9.1% ~ 24.4%**	**16.5%**	**0.4%**

HUBEI PROVINCE: SHIYAN - MANCHUANGUAN EXPRESSWAY
EIRR SIMULATION AND PROBABILISTIC RISK ANALYSIS

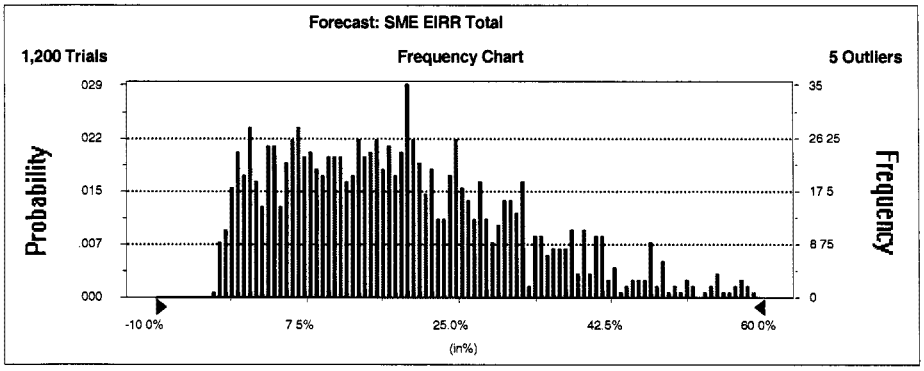
Summary:

Display Range is from -10.0% to 60.0% (in%)
Entire Range is from -3.3% to 73.0% (in%)
After 1,200 Trials, the Std. Error of the Mean is 0.4%

Statistics:	Value
Trials	1200
Mean	18.2%
Median	16.5%
Mode	---
Standard Deviation	13.7%
Variance	1.9%
Skewness	0.73
Kurtosis	3.21
Coeff. of Variability	0.75
Range Minimum	-3.3%
Range Maximum	73.0%
Range Width	76.3%
Mean Std. Error	0.39%

Percentiles:

	Percentile	(in%)
	0%	-3.3%
	10%	1.4%
Low Scenario	20%	5.6%
	30%	9.1%
Most Likely	40%	13.1%
	50%	16.5%
High Scenario	60%	19.8%
	70%	24.4%
	80%	29.5%
	90%	37.3%
	100%	73.0%



Assumptions

Traffic Growth Rate
Normal distribution with parameters:
Mean 100.0%
Standard Dev. 10.0%
Selected range is from -Infinity to +Infinity
Mean value in simulation was 100.4%

Traffic Diversion
Normal distribution with parameters:
Mean 100.0%
Standard Dev. 10.0%
Selected range is from -Infinity to +Infinity
Mean value in simulation was 99.9%

VOC Value
Triangular distribution with parameters:
Minimum 90.0%
Likeliest 100.0%
Maximum 110.0%
Selected range is from 90.0% to 110.0%
Mean value in simulation was 100.0%

Capital Cost
Triangular distribution with parameters:
Minimum 100.0%
Likeliest 105.0%
Maximum 110.0%
Selected range is from 100.0% to 110.0%
Mean value in simulation was 104.9%

II. Financial Analysis

Preface

28. The financial evaluation of the project is comprised of three sections:

(a) an assessment of the revenue earning entity (SME), focusing on consolidated financial statements;

(b) an assessment of the non-revenue earning entity (LRIP), focusing on financial risks regarding the construction, and operation and maintenance phases; and

(c) an assessment of the financial capacity of HPCD to sustain its highway activities, focusing on the adequacy of funding allocations with the provincial road development plan.

The financial cost of capital for the project is assumed to be 4.8 percent (25 percent of financing from local banks at 5.89 percent, 40 percent from the Bank at 4 percent and 35 percent from MOC/Hubei province grants at a normative 5 percent cost).

THE FINANCIAL EVALUATION OF SME

29. SME will be operated from its opening for traffic by a financially independent entity (HPSEC), responsible for the day-to-day management, operations and maintenance of the expressway. The main income of SME will be derived from tolls charged to road users; Hubei government will set toll rates.

Financial Objective

30. HPCD has clearly indicated that the financial purpose of the toll collection on SME is to repay the project's Bank's and domestic loans, cover operating and non-operating expenses and cover routine maintenance, and not to maximize the financial rate of return on the entire investment.

Financial Forecasts

31. *Tolls.* The toll will be charged on the basis of vehicle size (small passenger cars, large buses, small trucks, medium trucks, large trucks and trailers) and distance traveled. Toll exempted vehicles (police, ambulance and military) are expected to account for 10 percent of total traffic. Because of the higher average construction cost for this mountainous terrain and large debt amount in the financing plan (about 65 percent of the total cost), the toll on SME has to be set on the high side compared with other Chinese expressways (par. 41), to meet the above minimum financial requirements. For example, toll charges will be about 42 percent higher than those applied on the Xiaogan- Xiangfan Expressway, another expressway financed in Hubei by the Bank in 2002. Toll charges are assumed to increase once every five years (15 percent or an average of 2.8 percent per year).

Toll Charges (RMB / vehicle-km)

	Small vehicle	Medium vehicle	Large vehicle	Heavy vehicle	Overall average
SME- 2009 (a)	0.50	1.00	1.50	1.90	0.95
XXE- 2006 (b)	0.40	0.80	1.00	1.20	0.67
Increase (a)/(b)	25.0%	25.0%	50.0%	58.3%	41.8%

32. *Operations.* The operating costs of SME can be broken down between working costs (a. wages and benefits, b. maintenance, c. operating materials and supplies, d. administration, e. others) and depreciation.

33. *Profitability.* All operation and other expenses, including interest payments on the loans, are taken into account in the calculation of the SME profitability. It is estimated that the expressway will generate enough revenue over the loan period to achieve the above mentioned financial objective. However, deficits will take place in the early years of operation (2009-2013). The total interest payments alone in 2009 (RMB 127.31 million), for example, are 2.34 times higher than the total working costs (RMB 54.35 million), or equal 44.8 percent of the total revenue (RMB 283.93 million) in that year. Because of the low toll growth assumptions, the profitability of SME for the first fives years is low. (Income statement, page 1 of 3, Appendix A).

34. *Cash flow.* Despite the low profitability, SME's cash flow should be sufficient to meet all project needs, including the repayment of the Bank loan as from 2010, because of the large sum of depreciation reserves and the flexible principal payment terms agreed by domestic banks on their loans which allow SME to reduce cash outflows in the early years of operations. In 2009, for example, the total annual depreciation reserve (RMB 110.52 million) will represent about 2 times the total annual working cost, thereby generating strong internal cash flow and providing sufficient funds for the SME's operations, maintenance expenses and loan repayments. It is estimated that SME will not require any external cash injection and be able to maintain cash available above RMB 12 million over the life of the project (Sources and applications of funds, page 2 of 3, Appendix A).

35. *Leverage and Liquidity.* The low profitability and high proportion of debt in the financing plan will dilute the equity of SME and cause the debt/ equity ratio and debt/ capital ratio (the financial leverage of the company) to exceed 50 percent until 2021. But that will not affect the liquidity of SME, as it is ensured by strong cash flows. The current ratio will be in a sounder range of 1.1 or higher, whereas it should be at least 1.0 to avoid short-term solvency problems (Balance sheet, page 3 of 3, Appendix A). In addition, HPCD has reiterated its full commitment to the expressway, in an official document to the Bank that confirms its full financial support, which guarantees the project financial viability. Major assumptions for and results of the financial evaluation are shown in Appendix B.

Financial Internal Rate of Return (FIRR)

36. The low profit margin will impact the FIRR on the capital investment. The financial evaluation concludes that the FIRR is expected to be at 1.1 percent. This return would be reduced by 50 percent if the opening of the SME is delayed by one year (0.7 percent).

Financial Probabilistic Risk Analysis

37. To determine the degree of financial uncertainty on the project, a probabilistic risk analysis using Monte Carlo techniques was carried out. The six most uncertain factors which may affect the financial evaluation have been identified: (a) traffic growth rate, (b) the basic toll level, (c) toll charges growth rate (d) total working costs, (e) capital investment, and (f) one year delay in opening the expressway. The risk analysis reveals that the most likely FIRR would be 0.7 percent, while the worst and the best FIRR would respectively be 0.6 percent and 0.8 percent. Details are in Appendix C and summarized as follows.

SUMMARY OF FINANCIAL SENSITIVITY AND PROBABILISTIC RISK ANALYSIS

	Financial Sensitivity Tests		Financial Simulation and Risk Analysis		
	Open in Jan. 2009	Open in Jan 2010	Range of FIRR / NPV	Most Likely FIRR / NPV	Std. Error of The Mean
FIRR (in %)	1.1	0.7	06 ~ 0.8	0.7	0.0
NPV (4.8%, RMB million)	- 1,264	- 1,390	- 1,619 ~ -1,483	- 1,557	3.5

Toll Level and Toll Affordability

38. On a toll expressway, the level of tolls need to satisfy two criteria (a) generate enough revenue to ensure an acceptable financial rate of return on the investment, and (b) not deter potential users and compromise the project economic objectives. Those criteria can be contradictory, since the former requires a higher toll while the latter requires a lower one. To help address the conflict and assess the affordability of tolls to road users, the Bank has developed an "affordability rate" indicator (for private cars). The higher the rate, the less affordable the toll. That research is based on data from a series of tolled expressways in a selection of developed and developing countries and uses the purchase power income for each country to quantify a users "toll affordability rate". The toll affordability rate for the proposed SME has been estimated at 2.34% and can been compared with values in China and other countries as follows:

Toll Level and Toll Affordability Comparisons

Car	Developed countries	US	Developing countries	China	Hubei SME
Average toll (US cents/ km)	11.14	4.45	3.11	4.53	6.02
Toll affordability rate	0.69%	0.02%	0.65%	2.06%	2.34%

Sources: The theoretical and practical bases for setting road tolls (Draft), November 2003, the World Bank; HPCD.

39. Results indicate that: (a) the toll affordability rate for China is higher than in most developed and developing counties, and (b) the toll and toll affordability rate for SME are higher than the China's national averages - only next to Shaanxi and Anhui provinces. High tolls especially affect local traffic, when parallel free itineraries are available, but rates considered so far have less impact on the long distance traffic given the high time and cost savings ensured by the project. Based on the O/D pattern in the served highway corridor, the majority of vehicles (about 90 percent of the total traffic, par. 8) are long distance travelers who are less sensitive to the toll, because they are less likely to detour particular sections of the road just to avoid paying the toll.

Impact of the Toll Charge

40. Thus the proposed toll for SME is comparatively high. Raising further tolls would be mostly detrimental mostly to the local short-distance users along the project corridor and not be acceptable to Hubei government.

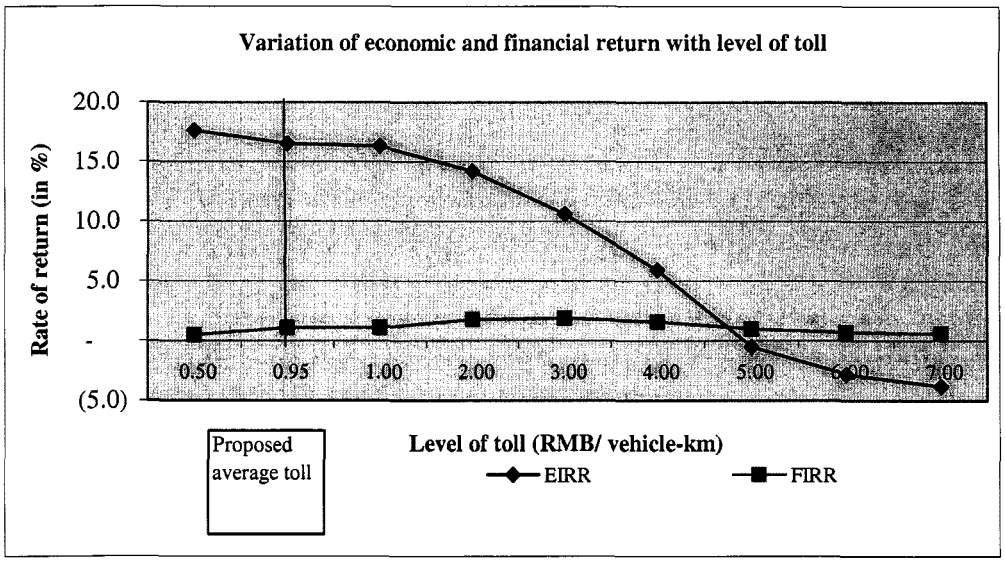
41. The impact of toll levels on EIRR and FIRR has been tested as follows:

- On the one hand, increasing the toll above RMB 1.0 per vehicle km would cause the EIRR to drop; a RMB 2.0 per vehicle km (or about 24 US cents/ km) charge- the highest toll rate in China- would reduce the EIRR by about 2 percent (16.5 percent vs. 14.2 percent). The EIRR starts to fall sharply once the toll exceeds RMB 2.0 per

vehicle km, because travelers will be motivated to seek alternative routes to SME even if it means a longer traveling distance.

- On the other hand, the FIRR would slightly increase with toll increases and reach a maximum (1.9 per cent) when the rate is at RMB 3.0 per vehicle km (or about 36 US cents/ km). Beyond this rate, the FIRR declines as the loss of traffic will have a greater impact than the increase of revenue per user.
- It is estimated that both the EIRR and the FIRR will be close to zero when the toll is at RMB 5.0 per vehicle km (or about 60 US cent/ km).

Impact of Toll Levels on the EIRR and FIRR



THE FINANCIAL EVALUATION OF THE LRIP

42. The financial evaluation of the LRIP focuses on HPCD's capacity to minimize financial risks, i.e. mobilize sufficient counterpart funds for the construction and ensure the maintenance of project roads.

43. HPCD budget forecasts show that the investment and maintenance costs of the LIRP component constitute only a small fraction of HPCD's road expenses. Based on HPCD's plan, financing the LRIP will require less than 1.1 percent of the projected annual total HPCD revenue. In addition, the maintenance costs of LRIP is less than 0.2 percent of the total maintenance expenditure of HPCD. These low ratios indicate that the project presents a modest financial risk as regards the availability of counterpart funds. Details are shown in **Appendix D** to this Annex and summarized as follows:

HPCD: Investments, Revenue and Maintenance Expenditures (Yuan million)

	2004	2005	2006	2007	2008	2009	2010
Investments and Revenue:							
LRIP Investments (a)	65.21	108.69	68.26	24.79	24.79	8.26	--
Total HPCD Revenue (b)	9,630.39	9,502.54	11,282.77	10,999.76	11,233.10	11,377.29	11,279.15
Ratios (a)/(b)	0.7%	1.1%	0.6%	0.2%	0.2%	0.1%	--
Maintenance Expenditures:							
LRIP (c)			-	3.06	3.14	3.28	3.39
Total HPCD Maintenance Expenditure (d)			1,840.27	1,933.22	2,028.83	2,184.46	2,321.23
Ratios (c)/(d)			--	0.2%	0.2%	0.2%	0.1%

Sources: HPCD and Bank staff.

FINANCIAL EVALUATION OF HPCD

44. HPCD has provided its financing plan, including forecasts on total revenues and expenditures during the *Tenth Five Year Plan* (10th FYP, 2001 –2005) and *Eleventh Five Year Plan* (11th FYP, 2006 –2010). Based on available information, the financing plan entails an emphasis on new construction, and an increase in maintenance expenditures which are largely dependent on the grants from the government.

45. Over the 10th FYP, it is estimated that new construction will consume about 63 percent of total revenue while maintenance expenditures will be budgeted at only about 10 percent of total revenue. The low emphasis on maintenance will accelerate the deterioration of the existing road network and cause higher rehabilitation expenditures (about 11 percent of total revenue). The funds' allocation is expected to improve during the 11th FYP. The new construction budget will be reduced to 47 percent while the maintenance one will increase to about 18 percent of the total revenue. Increasing maintenance expenditures will reduce the need for road rehabilitation works to about 8 percent of total revenue.

46. Road maintenance expenditures are calculated on the basis of standards issued by the MOC, that are expected to be revised during the 11th FYP. Facing the possibility of a sharp increase in maintenance expenditures, HPCD has budgeted a large increase in grants from the MOC. Without these grants, HPCD would have to seek other external resources to fund its operations. A moderate self- financing ratio (total internal cash generation against the total revenue, 52.3 percent for the 11th FYP) will ensure the implementation of the development plan. This is an improvement, compared to the 38.7 percent for the 10th FYP. The detailed sources of highway revenue and expenditures for 2001 – 2010 are shown in Appendix D of this Annex.

47. With regards the long term sustainability of road maintenance with allocated resources, the average yearly increase in maintenance expenditures during the 10th FYP (3.0 percent) exceeded the growth of the road network (2.3 percent), which means HPCD budget has provided for a net increase in average maintenance expenditures per kilometer. The trend should continue during the 11th FYP with percentages at respectively 3.9 percent and 2.0 percent.

HPCD: AVERAGE INCREASE IN THE ROAD NETWORK AND Road Maintenance Expenditures (in %)

	10th FYP	11th FYP
Average annual increase in the road network	2.3%	2.0%
Average annual increase in maintenance expenditures	3.0%	3.9%

Sources: HPCD and the Bank staff.

Hubei Highway Project

Income Statement- SME

(RMB million, year ending December 31)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Traffic (million veh-km) /1	298.27	307.87	317.94	328.55	339.57	351.16	363.29	375.98	389.38	403.38	418.19
Revenue											
Tolls	283.93	292.74	301.99	311.65	321.74	383.58	396.24	409.52	423.42	437.96	521.86
Others	-	-	-	-	-	-	-	-	-	-	-
Total	283.93	292.74	301.99	311.65	321.74	383.58	396.24	409.52	423.42	437.96	521.86
Operating Taxes											
Business tax	14.20	14.64	15.10	15.58	16.09	19.18	19.81	20.48	21.17	21.90	26.09
City tax	0.99	1.02	1.06	1.09	1.13	1.34	1.39	1.43	1.48	1.53	1.83
Education levy	0.43	0.44	0.45	0.47	0.48	0.58	0.59	0.61	0.64	0.66	0.78
Total	15.62	16.10	16.61	17.14	17.70	21.10	21.79	22.52	23.29	24.09	28.70
Net Revenue	268.31	276.64	285.38	294.51	304.04	362.48	374.45	387.00	400.13	413.87	493.16
Operating Costs											
Wages and benefits	7.49	7.86	8.25	8.66	9.09	9.54	10.02	10.52	11.05	11.60	12.18
Maintenance	7.00	7.35	7.70	8.09	44.60	8.92	9.37	9.84	10.33	140.96	11.38
Operating materials and supplies	30.29	31.80	33.39	35.06	36.81	38.66	40.59	42.62	44.75	46.99	49.33
Administration & management	4.49	4.72	4.95	5.20	5.45	5.72	6.01	6.31	6.63	6.96	7.31
Others /2	5.08	5.34	5.60	5.88	6.18	6.49	6.81	7.15	7.51	7.89	8.28
Total working costs	54.35	57.07	59.89	62.89	102.13	69.33	72.80	76.44	80.27	214.40	88.48
Depreciation	110.52	110.53	110.53	110.58	110.88	110.94	111.00	111.07	111.14	112.08	112.15
Total operating costs	164.87	167.60	170.42	173.47	213.01	180.27	183.80	187.51	191.41	326.48	200.63
Operating Profit	103.44	109.04	114.96	121.04	91.03	182.21	190.65	199.49	208.72	87.39	292.53
Financial charges: IBRD	66.24	65.42	62.10	58.62	55.02	51.27	47.37	43.31	39.08	34.69	30.11
Local Bank	61.07	61.07	59.89	58.72	57.54	56.95	54.59	52.24	50.47	49.29	48.70
Other income (expenses)	-	-	-	-	-	-	-	-	-	-	-
Profit Before Taxes	(23.87)	(17.45)	(7.03)	3.70	(21.53)	73.99	88.69	103.94	119.17	3.41	213.72
Taxable Profit	(23.87)	(41.32)	(48.35)	(44.65)	(66.18)	7.81	96.50	200.44	319.61	3.41	217.13
Income tax	-	-	-	-	-	2.58	31.85	66.15	105.47	1.13	71.65
Net Profit After Taxes	(23.87)	(17.45)	(7.03)	3.70	(21.53)	71.41	56.84	37.79	13.70	2.28	142.07
Working ratio	**20**	**21**	**21**	**21**	**34**	**19**	**19**	**20**	**20**	**52**	**18**
Operating ratio	**61**	**61**	**60**	**59**	**70**	**50**	**49**	**48**	**48**	**79**	**41**

/1: The highway will be opened to traffic in 2009.

/2: Others: Including highway research, studies and miscellaneous

Hubei Highway Project

Sources and Applications of Funds- SME

(RMB million, year ending December 31)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Sources:															
Net profits	-	-	-	-	(23.87)	(17.45)	(7.03)	3.70	(21.53)	71.41	56.84	37.79	13.70	2.28	142.07
Depreciation	-	-	-	-	110.52	110.53	110.53	110.58	110.88	110.94	111.00	111.07	111.14	112.08	112.15
State contribution	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HPCD's contribution	435.00	362.50	362.50	290.00	-	-	-	-	-	-	-	-	-	-	-
Borrowing: IBRD	496.80	414.00	414.00	331.20	-	-	-	-	-	-	-	-	-	-	-
Local	311.06	259.22	259.22	207.38	-	-	-	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1242.86	1035.72	1035.72	828.58	86.65	93.08	103.50	114.28	89.35	182.35	167.84	148.86	124.84	114.36	254.22
Applications:															
Capital expenditure	1242.86	1035.72	1035.72	828.58	10.59	10.80	11.02	11.24	11.46	11.69	11.93	12.16	12.41	12.66	12.91
Other expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loan repayment:															
IBRD	-	-	-	-	-	82.46	85.78	89.26	92.86	96.61	100.51	104.57	108.80	113.19	117.77
Local	-	-	-	-	-	20.00	20.00	20.00	10.00	40.00	40.00	30.00	20.00	10.00	100.00
Change w/ capital	-	-	-	-	-	(0.31)	(0.31)	(0.33)	(0.35)	(2.10)	(0.44)	(0.45)	(0.47)	(0.51)	(2.86)
Total	1242.86	1035.72	1035.72	828.58	10.59	112.95	116.49	120.17	113.97	146.20	152.00	146.28	140.74	135.34	227.82
Net Funds Flow	-	-	-	-	76.06	(19.87)	(12.99)	(5.89)	(24.62)	36.15	15.84	2.58	(15.90)	(20.98)	26.40
Open balance	-	-	-	-	-	76.06	56.19	43.20	37.31	12.69	48.84	64.68	67.26	51.36	30.38
Closing balance	-	-	-	-	76.06	56.19	43.20	37.31	12.69	48.84	64.68	67.26	51.36	30.38	56.78
D/S Cover	--	--	--	--	**1.68**	**0.96**	**0.99**	**1.02**	**0.94**	**1.19**	**1.11**	**1.06**	**0.98**	**0.96**	**1.12**

Hubei Highway Project

BALANCE SHEET- SME

(RMB million, year ending December 31)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Assets:											
Fixed Assets											
At cost	3,315.70	3,315.77	3,315.84	3,317.46	3,326.38	3,328.16	3,330.03	3,332.00	3,334.07	3,362.26	3,364.54
Less: Depreciation	221.00	331.53	442.06	552.64	663.52	774.46	885.46	996.53	1,107.67	1,219.75	1,331.90
Net fixed assets	3,094.70	2,984.24	2,873.78	2,764.82	2,662.86	2,553.70	2,444.57	2,335.47	2,226.40	2,142.51	2,032.64
Current Assets											
Inventory	1.42	1.46	1.51	1.56	1.61	1.92	1.98	2.05	2.12	2.19	2.61
Receivable	0.71	0.73	0.75	0.78	0.80	0.96	0.99	1.02	1.06	1.09	1.30
Cash	76.06	56.19	43.20	37.31	12.69	48.84	64.68	67.26	51.36	30.38	56.78
Subtotal	78.19	58.38	45.46	39.65	15.10	51.72	67.65	70.33	54.54	33.66	60.69
Other Assets	-	-	-	-	-	-	-	-	-	-	-
Total Assets	3,172.89	3,042.62	2,919.24	2,804.47	2,677.96	2,605.42	2,512.22	2,405.80	2,280.94	2,176.17	2,093.33
Liabilities & Equity											
State funds- Equity	468.18	440.00	422.02	416.10	392.03	453.53	500.31	527.91	531.27	549.08	680.52
L/T loans: IBRD	1,656.00	1,573.54	1,487.76	1,398.50	1,305.64	1,209.03	1,108.52	1,003.95	895.15	781.96	664.19
Local	1,036.88	1,016.88	996.88	976.88	966.88	926.88	886.88	856.88	836.88	826.88	726.88
Subtotal	2,692.88	2,590.42	2,484.64	2,375.38	2,272.52	2,135.91	1,995.40	1,860.83	1,732.03	1,608.84	1,391.07
Current Liabilities	11.83	12.20	12.58	12.99	13.41	15.98	16.51	17.06	17.64	18.25	21.74
Other Liabilities	-	-	-	-	-	-	-	-	-	-	-
Total Liabilities & Equity	3,172.89	3,042.62	2,919.24	2,804.47	2,677.96	2,605.42	2,512.22	2,405.80	2,280.94	2,176.17	2,093.33
Debt: capital ratio	**85.2**	**85.5**	**85.5**	**85.1**	**85.3**	**82.5**	**80.0**	**77.9**	**76.5**	**74.6**	**67.1**
Debt/ equity ratio	**85/15**	**86/14**	**86/14**	**85/15**	**85/15**	**83/17**	**80/20**	**78/22**	**77/23**	**75/25**	**67/33**
Current ratio	**6.6**	**4.8**	**3.6**	**3.1**	**1.1**	**3.2**	**4.1**	**4.1**	**3.1**	**1.8**	**2.8**

Fixed assets: 80% of capital investment and 20% of maintenance.
Equity = Total asset - Total Liabilities.
Current liabilities = ½ month of total revenue.

APPENDIX B

Hubei Highway Project

Assumptions for Financial Forecasts- SME

1. Normal Traffic (AADT):

	Small car	Medium bus	Large bus	Small truck	Medium truck	Large truck	Tractor -Trailer	Total
Section I:	Shiyan - Yunxian							
2009	2,818	172	400	628	683	1,543	85	6,329
2019	5,119	271	629	979	1,070	2,420	133	10,621
2029	7,577	331	767	1,194	1,305	2,950	162	14,286
Section II:	Yunxian - Yuanxi							
2009	1,053	105	242	535	561	1,502	34	4,032
2019	1,898	164	379	827	872	2,337	52	6,529
2029	2,809	199	462	1,008	1,063	2,849	64	8,454
Section III:	Yuanxi - Manchuanguan							
2009	945	99	231	424	481	1,463	31	3,674
2019	1,635	156	363	660	754	1,967	41	5,576
2029	2,197	190	443	805	919	2,397	50	7,001

2. Toll Rates (Yuan/ veh-km): Increase 15% every five year.

	Small car	Medium bus	Large bus	Small truck	Medium truck	Large Truck	Tractor -Trailer
2009	0.50	1.00	1.50	0.50	1.00	1.50	1.90

3. Operating Taxes:

a. Business Tax 5% of total revenue.
b. City Tax 7% of business tax.
c. Education levy 3% of business tax.

4. Operating Cost: Increase 5 % pa.

a. Wages and benefits: RMB 2,4000/ staff / year, 40 staffs/ station, 6 stations.
b. Maintenance (million RMB/ km):

	Routine Maintenance (annual)	Medium Maintenance (/5years)	Major Maintenance (/10 years)
Expressway	0.07	0.33	0.86

c. Operating materials and supplies 0.286 million RMB per km.
d. Administration 60.0% of wage and benefits.
e. Others 0.048 million RMB per km.
f. Depreciation 30 years straight-line method.

5. Income tax 33.0% of total profit before taxes

6. Borrowing: The IBRD 4.00% on 20 year maturities, LIBOR US$ based single currency including 5 years grace period.
The local bank 5.89% on 20 year maturities, including 5 years grace period and flexible principal payments.

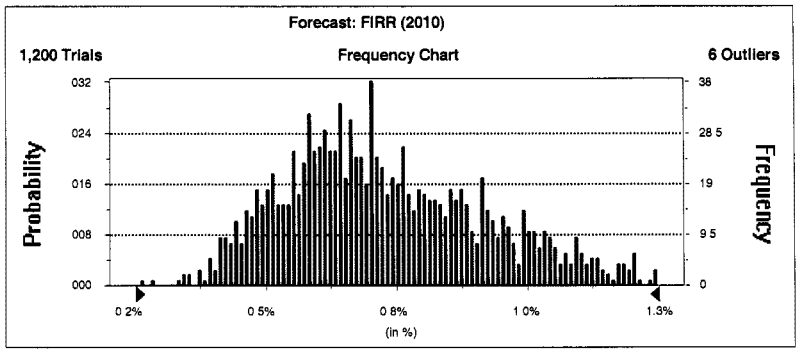
HUBEI PROVINCE: SHIYAN - MANCHUANGUAN EXPRESSWAY
FIRR SIMULATION AND PROBABILISTIC RISK ANALYSIS

Summary:
Display Range is from 0.2% to 1.3% (in %)
Entire Range is from 0.2% to 1.4% (in %)
After 1,200 Trials, the Std. Error of the Mean is 0.0%

Statistics:	Value
Trials	1200
Mean	0.7%
Median	0.7%
Mode	---
Standard Deviation	0.2%
Variance	0.0%
Skewness	0.51
Kurtosis	2.77
Coeff. of Variability	0.29
Range Minimum	0.2%
Range Maximum	1.4%
Range Width	1.2%
Mean Std. Error	0.01%

Percentiles:

	Percentile	(in %)
	0%	0.2%
	10%	0.5%
Low Scenario	20%	0.5%
⇨	30%	0.6%
Most Likely	40%	0.6%
⇨	50%	0.7%
High Scenario	60%	0.8%
⇨	70%	0.8%
	80%	0.9%
	90%	1.0%
	100%	1.4%



Assumptions

Traffic growth
Normal distribution with parameters:
Mean 100.0%
Standard Dev. 10.0%
Selected range is from -Infinity to +Infinity
Mean value in simulation was 100.0%

Total working cost
Triangular distribution with parameters:
Minimum 90.0%
Likeliest 100.0%
Maximum 110.0%
Selected range is from 90.0% to 110.0%
Mean value in simulation was 100.0%

Toll charges growth rate
Triangular distribution with parameters:
Minimum 90.0%
Likeliest 100.0%
Maximum 110.0%
Selected range is from 90.0% to 110.0%
Mean value in simulation was 100.1%

Basic toll
Normal distribution with parameters:
Mean 100.0%
Standard Dev. 10.0%
Selected range is from -Infinity to +Infinity
Mean value in simulation was 100.6%

Capital Investment
Triangular distribution with parameters:
Minimum 90.0%
Likeliest 105.0%
Maximum 110.0%
Selected range is from 90.0% to 110.0%
Mean value in simulation was 101.8%

Hubei: Highway Revenue and Expenditure During Tenth Five Year Plan

(RMB million)

		2001	2002	2003	2004	2005	Total
Revenue							
1	Road maintenance fee	1,384.70	1,458.08	1,535.36	1,616.74	1,702.42	7,697.30
2	Toll revenue	1,684.80	1,774.09	1,868.12	1,967.13	2,071.39	9,365.53
3	Surcharge on passenger tickets	263.25	277.20	291.89	307.37	323.66	1,463.37
4	Surcharge on freight tickets	112.67	118.64	124.93	131.55	138.52	626.31
5	Vehicle purchase fee	105.41	110.99	116.87	123.07	129.59	585.93
6	MOC subsidy	673.92	709.64	747.25	786.85	828.56	3,746.22
7	State (SDPC) subsidy	35.00	35.00	35.00	35.00	35.00	175.00
8							19,000.0
	Bank loan	5,155.90	4,500.00	3,500.00	3,000.00	2,844.10	0
9	Fund-raised by enterprise	219.78	300.00	300.00	233.37	-	1,053.15
10	Other funds	1,499.79	1,452.80	1,452.80	1,429.31	1,429.30	7,264.00
	Total						50,976.8
		11,135.22	10,736.44	9,972.22	9,630.39	9,502.54	1
Expenditure:							
1							37,878.7
	New construction and rehabilitation	8,783.64	8,250.83	7,351.53	6,884.25	6,608.48	3
2	Tax	53.95	56.80	59.82	62.99	66.32	299.88
3	Traffic safety supervision	19.29	20.32	21.39	22.53	23.72	107.25
4	Major maintenance	120.00	132.00	141.00	141.00	149.27	683.27
5	Medium maintenance	80.00	88.00	94.00	94.00	99.52	455.52
6	Routine maintenance	701.22	738.38	777.52	818.73	862.12	3,897.97
7	Administration and study	366.24	385.65	406.09	427.61	450.28	2,035.87
8	Repayment of interest and principle	1,010.88	1,064.46	1,120.87	1,179.28	1,242.83	5,618.32
	Total						50,976.8
		11,135.22	10,736.44	9,972.22	9,630.39	9,502.54	1
Total Road Network (km) -(a)		59,350	60,850	62,250	63,650	65,000	311,100
Average annual increase		2.6%	2.5%	2.3%	2.2%	2.1%	2.3%
Rehabilitation /_1		1,317.55	1,237.62	1,102.73	1,032.64	991.27	5,681.81
Periodic maintenance /_2		200.00	220.00	235.00	235.00	248.79	1,138.79
Routine maintenance		701.22	738.38	777.52	818.73	862.12	3,897.97
Total maintenance expenditure (million Yuan) -(b) /_3		901.22	958.38	1,012.52	1,053.73	1,110.91	5,036.76
Average unit maintenance expenditure ('000 Y/km)- (b)/(a)		15.18	15.75	16.27	16.56	17.09	16.19
Average annual increase		--	3.7%	3.3%	1.8%	3.2%	3.0%

/_1: Assuming 15% of new construction and rehabilitation based on an analysis of 1996-2000.
/_2: Sum of major and medium maintenance.
/_3: Sum of major, medium and routine maintenance.
Best estimate:2001, forecast: 2002- 2005.

Hubei: Highway Revenue and Expenditure During Tenth Five Year Plan

(RMB million)

	2006	2007	2008	2009	2010	Total
Revenue						
1 Road maintenance fee	2,036.64	2,158.84	2,288.37	2,425.67	2,571.21	11,480.73
2 Toll revenue	2,328.38	2,768.79	3,429.73	3,716.22	3,902.03	16,145.15
3 Surcharge on passenger tickets	78.72	82.65	86.79	91.13	95.68	434.97
4 Surcharge on freight tickets	103.03	108.18	113.59	119.27	125.23	569.30
5 Vehicle purchase fee	145.00	150.00	155.00	160.00	165.00	775.00
6 MOC subsidy	1,000.00	800.00	700.00	600.00	500.00	3,600.00
7 Local subsidy	390.00	500.00	446.62	580.00	480.00	2,396.62
8 Bank loan	3,981.00	3,106.30	2,805.00	2,550.00	2,350.00	14,792.30
9 Fund-raised by enterprise	650.00	750.00	628.00	550.00	500.00	3,078.00
10 Other funds	570.00	575.00	580.00	585.00	590.00	2,900.00
Total	11,282.77	10,999.76	11,233.10	11,377.29	11,279.15	56,172.07
Expenditure:						
1 New construction and rehabilitation	7,905.53	7,007.00	5,994.46	5,447.77	4,952.00	31,306.76
2 Tax	264.46	305.84	366.19	394.96	415.44	1,746.89
3 Traffic safety supervision	32.00	35.00	40.00	40.00	40.00	187.00
4 Major maintenance	732.00	786.00	840.00	932.00	1,021.00	4,311.00
5 Medium maintenance	512.50	537.50	562.50	587.50	630.00	2,830.00
6 Routine maintenance	595.77	609.72	626.33	664.96	670.23	3,167.01
7 Administration and study	552.92	631.20	743.30	800.00	842.43	3,569.85
8 Repayment of interest and principle	687.59	1,087.50	2,060.32	2,510.10	2,708.05	9,053.56
Total	11,282.77	10,999.76	11,233.10	11,377.29	11,279.15	56,172.07
Total Road Network (km) -(a)	66,300	67,626	68,979	70,359	71,766	345,030
Average annual increase	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Rehabilitation /_1	1,185.83	1,051.05	899.17	817.17	742.80	4,696.02
Periodic maintenance /_2	1,244.50	1,323.50	1,402.50	1,519.50	1,651.00	7,141.00
Routine maintenance	595.77	609.72	626.33	664.96	670.23	3,167.01
Total maintenance expenditure (million Yuan) -(b) /_3	1,840.27	1,933.22	2,028.83	2,184.46	2,321.23	10,308.01
Average unit maintenance expenditure ('000 Y/km)- (b)/(a)	27.76	28.59	29.41	31.05	32.34	29.88
Average annual increase	--	3.0%	2.9%	5.6%	4.2%	3.9%

/_1: Assuming 15% of new construction and rehabilitation based on an analysis of 1996-2000.
/_2: Sum of major and medium maintenance.
/_3: Sum of major, medium and routine maintenance.
Forecast: 2006- 2010.

Annex 10: Safeguard Policy Issues

CHINA: Hubei Shiman Highway Project

I. Environmental Safeguard Issues

1. Project Background

The main investment component of the project, the Shiman expressway (the Expressway), when completed, will form part of the road network which will eventually join Wuhan to Yinchuan, the capital city of northwestern Province of Ningxia. The feasibility study for the project was completed in November 2003 and the final engineering designs are expected to be completed in July 2004. The Environmental Assessment (EA) for the Project was prepared by the Second Navigation Survey and Design Institute (SNSDI) of MOC. The Terms of Reference (TOR) for the EA were prepared in August 2002. They were reviewed and revised and approved in December 2002 by the State Environmental Protection Administration (SEPA) and the Bank. The first draft Environmental Impact Assessment (EIA) report was prepared in June 2003 followed by a new draft (dated December 2003) which addressed the comments by the Bank. The December 2003 draft reports of the EIA and the Environmental Management Plan (EMP) were submitted to the Bank and SEPA in December 2003 and have been approved by SEPA in April 2004. The Bank received the revised final EIA and EMP reports, incorporating the Bank's comments, in April 2004.

The Shiman expressway is classified as a Category A project since it involves major Expressway construction on new alignment; at-grade connecting roads to be upgraded partially on new and existing alignments; increase in noise and motor vehicle air emission; occupation of fertile and barren land, excess waste material disposal; community severance, soil erosion, resettlement, etc..

The second investment component, the LRIP, will comprise the upgrading of local roads selected in Shiyan City, a remote and mountainous area in the western edge of Hubei. EIAs and EMPs have been prepared on each road selected under the first phase of the LRIP and the Bank received the final reports in November 2003.

2. Basis of the Environmental Impact Assessment

The preparation of the EIAs has followed the regulatory and policy requirements for environmental assessment of development projects in China and the Bank's Safeguard policies. The major laws and regulations applied to the EA are: (i) Laws of Environmental Protection of the P.R. China (December 1989); (ii) Environmental Impact Assessment Law of P.R. China (October 2002); (iii) Law of Water and Soil Conservation (June 1996); (iv) Law of Air Pollution Control (August 2000); (v) Law of Water Pollution Control (May 1996); (vi) Law of Environmental Noise Pollution Control (October 1996); (vii) Circular on Strengthening EIA for Construction Projects Receiving International Financing (June 1993); and (viii) Technical Specifications for Environmental Impact Assessment (Five Volume Series 1993 - 1997).

Of the ten Bank Safeguard policies, the Project triggered Environmental Assessment (OP/BP/GP4.01), Involuntary Resettlement (OD4.30), Cultural Property (OP4.11), and Public

Disclosure (BP 17.50). Relevant international environmental agreements in which China is a signatory have also been consulted where appropriate.

3. Project Description

Table 1 shows the key components of the Shiman Expressway. The connecting and rural roads are located within the Shiyan municipality and service Yun, Yunxi and Zhushan counties which are State and Provincial level poverty regions. The Expressway will be constructed entirely on new alignment, while the connecting roads will be constructed partially on new and partially on the existing alignments. The local roads under the LRIP will be primarily exiting roads, involving strengthening and minor widening and realignment of the existing low grade roads to increase their transportation capacity and all season access. The construction of the Expressway is scheduled to commence in 2004 and be completed in 2008.

Table 1 Major Project Components

Items	**Expressway**	**Connecting Roads**	**Rural Roads**	
			Baozhu	Jianjunhe Bridge
Road classification	Expressway	Grade II	Grade III	Grade II
Total length (km)	106.8	6.05	85	355
Design speed (km/hr.)	120	40	30	40
Alignment	New	Partially new	Upgrading	New

4. Baseline Environment

The Project area is located in the north semi-tropical region with a continental monsoon climate. The average annual temperature ranges from 11 to 17°C, and the average annual precipitation from 696 to 1200 mm. The terrain and the Expressway alignment has the same general orientation with the mountain bodies in the area. The area slopes from northwest to southeast with elevations ranging from 200 to 1200 m.

The EIA on SME has identified about 23 villages/townships and 10 schools, at about 30 to 150 m from the Expressway center line, which would be vulnerable to increased noise, dust, etc. due to the construction activities. The Expressway will also cross five rivers and run near a dinosaur egg protection area which is a national level reserve. The upgrading of the connecting road will impact two villages and one school while the upgrading of the rural roads will impact nine villages, 11 schools and five hospitals.

The air quality monitoring conducted (between March and April 2003) near seven villages and schools to establish a baseline, showed NO_x, concentrations between 0.012 to 0.044 mg/m^3, well below the Class II Air Quality Standard of 0.12 mg/m^3. The TSP and PM_{10} on the road sides were between 0.06 to 0.33 mg/m^3 and 0.03 to 0.16 mg/m^3, respectively, slightly higher than their respective applicable standards. The results indicate fairly good existing ambient air quality in the Project areas. The noise monitoring results show that the day and night time noise levels along the main expressway alignment are well below the applicable standards.

In the local road areas, the noise levels were significantly higher than the applicable standards. At some schools, the noise level reached as high as 72.5 dB(A) in day time, significantly

exceeded the Class I standards. The two rural villages along the road had noise levels of 56.4 and 57.1 dB(A) in day time and 47.9 and 49.6 dB(A) at night meeting the Class II standards.

Surface water quality in the Hanjiang river show that for all monitored parameters (pH, COD, Oil, SS and total P) the results were within their respective standards. The results of water quality monitoring, conducted in April 2003, of the Dong, Liayu, Beixing and Jiangjun rivers, show that all water quality parameters met the applicable standards except for SS in the Beixi river, which slightly exceeded the Class II standard.

The soil erosion intensity along the main expressway area ranges between 1874-2139 t/km^{2}a. The rural road area along the upper reach of the Hanjiang river has severe soil erosion. The intensity is 2100-4600 t/km^{2}a while at the Jiangjunhe river bridge site, it is 3000 t/km^{2}a.

Archeological surveys, in January 2001 and June 2003, covering the main Expressway and alternative alignments, connecting roads, borrow pits and spoil disposal sites identified the Jianliupu New Stone age site, a Tang-Song Dynasty tomb, and a Revolution site in the modern history. Only the Jianliupu site will be directly impacted by the Expressway. The Expressway will also run about 140m from the edge of the experimental zone of the state level Qinglongshn dinosaur egg fossil reserve.

The total population traversed and serviced by the Expressway is approximately 1.69 million. The Expressway will not directly impact the urban areas, but it will affect 59 villages and townships, 10 schools, five major rivers and many small tributaries, creeks, irrigation channels, fish/water ponds, etc. because of their proximity to the alignment.

5. Environmental Impacts

According to the modeling results, the soil erosion intensity during SME construction will reach about 9866 t/km^{2}a, and if no protection measures are taken during the construction period and the total soil lost will be considerably higher than the "no project" scenario. The erosion will continue in the early part of the operation phase until such time as the mitigation measures take effect. Soil erosion for the rural road construction is also expected to increase.

The Expressway will permanently occupy 12605 *mu* of land including 40% of waste land and wood land, and 39.4% of cultivated land. In addition, 104 borrow pits will occupy 7425.4 *mu* of temporary land. Permanent waste soil disposal area will occupy 576.77 *mu* of land. The construction, borrow pits and disposal sites for the connecting roads and rural roads will occupy additional land, but, as the rural road is an upgradation of the existing road, the permanent occupation of additional land will be minimum.

During the construction, farm crops, trees and other vegetation on the occupied farmland and woodland will be lost to the project. However, this will amount to only about 0.013% to 0.29% of the cultivated land. The impact of the loss of vegetation cover will be of short duration as the slopes, interchanges, borrow pits, disposal sites and other temporary occupied areas will be landscaped and rehabilitated with grass, trees, shrubs, bushes and other vegetation. The landscaping programs is expected to result in a net increase in the vegetation coverage along the expressway.

The proposed Expressway alignment is 2 km away from the Sifangshan Botanic Park and 12 km from the Niutoushan Forest Park. Direct impacts from the construction activities are expected to be negligible.

The primary impact on the water environment during the construction phase include discharge of sanitary sewage from the approximately 21 construction camps, surface runoff from camps, storage areas, bridge construction, etc. The camps are expected to generate about 2-3 tons of sanitary sewage per day which, if not treated properly, would affect the water quality of the receiving streams. Bridge construction could result in the re suspension of river sediments, and create risk of oil contamination from leaks and spills. Solid wastes from camps, service areas, storage areas, if not handled properly, could also create pollution problem.

Wastewater from the operation phase will include sanitary sewage from service stations and parking lots, car washing effluents and pavement runoff. Wastewater from point sources will be treated to the applicable standards before discharge to the receiving streams. Surface runoff will be smaller compared to the receiving river flows and it's impact, based on modeling, is expected to be insignificant.

Traffic accidents on the bridges involving the transportation of hazardous materials, could result in major spills and pose risk of water contamination. Analysis of accident data and prediction indicate that there exists a very small probability of water contamination from such accidents. However, the consequence could be severe and the spills may impact water quality, aquatic life and eco-system, and health and safety of the people living downstream of the spills. The impact of the increase in the Danjiangkou reservoir water level (due to south-north transfer of water) on the Jiangjunhe river bridge, which is part of the rural road component, is accounted for in the design.

According to the noise attenuation model, noise from multiple construction machines will drop below the applicable day time noise standards at 55m from the machinery and meet the night time standards at about 250m. Since there are only a few residents who live within 55m from the construction sites, the day time noise impacts will be limited. However, there are a large number of people within the 250m distance from the construction sites who would be significantly impacted if the construction equipment is operated at night. Residents living on both sides of the access roads will be impacted by higher noise levels from increased construction traffic.

Noise levels in the 23 villages located near the proposed Expressway show that noise at all the villages will be within the applicable standards in 2009. With the increase in traffic, some villages will start to be exposed to higher noise levels particularly at night. In 2020 and 2028, the day time noise levels will still be within the applicable standards, but 2 villages will exceed the night standard by about 1.9 to 2.4 dB(A) in 2020 and five villages will exceed it in 2028 by 0.6-5.9 dB(A). For the schools near the expressway, the noise model predicts that for the period 2009 - 2028, only two schools will exceed the applicable noise standard by 2.3-5.9 dB(A) beginning 2009.

For the local road upgrading, the traffic is projected to increase from the current level to 1245 medium truck equivalent per day in 2009 and 2516 MTE/day in 2020. The noise level in 2009 is expected to be less than 65 dB(A) during the day time and less than 55 dB(A) at night at 10 m from the road side. These levels meet Class III standards. The noise will meet day and night time Class II standards, at 30m from the road side.

Fugitive dust from unpaved access roads, disposal areas, materials storage areas, crushers and mixing plants, asphalt plants, materials transport, etc. will be the primary air contaminant during the construction phase. Depending on the terrain and climatic conditions, the impact area can range from 50 m from the source of dust to 300m in case of asphalt plants.

The "with and without" project scenario predicts 42% increase in NOx, but lower CO (by 47%) and THC (by 44%) during the project operation, from increased vehicle traffic and speed. Motor vehicle emissions and air modeling, predicts NOx concentrations below the standards in the year 2028 under the normal weather conditions but exceeding the standards under unfavorable weather conditions.

The expressway will be fully fenced with limited access, and will separate farmland and rural communities from one another. In total, 23 villages will be affected by the restricted access to the farmland, services, schools, markets, and other parts of the communities.

The Hubei Provincial Relics and Archaeological Research Institute identified three cultural relics sites which will be impacted by the proposed Expressway alignment, namely, the Jianliupu site of the New Stone Age (3000-4000 BC), the Pingchi tomb of Tang-Song Dynasties (300-1000 AD) and the Shaanan military hospital site (1920-30s). According to the Institute, these sites do not have significant historical, cultural or architectural values and are not listed in any of the state, provincial or county level cultural relics lists. Preservative excavation will be conducted only at the Jianlilupu site as the other two sites are farther away from the proposed Expressway.

The proposed Expressway alignment will skirt the Qinglongshan dinosaur egg fossils national reserve. The reserve is divided in central, buffer and experimental zones. To date, the outer experimental zone has no finds of any dinosaur egg fossils, but the regulations prohibit construction activities within the zone. To further minimize any construction related impacts, the original K line alignment (about 45m to the edge of the experimental zone) was shifted to about 140m from the edge of the experimental zone.

The proposed Expressway will greatly improve the accessibility to the project areas including national tourist attractions and conservation areas, such as the Wudaoshan Mountain Park (located about 40 km away from the expressway). The increased tourists and vehicle traffic may put additional stress on the environment and eco-system in the park, including air emission, sewage, and solid waste generation.

The proposed SME will occupy 9904 *mu* of land permanently, affect three urban districts, 92 townships, 46 villages and 142 village groups. The Expressway will impact residences, water wells, walls, trees, irrigation systems, country roads and utilities within the Expressway area.

6. Analysis of Alternatives

The analysis of alternative SME alignment was carried out in a systematic way, first by identifying three transport corridors between Shiyan and Xi'an and then selecting the one with the best technical, economic, social and environmental attributes. Within the selected corridor, two alternative alignments were identified and the one with the least social and environmental impacts was selected as the preferred alignment. Finally, the preferred alignment was fine-tuned at several locations to further avoid and minimize potential adverse impacts of the Expressway.

Corridor I, (the preferred corridor) starts from Shiyan and passes through Manchuanguan, Sihepu and Zhashui ending in Xi'an. It is the shortest corridor by about 90 km with a total length of 300 km. It was selected based on least land occupation and resettlement, relatively stable geology with milder soil erosion, and least cuts and fills involving minimal disturbance and lower disposal requirements. Corridor I has also received the widest supports from the people and the local governments.

Within Corridor I, and limited only by the site topography and geology, two alignments, Alignment K (107.14 km) and Alignment B (108.97 km) were selected for comparison. The two alignments overlap in the Shiyan section and separate before merging again near the end of the Expressway at Manchuanguan. Based on detailed analysis of the potential impacts, and comparison of the two alignments, Alignment K was selected as the preferred alignment based on lower soil erosion, land requirement, biodiversity and the amount of biomass disturbed. It crosses fewer rivers, has fewer bridges and uses less water in construction, has less cuts and fills and fewer tunnels, and has less cultural relics. Unfortunately, Alignment K has higher number of sensitive receptors to noise and higher numbers of housing relocation and displaced persons, though, it will result in less community severance and social impacts during construction and operation and it has received better supports from the local governments.

Within Alignment K, nine sub alignments were identified, analyzed and compared with their corresponding K line sections. In general, the sub alignments or their corresponding K line sections were rejected because they either impacted more sensitive receptors (A1) or came close to the Qinglongshan dinosaur egg fossil reserve (A3) or created more resettlement problems and went through more sensitive receptors, though it may have provided better geological stability (B1) or created more spoil (B4). In the final analysis, sub alignment A2 was accepted because it minimized the disturbance to the existing highway G209; A0 was selected because it shifted the alignment away from the Qinglongshan dinosaur egg reserve; A4 was selected to accommodate the growth needs of the Qingqi township and reduce resettlement; and B2 and B3 were selected to reduce spoils, avoid unstable geological condition, reduce land occupation, etc.

7. Mitigation Measures

The SME EIA includes a series of measures to avoid, minimize, mitigate or otherwise compensate the adverse impact from the project. These mitigation measures are summarized below:

Design Phase

The design includes concrete and stone pitching on steep slopes, interception ditches and landscaping to control erosion. The borrow pits will be rehabilitated through the conversion of the pits into ponds or landscaping. Erosion from the construction waste disposal sites will be controlled by constructing retaining walls, settling ponds, and drainage systems and the stockpiles will be covered with soil and landscaped. Similar measures will also be applied to borrow pits and disposal sties for the other roads.

To control noise, the design includes measures such as noise barriers, tree planting, etc. to minimize noise impacts on schools and villages. At other locations, where the predicted noise levels are below the applicable standards, noise monitoring will be undertaken and if necessary, mitigation measures will be implemented to control noise.

The design also includes wastewater treatment facilities to treat contaminated water from service areas, car washing operations, repair shops, etc. Community severance is mitigated through the inclusion of 145 facilities (bridges, grade separation bridges, passageways, culverts, etc.) capable of accommodating vehicular and pedestrian traffic. The project also allows for excavation, documentation, removal and preservation of archeological and cultural relics. The Jianliupu cultural relic site along the alignment will be excavated, prior to the start of the construction. The result of excavation will be moved to Provincial museums for permanent protection and displays.

A procedure for handling "chance finds" has been included in the contract specifications whereby the contractor will halt construction until the chance finds have been studied by professional archaeologists. Although the project will not directly impact Sifangshan Botanic Park, Niutaoshan Forest Park or Wudangshan Mountain Park, the project will mitigate indirect impacts to the parks from increased traffic, by locating motor vehicle parking lot at 300m away from the park area, and providing sufficient garbage bins and washroom facilities.

Construction Phase

The construction workspace will be minimized to reduce the impact of land occupation. Areas which must be occupied will be re-vegetated after the completion of the project. Workers will be sensitized to protect trees and wild animals. To minimize soil erosion in disturbed areas, temporary protection measures, such as grass mats, will be applied in places where permanent protection cannot be completed in time for the raining season.

Large and noisy construction activities will kept away at least 50m from populated areas. Operation of noisy construction machinery and activities will be restricted to the day time and banned at night in sensitive areas. Where necessary, temporary noise barriers will be constructed to protect the sensitive receptors from the impact of the construction noise.

The project will use cofferdam techniques in bridge construction to isolate work areas to minimize impact on surface water. Where possible, the construction will be scheduled during the low flow periods. Construction camps will be located to minimize disturbance to the nearby communities. Solid wastes will be stored with proper protection and removed from the sites regularly by qualified vendors for proper disposal. The camps will be maintained in sanitary, hygienic and orderly conditions with good housekeeping to minimize health hazards to the workers and adverse impacts to the surrounding environment. Sewage from the camps will be treated in septic tanks to meet the irrigation discharge standards.

Unpaved access road and construction sites will be water prayed at least twice a day to suppress airborne dust. Mixing stations and hot mix plants will be located at least 300m on leeward side of the nearest village to minimize dust and smoke impacts. Trucks carrying dust generating materials, and materials stockpiles will be covered with canvas.

The EMP will be incorporated in the bid documents and its implementation will be a contractual obligation. Training will be provided to all winning contractors and construction supervision staff on environmental policies and regulations, potential impacts, mitigation measures, daily monitoring and reporting, emergency handling, etc.

As regard the LRIP, road sections are located in a remote mountainous region and upgrading works will likely be carried out by local contractors who may lack proper managerial and trained staff. Supervision too is expected to be weak and the environmental management of the rural road construction may be poor. Therefore, the project provides for the local transport bureau and the winning contractors to receive environmental management training by specialists from HPCD. The training will encompass environmental management during construction, noise and dust control, construction camps management, borrow pits and disposal sites reclamation, construction safety and health, etc. The monitoring will be carried out by the local Environment Protection Bureaus (EPB).

Operation Phase

To minimize the impacts from noise, the EMP recommends that in future, no new school, hospital or other sensitive facilities should be built within 250 m from the central line of the Expressway or 37 to 50 m from the central line of the connecting roads. Traffic management and motor vehicle safety and emissions control will be enforced to minimize air and noise pollution.

8. Environmental Management Plan

A stand alone Environmental Management Plan (EMP) has been developed on SME and includes applicable environmental standards, environmental management system, mitigation measures and monitoring plans for the construction and operation phases. The implementation of the EMP will be supervised by the Environmental Office of the HPCD, the HPSECH, responsible for the construction of the Expressway and the HPSEC, which will be responsible for the Expressway operation. In addition, the EPBs in the Project area will monitor it.

The EMP includes environmental monitoring programs for construction and operation phases. The parameters to be monitored include noise, dust, water quality, etc. During the construction phase, environmental monitoring will be conducted on daily and routine basis using mainly visual observations and portable equipment such as hand-held noise meters; while periodic monitoring will be carried out by accredited institutes using standard methods. Monitoring reports will be compiled at regular intervals and submitted to the Project Office, the relevant agencies and the World Bank. During the operation phase, noise levels will be monitored once a month for the first six months and once every six months thereafter; while air and water quality will be monitored once a year. Appropriate measures to detect and control possible diseases (SARS, HIV...) will be taken on the construction field in cooperation with the local hospital.

To ensure the environmental performance of the Project, the EMP emphasizes institutional building and strengthening and includes detailed programs for training of technical personnel from the governments, project proponent and operation units, environmental institutions and the contractors.

The environmental training for contractors and construction supervisors will be held prior to the commencement of the construction. Each contractor and construction supervision unit will have a full time, on-site, staff for environmental supervision on daily basis. The training will cover basic knowledge of environmental protection and pollution control, the outcome of the EIA and requirements of the EMP, environmental management and monitoring, reporting requirements etc. The training for HPCD, PMO, the Expressway Company, and environmental institutions will cover environmental management, regulatory framework, applicable environmental standards, mitigation planning, environmental decision making and pollution control technologies.

Table 7 summarizes the cost of environmental management and mitigation measures.

Table 7 Summary of Estimated Cost of Environmental Management

Items	Stages	Estimated Cost (RMB x1000)
EIA and environmental studies	Project preparation/design	800
Mitigation measures	Construction/operation	24,623
Environmental monitoring	Construction/operation	4,700
Procurement of monitoring equipment	Construction	2,000
Staff training	Preparation/construction	423
Engineering work (landscaping/soil erosion control)	Construction	37,060
Environmental supervision	Construction	259
Rural road EMP	Preparation/construction/operation	4,427.8

With respect to the first phase of the LRIP, EIA/EMP reports have been prepared on each road section to be upgraded. Monitoring and mitigating measures proposed in the EMPs encompass noise, soil erosion, surface water and air pollution, health and safety.

9. Public Consultation and Information Disclosure

Two rounds of public consultation were carried out during the preparation of the EA: the first round followed the preparation of EA Terms of Reference (TOR) in December 2002 and the second round during the preparation of the draft EA reports between March 2003 and August 2003. The consultation included public opinion surveys through questionnaires, public meetings in villages and with the local people's representatives, and interviews with the affected groups and individuals.

2,759 copies of the questionnaire were distributed and 2,754 were returned. Among the people surveyed, some 24.6% were aware of the Project while 75.4% had some knowledge of it. The vast majority of the people (98.9%) felt that the Expressway, and the connecting roads and rural roads were necessary and wished to see the construction start as soon as possible. On the environment, 86.5% of the people surveyed cited noise and 41.3% cited dust as the major concern during construction. Most of the affected people (84.7%) would like to see landscaping and tree planting as measures to mitigate adverse impacts of the project.

In total, 61 villages, 11 schools, two hospitals, eight local government agencies and eight non-government groups participated in the two rounds of public consultation. There were a total of 21 public meetings and 85 group interviews. The main public concerns included appropriate compensation for land acquisition, resettlement and relocation, timely rehabilitation or restoration of damaged irrigation systems, construction safety, noise at schools, better access to and exits from the Expressway, and sufficient numbers of passageways to cross the Expressway.

For the rural roads, the public was also concerned about road blocks and access to services during the road upgradation, student safety, and convenient links with and access to the Expressway.

The Project has responded to the public concerns by: (i) setting up land acquisition and resettlement offices under HPCD to develop, supervise and implement resettlement action plan (RAP); (ii) developing plans for irrigation system restoration; (iii) conducting public education program and erecting warning signs for construction safety; (iv) constructing passageways and crossings for pedestrians and farm vehicles at about every 740m to mitigate community severance impacts; (v) installing safety barriers at select locations along the rural road to provide protection to students, residents and livestock; (vi) installing noise insulation windows and tree planting to minimize the impacts of noise from the Expressway and connecting roads: (vii) rationalizing the locations of access ramps/interchanges, etc.

In compliance with the EIA process requirements of the P.R. of China and the World Bank, the draft EIA and EMP reports and parts of the public consultation records were disclosed in public places in libraries, social centers, etc. along the Expressway. The Project information and availability of the reports were advertised in the Hubei Daily, the Province wide newspaper and at two web sites in the Province and the nation. The public consultation and information disclosure are summarized in the tables below. Additional disclosures were carried out in February 2004.

Table 8 Public Consultation

Activity	By whom, with whom	When	Where
Draft EA TOR, meetings, interviews and questionnaires	By EA team with affected people and local agencies	December 2002	Villages, schools and interviews along the expressway
Draft EA reports, public meetings and interviews	By EA team, with rural residents and local agencies	March-April 2003	1,500 individuals from 54 villages, 4 schools, 2 hospital, etc.
Draft EA reports, using public meetings and interviews	By EA team, with affected rural residents	August 2003	Villages and schools and local agencies along rural roads

Table 9 Information Disclosure

Document	Date of disclosure	Location
Draft and Final EA Report	December 2003 and February 2004	Shiyan City Library, Maojian District Government, Zhangwan District Government, Yun and Yunxi County Libraries
Draft and Final EA Reports	December 2003 and February 2004	Township Governments of Liupo, Qingqu, Hejia, Yunxi, Chengguan, Tumen, Shangjin and Xiangkou
EA Booklet	February 2004	Townships along the Highway
Newspaper Advertising	December 31, 2003	Hubei Daily
Internet Sites	October, 2003 and December 2004	www.people.com.cn www.cnhubei.com www.hbjt.gov.cn

II. Social Safeguards Issues

SME

Land Acquisition and Resettlement-Related Impacts

From November 2002 to February 2003, HPCD set up teams of local officials, representatives of villagers, to start field survey work. The Land Resources Administration Departments and local governments also participated in the census of displaced people and inventory of affected assets. The census and various categories of impacts were recorded in tabular format for each household and village. They were verified and signed off on by the village committee, the head of the household, and the investigation team. HPCD sent another team to the field during March to September 2003 to prepare the Resettlement Action Plan. Beijing University was hired to conduct social assessments during August to September 2003.

Socioeconomic Survey

Resettlement planning is based on the preliminary project design, a census of the displaced population, an inventory of affected assets, a socioeconomic survey, a social assessment, and ongoing consultations with the displaced population. HPCD conducted the socioeconomic survey to analyze project impacts, understand the socioeconomic background in project-affected areas, and consult with displaced people to have their feedback in resettlement planning.

The project starts east of Shiyan city and ends at the border between Hubei and Shaanxi provinces, in the western part of Hubei 500 km from Wuhan, the capital. Corn and rice are grown here, but the average yield is low. Land holding per capita is about 0.9 mu. Animal husbandry is also important. In the project areas along the SME, farmers' non-farm activities have become an important source of income. Farmers often go to work as wage laborers, some long term and some seasonal.

Project Impact

According to the SME Resettlement Action Plan (RAP), the project will affect 46 villages in 9 townships in 4 counties or districts. The project will require the permanent acquisition of 12,605 mu (840 hectares) of land. This includes 5,329 mu (355 hectares) of collective agricultural land and 7,276 mu (485 hectares) of collective non-agricultural land. Of the collective agricultural land to be acquired, 1,052 mu (68 hectares) is paddy land, 2,942 (196 hectares) mu is dry land, 679 (45 hectares) mu is vegetable land, and 611 (41 hectares) mu is orchard land. Of the collective non-agricultural land to be acquired, 5,107 mu (340 hectares) is timber forestland, 542 mu (36 hectares) is cultivated forestland, and 1,060 mu (71 hectares) is wasteland. House plots take up 566 mu (38 hectares).

The project will affect 5,302 households with a population of 21,176, including the people affected by land acquisition and structure demolition. Structural demolition of private residential housing is expected to total 41,256 sq m, with 1,619 households (6,699 individuals) affected. A total of 3,683 households with 14,477 individuals will be affected only by land acquisition. Nine enterprises will be affected.

Relatively minor design changes are likely to continue until implementation. Typically, final designs result in marginal reductions in land acquisition and structural demolition, as well as changes in the proportions of categories of affected land and structures.

Legal Framework

The project will comply with the following policies in resettlement planning and the resettlement policy framework for rural roads:

- World Bank OP 4.12 on Involuntary Resettlement
- Land Administration Law of People's Republic of China
- Implementation Regulations of the Land Law of People's Republic of China
- Forest Law of People's Republic of China
- Mineral Resources Law of People's Republic of China
- Relevant Hubei Province regulations on land, water resources, and forest resources.

The following policy principles were followed in the development of the RAP:

- All kinds of measures will be explored to minimize adverse impacts, including engineering, technical, environmental and economic measures.
- The objective of resettlement planning is to increase or at least restore the living standard of the affected population.
- All affected assets will be compensated at replacement cost without depreciation.
- The affected people and local governments will be consulted about compensation rates.
- A compensation fund will be paid three months before acquisition of assets.
- Resettlement will be land based, with non-farm industrial employment and self-employment as complementary measures.
- The affected people and the host population will be encouraged to participate in resettlement planning.
- Resettled people will be relocated in existing villages or production teams.

Compensation Standards

The project office consults each county involved and negotiates compensation. Actual compensation rates will be based on replacement costs for various categories of affected assets. Land compensation will be based on the highest average annual output value per mu on the same land in the affected counties. Compensation rates must meet or exceed legal requirements and replacement cost valuation.

The land compensation rates for paddy and vegetable land are RMB 7,219 (about US$880) per mu, which is 14 times the average agricultural output. The land compensation rates are RMB 6,443 (about US$786) per mu for dry land, timber forestland, and water pool and orchard land, which is about 14 times the annual average output of the land. In addition, for wasteland to be acquired, the project will pay a nominal compensation of RMB 200 (about US$24) per mu.

Compensation rates for affected structures are based on replacement cost. The rate for residential structures constructed primarily of brick and concrete will be RMB 260 (about US$32) per square meter. For residential structures constructed primarily of brick and wood, the rate will be RMB 160 (about US$20) per square meter. The rate for the earth and wood structures is RMB 110 (about US$15).

In many cases, local authorities may increase compensation rates for acquired land and demolished structures in response to local variations in property valuation or to meet other local contingencies. In all cases, however, compensation will meet or exceed standards established in the RAP.

The project also will affect public infrastructure. Compensation based on replacement value will be paid to government agencies or local governments to restore affected infrastructure and services.

Resettlement Budget and Disbursement

The RAP contains detailed compensation rates for all affected assets. These rates were arrived at according to the above principles and after consultation with local governments and affected people. Land compensation was estimated at 14 times the average output value per mu for the entire project area. Detailed unit-rate analysis was conducted to determine the replacement costs for different types of houses. They are described in the RAP. Compensation for affected public facilities was estimated at reconstruction cost.

A detailed resettlement budget has been developed, by village, on the basis of the inventory and compensation rates. This budget includes the base cost, management fees, and contingencies. The base cost includes the compensation fund for land, standing crops, houses, attached structures, facilities, land acquisition tax, resettlement subsidy, and fund for land leveling, training, and monitoring. The management fee is about 2.7 percent of the base cost. Contingencies are estimated at 10 percent of the base cost. The total resettlement budget is RMB 223 million, about 6.7 percent of the total project budget. Resettlement will be financed entirely through counterpart funds.

Resettlement funds will be disbursed from the project office to the various entitled units through the resettlement offices at city and county levels. Land compensation, including compensation for standing crops, will be paid to the villages from county government agencies. The project office will open a bank account for each village and allocate compensation funds three months before the village land is acquired and assign the local bank to supervise disbursement. For

private houses and other private assets, compensation will be paid directly to the affected farmers and individuals through a specific local bank account. Compensation for public facilities will be paid to the owner of government agencies.

Livelihood Restoration

Relocation of households. Villages will receive new residential plots. Sites for the houses will be finalized during consultation with affected households. Farmers will receive cash compensation to build their own new houses. All relocating households will be serviced with existing public facilities and infrastructure. No need for additional village infrastructure is anticipated.

The project will require 99,323 sq m of residential structures constructed primarily of earth and wood, about 62 percent of major structures required by the project. The Bank team suggested that HPCD not only compensate for earth and brick structures with replacement cost but consider as well (i) some kind of assistance to displaced families in poor areas, (ii) a preferential policy for poor families who may not be able to build brick and wood houses but are eager do so, (iii) consultation on and survey in the field of minimum living space per family, (iv) protection of cultivated land to avoid using topsoil to build earth and wood houses.

HPCD has increased compensation for earth and wood structures by RMB 20 per sq m. Earth and wood structures, like brick and wood structures, will be compensated for with as much as RMB160 per sq m if total compensation for a family of three is not enough to build 60 sq m of brick-and-wood house. Smaller families will receive enough compensation to build 20 sq m of brick and wood house per person

Rehabilitation of public facilities. Affected infrastructure facilities are mainly irrigation canals, power and telecommunication lines, and transport facilities. For these facilities, compensation based on the replacement cost will be paid to the owners. The project office conducted surveys of irrigation canal recovery and underpasses for herds and the results are reflected in the RAP. The records have taken into account for the design of SME. The affected irrigation canals and underpasses will be reconstructed by project construction contractors and supervised by the affected villages. The owners of the other facilities will be responsible for their reconstruction.

Livelihood restoration. The proposed expressway alignment will pass primarily through relatively rural areas. The rural population densities are comparatively high with on average 0.9 mu of farmland per capita before land acquisition and 0.8 mu after land acquisition. Resettlement planning included a review of impacts on incomes, which is based on village impact analysis. Fourteen villages will be affected by land acquisition of more than 10 percent of total village farmland. Livelihood restoration for farmers losing agricultural land will follow a land and agricultural development–based strategy. All affected farmers will get cultivated land through redistribution of collective village land or land reclamation. Land reclamation is an important strategy that solves problems caused by construction waste material and creates land for villages that lose farmland. It is expected that 2,287 mu of land will be created—about 49 percent of total acquired farming land.

Land redistribution and development are likely to start in July 2004. Consultations with the displaced villages on livelihood development have begun. Resettlement subsidy funds and land compensation funds will be used to provide assistance for self-employment and improving

agricultural productivity through land reclamation and irrigation development, soil improvement, and other activities.

A village-based development plan was undertaken in each affected village. In most villages, land redistribution will be undertaken so that all village members can retain access to land, and the village will use compensation to improve agricultural production. If affected villagers lose land and others are not willing to redistribute their land to the affected people, further consultations will be held to devise village-specific strategies for livelihood development and income-generating measures.

Institutional Arrangements

The provincial resettlement leading group led by a vice governor and made up of officials from HPCD, cities, and counties will oversee resettlement operations. HPCD has established the Hubei Expressway Resettlement Office to manage those operations. This office has set up a multilevel organizational framework to plan and implement resettlement, with resettlement offices at different levels of governments, including project level and City, county/banner, and township levels. Local offices are staffed with experts, and their responsibilities are specified in detail in the RAP. Other relevant government agencies are involved at different levels, including planning, finance, communications, and land administration. A detailed training program has been developed to build the capacity of project offices.

HPCD will control resettlement fund cash flow, and each affected village will open a local bank account that will be supervised by the bank. HPCD will issue specific regulations on resettlement fund approval and usage. The appointed bank will report resettlement fund usage item by item daily to the project office. HPCD will also strengthen the capacity of township-level and county-level resettlement fund management.

Implementation Schedule

Resettlement scheduling will follow the following principles:

- House demolition will be phased, and civil works will not start before the relocating households move into their new houses.
- Demolition notice must be served at least three months before relocation, and relocating households will be given at least three months for new house construction.
- Civil works cannot start before compensation payment and land acquisition are completed.
- Redistribution of land will be carried out during seasonal breaks.
- Village-specific livelihood restoration measures will be developed at the same time as land redistribution.
- Reconstruction and rehabilitation of affected public facilities and infrastructure will be completed before civil works start.

Public Consultation and Grievance Redress

The RAP was prepared with the participation of the displaced population. Local governments, village leaders, and the affected people participated in the census and inventory, the finalization of the alignment, and the establishment of the compensation rates and relocation and livelihood development schemes. In November 2002, HPCD hired Wuhan University to guide the

socioeconomic survey. Asset compensation and resettlement policy were addressed in March 2003. In August 2003, HPCD hired the Beijing University to conduct the social assessment, and Wuhan University to guide the livelihood restoration plan. Project information and resettlement policies were disseminated among them before and during the consultation process. The affected population was systematically consulted during the social assessment, and its feedback was incorporated into the RAP. The final draft RAP was placed in local libraries and its availability announced in local newspapers. The project office will prepare a resettlement information booklet and distribute it to all displaced households.

The project office has designed a grievance redress mechanism. Grievances will be redressed through the resettlement management at different levels. The RAP contains detailed procedures and timeframes for grievance redress. This mechanism will be described in the resettlement information booklet.

Resettlement Monitoring

To ensure the smooth and successful implementation of the RAP, the project office has designed both internal and independent monitoring mechanisms for RAP implementation. Internal monitoring will be conducted through the resettlement offices at various levels of governmental agencies. It will focus mainly on physical progress. Independent monitoring will be carried out by Wuhan University every six months. Besides physical progress, it will evaluate livelihood restoration efforts and their effectiveness. The RAP describes in detail monitoring purpose, responsibility, indicators, methodology, procedures, and reporting requirements.

Linkage

SME will connect to Xianshi expressway, which opened to traffic in December 2003, at the Shiyan end of the alignment, and to the Shangluo - Manchuangan expressway at the border with Shaanxi province to be constructed at the same time as SME. Because the Xianshi expressway construction project was implemented by HPCD, environmental and social issues were assessed during the preparation of the Bank-financed Hubei Xiaoxian Highway project. The Bank found that the Xianshi expressway meets domestic environmental laws and standards, including approval of the environmental impact assessment (EIA) by the State Environmental Protection Agency (SEPA), and resettlement operations were carried out in accordance with provisions of the national and provincial Land Administration Laws. The Bank has undertaken due diligence on the new Shangluo-Manchuangan expressway in Shaanxi. This province has provided assurances satisfactory to the Bank that the environmental assessments and resettlement action plans will be conducted in accordance with national and provincial legal requirements.

LRIP

Resettlement

The Social Investigation and Research Institute of Beijing University carried out a social assessment in the areas served by SME and the first phase of the LRIP and completed a social assessment report and a poverty alleviation appraisal report. The social assessment screened the socioeconomic settings, reviewed the key social development issues in the project areas, identified key stakeholders, facilitated community consultation through focus group discussions and interviews, and recorded the concerns and recommendations of the community. The social assessment report indicates that local economic development is impeded by inconvenient transportation, lack of information, and low prices for agricultural products, among other things.

The report also concluded that the project will meet urgent transportation demands and should increase farmers' income, improve connections to outside markets, foster employment opportunities, reduce poverty, and promote the social position of women and children's education. The villagers interviewed support both the expressway and local road improvements.

The social assessment paid particular attention to ethnic minority groups, women, and other vulnerable groups to ensure that they participate in and benefit from the project. The report concluded that no minority community is affected by the project. Thus, a separate Ethnic Minorities Development Plan is not needed.

Annex 11: Project Preparation and Supervision

CHINA: Hubei Shiman Highway Project

	Planned	Actual
PCN review	30-May-03	03-Jun-03
Initial PID to PIC	16-Jun-03	11-Jun-03
Initial ISDS to PIC	16-Jun-03	02-Jul-03
Appraisal	08-Mar-04	08-Mar-04
Negotiations	20-Apr-04	20-Apr-04
Board/RVP approval	24-Jun-04	
Planned date of effectiveness	29-Oct-04	
Planned date of mid-term review		
Planned closing date	30-June-09	

Hubei Provincial Communications Department was responsible for preparing the project for the Borrower. It was assisted by (i) the HPCDI and the Second Highway Institute of MOC for the engineering design of SME, (ii) the HPHAB and HPCDI for the preparation of the LRIP, (iii) the Second Navigation Survey and Design Institute of MOC for the environmental safeguard documents for SME, and the Shipping Research Institute for those for the LRIP, (iv) the Beijing University for social surveys on SME and the LRIP, and (v) the Wuhan University for the SME RAP.

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Michel Bellier	Task Team Leader/Lead Transport Specialist	EASTR
Robin Carruthers	Lead Transport Economist	TUDTR
Han-Kang Yen	Research Analyst	EASTR
Jean-Marie Braun	Highway Engineering Consultant	EASTR
Boping Gao	Transport Specialist	EACCF
Anil Somani	Sr. Environmental Specialist	EASEN
Daniel Gibson	Sr. Social Scientist	EASSD
Zhefu Liu	Social Development Specialist	EASSD
Anthony Bliss	Sr. Road Safety Specialist	TUDTR
Christopher Bennett	Sr. Transport Specialist	EASTR
Emmanuel Py	Jr. Professional Associate	EASTR
Xiaoping Li	Procurement Specialist	EAPCO
R.I. Gopalkrishnan	Procurement Consultant	EAPCO
Karin Nordlander	Lead Counsel	LEGEA
David I	Sr. Financial Management Specialist	EAPCO
Yi Dong	Financial Management Specialist	EAPCO
Teresita Ortega	Program Assistant	EASTR

Furthermore, a Spanish CTF grant for $95,000 was received and used for project preparation by the Bank to contract consulting services for the engineering audit the design of SME. Consultant activities included the following:

Bank funds expended to date on project preparation:

- Bank resources: US$355,000
- Trust funds: US$95,000 TF030446 (Spanish CTF)
- Total: US$450,000

Estimated approval and supervision costs:

- Remaining costs to approval: US$10,000
- Estimated annual supervision cost: US$80,000

Annex 12: Documents in the Project File

CHINA: Hubei Shiman Highway Project

A. General Documents

• Hubei Shiman Highway Project - Feasibility Study Report	October 2002
• Technological Argumentation on Schemes of Implementation by Stages	May 2003
• Result on Comparison and Selection of Route Schemes	October 2003
• Special Subject Report of Traffic Predictions	May 2003
• Hefei – Xi'an – Wuhan Transport Corridor, Regional Traffic Forecast Study	November 2003
• Statements of Review on Feasibility Study Report of Shiyan-Manchuanguan (boundary between Hubei and Shanxi Province) Expressway	October 2003
• Official Agreement Between Shanxi Provincial Communications Department and Hubei Provincial Communications Department Regarding the Inter-province Expressway Connecting Point on Yinchuan-Xi'an-Wuhan between Shanxi and Hubei Province	May 2003
• Baoxia-Zhushan Highway - Engineering Feasibility Study Report	August 2003
• Jainghunhe Hanjian River Bridge – Study Report of Project Feasibility	April 2003
• Project Implementation Plan	March 2004

B. Safeguard Documents

Environment

• Environmental Assessment Summary for Shiyan to Manchuanguan Section of Yinwu Inter-Provincial Highway Project	March 2004
• Environment Impact Assessment for Shiyan to Manchuanguan Section of Yinwu Inter-Provincial Highway Project	March 2004
• Environment Management Plan for Shiyan to Manchuanguan Section of Yinwu Inter-Provincial Highway Project	March 2004
• The Additional Report of the Protection Project of Cultural Relics on Shiyan-Manchuanguan Highway	October 2003
• Shi-Man Expressway Rural Road Upgrading Project, Baoxia-Zhushan Rural Road, Environment Impact Assessment and Environment Management Plan	March 2004
• Shi-Man Expressway Rural Road Upgrading Project, Jiangjunhe Hanjiang River Bridge, Environment Impact Assessment and Environment Management Plan	March 2004
• Environmental Management Plan, Sanguan Tunnel on BaoZhu Road	March 2004

Social/Resettlement

• The Social Appraisal Report on Hubei Shiman Highway Project & Rural Road Improvement Program (Revised)	August 31, 2003
• Resettlement Action Plan	March 2004
• Policy Framework for Resettlement and Land Acquisition of Local Roads Improvement Program under Hubei Shiman Expressway Project	January 2004

C. Others

• Procurement Plan	April 2004
• Procurement Management Manual	February 2004

Annex 13: Statement of Loans and Credits

CHINA: Hubei Shiman Highway Project

29-Apr-04

Project ID	FY	Purpose	Original Amount in US$ Millions IBRD	IDA	GEF	Cancel.	Undisb.	Difference between expected and actual disbursements* Orig.	Frm Rev'd
P066955	2004	CN-ZHEJIANG URBAN ENVMT	133.00	0.00	0.00	0.00	133.00	0.00	0.00
P065463	2004	CN - Jiangxi Integrated Agric. Modern.	100.00	0.00	0.00	0.00	100.00	2.25	0.00
P065035	2004	CN-Gansu & Xinjiang Pastoral Development	66.27	0.00	0.00	0.00	65.61	5.18	0.00
P073002	2004	CN-Basic Education in Western Areas	100.00	0.00	0.00	0.00	100.00	0.00	0.00
P077615	2004	CN-GEF-Gansu & Xinjiang Pastoral Develop	0.00	0.00	10.50	0.00	10.50	0.90	0.00
P077137	2004	CN-4th Inland Waterways	91.00	0.00	0.00	0.00	91.00	0.00	0.00
P069852	2004	CN-Wuhan Urban Transport	200.00	0.00	0.00	0.00	200.00	26.65	0.00
P067337	2003	CN-2nd GEF Energy Conservation	0.00	0.00	26.00	0.00	14.60	17.15	0.00
P040599	2003	CN-TIANJIN URB DEV II	150.00	0.00	0.00	0.00	148.50	-1.50	0.00
P058847	2003	CN-3rd Xinjiang Hwy Project	150.00	0.00	0.00	0.00	106.13	12.38	0.00
P068058	2003	CN-Yixing Pumped Storage Project	145.00	0.00	0.00	0.00	133.25	-4.90	0.00
P076714	2003	CN-Anhui Hwy 2	250.00	0.00	0.00	0.00	247.50	14.75	0.00
P070441	2003	CN-Hubei Xiaogan Xiangfan Hwy	250.00	0.00	0.00	0.00	156.78	-16.22	0.00
P070191	2003	CN-SHANGHAI URB ENVMT APL1	200.00	0.00	0.00	0.00	190.00	-10.00	0.00
P071147	2002	CN-Tuberculosis Control Project	104.00	0.00	0.00	0.00	90.28	-13.72	0.00
P060029	2002	CN-Sustain. Forestry Dev(Natural Forest)	0.00	0.00	16.00	0.00	14.11	3.40	0.00
P064729	2002	CN-SUSTAINABLE FORESTRY DEV. PROJECT	93.90	0.00	0.00	0.00	76.07	3.91	0.00
P058846	2002	CN-Natl Railway Project	160.00	0.00	0.00	0.00	34.62	0.87	0.00
P070459	2002	CN-Inner Mongolia Hwy Project	100.00	0.00	0.00	0.00	85.84	4.84	0.00
P068049	2002	CN-Hubei Hydropower Dev in Poor Areas	105.00	0.00	0.00	0.00	87.68	15.18	0.00
P056199	2001	CN-3rd Inland Waterways	100.00	0.00	0.00	0.00	79.60	7.10	0.00
P051859	2001	CN-LIAO RIVER BASIN	100.00	0.00	0.00	0.00	70.70	30.30	0.00
P058845	2001	Jiangxi II Hwy	200.00	0.00	0.00	0.00	127.20	6.20	0.00
P045915	2001	CN-Urumqi Urban Transport	100.00	0.00	0.00	0.00	52.54	48.64	0.00
P047345	2001	CN-HUAI RIVER POLLUTION CONTROL	105.50	0.00	0.00	0.00	87.18	-18.32	0.00
P056596	2001	CN-Shijiazhuang Urban Transport	100.00	0.00	0.00	0.00	85.41	54.31	0.00
P056516	2001	CN - WATER CONSERVATION	74.00	0.00	0.00	0.00	37.49	7.59	0.00
P064924	2000	CH-GEF-BEIJING ENVMT II	0.00	0.00	25.00	0.00	23.32	19.26	3.52
P045264	2000	CN-SMALLHLDR CATTLE DEV	93.50	0.00	0.00	0.00	11.60	5.95	0.00
P064730	2000	CN - Yangtze Dike Strengthening Project	210.00	0.00	0.00	0.00	109.29	97.29	0.00
P045910	2000	CN-HEBEI URBAN ENVIRONMENT	150.00	0.00	0.00	0.00	119.36	48.86	0.00
P049436	2000	CN-CHONGQING URBAN ENVMT	200.00	0.00	0.00	3.70	152.28	64.58	0.00
P058843	2000	Guangxi Highway	200.00	0.00	0.00	0.00	100.22	47.22	0.00
P042109	2000	CN-BEIJING ENVIRONMENT II	349.00	0.00	25.00	0.00	286.54	185.32	0.00
P058844	2000	3rd Henan Prov Hwy	150.00	0.00	0.00	0.00	55.58	24.58	0.00
P056424	2000	CN-TONGBAI PUMPED STORA	320.00	0.00	0.00	100.00	148.71	96.21	0.00
P050036	1999	Anhui Provincial Hwy	200.00	0.00	0.00	9.60	32.99	34.79	0.00
P057352	1999	CN-RURAL WATER IV	16.00	30.00	0.00	0.00	21.42	16.26	9.69
P056216	1999	CN - LOESS PLATEAU II	100.00	50.00	0.00	0.00	22.35	24.48	0.00
P051888	1999	CN - GUANZHONG IRRIGATION	80.00	20.00	0.00	0.00	28.59	22.68	0.00
P051856	1999	ACCOUNTING REFORM & DEVELOPMENT	27.40	5.60	0.00	0.00	17.89	17.86	0.00
P058308	1999	CN-PENSION REFORM PJT	0.00	5.00	0.00	0.00	1.77	1.75	0.00
P051705	1999	Fujian II Highway	200.00	0.00	0.00	0.00	65.73	63.73	0.00
P049665	1999	CN-ANNING VALLEY AG.DEV	90.00	30.00	0.00	0.00	19.19	11.38	0.00
P036953	1999	CN-HEALTH IX	10.00	50.00	0.00	0.00	34.47	21.83	0.00
P060270	1999	CN-ENTERPRISE REFORM LN	0.00	5.00	0.00	0.00	2.71	4.29	4.07

P038121	1999 CN-GEF-RENEWABLE ENERGY DEVELOPMENT	0.00	0.00	35.00	0.00	23.09	27.86	8.34
P041268	1999 CN-Nat Hwy4/Hubei-Hunan	350.00	0.00	0.00	0.00	59.72	40.72	0.00
P003653	1999 CN-Container Transport	71.00	0.00	0.00	18.61	3.16	21.74	0.46
P041890	1999 CN-Liaoning Urban Transport	150.00	0.00	0.00	0.00	33.14	33.14	0.00
P046829	1999 RENEWABLE ENERGY DEVELOPMENT	100.00	0.00	0.00	0.00	12.87	99.87	10.40
P046564	1999 CN - Gansu & Inner Mongolia Poverty Red.	60.00	100.00	0.00	13.30	37.89	28.93	-10.99
P046051	1999 CN-HIGHER EDUC. REFORM	20.00	50.00	0.00	0.00	5.70	7.31	0.00
P043933	1999 CN-SICHUAN URBAN ENVMT	150.00	2.00	0.00	0.00	88.89	78.42	22.92
P042299	1999 TEC COOP CREDIT IV	10.00	35.00	0.00	0.00	36.03	-11.40	0.00
P037859	1998 CN-GEF Energy Conservation	0.00	0.00	22.00	0.00	0.71	22.06	0.00
P040185	1998 CN-SHANDONG ENVIRONMENT	95.00	0.00	0.00	1.40	20.07	21.47	3.95
P036414	1998 CN-GUANGXI URBAN ENVMT	72.00	20.00	0.00	0.00	71.56	66.78	27.87
P003606	1998 ENERGY CONSERVATION	63.00	0.00	22.00	0.00	33.80	17.68	0.00
P035698	1998 HUNAN POWER DEVELOP.	300.00	0.00	0.00	145.00	31.45	174.20	-14.46
P003614	1998 CN-Guangzhou City Transport	200.00	0.00	0.00	20.00	100.31	120.31	100.31
P003619	1998 CN-2nd Inland Waterways	123.00	0.00	0.00	37.00	16.35	52.12	5.79
P003566	1998 CN-BASIC HEALTH (HLTH8)	0.00	85.00	0.00	0.00	36.95	23.71	0.00
P003539	1998 CN - SUSTAINABLE COASTAL RESOURCES DE	100.00	0.00	0.00	2.06	45.61	45.18	37.80
P051736	1998 E. CHINA/JIANGSU PWR	250.00	0.00	0.00	86.00	44.95	130.95	10.36
P049700	1998 CN - IAIL-2	300.00	0.00	0.00	0.00	3.97	3.97	1.26
P046952	1998 CN - FOREST. DEV. POOR AR	100.00	100.00	0.00	0.00	29.62	-71.11	11.24
P046563	1998 CN - TARIM BASIN II	90.00	60.00	0.00	2.67	7.14	9.54	0.00
P045788	1998 Tri-Provincial Hwy	230.00	0.00	0.00	0.00	16.51	14.21	0.00
P036949	1998 CN-Nat Hwy3-Hubei	250.00	0.00	0.00	0.00	21.15	21.15	0.00
P003637	1997 CN-NAT'L RURAL WATER 3	0.00	70.00	0.00	0.00	0.56	3.77	3.35
P003590	1997 CN - QINBA MOUNTAINS POVERTY REDUCTIO	30.00	150.00	0.00	0.00	13.16	16.34	1.39
P003650	1997 TUOKETUO POWER/INNER	400.00	0.00	0.00	102.50	30.47	132.97	23.19
P044485	1997 SHANGHAI WAIGAOQIAO	400.00	0.00	0.00	0.00	73.66	46.51	38.21
P036405	1997 CN - WANJIAZHAI WATER TRA	400.00	0.00	0.00	75.00	22.58	97.58	15.00
P038988	1997 CN - HEILONGJIANG ADP	120.00	0.00	0.00	0.00	7.60	7.60	5.26
P035693	1997 FUEL EFFICIENT IND.	0.00	0.00	32.80	0.00	6.74	32.81	0.00
P003654	1997 Nat Hwy2/Hunan-Guangdong	400.00	0.00	0.00	0.00	48.52	48.52	24.66
P003602	1996 CN-HUBEI URBAN ENVIRONMENT	125.00	25.00	0.00	28.32	39.72	70.08	35.08
P003599	1996 CN-YUNNAN ENVMT	125.00	25.00	0.00	19.48	35.68	56.92	11.13
P003648	1996 CN-SHANGHAI SEWERAGE II	250.00	0.00	0.00	0.00	32.67	32.67	2.54
P003594	1996 CN - GANSU HEXI CORRIDOR	60.00	90.00	0.00	0.00	73.92	61.33	0.00
P003589	1996 CN-DISEASE PREVENTION (HLTH7)	0.00	100.00	0.00	0.00	1.87	10.93	0.00
P034618	1996 CN-LABOR MARKET DEV.	10.00	20.00	0.00	0.00	5.56	7.67	0.00
P040513	1996 2nd Henan Prov Hwy	210.00	0.00	0.00	19.00	12.88	31.88	20.88
P003571	1995 CN-7th Railways	400.00	0.00	0.00	119.00	10.28	129.28	20.28
P003639	1995 CN-SOUTHWEST POVERTY REDUCTION PROJE	47.50	200.00	0.00	0.01	1.21	25.36	25.36
P003647	1995 China Economic Law Reform -LEGEA	0.00	10.00	0.00	0.00	0.50	0.83	0.00
P003603	1995 CN-ENT HOUSING & SSR	275.00	75.00	0.00	57.46	37.16	92.53	2.19
P003596	1995 CN-Yangtze Basin Water Resources Project	100.00	110.00	0.00	1.92	0.21	4.60	4.60
P003540	1994 CN-LOESS PLATEAU	0.00	150.00	0.00	0.00	0.93	0.27	0.00
P003632	1993 CN-ENVIRONMENT TECH ASS	0.00	50.00	0.00	0.00	1.02	1.58	1.26
	Total:	12,010.07	1,722.60	214.30	862.02	5117.15	2,896.09	466.91

CHINA
STATEMENT OF IFC's
Held and Disbursed Portfolio
Mar-04
In Millions US Dollars

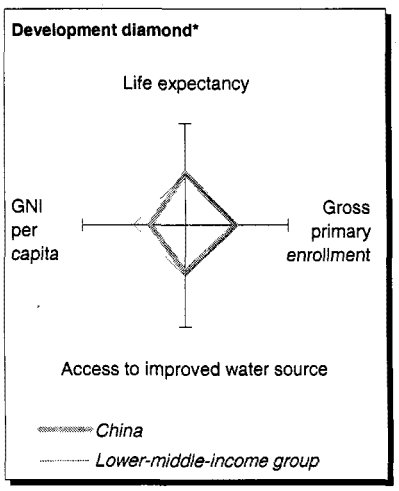
		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic
2004	China II	28.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2004	China Re Life	0.00	15.41	0.00	0.00	0.00	15.29	0.00	0.00
1994	China Walden Mgt	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00
1995	Dupont Suzhou	7.79	0.00	0.00	0.00	7.79	0.00	0.00	0.00
1994	Dynamic Fund	0.00	8.05	0.00	0.00	0.00	6.40	0.00	0.00
2003	Great Infotech	0.00	3.50	0.00	0.00	0.00	2.80	0.00	0.00
1999	Hansom	0.00	0.08	0.00	0.00	0.00	0.08	0.00	0.00
2002	Huarong AMC	9.00	3.00	0.00	0.00	9.00	0.49	0.00	0.00
2004	IB	0.00	52.18	0.00	0.00	0.00	0.19	0.00	0.00
2002	IEC	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998	Leshan Scana	5.21	1.35	0.00	0.00	3.61	1.35	0.00	0.00
2001	Maanshan Carbon	9.00	2.00	0.00	0.00	9.00	2.00	0.00	0.00
2001	Minsheng Bank	0.00	23.50	0.00	0.00	0.00	23.50	0.00	0.00
2001	NCCB	0.00	26.58	0.00	0.00	0.00	26.46	0.00	0.00
1996	Nanjing Kumho	0.00	3.81	0.00	0.00	0.00	3.81	0.00	0.00
2001	New China Life	0.00	30.70	0.00	0.00	0.00	23.32	0.00	0.00
1995	Newbridge Inv.	0.00	1.95	0.00	0.00	0.00	1.95	0.00	0.00
1997	Orient Finance	6.67	0.00	0.00	8.33	6.67	0.00	0.00	8.33
2003	PSAM	0.00	1.93	0.00	0.00	0.00	0.00	0.00	0.00
1997/00	PTP Holdings	0.00	0.03	0.00	0.00	0.00	0.03	0.00	0.00
2001	Peak Pacific	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00
2003	SAIC	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2004	SBTS	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
2000	SSIF	0.00	4.50	0.00	0.00	0.00	1.02	0.00	0.00
1998	Shanghai Krupp	27.50	0.00	0.00	61.43	27.50	0.00	0.00	61.43
1999	Shanghai Midway	0.00	16.02	0.00	0.00	0.00	16.02	0.00	0.00
1993	Shanxi	15.36	0.00	0.00	0.00	12.81	0.00	0.00	0.00
2002	Shenzhen PCCP	3.76	0.00	0.00	0.00	3.76	0.00	0.00	0.00
2001	Sino Gold	0.00	4.00	0.00	0.00	0.00	4.00	0.00	0.00
1995	Sino-Forest	23.33	0.00	0.00	0.00	18.33	0.00	0.00	0.00
2000	Suzhou PVC	0.00	2.48	0.00	0.00	0.00	2.48	0.00	0.00
1996	Wanjie Hospital	13.64	0.00	0.00	0.00	13.64	0.00	0.00	0.00
2004	Weihai Weidongri	0.73	0.00	0.00	0.00	0.73	0.00	0.00	0.00
2003	Wumart	0.00	6.48	0.00	0.00	0.00	6.48	0.00	0.00
1993	XACB	0.00	19.93	0.00	0.00	0.00	0.00	0.00	0.00
2003	Yantai Cement	4.73	0.00	0.00	0.00	4.73	0.00	0.00	0.00
2002	Zhengye-ADC	15.00	0.00	0.00	7.00	6.14	0.00	0.00	2.86
2002	Zhong Chen	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	ASIMCO	0.00	10.00	0.00	0.00	0.00	10.00	0.00	0.00
2003	Anjia	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
1999/00/02	BCIB	0.00	0.00	11.60	0.00	0.00	0.00	0.00	0.00
2002	Bank of Shanghai	0.00	24.67	0.00	0.00	0.00	24.67	0.00	0.00
2003	CDH China Fund	0.00	15.17	0.00	0.00	0.00	2.09	0.00	0.00
	CSMC	0.00	12.00	0.00	0.00	0.00	9.60	0.00	0.00
	Total Portfolio:	212.50	311.86	36.60	83.80	134.49	188.96	0.00	79.66

		Approvals Pending Commitment			
FY Approval	Company	Loan	Equity	Quasi	Partic
2002	ASIMCO	0.00	5.00	0.00	0.00
2004	CCB-MS NPL	0.00	0.00	3.00	0.00
2003	Cellon	0.00	0.00	5.70	0.00
2004	Colony China	0.00	0.00	50.00	0.00
2002	Darong	10.00	0.00	1.50	8.00
2002	Huarong AMC	15.00	0.00	0.00	0.00
2002	IEC	0.00	5.00	0.00	0.00
2002	KHIT	0.00	0.00	3.00	0.00
2004	NCFL	0.00	0.00	17.88	0.00
2004	Nanjing Kumho Ex	34.00	0.00	6.00	0.00
2003	Peak Pacific 2	0.00	0.00	10.00	0.00
2004	SIBFI	0.26	0.00	0.00	0.00
2002	SML	1.00	0.00	0.00	0.00
2002	Sino Mining	5.00	0.00	0.00	5.00
2002	Zhong Chen	0.00	0.00	0.00	32.00
	Total Pending Commitment:	65.26	10.00	97.08	45.00

Annex 14: Country at a Glance

CHINA: Hubei Shiman Highway Project

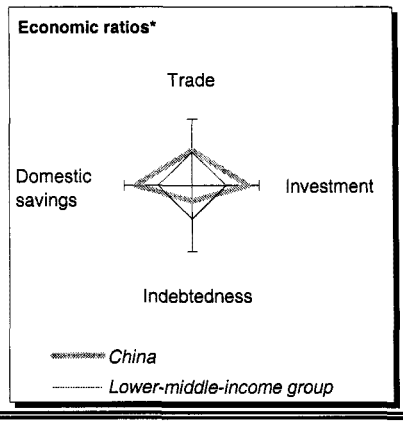
POVERTY and SOCIAL	China	East Asia & Pacific	Lower-middle-income
2002			
Population, mid-year *(millions)*	1,281.0	1,838	2,411
GNI per capita *(Atlas method, US$)*	950	950	1,390
GNI *(Atlas method, US$ billions)*	1,219.1	1,740	3,352
Average annual growth, 1996-02			
Population *(%)*	0.8	1.0	1.0
Labor force *(%)*	0.9	1.2	1.2
Most recent estimate (latest year available, 1996-02)			
Poverty *(% of population below national poverty line)*	5	..	..
Urban population *(% of total population)*	38	38	49
Life expectancy at birth *(years)*	71	69	69
Infant mortality *(per 1,000 live births)*	30	33	30
Child malnutrition *(% of children under 5)*	10	15	11
Access to an improved water source *(% of population)*	75	76	81
Illiteracy *(% of population age 15+)*	14	13	13
Gross primary enrollment *(% of school-age population)*	106	106	111
Male	105	105	111
Female	108	106	110



KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1982	1992	2001	2002
GDP *(US$ billions)*	221.5	454.6	1,167.1	1,232.7
Gross domestic investment/GDP	33.2	36.2	38.5	41.0
Exports of goods and services/GDP	8.9	19.5	25.5	29.5
Gross domestic savings/GDP	34.8	37.7	40.9	44.0
Gross national savings/GDP	35.1	38.0	40.0	43.8
Current account balance/GDP	2.4	1.9	1.5	2.9
Interest payments/GDP	0.2	0.6	0.5	0.5
Total debt/GDP	3.8	15.9	14.6	12.6
Total debt service/exports	8.0	8.6	7.7	6.1
Present value of debt/GDP	..	..	14.1	..
Present value of debt/exports	..	..	51.8	..

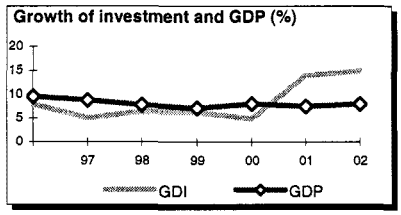
	1982-92	1992-02	2001	2002	2002-06
(average annual growth)					
GDP	9.7	9.0	7.5	8.0	7.5
GDP per capita	8.1	8.0	6.7	7.2	6.6

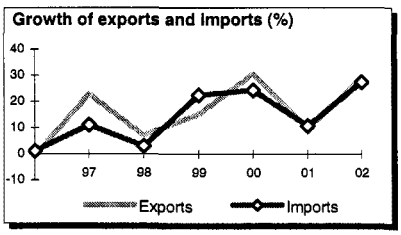


STRUCTURE of the ECONOMY

	1982	1992	2001	2002
(% of GDP)				
Agriculture	33.3	21.8	15.8	14.5
Industry	45.0	43.9	50.1	51.7
Manufacturing	37.3	33.1	34.2	44.5
Services	21.7	34.3	34.1	33.7
Private consumption	50.7	49.2	45.7	42.5
General government consumption	14.5	13.1	13.4	13.5
Imports of goods and services	7.3	18.0	23.1	26.5

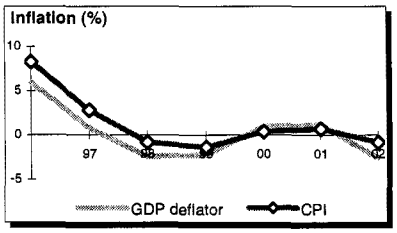
	1982-92	1992-02	2001	2002
(average annual growth)				
Agriculture	4.6	3.7	2.8	2.9
Industry	11.6	11.3	8.4	9.9
Manufacturing	11.2	10.4	9.0	8.1
Services	11.7	8.4	8.4	7.3
Private consumption	11.4	8.1	2.8	1.9
General government consumption	9.9	8.4	10.5	7.0
Gross domestic investment	9.5	9.7	13.9	14.9
Imports of goods and services	9.7	12.8	10.8	27.5





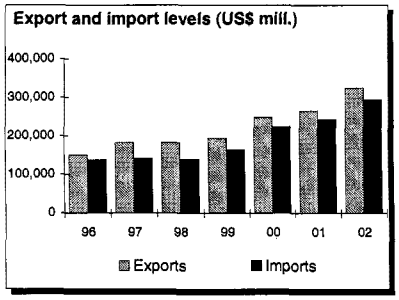
PRICES and GOVERNMENT FINANCE

	1982	1992	2001	2002
Domestic prices				
(% change)				
Consumer prices	6.0	6.4	0.7	-0.8
Implicit GDP deflator	-0.2	7.9	1.2	-2.6
Government finance				
(% of GDP, includes current grants)				
Current revenue	22.9	14.7	17.1	17.9
Current budget balance	..	2.0	1.1	0.0
Overall surplus/deficit	-0.3	-1.0	-4.7	-3.0



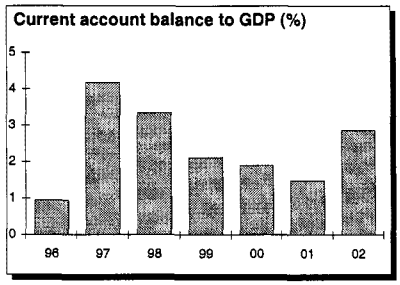
TRADE

	1982	1992	2001	2002
(US$ millions)				
Total exports (fob)	22,321	84,940	266,155	325,565
Food	2,908	8,309	12,780	14,623
Fuel	5,314	4,693	8,420	8,372
Manufactures	12,271	67,936	239,802	297,085
Total imports (cif)	19,285	80,585	243,610	295,203
Food	4,201	3,146	4,980	5,237
Fuel and energy	183	3,570	17,495	19,285
Capital goods	3,204	31,312	107,040	137,030
Export price index *(1995=100)*	41	85	83	78
Import price index *(1995=100)*	71	95	91	86
Terms of trade *(1995=100)*	58	89	91	90



BALANCE of PAYMENTS

	1982	1992	2001	2002
(US$ millions)				
Exports of goods and services	24,906	94,198	299,409	365,395
Imports of goods and services	20,555	86,752	271,325	328,013
Resource balance	4,350	7,446	28,084	37,383
Net income	376	249	-19,174	-14,945
Net current transfers	486	1,155	8,492	12,984
Current account balance	5,212	8,850	17,401	35,422
Financing items (net)	-995	-10,952	30,046	40,085
Changes in net reserves	-4,217	2,102	-47,447	-75,507
Memo:				
Reserves including gold *(US$ millions)*	..	24,842	220,051	297,721
Conversion rate *(DEC, local/US$)*	2.4	5.9	8.3	8.3



EXTERNAL DEBT and RESOURCE FLOWS

	1982	1992	2001	2002
(US$ millions)				
Total debt outstanding and disbursed	8,358	72,428	170,110	155,678
IBRD	0	3,752	11,550	12,051
IDA	1	4,287	8,654	8,729
Total debt service	2,125	8,618	24,297	23,688
IBRD	0	460	1,550	1,631
IDA	0	30	151	175
Composition of net resource flows				
Official grants	47	327	240	..
Official creditors	657	2,343	2,156	-839
Private creditors	-122	8,949	-4,017	-13,593
Foreign direct investment	430	11,156	44,241	49,308
Portfolio equity	0	1,243	3,015	2,286
World Bank program				
Commitments	330	1,865	782	563
Disbursements	1	1,331	1,791	1,733
Principal repayments	0	197	904	1,157
Net flows	1	1,134	887	576
Interest payments	0	293	797	649
Net transfers	1	841	90	-73