Report and Recommendation of the President to the Board of Directors

Project Number: 45030-02
November 2013

Proposed Loan
People's Republic of China: Yunnan Sustainable Road Maintenance (Sector) Project

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 8 October 2013)

Currency unit	–	yuan (CNY)
CNY1.00	=	$0.1634
$1.00	=	CNY6.1206

ABBREVIATIONS

ADB	–	Asian Development Bank
ESSU	–	environment, social, and safety unit
km	–	kilometer
PRC	–	People's Republic of China
TA	–	technical assistance
YHAB	–	Yunnan Highway Administration Bureau
YPDOT	–	Yunnan Provincial Department of Transport

NOTE

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

Vice-President	S. Groff, Operations 2
Director General	A. Konishi, East Asia Department (EARD)
Director	T. Duncan, Transport Division, EARD
Team leader	A. Véron-Okamoto, Transport Economist, EARD
Team members	T. Bisht, Safeguards Specialist, EARD
	M. Davidovski, Senior Counsel, Office of the General Counsel
	G. Gadiano, Operations Assistant, EARD
	G. O'Farrell, Environment Specialist, EARD
	C. Roldan, Associate Project Analyst, EARD
	D. Samson, Administrative Assistant, EARD
	V. Tian, Transport Specialist, EARD
	X. Yang, Lead Transport Specialist, EARD
Peer reviewer	S. Date, Senior Transport Specialist, Southeast Asia Department

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PROJECT AT A GLANCE

1. Project Name: Yunnan Sustainable Road Maintenance (Sector) Project **2. Project Number:** 45030-002

3. Country: China, People's Republic of **4. Department/Division:** East Asia Department/Transport and Communications Division

5. Sector Classification:

Sectors	Primary	Subsectors
Transport, and information and communication technology	√	Road transport

6. Thematic Classification:

Themes	Primary	Subthemes
Economic growth	√	Widening access to markets and economic opportunities
Private sector development		Policy reforms
Capacity development		Institutional development
Governance		Economic and financial governance

6a. Climate Change Impact

No climate change indicator available.

6b. Gender Mainstreaming

Gender equity theme (GEN)	
Effective gender mainstreaming (EGM)	
Some gender elements (SGE)	√
No gender elements (NGE)	

7. Targeting Classification:

General Intervention	Targeted Intervention		
	Geographic dimensions of inclusive growth	Millennium development goals	Income poverty at household level
√			

8. Location Impact:

Regional	Medium
Rural	High

9. Project Risk Categorization: Low

10. Safeguards Categorization:

Environment	B
Involuntary resettlement	B
Indigenous peoples	C

11. ADB Financing:

Sovereign/Nonsovereign	Modality	Source	Amount ($ Million)
Sovereign	Sector loan	Ordinary capital resources	80.0
Total			80.0

12. Cofinancing:

No cofinancing is required.

13. Counterpart Financing:

Source	Amount ($ Million)
Government	152.4
Total	152.4

14. Aid Effectiveness:

Parallel project implementation unit	No
Program-based approach	No

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the People's Republic of China (PRC) for the Yunnan Sustainable Road Maintenance (Sector) Project.[1]

2. The project will improve the sustainability of the trunk road network in Yunnan, one of the PRC's least developed provinces. It will (i) rehabilitate about 890 kilometers (km) of trunk roads, (ii) introduce performance-based road maintenance on a pilot basis for 164 km of trunk roads, (iii) set up a road asset management system, and (iv) implement an institutional development plan.[2]

II. THE PROJECT

A. Rationale

3. Yunnan is poor, mountainous, and, with 46 million people, densely populated. Because the province is landlocked, trade with the rest of the PRC and with foreign countries involves land transport over long distances, which makes its products less competitive. The large pockets of poverty that exist in the province are linked to inadequate road access, the limited availability of land, and cultural barriers to outmigration. In 2011, 27% of Yunnan's rural people were living under the PRC's official poverty line of CNY2,300 in annual income.

4. Yunnan is strategically located along the PRC's border with the Lao People's Democratic Republic, Myanmar, and Viet Nam. About 60% of freight and 80% of passenger transport is by road. The Yunnan Highway Administration Bureau (YHAB) of the Yunnan Provincial Department of Transport (YPDOT) manages a trunk road network of 24,089 km, including 45% of the province's paved roads. These roads connect with or form part of the northern and north–south transport corridors of the Greater Mekong Subregion.

5. With strong support from central government, Yunnan has invested heavily in upgrading its transport network, and allotted an amount equivalent to 10% of the provincial gross domestic product in 2011. Nonetheless, the trunk road network has been inadequately maintained and is often in poor condition. This reduces the province's economic competitiveness and slows the pace of poverty reduction. In 2011, YHAB rated only 37% of the trunk road network as being in good condition; about 31% of the network was designated as very poor. The project preparatory TA consultant estimated that the pavement on almost one-half of the roads will soon need to be completely reconstructed. Despite this, traffic on the network has been rapidly increasing, which not only further damages substandard roads but threatens to degrade newly built ones prematurely. Yunnan's economy is therefore suffering the effects of a vicious cycle afflicting the trunk road network. Overemphasis on new road construction, along with funding and spending inefficiencies, leaves little budget for necessary maintenance. The lack of maintenance increases the life cycle cost of pavement care and thus widens the future maintenance demand–resource gap.

6. Poor trunk road conditions have also reduced road safety. In 2009, the risk of being killed in a road accident on the network was almost five times the rate in some developed countries—30 fatalities per billion vehicle-kilometers, compared to about 6 in France and the

[1] The design and monitoring framework is in Appendix 1.
[2] The Asian Development Bank (ADB) provided project preparatory technical assistance.

United Kingdom. Although the road fatality rate has fallen since 2004, it could rise again as traffic volume increases on older roads that are being ill-maintained and therefore becoming more dangerous to use.

7. The project design is based on a detailed analysis of how to make Yunnan's trunk road network more sustainable. The network's current condition is the product of YHAB's historically low maintenance budgets and high management costs. In 2011, YHAB's maintenance budget reached $350 million, or about $14,600 per network km. Of that total $263 million was spent on labor and management costs, $47 million on routine maintenance and only $40 million on rehabilitation works. If past trends continue, future revenue increases will be absorbed by rising staff costs. Meanwhile, road condition modeling studies show that the share of the network in very poor condition may rise from 31% in 2011 to 40% in 2016 and 50% by 2021. To stop the degradation and bring the network to a generally good condition, YHAB will need to double its maintenance budget over a 10-year period. Such additional spending on rehabilitation works would bring economic benefits to Yunnan worth 6–10 times the costs.[3]

8. The project also envisages raising the cost-effectiveness and efficiency of YHAB maintenance spending. As is a common practice in the PRC, YHAB uses its own work force to carry out maintenance. International experience has shown, however, that outsourcing maintenance, particularly through performance-based contracts, can substantially reduce costs.[4] Improved maintenance planning and programming methods would help to make better use of YHAB resources. Road condition modeling studies show that using a road asset management system and prioritizing works based on works' economic returns would increase the economic benefits of YHAB maintenance by 20% (footnote 3).

9. Making road maintenance in the PRC more sustainable is a strategic objective under the government's 12th Five-Year Plan (2011–2015). The government intends to achieve this by raising the priority accorded to maintenance relative to construction; increasing road rehabilitation efforts; reducing management costs and improving the efficiency of maintenance; and introducing market-based delivery mechanisms on a pilot basis. It is also emphasizing greater road safety, the strengthening of environmental management practices, and the use of modern maintenance planning systems. To reach these goals, YPDOT established a series of medium-term targets for road maintenance through policy dialogue with the Asian Development Bank (ADB). YPDOT aims to (i) raise the proportion of roads rated in good condition from 40% of the trunk road network in 2011 to 50% in 2017, (ii) reduce the gap between maintenance financing needs and budgets from an estimated 50% to about 20%, (iii) increase the share of the network that is rehabilitated each year from 0.5% to 4.0%, and (iv) modernize YHAB's management systems and operational processes.

10. Yunnan's road maintenance strategy entails policy and institutional changes. The government has committed to increase YHAB's maintenance budget resources to about $550 million annually in 2017, or $24,000 per km. This is to be done initially by supplementing YHAB's budgetary resources with loans from development partners and gradually increasing fuel tax allocations to YHAB from CNY1.7 billion in 2011 to CNY3.0 billion in 2017, with additional resources to be spent on rehabilitation. To reduce costs and improve efficiency, YHAB will also gradually outsource road maintenance operations and reduce its management and staff costs. Institutional capacity will be strengthened by establishing a road asset

[3] Road Network Sustainability Analysis (accessible from the list of linked documents in Appendix 2).
[4] See, for example, World Bank. 2009. Performance-Based Contracting for Preservation and Improvement of Road Assets. *Transport Research Notes*. Washington, DC.

management system, creating the internal capacity and skills necessary to manage the environmental and social impacts of road maintenance works, and monitoring progress toward the road sector targets. YHAB will incorporate road safety improvements in the rehabilitation works it undertakes.

11. These changes will be rolled out gradually with project support. Four documents developed during project preparation will guide implementation: (i) a road sector maintenance strategy; (ii) an institutional development plan; (iii) a road sector roadmap that sets annual targets for key performance and sustainability indicators, as well as policy reform milestones; and (iv) an operational manual. The manual will be used to improve YHAB's processes for planning; environmental, social, and safety management; monitoring systems; and procurement.[5]

12. The government has asked ADB to support YHAB's trunk road maintenance program and assist in sector reform and institutional strengthening. The project represents a second phase of ADB support to road maintenance in Yunnan. In 2010, ADB approved lending support for, among others, rehabilitation by YHAB of 605 km of trunk roads, and also helped YPDOT pilot new forms of rural road maintenance.[6] The project draws on lessons from past ADB projects for road maintenance by adopting a sector approach that can address Yunnan's trunk road maintenance needs, key sector issues, and institutional constraints more comprehensively than has been done in the past. ADB's sector lending modality is appropriate for a project that comprises about 30 small-scale subprojects that are dispersed throughout Yunnan and must be implemented in phases. The project qualifies for this modality because a sector development plan exists, the institutions involved have the capacity required, and it supports policy reforms that are mandated under the country's 12th Five-Year Plan. By targeting a poor province and by advancing the agendas of road asset management and safety, the project is aligned with ADB's PRC country partnership strategy for 2011–2015[7] and ADB's Sustainable Transport Initiative Operational Plan.[8]

B. Impact and Outcome

13. The impact of the project will be improved access for the people of Yunnan to a quality and safe trunk road network. The outcome will be improved sustainability of Yunnan's trunk road network.

C. Outputs

14. The project will deliver four outputs: (i) 890 km of trunk roads rehabilitated, (ii) performance-based road maintenance piloted for 164 km of trunk roads, (iii) road asset management system enhanced, and (iv) institutional capacity of YHAB strengthened.

1. Output 1: Trunk Road Rehabilitation

15. **Rehabilitation program.** The project will restore about 890 km of trunk road pavements to good condition through asphalt overlays on about 180 km of road and the reconstruction of

[5] Sector Maintenance Strategy, Institutional Development Plan, Road Sector Roadmap, and Operational Manual (accessible from the list of linked documents in Appendix 2).
[6] ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Yunnan Integrated Road Network Development Project*. Manila.
[7] ADB. 2012. *Country Partnership Strategy: People's Republic of China, 2011–2015*. Manila.
[8] ADB. 2010. *Sustainable Transport Initiative Operational Plan*. Manila.

pavement on 710 km of road. The estimated cost is $208.7 million, $67.8 million of which will come from the ADB loan. The project is part of YHAB's 2013–2016 program to overlay, strengthen, or reconstruct pavement on about 2,250 km of trunk highways. The program prioritizes (i) pavement strengthening, reconstruction, or asphalt overlay for roads with high traffic of more than 2,000 vehicles per day that are rated in poor or very poor condition, and (ii) pavement reconstruction for roads with medium traffic of 1,000–2,000 vehicles per day that are already rated in very poor condition. Where the sub-base has failed, pavement will be reconstructed. Where the pavement is still in fair condition but shows signs of deterioration, an asphalt overlay will be applied to extend pavement life. Where current or future traffic is higher than planned for in the road's original design, the pavement will be strengthened.

16. **Subprojects.** The works will be implemented in four phases, corresponding to YHAB's annual road maintenance plans for 2014, 2015, 2016, and 2017. Seven highway sections of 192 km in total length were selected for phase I of the project based on their high traffic volume and poor condition.[9] The roads were built 20–40 years ago, with satisfactory geometry and adequate capacity, but the pavement has failed due to age and heavy traffic. At the start of the three subsequent annual phases, YHAB will identify highway segments that require rehabilitation, and give priority to the maintenance works that bring the highest economic returns. This will be determined through evaluation using a road asset management system and data from annual traffic and road condition surveys. YHAB will prepare data on each subproject to be considered, with information on its rationale; environmental, social, and road safety assessments; technical solutions; cost estimates; economic evaluation; and schedule. Subprojects will conform to the agreed selection criteria, as confirmed by YHAB and endorsed by ADB.[10]

17. **Safety enhancement.** The project will take steps to improve road safety on the subproject roads. YHAB will coordinate road safety education activities with schools, village groups, and local governments after works are completed. The rehabilitation will include safety feature upgrades such as better signage, rumble strips, and improved grade and curve design. The safety features to be undertaken will be chosen based on an assessment procedure set out in the manual prepared for the project. The operational manual provides a guide for classifying safety risks as very high, high, moderate, and low, and prescribes the type and extent of the safety features needed to match the level of risk. Based on preliminary design, about 10% of the cost of the phase I subprojects will be allocated to safety features. YHAB will conduct an independent road safety audit of all subprojects at the detailed design and completion stages.

2. Output 2: Performance-Based Road Maintenance

18. The project will introduce performance-based road maintenance on a pilot basis. Under the performance-based road maintenance schemes, contractors will be paid for consistently maintaining the road at a contractually stated performance standard over several years. This differs from other mechanisms linking payments to inputs, or outputs. To increase the potential for lessons and replication, the project will pilot two performance-based modalities, one using outsourcing and the other a contract with YHAB's own maintenance work force.

19. The first pilot will be for ADB-funded rehabilitation and routine maintenance of a 57 km segment of the G-323 highway in Wenshan Prefecture over 5 years. This will test the feasibility of contracting-out of performance-based maintenance operations. During the first year, the

[9] ADB financing will be applied to four subprojects on highways G213, G320, and S211. The government will fully finance three subprojects on G108, S321, and X214.
[10] Subproject Selection Criteria (accessible from the list of linked documents in Appendix 2).

contractor will reconstruct 40 km of pavement and overlay an additional 17 km. During the following 4 years, the contractor will undertake routine maintenance. The second pilot, funded by YHAB, will be for the periodic and the routine maintenance of a network of 107 km of paved roads within Ruili County in Dehong Prefecture for 3 years. This will test the feasibility of improving the efficiency of YHAB's internally delivered maintenance operations by introducing contractual and performance-based mechanisms. To implement the pilot, YHAB will enter into a contractual arrangement with its Ruili County maintenance section at a negotiated contract price and with a performance agreement. An independent supervision engineer will undertake monthly inspections to assess compliance with the performance standards under each of the pilots. In case of nonperformance, YHAB will make only partial payments to the contractor.[11]

3. Output 3: Road Asset Management System

20. The project will introduce and launch a computerized road asset management system in YHAB. A new road database will consolidate YHAB's existing road inventory, road condition, equipment, and traffic databases. The highway network will be spatially referenced and use a geographic information system. The system will also include (i) a road condition evaluation system, (ii) a pavement management system, (iii) a routine maintenance management system, and (iv) an interface with Highway Development and Management Model (HDM-4) software for works planning. It will make information on road conditions available online through a traffic information subsystem. To set up and maintain the road asset management system, the Yunnan Scientific Research Institute under YHAB will carry out pavement condition surveys each year and update the road inventory. This system will be used by YHAB as an input in the preparation of annual and medium-term maintenance strategies and programs.

4. Output 4: Institutional Development

21. The project will increase YHAB's capacity to manage new approaches to road maintenance, help implement the road sector maintenance strategy and the institutional development plan, and assist in monitoring the road sector roadmap.

22. **Environment, social, and safety management.** YHAB will establish a new environment, social, and safety unit (ESSU) with three full-time staff members. The ESSU will help YHAB to (i) ensure that the project meets environmental, social, and safety requirements; (ii) conduct road safety audits, consultations, and environmental and social assessments; (iii) develop environmental management instructions for maintenance works; (iv) prepare road safety engineering guidelines and design and evaluate safety engineering measures; and (v) monitor YHAB's environmental, social, and safety performance.

23. **Performance and sustainability assessment.** The project will strengthen YHAB's performance management. YHAB will prepare a performance and sustainability assessment report each year and submit it to ADB (footnote 11). The report will give a comprehensive picture of YHAB's maintenance program, including its efficiency, effectiveness, and management performance, as well as the quality of its environmental, social, and safety management processes. YHAB and ADB will jointly review progress, based on the indicators and annual targets set out in the road sector roadmap, and agree on any remedial action needed.

[11] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

24. **Project management.** A project management consultant will be recruited to provide support to YHAB to implement the project; select and prepare the subprojects for its second, third, and fourth phases; provide training for the staff of the new ESSU; and advise in setting up the ESSU procedures and guidelines.

25. **Training.** The project will finance a 4-year program to provide training abroad and in the PRC for YHAB personnel. The personnel will receive 100 person-months of international training and about 500 person-months of training in-country in road maintenance engineering, road asset management, performance-based maintenance, and the management of road safety and environmental and social safeguards.

D. Investment and Financing Plans

26. The project is estimated to cost $232.4 million (Table 1). The government has requested a loan of $80.0 million from ADB's ordinary capital resources to help finance the project. The loan will have a 28-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility,[12] a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan and project agreements. The government will meet the cost of financing charges during implementation.

Table 1: Project Investment Plan
($ million)

Item		Amount[a]
A.	**Base Cost**[b]	
	1. Trunk road rehabilitation	189.1
	2. Performance-based road maintenance	15.3
	3. Road asset management system	1.9
	4. Institutional strengthening	3.3
	Subtotal (A)	**209.6**
B.	**Contingencies**[c]	**17.3**
C.	**Financing Charges During Implementation**[d]	**5.5**
	Total (A+B+C)	**232.4**

[a] Includes taxes and duties to be financed from government resources and ADB loan resources.
[b] In mid-2012 prices.
[c] Physical contingencies computed at 4% for civil works. Price contingencies computed at 2% for 2013, 4% for 2014, 6% for 2015, and 8% for 2016.
[d] Includes interest and commitment charges. Interest during construction for the ADB loan has been computed at the 5-year forward London interbank offered rate plus a spread of 0.6%. Commitment charges for an ADB loan are 0.15% per year to be charged on the undisbursed loan amount.
Source: ADB estimates.

27. The financing plan is in Table 2. The ADB loan will finance 34.42% of the total project costs.[13] Counterpart funds will come from the Yunnan provincial government. The government will finance any shortfall that may arise during implementation. The government will relend the proceeds of the loan to the Yunnan provincial government upon terms and conditions acceptable to ADB, and the Yunnan provincial government will make the proceeds of the loan available to YHAB pursuant to onlending arrangements on terms and conditions satisfactory to

[12] The interest includes a maturity premium of 20 basis points. This is based on the above loan terms and the government's choice of repayment option and dates.
[13] ADB financing under the Wenshan pilot will be front-loaded since (i) this contract will extend beyond the implementation schedule for the remainder of the project, (ii) it would not involve material risk for the success of the project, and (iii) it will enable timely loan closure.

ADB, with the provision of a guarantee of the obligation to repay being issued by YPDOT. Detailed onlending arrangements are in the project administration manual (footnote 11).

Table 2: Financing Plan

Source	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank	80.00	34.42
Yunnan Provincial Government	152.40	65.58
Total	**232.40**	**100.00**

Source: Asian Development Bank.

E. Implementation Arrangements

28. YPDOT will be the executing agency, responsible for overall implementation of the project. YHAB will be the implementing agency, responsible for day-to-day implementation of all project components. Additional financing may be considered if the project performs well. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual (footnote 11).

Table 3: Implementation Arrangements

Aspects	**Arrangements**		
Implementation period	December 2013–September 2018		
Estimated completion date	30 September 2018		
Management			
(i) Oversight body	Yunnan Provincial Government		
(ii) Executing agency	Yunnan Provincial Department of Transport		
(iii) Key implementing agency	Yunnan Highway Administration Bureau		
(iv) Implementation unit	Project Management Office including 6 ADB project staff		
Procurement (ADB-financed contract packages)	National competitive bidding	17 contracts (estimated)	$77.55 million
	Shopping (goods)	5 contracts	$0.30 million
Consulting services (ADB-financed contract packages)	Quality- and cost-based selection (80:20) 40 person-months international consulting services 3 person-months national consulting services		$2.15 million
Retroactive financing and/or advance contracting	Advance contracting and retroactive financing are proposed for the recruitment of the consulting services and for the procurement of the road asset management database equipment and civil works. [a]		
Disbursement	The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2012, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

[a] The amount to be retroactively financed will not exceed the equivalent of 10% of the ADB loan, and may finance costs incurred before loan effectiveness but not more than 12 months before the signing of the loan.

Source: ADB.

III. DUE DILIGENCE

A. Technical

29. The technical viability of the project was confirmed during preparation. The preliminary design of first-year works was prepared by the project preparatory TA. Maintenance and safety policies and guidelines are detailed in the operational manual (footnote 5). Pavement repairs will include various technical solutions, including local repairs, slurry seals, double bituminous surface treatment, concrete asphalt overlay, and reconstruction (asphalt overlay or surface treatment over cement-treated gravel). Safety works will include provision of shoulders, lay-bys, steep grade management, left-turn lanes at busy junctions, basic and enhanced centerline

markings, safety barriers, footpaths on sections near villages and towns, nonmotorized traffic lanes, and traffic calming measures.

B. Economic and Financial

30. The primary economic benefit of the road maintenance works will be a reduction in the costs of transport (vehicle operating costs and time costs) along Yunnan's trunk roads by up to 40%. The subprojects to be implemented in the first year of the project have an economic internal rate of return of 34%. Sensitivity analysis showed that (i) under a worst-case scenario, including a substantial drop in the benefits by 66% and a 200% cost increase, the project would still yield an economic rate of return of about 14%; and (ii) the investment costs would need to be multiplied by 8 or the benefits be divided by 10 to yield a net present value equal to zero. A financial analysis indicated that, with respect to the availability of resources to cover the project cost and the loan service requirements, the project presents only a small financial risk.

C. Procurement and Governance

31. All procurement for ADB-financed contracts will follow ADB's Procurement Guidelines (2013, as amended from time to time). Procurement for ADB-financed civil works under outputs 1 and 2 will use the 2012 Ministry of Finance standard bidding documents for national competitive bidding agreed upon with ADB and the World Bank in 2012. For non-ADB financed works and services, YHAB will use government procurement procedures.[14] Procurement and financial assessments were carried out as part of project preparation. Financial management risk is considered low, while the procurement risk is rated average based on YHAB's limited prior experience with ADB. To mitigate the risk, YHAB will recruit a procurement agent, and staff involved in the project will receive training in ADB procurement procedures and guidelines. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and YPDOT. The specific policy requirements and supplementary measures are described in the project administration manual (footnote 11). An institutional assessment carried out by ADB concluded that YHAB's capacity to execute the project was generally appropriate but that it needed strengthening in the areas of planning, safety, environmental management, and procurement.[15]

D. Poverty and Social

32. The project will benefit an estimated 12 million people, of whom 85% are rural residents. The subprojects to be implemented in the first year of the project will directly benefit 4.17 million people in five prefectures and 15 counties. The project preparatory TA consultant evaluated the impact of recently completed pavement rehabilitation works in Yunnan. The evaluation shows that the poor, particularly women, quickly benefited from increased transport opportunities once works were completed. Specific impacts identified include: (i) greater and more diversified income-generating opportunities for households, including seasonal work-related migration opportunities; (ii) more reliable, frequent, and cheaper public transport, which benefitted women in particular; (iii) more timely transport of farm products over the improved roads, which was especially important to ensure that perishable commodities such as fruits, vegetables, and flowers arrived at markets in good condition; (iv) a reduction in farm input costs due to improved transport from providers; (v) more small business activity alongside the roads; (vi) improved

[14] Government procurement procedures include limited bidding for rehabilitation works. ADB assessed the efficiency of the procedures and concluded that YHAB could carry them out diligently and efficiently.

[15] The findings are summarized in the Sector Assessment (accessible from the list of linked documents in Appendix 2.

connectivity and fewer road accidents, especially during the rainy season; and (vii) less dust generated by traffic in areas along the improved roads.

33. To maximize the social benefits and minimize risks, YHAB will implement a social development action plan to undertake such steps as (i) facilitation of public transport services, (ii) communication with local stakeholders, (iii) provision of employment and other income opportunities during the works, and (iv) prevention of HIV/AIDS spread.[16]

E. Safeguards

34. **Environment.** The project is category B for environment. A consolidated initial environmental examination and environmental management plan was prepared for the seven subprojects chosen for rehabilitation during phase 1 (footnote 9) and the pilot testing of the two performance-based road maintenance modalities. These documents comply with the PRC's regulatory requirements and ADB's Safeguard Policy Statement (2009) and were disclosed on the ADB website on 25 April 2013. Two of the subprojects have been classified as category B, and the rest as category C. The works will be confined to the original right-of-way of existing national, provincial, and county roads. All identified environmental impacts will be mitigated through activities under the environmental management plan. An environmental assessment review framework has been prepared to guide the assessment of subprojects to be identified and carried out later under the project's three subsequent phases. YHAB accepted PPTA recommendations to increase its environmental capacity, and tools have been developed to manage environmental impacts and opportunities associated with maintenance activities (PAM, para. 65).

35. **Social safeguards.** Due diligence indicated that no land acquisition or resettlement will be required for the first-year subprojects. While the subprojects yet to be selected for the remaining phases are expected to be similar, the project was classified as resettlement category B to allow for changes at detailed design stage if a future subproject involves modest resettlement due to road widening or straightening or to improve safety features. A resettlement framework and a sample resettlement plan have been prepared and were disclosed on the ADB website on 25 April 2013. Should a subproject require land acquisition or resettlement, the executing agency will prepare and submit resettlement plan(s) for ADB review and clearance; this will include a participatory consultation process, and other measures defined in the resettlement framework. The project will not finance a subproject that requires significant resettlement. Due diligence conducted during the project preparatory TA found no significant adverse impacts on ethnic minorities in the project area that would trigger the indigenous peoples safeguard requirements, hence the project is classified as indigenous peoples category C.

F. Risks and Mitigating Measures

36. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[17]

[16] The social development action plan is included in the project administration manual (footnote 11).
[17] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
Insufficient financing is made available for medium-term road maintenance.	The Yunnan Provincial Department of Transport has committed to gradually raising YHAB's allocation of fuel tax resources.
YHAB lacks capacity to properly select and appraise subsequent subprojects.	The project management consultant will help select and appraise the subprojects under the project's final three phases.
YHAB has too little knowledge of the needed modern approaches to road maintenance.	The operational manual describes the new processes. YHAB will recruit a project management consultant and conduct capacity-building activities.
Road safety risks increase after the project road improvements.	The road safety of phase I subprojects will be assessed. Risk mitigation measures will be included in detailed design of all subprojects.

YHAB = Yunnan Highway Administration Bureau.
Source: Asian Development Bank.

IV. ASSURANCES AND CONDITIONS

37. The government and YPDOT have assured ADB that implementation of the project shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the project administration manual and loan documents.

38. The government and YPDOT have agreed with ADB on certain covenants for the project, which are set forth in the loan agreement and project agreement. The government and YPDOT have further agreed that YPDOT and YHAB shall not award any works contract in respect of works under phases II, III and IV of output 1 until YPDOT, YHAB and ADB shall have concluded a memorandum of understanding in respect of the corresponding phase, following a joint review of preparatory steps, including selection of the proposed subprojects for the upcoming phase, and of the status of agreed measures under the road sector roadmap.

V. RECOMMENDATION

39. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of $80,000,000 to the People's Republic of China for the Yunnan Sustainable Road Maintenance (Sector) Project, from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 28 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Takehiko Nakao
President

5 November 2013

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact The people of Yunnan have improved access to a quality and safe trunk road network.	Percentage of population in counties where the average trunk road condition is good or better (RQI≥80) increased to 60% by 2021 (2011 baseline: 17%)	YHAB road data and YSRI road condition survey	**Assumptions** The current level of attention paid by the PRC government to road maintenance and road safety continues to increase in the 13th 5-year plan (2016–2021).
	Average vehicle operating costs per vehicle-km on trunk roads reduced by 10% in 2021 (2011 baseline: $0.56/km)		Road transport cost inflation is in line with PRC-wide inflation.
	Road accident fatalities on national and provincial roads per 1 billion vehicle-km of registered vehicles in Yunnan reduced to 21 in 2021 (2009 baseline: 30)	Traffic police reports	**Risk** Large natural disasters significantly damage Yunnan's trunk road network.
Outcome The sustainability of Yunnan's trunk road network Improved.	Percentage of the surveyed trunk road length in good or excellent condition (RQI≥80) increased from 37% in 2011 to 50% by 2018	YSRI road condition survey, YHAB PSAR	**Assumptions** Yunnan Provincial Department of Transport fuel tax revenues rise as steadily as expected.
	Safety risk of 1,050 km of the trunk network lowered to low or medium, as assessed by a safety audit by 2018 against medium to high in 2011	YHAB PSAR	No major negative policy or institutional changes occur in the road sector.
	Percentage of the paved trunk network rehabilitated every year increased to 4% by 2018 (2010 baseline: 1.4%)	YHAB PSAR	**Risk** YHAB is given responsibility for new roads that are in poor condition, which depresses the overall average condition of the trunk road network and increases the maintenance burden.
	Percentage of YHAB budget allocated to maintenance implementation (as defined in the PSAR) increased to 45% by 2018 (2011 baseline: 25%)	YHAB PSAR	
	Percentage of rehabilitation works carried out by YHAB after an environmental screening and with an environmental management plan reaches 100% by 2018 (2011 baseline: 0%)	ESSU/YHAB PSAR	
Outputs 1. Trunk roads rehabilitated	Rehabilitation carried out on 890 km of trunk roads by 2018	Progress reports	**Assumption** Cooperation of YHAB with local government representatives and public safety bureaus is effective.
	Road safety risk assessment and audits carried out and road safety engineering and awareness	Progress reports	**Risk** Commodity prices rise well beyond normal price contingency allowances.

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	measures implemented on all project roads (890 km) by 2018		
2. Performance-based road maintenance piloted	Multiannual contracts for performance-based maintenance of 164 km of trunk roads signed by 2014 and evaluated by 2018	Contract and bidding documents, inspection reports	**Risk** Private sector contractors are reluctant to bid and/or raise prices unduly to cover risks.
3. Road asset management system enhanced	RAMS installed by 2016 and ready for operation, with all relevant road data incorporated, by 2018 Percentage of maintenance works in line with prioritization by RAMS increased to 80% by 2018	Progress reports	**Assumption** The Ministry of Transport continues to promote road asset management standards and systems.
4. Institutional capacity of YHAB strengthened	YHAB PSAR is completed each year of project implementation and shows improvement in line with the targets set in the road sector roadmap 100 person-months of international training provided to staff of YHAB by 2018 ESSU created and institutional development plan in YHAB implemented by 2018	YHAB PSAR Training reports YHAB PSAR	**Assumptions** The PRC government continues to promote performance assessments and to increase the priority of sustainability in the road sector. Trainees have the opportunity to apply what they have learned to their work.

Activities with Milestones

1. Rehabilitate Trunk Roads

1.1 Carry out the prioritization and selection of project roads for phases II (October 2013), III (October 2014), and IV (October 2015), including environmental and resettlement screening of all subprojects, as required by environmental assessment and review framework and resettlement framework;
1.2 Prepare the detailed designs and cost estimates for the project roads in phases I (November 2013), II (November 2014), III (November 2015), and IV (November 2016)
1.3 Carry out bidding procedures for the implementation of the works for phases I (March 2014), II (March 2015), III (March 2016), and IV (March 2017)
1.4 Implement periodic maintenance and rehabilitation works on the project roads for phases I (March 2015), II (March 2016), III (September 2016), and IV (September 2017)
1.5 Carry out road safety risk assessment and include safety measures in detailed designs for all project roads (June 2013–September 2018)
1.6 Carry out road safety audits after works and carry out community-based road safety program (June 2014–September 2018)
1.7 Carry out environmental and resettlement screening of all subprojects and prepare and implement management and resettlement plans, as required by environmental assessment and review framework and resettlement framework (September 2013–September 2018)
1.8 Implement social development action plan for all project roads (June 2013–September 2018)

2. Pilot Performance-based Road Maintenance

2.1 Prepare detailed design and finalize bidding and contract documents for performance-based maintenance pilots (by March 2014)
2.2 Carry out procurement for the performance-based maintenance pilot projects

Inputs

ADB: $80 million

Civil works: $77.55 million

Equipment and software: $0.3 million

Consulting services and training: $2.15 million

Yunnan Provincial Government: $152.4 million

Civil works: $119.3 million

Design, procurement and supervision: $7.6 million

RAMS development: $1.6 million

Training: $0.5 million

ADB project office and ESSU: $0.6 million

Financing charges: $5.5 million

Contingencies:

Activities with Milestones	Inputs
(by December 2014) 2.3 Carry out performance-based maintenance pilots (December 2014–December 2018) 2.4 Implement environmental management and social development action plans on all project roads (December 2014–December 2018) **3. Enhance road asset management system** 3.1 Purchase the RAMS equipment and software (by December 2014) 3.2 Collect the necessary road condition, geometric, traffic, and GIS data to populate the RAMS database (by December 2015) 3.3 Provide training in the use of the RAMS software (by June 2015) 3.4 Use the RAMS software in preparing long-term and annual maintenance plans (by June 2016 and June 2017) **4. Strengthen Institutional Capacity of YHAB** 4.1 Fill in the YHAB PSAR at the start of each year (by December 2013, June 2014, June 2015, June 2016, and June 2017) 4.2 Provide training in, among others, road safety, environmental management, maintenance planning, and performance-based contracting (complete by September 2018) 4.3 Create an ESSU with at least three qualified professionals (by June 2013) 4.4 Implement YHAB institutional plan in procurement, planning, safety, environment, and social safeguards areas (by September 2018)	$17.3 million

≥ = superior or equal; ADB = Asian Development Bank; ESSU = environmental, social, and safety unit of YHAB; GIS = geographic information system; PRC = People's Republic of China; RAMS = road asset management system; PSAR = performance and sustainability assessment report; RQI = Riding Quality Index; YHAB = Yunnan Highway Administration Bureau; YSRI = Yunnan Science and Research Institute.
Source: ADB.

LIST OF LINKED DOCUMENTS

http://adb.org/Documents/RRPs/?id=45030-002-3

1. Loan Agreement
2. Project Agreement
3. Sector Assessment (Summary): Transport
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Initial Environmental Examination
12. Environmental Assessment and Review Framework
13. Resettlement Framework
14. Risk Assessment and Risk Management Plan

Supplementary Documents

15. Road Sector Maintenance Strategy
16. Institutional Development Plan
17. Road Sector Roadmap
18. Subproject Selection Criteria
19. Operational Manual
20. Maintenance Sustainability Analysis