



Technical Assistance Report

Project Number: 40626
September 2007

People's Republic of China: Preparing the Western Yunnan Roads Development II Project

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 11 September 2007)

Currency Unit	–	yuan (CNY)
CNY1.00	=	\$0.1327
\$1.00	=	CNY7.5355

ABBREVIATIONS

ADB	–	Asian Development Bank
EIA	–	environmental impact assessment
EMDP	–	ethnic minority development plan
GDP	–	gross domestic product
GMS	–	Greater Mekong Subregion
IPSA	–	initial poverty and social assessment
km	–	kilometer
PRC	–	People's Republic of China
REA	–	rapid environmental assessment
RP	–	resettlement plan
TA	–	technical assistance
VOC	–	vehicle operating cost
YPCD	–	Yunnan Provincial Communications Department

TECHNICAL ASSISTANCE CLASSIFICATION

Targeting Classification	–	General intervention
Sector	–	Transport and communications
Subsector	–	Roads and highways
Themes	–	Sustainable economic growth, regional cooperation
Subthemes	–	Promoting economic efficiency and enabling markets, cross-border infrastructure

NOTE

In this report, "\$" refers to US dollars.

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



Western Yunnan Roads Development Project

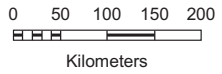
Yunnan Expressway Project

Central Yunnan Roads Development Project

Project Road

Southern Yunnan Roads Development Project

- ★ National Capital
 - ⊙ Provincial Capital
 - City/Town
 - Proposed Project Road
 - ADB-Financed Road
 - Expressway
 - - - Expressway (under planning or construction)
 - Major Road
 - + + + + Railway
 - River
 - - - Provincial Boundary
 - - - International Boundary
- Boundaries are not necessarily authoritative.



I. INTRODUCTION

1. During the 2007 Country Programming Midterm Review Mission to the People's Republic of China (PRC), the Government confirmed its request for technical assistance (TA) for the preparation of the Western Yunnan Roads Development II Project.¹ An Asian Development Bank (ADB) fact-finding mission in June 2007 visited the PRC; traveled to the project area; carried out an initial poverty and social assessment (IPSA) and a rapid environmental assessment (REA), and held consultation meetings; and discussed economic and social development, and project-specific issues with government officials and other stakeholders. This report is based on the agreement reached with the Government during the mission, on the objective, scope, costs, financing, terms of reference, and implementation arrangements for the TA, and the mission's observations in the field.

II. ISSUES

2. The PRC's rapid economic growth since the 1980s has substantially increased the demand for transport services. As the economy has changed in structure and become more diversified, the pattern of transport demand has changed. Demand for road transport, a mode of transport that is more flexible and responsive to the needs of a market economy, has outpaced that for other modes. The shift in transport demand also reflects the loosening of anticompetitive restrictions in the road transport industry itself. From 1990 to 2005, passenger traffic by road grew by 8.8% yearly, to 929.9 billion passenger-kilometers (km), and freight traffic by road grew by 6.4% yearly, to 857.4 billion ton-km. In Yunnan, road traffic during the same period grew by 8.8% a year for passenger traffic, to 23.3 billion passenger-km, and by 5.7% a year for freight, to 38.2 billion ton-km. In 2005, road traffic accounted for 53.0% of the country's total passenger traffic and 11.0% of the total freight traffic. The vehicle fleet will continue to expand with the country's rapid economic growth, low vehicle ownership rates, increasing access to loans to finance automobile purchases, and large investment in automotive manufacturing. By 2005, total vehicle ownership in the PRC was 43.3 million (20.6% higher than in 2004); of this total, 23.7 million vehicles were privately owned (22.0% more than a year earlier). Total vehicle ownership in Yunnan increased by 75.3% from 2000 to 2005, from 586,700 to 1,036,100.

3. To meet the growing demand for improved transport infrastructure and services, the Government spent more than CNY1,900 billion on new roads during the 10th Five-Year Plan period (2001–2005). By the end of 2005, the PRC had 1.92 million km of roads, about 17% of these are class II roads or better. Road network density, however, was still low, at 20.0 km per 100 square kilometers—only one third of Brazil's and a quarter of India's. The Government's policy for the road sector, as reflected in its 11th Five-Year Plan (2006–2010), calls for (i) the construction of 380,000 km of roads to increase the total road network to 2.3 million km, including 25,000 km of expressways;² (ii) the completion of the national trunk highway system by 2007; (iii) the completion of the interprovincial western development corridors by 2010; and (iv) the completion of 65–70% of the national expressway network, for a total length of 55,000–60,000 km, by 2010.

4. While the national trunk highway system is being developed, most of rural PRC is hard to reach. Many townships and villages still depend on earth tracks that are almost impassable to motorized traffic, particularly during the rainy season. Even where all-weather roads have been built, rural roads are of low standard and poorly maintained, and many are in serious need of repair. Each year since 2003, the Government has invested about CNY20 billion in rural road

¹ The TA first appeared in *ADB Business Opportunities* on 26 April 2007.

² The PRC had 45,400 km of expressways in 2006, second only to the United States.

development, building about 50,000 km and upgrading 150,000 km. By the end of 2005, the Government had built 494,276 km of county roads and 981,430 km of township roads. About 99.8% townships and 94.3% villages were connected by all-weather roads, and 81.1% of townships and 55.5% of villages by paved roads. According to the Rural Road Development Plan, the Government will invest CNY800 billion in rural roads during the 11th Five-Year Plan period (2006–2010). As planned, all townships and villages in the PRC will be connected by all-weather roads, and 90% of townships and 80% of villages by paved roads. Paved roads will link all townships and villages in the eastern region, all townships and 88% of villages in the central region, and 90% of townships and 50% of villages in the western region.

5. During the 10th Five-Year Plan period (2001–2005), road investments totaled CNY1,978 billion, or CNY396 billion per year, and grew by about 20 times annually—more than double the rate in the previous 5 years. The Yunnan Provincial Communications Department (YPCD) invested about CNY15.1 billion in the road sector of the province in 2005, CNY12.1 billion of this in construction and CNY1.5 billion in maintenance. During the 10th Five-Year Plan period, the YPCD invested about CNY71 billion. An increase to CNY78 billion is planned for 2006–2010. Given the limited public financing, YPCD needs to explore alternative financing from private sources (e.g., asset-backed securitization) to meet the investment requirements.

6. Yunnan is a landlocked province, with no direct access to ocean ports or international trade routes except by long routes through other provinces or countries. The western part of the province is particularly disadvantaged by its distance from the provincial capital of Kunming. It is in the southwest of the PRC, and is bordered on the east by Guizhou Province and Guangxi Zhuang Autonomous Region and on the north by Sichuan Province. Yunnan is also part of the Greater Mekong Subregion (GMS), but is not connected with the other GMS countries by an expressway link. Although relatively underdeveloped compared with eastern PRC, Yunnan has developed faster than many of the other western provinces. In 1995–2000, gross domestic product (GDP) grew at 8.4% while per capita GDP grew at 7.1%. These rates slowed to 7.8% and 6.1%, respectively, in 2000–2003 but increased in 2004 and 2005 to more than 10% on the average. However, per capita GDP, as well as average rural income, is still only about two thirds of the national average. Yunnan Province has a population of 44.2 million, with 26 minorities making up a third of the total.

7. The impact of road investments on poverty reduction is well documented in studies and evaluations of completed road projects financed by ADB³ and the World Bank.⁴ Integrated road development helps ensure that the transport cost and time savings, along with the increased incomes, are passed on through the transport chain to townships and villages and eventually reach the poor. These results affirm the relevance of ADB's strategy in the PRC road sector. A case study in Shaanxi Province found that improved roads were correlated with poverty reduction, and that (i) for every CNY10,000 invested in roads, 3.2 poor people are lifted out of poverty; and (ii) for every 1% increase in kilometers of road per capita, household consumption increases by 0.08%.⁵ Rural poor areas benefit from lower transport costs; lower cost of inputs; expanded agricultural support services; improved farming practices; greater access to urban jobs; and better access to health, education, and social services.⁶

³ ADB. 2002. *Technical Assistance for Socioeconomic Assessment of Road Projects*. Manila.

⁴ Hajj, Hatim, and V. Setty Pendakure. 2000. *Roads Improvement for Poverty Alleviation in China*. Working Paper No. 1. Transport Sector Unit, East Asia and Pacific Region. Washington, DC: World Bank.

⁵ ADB. 2000. *Technical Assistance to the People's Republic of China for Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction*. Manila.

⁶ Hettige, Hemamala. 2006. *When Do Rural Roads Benefit the Poor and How? An In-Depth Analysis Based on Case Studies*. Manila: Operations Evaluation Department, ADB.

8. Yunnan Province is strategically located on the PRC's southern border with the other GMS countries to support regional cooperation and integration. The proposed project is part of the GMS Northern Corridor connecting Fangcheng port in Guangxi Zhuang Autonomous Region, Kunming, Ruili (on the border with Myanmar), and Tamu (on the border between Myanmar and India), as provided in ADB's GMS Regional Cooperation Strategy and Program Update (2007–2009) and the GMS Transport Sector Strategy Study.⁷ To facilitate trade with the other GMS countries, an expressway link is being developed between Kunming and Ruili, one of the three major inland ports that serve as outlets for trade with the rest of the GMS. The Kunming–Baoshan section is open to traffic, while the Baoshan–Longling section is being implemented under ADB financing. The proposed project completes the missing link between Longling and Ruili, thus providing an important trade link with the other GMS countries. Ruili is a national land port, with a trade volume of 470,000 tons in 2006, valued at CNY3.2 billion, and the potential to grow in the not-too-distant future. To reduce nonphysical barriers to trade, ADB has been supporting the implementation of the GMS Cross-Border Transport Agreement, which facilitates the movement of goods and people among the six GMS countries. The agreement was ratified by all six GMS governments by 2005, and is expected to be fully implemented by 2008.

9. The proposed project (see map) is the fifth road project in Yunnan to be financed by ADB. The first two projects⁸ have been successfully completed, the third⁹ is being implemented satisfactorily, and the fourth project is under preparation. The proposed project expressway, connecting Longling and Ruili, is a 158 km access-controlled four-lane expressway with a designed speed of 80 km per hour. The expressway will be supported by associated local road upgrading and other complementary components. Class 2 and class 4 roads in the project area stretch 175 km and in 2005 carried a traffic volume of 4,295 passenger cars per day. Traffic on this road is likely to reach capacity by 2010. Eastward, this project will link the western part of Yunnan province with Kunming and then Shanghai (2,500 km in total) as one of the east–west routes of the national trunk highway system. Toward the west, the project will link with other GMS countries as the GMS Northern Corridor and eventually reach India.

10. The project area includes Longling County in Baoshan Prefecture and Dehong Dai and Jingpo Autonomous Prefecture in the western part of Yunnan Province. The area has a population of 1,443,000, of which 603,800 (41.8%) are rural poor and 596,500 (41.3%) are ethnic minorities. The main ethnic minorities in the area are Dai, Jingpo, Lishu, De'an, and A'chang. Per capita GDP in 2006 varied between counties from CNY5,091 to CNY10,000, (CNY15,973 for the PRC and CNY8,961 for Yunnan Province), and average annual net rural income per capita ranged from CNY1,800 to CNY2,240 (CNY3,587 for the PRC and CNY2,250 for Yunnan Province). The project area is predominantly rural; the main agricultural produce are rice, tobacco, sugarcane, coffee, vegetables, and fruits.

11. ADB's operational strategy¹⁰ in the road sector supports (i) the construction of roads that connect major growth centers and link the hinterland economies; (ii) the integration of the network so that the national trunk highway system is supported by a system of local roads, particularly those that provide access to poor areas; (iii) the promotion of road safety and reduction of vehicle emissions; (iv) institutional strengthening to increase the commercial orientation and efficiency of expressway organizations; (v) the improvement of highway planning

⁷ ADB. 2006. *GMS Transport Sector Strategy Study*. Manila. (Final Report, May).

⁸ ADB. 2001. *Project Completion Report on the Yunnan Expressway Project in the People's Republic of China*. Manila; and ADB. 2006. *Project Completion Report on the Southern Yunnan Road Development Project in the People's Republic of China*. Manila.

⁹ ADB. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Western Yunnan Roads Development Project*. Manila.

¹⁰ ADB. 2006. *Country Strategy and Program Update (2007–2008): People's Republic of China*. Manila.

and evaluation techniques; (vi) the adoption of pricing policies that will ensure the best possible use of road transport capacity; and (vii) the use of alternative methods of investment financing, including private sector participation. ADB road sector assistance targets the less-developed central and western provinces, where most of the poor live. It also promotes regional cooperation and integration. Since 1991, ADB has provided 34 loans, totaling nearly \$6.9 billion, to finance 4,589 km of expressways, together with 9,321 km of associated local road networks. The proposed project is consistent with the PRC's development priorities and ADB's strategy. Recently completed reviews of the transport sector assistance program¹¹ concluded that ADB's support for the PRC road sector in 1997–2005 was a success, and suggested giving more attention to addressing the question of value addition in ADB-financed road projects. That recommendation will be taken into account in the preparation of the Project.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

12. The TA will help develop efficient, safe, and clean road transport in the project area. It will help improve the project design, feasibility study, and other related project documents to a level suitable for ADB financing. A design and monitoring framework, outlining the project's impact, outcome, outputs, and activities, is in Appendix 1.

B. Methodology and Key Activities

13. The IPSA and REA (Appendix 2) carried out during the fact-finding mission helped identify the social and environmental issues that would need to be addressed during project preparation. The IPSA examined poverty conditions, minority issues, resettlement effects, gender issues, and vulnerable groups, and concluded that project preparation should deal with these key issues: poverty impact, resettlement effects, HIV/AIDS¹² and drug use, and related impacts on ethnic minorities. The Project, according to the IPSA, is in involuntary resettlement category A and indigenous peoples category A, and requires an RP and an EMDP. According to the REA, it is also in environmental category A, and thus requires a full EIA. The TA will examine the project documents, and prepare a project that is technically, economically, and financially feasible and complies with ADB's safeguard policies on the environment, resettlement, and indigenous peoples. The TA will help develop a results-based monitoring system with adequate baseline and target values identified. Key activities will include field surveys, document review, data analysis, and discussion with stakeholders, including government officials, project beneficiaries, and project-affected people.

C. Cost and Financing

14. The total cost of the TA is estimated at \$500,000. The Government has requested ADB to finance \$400,000 of this amount (Appendix 3). The funds will be provided on a grant basis from ADB's TA funding program. The Government will finance the remaining \$100,000 through in-kind contributions—counterpart staff, office facilities, and other support services. The Government has been informed that TA approval does not commit ADB to finance any ensuing project.

¹¹ ADB. 2007. *Sector Assistance Program Evaluation of the Asian Development Bank Assistance for Roads and Railways in the People's Republic of China*. Manila.

¹² Human immunodeficiency virus/acquired immunodeficiency syndrome.

D. Implementation Arrangements

15. The TA will require 28.5 person-months of consulting services (8.5 international and 20 domestic), spread over 4 months, to carry out the work defined in the terms of reference (Appendix 4). ADB will hire a consulting firm through simplified technical proposal procedures and quality- and cost-based selection based on an 80:20 quality-to-cost ratio, according to ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time) and other arrangements satisfactory to ADB for the hiring of national consultants. The international consultants will have expertise in (i) highway engineering, (ii) transport economics, (iii) financial analysis and expressway operations, and (iv) social analysis. Expertise required of the national consultants will be in (i) highway engineering; (ii) transport economics; (iii) financial analysis and expressway operations; (iv) transport service and trade facilitation; (v) environmental analysis; (vi) resettlement planning; (vii) poverty, social, and gender analysis; (viii) ethnic minority development; and (ix) health impact analysis. Equipment will be provided for consultants to carry out the service and will be procured in accordance with ADB's *Procurement Guidelines* (2006, as amended from time to time).

16. YPCD will be the Executing Agency and will appoint counterpart staff to coordinate and supervise the TA activities, including (i) monitoring progress, (ii) resolving issues during implementation, (iii) assisting in arranging meetings, and (iv) coordinating with government agencies and organizations. The Ministry of Finance will ensure coordination among the National Development and Reform Commission, Ministry of Communications, State Environmental Protection Administration, Ministry of Land and Resources, YPCD, and other government agencies relevant to the TA. Workshops involving the Government, ADB, and the consultants will be held in the PRC to review the consultants' reports. Their final report will be posted on ADB's website upon TA completion. The TA will be implemented for about 4 months starting from March 2008 and ending in July 2008.¹³

IV. THE PRESIDENT'S DECISION

17. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$400,000 on a grant basis to the Government of the People's Republic of China for preparing the Western Yunnan Roads Development II Project, and hereby reports this action to the Board.

¹³ The TA account is expected to be closed by 31 December 2008, allowing time for all the necessary documents to be received from the consultants and YPCD.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
<p>Impact The YPCD provides efficient, safe, and clean road transport in the project area.</p>	<p>Traffic volume on project expressway increases from 10,800 passenger car units per day in 2013 to 29,000 in 2030. Travel distance is reduced by 17 km. Road accident rates in the project area are reduced.</p>	<p>Transport statistics reports published by YPCD</p> <p>Traffic accident reports published by the Yunnan Provincial Public Security Bureau</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • Assumed economic growth rates materialize. • Effective traffic enforcement and a public awareness campaign promote road safety.
<p>Outcome Project design, feasibility study, and other related project documents are improved to a level suitable for ADB financing and agreed upon by Government and ADB.</p>	<p>Memorandum of understanding signed by Government and ADB during final TA tripartite meeting in June 2008</p>	<p>Memorandum of understanding</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • The Government is willing to adopt the recommendations of the TA. • The Government obtains necessary funding.
<p>Outputs</p> <p>1. Technical assessments completed</p> <p>2. Project design requirements accomplished</p>	<p>Inception report submitted to the Government and ADB by March 2008, and interim report by April 2008</p> <p>Summary EIA and EMP, poverty and social analysis, resettlement plan, ethnic minorities development plan, and results-based monitoring system submitted to Government and ADB by May 2008</p> <p>Draft final report submitted to the Government and ADB by May 2008, and final report by July 2008</p>	<p>ADB document registration Government document registration</p> <p>TA workshops to report findings of the consultants at inception, interim, and draft final report stages</p>	<p>Assumption</p> <ul style="list-style-type: none"> • Stakeholder participation and ownership are effective. <p>Risk</p> <ul style="list-style-type: none"> • Availability of and access to information and government personnel may be restricted.

Activities with Milestones	Inputs
<p>1.1 Analyze transport demand in the region (by March 2008). 1.2 Assess road infrastructure (by March 2008). 1.3 Assess transport services (by March 2008). 1.4 Review the technical and financial aspects of local road maintenance (by March 2008). 1.5. Develop a results-based monitoring system, including performance indicators (by April 2008). 1.6 Recommend policy reform measures and institutional development needs (by April 2008). 1.7 Review the potential for private sector participation (by April 2008). 1.8 Complete the baseline survey (by April 2008).</p> <p>2.1 Hold consultation workshops with stakeholders (government officials, project beneficiaries, and project-affected people, including women and the poor) (by April 2008). 2.2 Carry out a social and poverty assessment (by April 2008). 2.3 Carry out financial and economic analyses (by May 2008). 2.4 Carry out institutional analysis (by May 2008). 2.5 Complete summary EIA, EMP, RP, and EMDP (by July 2008). 2.6 Finalize the project design and monitoring framework (by July 2008).</p>	<ul style="list-style-type: none"> • ADB: \$400,000, mostly for 8.5 person-months of international and 20 person-months of national consulting services • Government: \$100,000 in counterpart funding

ADB = Asian Development Bank, EIA = environmental impact assessment, EMP = environment management plan, EMDP = ethnic minority development plan, km = kilometer, RP = resettlement plan, TA = technical assistance, YPCD = Yunnan Provincial Communications Department.

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SOCIAL AND ENVIRONMENTAL ASSESSMENTS

Table A2.1: Initial Poverty and Social Analysis

A. Linkages to the Country Poverty Analysis

Is the sector identified as a national priority in country poverty analysis? Yes	Is the sector identified as a national priority in country poverty partnership agreement? Yes
<p>Contribution of the sector/subsector to reducing poverty in the People's Republic of China: The transport sector contributes directly to poverty reduction by improving access to markets, employment opportunities, and social services, and indirectly by facilitating economic development. The project area is in a remote part of Yunnan, but connects with an ongoing ADB-financed expressway. The proposed project between Longlin and Ruili counties will complete the expressway system from Kunming to the Myanmar border. It will reduce travel time and cost, thereby helping to speed up economic development, job creation, and improved access to larger markets and higher-quality social services.</p>	

B. Poverty Analysis

Targeting Classification: General intervention

What type of poverty analysis is needed?

The Project will contribute directly to poverty reduction in the project area by generating construction employment opportunities in the short term and improving access to markets for specialty cash crops, such as sugarcane and fruits. The Project will substantially improve transport infrastructure and services and will facilitate economic development, thus providing more employment and income generation opportunities for local people. The Project will also improve access to social services in the county centers and towns. In the project area of Dehong Prefecture and Longling county, 603,800, or 41.8%, of people in the countryside are below the poverty line. There are two poverty townships and 76 poverty villages. Nearly all the poor belong to the Dai ethnic minority.

A detailed poverty analysis will be carried out to assess poverty incidence in the project area and demonstrate how the Project will help reduce poverty by incorporating specific measures in the project scope. The analysis will be based on the *Handbook on Poverty Analysis*, *Handbook on Social Analysis*, and *Handbook for Integrating Poverty Impact Assessment in the Economic Analysis of Projects*.

C. Participation Process

Is there a stakeholder analysis? Yes

Stakeholder analysis: Major stakeholders include YPCD, local governments, transport companies, local businesses, and local residents. Consultation began during the preparation of the feasibility study, which focused on two major alternatives for the expressway routing. The PPTA fact-finding mission conducted initial stakeholder consultation in the affected counties. Further consultation will be carried out for the EIA, resettlement planning, and poverty and social analysis during the PPTA.

Is there a participation strategy? Yes

Local people will (i) be consulted during the feasibility study, PPTA implementation, and preliminary design to fix the expressway alignment; (ii) participate in the preparation and implementation of village rehabilitation plans and EMDP; and (iii) be hired for the construction of the expressway and link roads.

D. Gender Development

Strategy to maximize positive impacts on women:

The PPTA will investigate opportunities to enhance the benefits to women (e.g., improved public transport service and local road improvements, which will give better access to education, health care, and markets). The RP and the EMDP will also include special measures to mitigate adverse impacts and improve the conditions for women, especially by improving access to education, health facilities, and employment.

Has an output been prepared? No. This will be prepared during the PPTA and incorporated into the RP and EMDP.

E. Social Safeguards and other Social Risks

Item	Significant/ Nonsignificant/ None	Strategy to Address Issues	Plan Required
Resettlement	Significant	A resettlement plan will be prepared in accordance with the government regulations and ADB's <i>Involuntary Resettlement Policy (1995) and OM F2</i> .	Full RP to be prepared
Affordability	Not significant	The Project will reduce the cost of transportation and goods purchased from outside. Tolls are already charged for the existing road.	No
Labor	Not significant	The Project will create employment opportunities during construction. It will not have any adverse impact on labor issues.	No
Indigenous Peoples	Significant	There are many ethnic minority townships and villages along the alignment (mainly Dai) in the project beneficiary area.	EMDP to be prepared
Other Risks/ Vulnerabilities	Not significant	The risk of HIV/AIDS and other communicable diseases is considered high. There is also human and drug trafficking in this region. These will be assessed during the PPTA and mitigation measures will be included in the EMDP or separate plans.	Yes

ADB = Asian Development Bank, EIA = environmental impact assessment, EMDP = ethnic minority development plan, HIV/AIDS = human immunodeficiency virus/acquired immunodeficiency syndrome, PPTA = project preparatory technical assistance, RP = resettlement plan, YPCD = Yunnan Provincial Communications Department.

Table A2.2: Rapid Environmental Assessment

Screening	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		x	To be confirmed by a cultural heritage site survey
Protected area		x	
Wetland		x	To be confirmed during detailed design
Mangrove		x	
Estuarine		x	
Buffer zone of protected area		x	To be confirmed during detailed design
Special area for protecting biodiversity		x	

B. Potential Environmental Impacts Will the project cause...			
<ul style="list-style-type: none"> ▪ encroachment on historical/cultural areas? ▪ disfiguration of landscape by road embankments, cuts, fills, and quarries? 	x	x	None reported on the alignment. To be confirmed during the TA. Two thirds of the proposed alignment goes through mountainous area; measures for landscape preservation will be reviewed during the TA.
<ul style="list-style-type: none"> ▪ encroachment on precious ecology (e.g., sensitive or protected areas)? 		x	The alignment indicates no encroachment on protected area.
<ul style="list-style-type: none"> ▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site? 		x	None reported on the alignment. To be confirmed during detailed design. Mitigation measures will be included in the EMP.
<ul style="list-style-type: none"> ▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction? 	x		Possible risks due to inappropriate arrangement of the construction camps. Mitigation measures will be included in the EMP and sanitation requirements in the civil works contracts.
<ul style="list-style-type: none"> ▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing? 	x		Mitigation measures will be included in the EMP, and other requirements related to the location and operation of construction equipment in the civil works contracts.
<ul style="list-style-type: none"> ▪ noise and vibration due to blasting and other civil works? 	x		Mitigation measures will be identified for some places during detailed design and implemented under the EMP.
<ul style="list-style-type: none"> ▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress? 	x		Possible risks due to air pollution. Mitigation measures will be included in the EMP.
<ul style="list-style-type: none"> ▪ hazardous driving conditions where construction interferes with preexisting roads? 	x		Proper construction procedures will be identified during the TA and will be implemented during the construction.
<ul style="list-style-type: none"> ▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations? 	x		Contractor awareness of appropriate collection and disposal of solid wastes will be increased, and requirements for appropriate facilities will be included in the civil works contracts and monitored.
<ul style="list-style-type: none"> ▪ creation of temporary breeding habitats for mosquito vectors of disease? 		x	Possible risks to be identified during feasibility study.
<ul style="list-style-type: none"> ▪ dislocation and compulsory resettlement of people living in right-of-way? 	x		Necessary measures will be implemented under the resettlement plan, and compensation will be provided.
<ul style="list-style-type: none"> ▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life? 	x		Possible risks will be identified during detailed design and an emergency response plan will be prepared.
<ul style="list-style-type: none"> ▪ increased noise and air pollution resulting from increased traffic volume? 	x		Increased emissions due to increased traffic will be addressed by an emission reduction plan.
<ul style="list-style-type: none"> ▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road? 	x		Possible risks will be identified during detailed design and an emergency response plan will be prepared.

EIA = environmental impact assessment, TA = technical assistance.
Source: Yunnan Provincial Communications Department.

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Total Cost
A. Asian Development Bank (ADB) Financing^a	
1. Consultants	
a. Remuneration and Per Diem	
i. International Consultants	181.0
ii. National Consultants	108.0
b. International and Local Travel	35.0
c. Reports and Communications	11.0
2. Office Equipment ^b	5.0
3. Surveys, Workshops, and Miscellaneous Administration Support Costs	30.0
4. Representative for Contract Negotiations ^c	5.0
5. Contingencies	25.0
Subtotal (A)	400.0
B. Government Financing	
1. Office Accommodation and Transport	60.0
2. Remuneration and Per Diem of Counterpart Staff	30.0
3. Others	10.0
Subtotal (B)	100.0
Total	500.0

^a Financed from ADB's technical assistance funding program.

^b Including computer hardware and software and other office equipment to be procured under the consultant's contract and to be transferred to the Government after the contract period.

^c Includes cost of government observers at contract negotiations at ADB headquarters. Face-to-face negotiations were requested by the Government to ensure clear understanding of the role and responsibility of the Government and the consultants in carrying out the technical assistance.

Source: ADB estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Highway Engineering

1. Review all technical aspects presented in the feasibility studies¹ and available engineering designs. The difficult topography in the project area demands a thorough technical review covering (i) horizontal and vertical alignment; (ii) subsurface investigation, particularly where tunnels are proposed; (iii) pavement, bridge, and tunnel design options; (iv) drainage facilities; (v) siting and configuration of interchanges, toll stations, and service areas; (vi) provision for cross-expressway access; and (vii) road safety features. Given traffic volumes, forecast traffic, traffic mix, and axle loads, review the adequacy of the proposed road capacity and pavement design, and recommend measures to prevent overloading on the project expressway, such as installing vehicle weighing stations at selected entry points and other measures. Review watershed and drainage design criteria for major drain culverts and bridge structures to ensure the adequacy of waterway openings, taking into account load capacity, storm frequency design, anticipated future expansion, and the extent of construction needed.

2. Review bills of quantities, unit prices, and costs of (i) civil works for expressway construction and road improvement, and (ii) equipment and other facilities to be procured under the Project. Review the current road maintenance operation and management systems in Yunnan Province and the project area. Estimate the costs of routine and periodic maintenance for the expressway and local road development components. Recommend suitable road maintenance operation and management systems and the necessary equipment. Review and update the project cost estimates and indicate the foreign exchange (direct and indirect) and local currency costs, considering the actual costs of recently awarded contracts of a similar nature in Yunnan. Prepare a procurement plan and implementation schedule using a prescribed format. Review the requirements for construction supervision, and prepare terms of reference for the international consulting services.

3. Review the current design methodology in relation to road safety and road safety monitoring, and the latest accident statistics in Yunnan and the project area. Design a suitable road safety component for inclusion in the Project in consultation with the Executing Agency and the Provincial Public Security Bureau. On the basis of the available road development plans of the Government, identify an improvement program for secondary and tertiary road networks, including provincial, county, and township roads. This local road development program, to be incorporated into the Project, will be designed to enhance the distribution of the anticipated project benefits to the hinterland and the rural population in the project area. Particular attention will be given to roads in poverty and minority counties and townships.

B. Transport Economics

4. Review existing traffic counts and origin-destination surveys, and obtain any additional necessary information on the present pattern of traffic by vehicle type and mode in the zone of influence of the Project. Undertake a capacity assessment of the existing road networks and assess the effects of the capacity constraints on vehicle operating costs (VOCs), travel time, and patterns of transport movement. Review the parameters for traffic diversion from the existing transport modes (roads, railways, and waterways) to the Project, including the effects of changes in toll rates and the capacity constraints of the existing roads. Prepare traffic forecasts, taking into account the most recent data for each vehicle type, at a range of toll rates for the

¹ The project scope may also include a proposed a 169 km class 2 road from Tengchong to Longchuan.

Project for normal, generated, and diverted traffic. Traffic diversion from the railways and waterways should also be assessed, as appropriate. Considering the effect of the toll rates on traffic diversion, prepare traffic forecasts for the Project at various toll rates. In developing the traffic forecasts, the consultants will take into account long-term gross domestic product and other forecasts for the People's Republic of China (PRC) prepared by the Asian Development Bank (ADB). Review VOC information by vehicle type; calculate VOCs for the existing and the proposed road networks; and quantify the benefits using appropriate shadow prices. Assess the extent of the benefits that will be passed on to transport users from reduced VOCs through lowered passenger fares and freight charges.

5. Undertake economic evaluation in accordance with ADB's *Guidelines for Economic Analysis of Projects*² for the Project, comprising all components over the construction and operation period, by calculating the economic internal rate of return. The analysis should take into account construction, operation, and maintenance costs; VOCs; passenger and freight time savings; producer surplus; accident savings; and any other quantifiable benefits attributable to the Project. Undertake sensitivity analysis by appropriately varying benefits, costs, implementation period, traffic diversion, generated traffic, and a combination of these factors. Calculate switching values and compare with evidence for existing expressway projects. Carry out risk analysis³ using Monte Carlo simulation by considering the likely probability distributions of key variables. Recommend ways in which project risks can be reduced.

6. With the assistance of the social and poverty consultants, carry out distribution analysis of project benefits, calculate the poverty impact ratio, and undertake a cause-and-effect analysis, following the methodology set forth in ADB's *Guidelines for the Economic Analysis of Projects*. Together with other specialists, develop a results-based monitoring system, using the design and monitoring framework⁴ in ADB format.

C. Financial Analysis and Expressway Operations

7. Carry out financial evaluation of the Project over the construction and operation period by calculating the financial internal rate of return, using the proposed toll rates, and comparing it with the weighted average cost of capital. Determine and justify appropriate toll rates by vehicle type, taking into account the relationship between the toll rates and the cost of providing the road services. Undertake sensitivity tests for the Project by appropriately varying toll rates, project costs, implementation period, overall projected traffic volume, traffic diversion, change in the exchange rate, and a combination of these factors.

8. Assess and prepare financial projections for the proposed expressway operating entity over 10 years of expressway operation, following ADB's *Guidelines for Financial Management and Analysis of Projects* (2005), including balance sheets, income statements, and cash flow statements in accordance with internationally acceptable standards in nominal terms. The financial projections should be subjected to sensitivity analysis for different exchange rates. The financial assessment of the operating entity should include (i) corporate planning and budgetary control, (ii) financial and management accounting, (iii) cost accounting, (iv) internal control and audit system, and (v) data processing.

² Also see ADB. 2001. *Handbook for Integrating Poverty Impact in Economic Analysis of Projects*. Manila.

³ ADB. 2002. *Integrating Risk into ADB's Economic Analysis of Projects*. Manila.

⁴ ADB. 2006. *Project Performance Management System: Guidelines for Preparing a Design and Monitoring Framework*. Manila.

9. Review the current status of private sector participation in expressway development and operations in Yunnan Province and assess the potential for operation of the project expressway as a corporation or as a concession by the private sector. Identify appropriate arrangements for implementing such a strategy, considering options such as leasing, securitization, joint venture, build-operate-transfer, and other arrangements for operation and maintenance.

D. Road Transport Services and Trade Facilitation

10. Assess the provision of trucking and public transport services in the project area in terms of pricing, and the quality and frequency of service. Assess the degree of competition and the proportion of the reduced transport costs that are likely to be passed on to end users. Review the current conditions of road transport services, including passenger and freight transport in Yunnan in general and in the project area in particular, and examine how such services could be improved to provide efficient services in the poor remote areas. Recommend suitable components, e.g., public transport center, freight distribution center, improvement of bus services, and any others, for inclusion in the Project.

11. Review the current status of trade between Yunnan and neighboring Greater Mekong Subregion countries.⁵ Evaluate the potential for trade development between the western PRC and Southeast Asia after the completion of the proposed Kunming–Ruili corridor in the Western Development Strategy. Assess the impact of the proposed project on trade in the short and long term. Recommend practical components to be included in the Project for trade facilitation, considering both physical infrastructure and capacity building in selected cities, such as Ruili and Kunming, e.g., border road development, implementation of cross-border transport agreement, dissemination of an expressway development model.

E. Social, Poverty, and Gender Analysis

12. Prepare socioeconomic and poverty profiles for the project area. Data will be obtained from statistical records, field surveys, and key informant interviews and participatory community appraisal techniques. The information should include population, income levels, occupations, unemployment, education levels, health conditions, transport expenditures, and other relevant socioeconomic data. Data should be disaggregated by gender and ethnicity. These data and profiles should be sufficiently comprehensive to serve as the baseline for socioeconomic performance indicators. Poverty incidence will be assessed on the basis of the government poverty lines and the \$1-a-day international measure of poverty. Conduct surveys to develop a profile of transport services and costs in the project areas, and assess affordability to low-income groups.

13. From the initial poverty and social analysis, conduct a full poverty, social, and gender analysis in accordance with ADB's *Handbook on Poverty Analysis* and *Handbook on Social Analysis*. Assess how the proposed project may help improve people's livelihoods, particularly through the improvement of transport services such as local roads and bus services. Quantify how the Project will improve benefits for local people. The analysis will estimate (a) the number of project beneficiaries, by ethnicity and income level; and (b) gender benefits and opportunities. Recommend measures to enhance project benefits and social inclusion; these measures will be

⁵ Consultants may refer to ADB. 2004. *Technical Assistance for Greater Mekong Subregion Transport Sector Strategy Study*. Manila; and ADB. 2004. *Technical Assistance for Facilitating Cross-Border Trade and Investment in the Greater Mekong Subregion*. Manila.

incorporated into an ethnic minority development plan (EMDP) to be implemented as part of the Project.

14. Assess gender issues, human and drug trafficking issues, and other social issues related to project construction or operation. Quantify the number of people who could be adversely affected by the Project, by type of impact, and disaggregate by gender, ethnicity and income group. Identify vulnerable groups and recommend appropriate measures to address adverse impacts and promote development opportunities during the construction, operation, and maintenance of the Project. Recommend measures to avoid, minimize or mitigate adverse impacts, including the cost and implementation arrangements; these will also be incorporated into the EMDP.

15. Establish a consultation and participation process for the Yunnan Provincial Communications Department (YPCD) during project preparation that will continue throughout project design, construction, and operation. Prepare a stakeholder consultation and participation report, providing details of consultation meetings during project preparation, including names, agencies, dates, and comments.

F. Ethnic Minority Safeguards

16. Review the draft EMDP prepared by YPCD and assist the department in making improvements as required to comply with ADB's *Policy on Indigenous Peoples* (1998). From these analyses, the consultant (an expert on the Dai nationality), in collaboration with YPCD and the local government, will formulate an ethnic minority development plan (EMDP) in order to (a) safeguard livelihoods and customs, and (b) enhance project benefits in a culturally appropriate manner. Important issues to address will include resettlement impacts, health issues, gender issues, human and drug trafficking, social inclusion, and protection of cultural inheritance. The EMDP must be based on targeted social analysis and consultation with affected persons and the local government to ensure that livelihoods and customs are safeguarded. The cost of such measures and the means for implementation and monitoring will be clearly proposed in the EMDP to be implemented as part of the Project. Assess and confirm the sufficiency of the EMDP budget for the implementation of the action plan, including administrative fees for local government. Assist YPCD in conducting workshops to finalize the EMDP and ensure that it is disclosed to local people in accordance with ADB's disclosure policy (*Public Communications Policy* [2005]).

G. Health Impact Analysis

17. Assess the risks of HIV/AIDS⁶ and other communicable diseases related to the project construction and operation. Quantify the incidence of diseases in the project area, and look into the reasons for their prevalence, and the existing programs and capacity of the local health bureaus and centers for disease control. Review the progress and findings of TA 4142-PRC: *Fighting Poverty through HIV/AIDS on Road Projects in Yunnan Province*. Formulate a mitigation and monitoring action plan to prevent the outbreak of disease and protect the local population, with special attention to high-risk groups. The action plan should consider the requirements for contractors as stipulated in ADB's standard bidding documents, ongoing local programs of local government or nongovernment organizations, and lessons learned from the Western Yunnan Roads Project. Assess and confirm the sufficiency of the action plan budget, including incremental costs of monitoring by local health bureaus.

⁶ Human immunodeficiency virus/acquired immunodeficiency syndrome.

H. Environmental Impact Assessment

18. Review the environmental impact assessment (EIA) to ensure it conforms to ADB's *Environment Policy* (2002) and guidelines. The consultants will assist the Executing Agency in carrying out further investigations and analysis, as required, and in finalizing the environmental impact statement, management plan, and monitoring plan by incorporating the comments from ADB and the Environmental Protection Bureau. The consultants will also prepare a summary EIA in accordance with ADB requirements, and a loan processing schedule.

19. Assess the environmental conditions in the project area through site investigation, including natural resources, forest, cultural sites, and historical monuments, as well as the current negative environmental impacts resulting from industrial activities and road traffic. Review the cumulative environmental effects that are additive or interactive (synergetic) in nature and result from multiple activities over time. Assess the direct and indirect environmental impacts of the Project resulting from project construction activities or operation. From a preliminary environment scoping, the EIA should include impacts on (i) surface and groundwater water, (ii) soil erosion, (iii) socioeconomic conditions, (iv) noise and air quality, (v) road safety and potential spills of hazardous or toxic chemicals, and (vi) local community disturbances from construction activities. Secondary environmental impacts, arising from mineral exploitation, tourism, etc., will also be assessed and mitigation measures proposed. Review the Government's plan to reduce adverse environmental impacts, in particular those resulting from road construction and operation. Improve the mitigation measures as necessary.

I. Resettlement

20. Review the draft resettlement plan (RP) and prepare modifications as required to comply with ADB's *Involuntary Resettlement Policy* (1995), the related operations manual, and other related ADB policies. The *Handbook on Resettlement* (1998) may be used as a guide. The RP will address all project components including the expressway, local roads, bus station, and construction areas. Review the results of the socioeconomic profiles, village surveys, and household surveys conducted by YPCD. Conduct further village and household surveys, as required to ensure compliance with ADB's requirements for social analysis and resettlement consultation and planning. Quantify the types and degree of impacts on the affected people, including income levels and sources, housing conditions, occupations, expenditure patterns, landholdings, skills base, and assets (production and living). Assess the socioeconomic condition, needs, and priorities of women affected by land acquisition and resettlement, and identify specific measures to assist them and ensure that the process of land acquisition and resettlement will benefit women, according to ADB's Gender Checklist for Resettlement.

21. Assess and confirm the following: (i) the compensation standards are based on replacement value; (ii) the overall resettlement budget is sufficient to implement the resettlement plan, given the proposed entitlements and rehabilitation plans; (iii) adequate land is available for reallocation (if there is to be land redistribution) without adversely affecting the host population; and (iv) affected people are consulted on the selection of relocation sites (if such sites are to be developed), and local government has adequate plans and budget for the provision of new village infrastructure. For any seriously affected villages, time-bound economic rehabilitation plans will be prepared. Identify compensation and rehabilitation options, and develop livelihood rehabilitation and improvement programs in consultation with the affected people. Assess and confirm the sufficiency of the overall resettlement budget for land acquisition and RP implementation.