Project Administration Manual

Project Number: 46042-002
September 2015

People's Republic of China: Shaanxi Mountain Road Safety Demonstration Project

The project administration manual is an active document, progressively updated and revised as necessary, particularly following any changes in project costs, scope, or implementation arrangements. This document, however, may not reflect the latest project changes.

Contents

APPENDIXES

Project Administration Manual Purpose and Process

The project administration manual (PAM) describes the essential administrative and management requirements to implement the project on time, within budget, and in accordance with Government and Asian Development Bank (ADB) policies and procedures. The PAM should include references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

The Shaanxi Provincial Transport Department, the executing agency (EA) ; and Ankang City Traffic Bureau and Shangnan County Government, the implementing agencies (IAs) are wholly responsible for the implementation of ADB-financed projects, as agreed jointly between the borrower and ADB, and in accordance with Government and ADB's policies and procedures. ADB staff is responsible to support implementation including compliance by the EA and IAs of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

At Loan Negotiations, the borrower and ADB shall agree to the PAM and ensure consistency with the Loan Agreement. Such agreement shall be reflected in the minutes of the Loan Negotiations. In the event of any discrepancy or contradiction between the PAM and the Loan Agreement, the provisions of the Loan Agreement shall prevail.

After ADB Board approval of the project's report and recommendations of the President (RRP), changes in implementation arrangements are subject to agreement and approval pursuant to relevant Government and ADB administrative procedures (including the Project Administration Instructions) and upon such approval they will be subsequently incorporated in the PAM.

ABBREVIATIONS

ADB	=	Asian Development Bank
AKTB	=	Ankang City Traffic Bureau
DSC	=	design and supervision consultant
EA	=	executing agency
EIA	=	environmental impact assessment
EIRR	=	economic internal rate of return
EMP	=	environmental management plan
FFPO	=	foreign fund financed project office
GAP	=	gender action plan
GDP	=	gross domestic product
HAHTP	=	HIV/AIDS and Human Trafficking Prevention Plan
IA	=	implementing agency
km	=	kilometer
MOF	=	Ministry of Finance
NGO	=	non government organization
PAM	=	project administration manual
PMO	=	project management office
PPMS	=	project performance monitoring system
PPTA	=	project preparatory technical assistance
RF	=	resettlement framework
RP	=	resettlement plan
RSAP	=	road safety action plan
SCG	=	Shangnan County Government
SGDAP	=	social and gender development action plan
SPDOF	=	Shaanxi Provincial Department of Finance
SPG	=	Shaanxi Provincial Government
SPHB	=	Shaanxi Provincial Highway Bureau
SPTD	=	Shaanxi Provincial Transport Department

NOTES

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

I. PROJECT DESCRIPTION

1. Shaanxi Province is one of the least-developed provinces with per capita rural income in 2012 at 73% of the national average, ranking 26th among the 31 administrative provinces and autonomous regions in the PRC. On a gross domestic product (GDP) per capita basis, Shaanxi ranks 15th (CNY38,564 in 2012). Fifty of Shaanxi's 107 counties are designated national poverty counties.[1] Shaanxi has a total land area of 205,800 square kilometers and a population of 37.53 million (2013 census). The southern prefectures of Ankang and Shangluo (in which the project roads are located) have GDP per capita of CNY18,878 (Ankang) and CNY18,097 (Shangluo), both less than half the Shaanxi average. The net average income per head for rural households is CNY5,763 compared with CNY20,734 for urban Shaanxi households.

2. The Qinba Mountains area is especially poor with a poverty incidence exceeding 30% in 2012. It is one of 11 high-poverty areas targeted for concentrated interventions under the China Rural Poverty Alleviation and Development Program (2011–2020). Both Ankang and Shangluo, two prefecture-level cities in the Qinba Mountains area, have strong potential for expansion of the agriculture, mineral, and hydropower industries, and for the development of tourism.

3. A lack of transport infrastructure is constraining economic growth and poverty reduction. Due to road network and capacity limitations, the rural population suffers from a lack of access to markets and economic opportunities. High transport costs directly limit the extent of trade and constrain residents' income-earning potential. Better road connections, with improved capacity, will enable southeast Shaanxi to realize its full economic potential.

4. In the PRC, it is reported that 65,225 people were killed in road crashes in 2010.[2] The World Health Organization, however, estimates 275,983 road crash deaths at a rate of 20.5 deaths per 100,000 population in PRC.[3] Between 2005 and 2012, the number of reported crashes has declined while the proportion of reported crashes resulting in fatalities increased—29% in 2012 compared with 22% in 2005—indicating a reporting trend toward fewer but more serious crashes.[4]

5. Reported road fatalities (9,831) and injuries (30,021) in Shaanxi from 2008 to 2012 cost $5 billion. Ankang and Shangluo are experiencing road fatality and injury rates that far exceed the provincial and national averages with a crash rate 4 times the national average for roads of similar class in the PRC (footnote 18). Analysis of 1,000 kilometers (km) of roads in the Qinba Mountains area found that road fatalities and injuries cost $84 million (0.3% of Shaanxi's GDP) per year from 2007 to 2011. There is an obvious and urgent need to improve road safety provisions throughout the project area.

6. Most crash victims are male vulnerable road users[5] aged 21–65 living in rural areas.[6] Across transport modes, road fatalities involve vehicle and truck occupants (28%), motorcyclists

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1 Counties with an average annual rural per capita net income of less than CNY2,300.

2 World Health Organization. 2013. Global Status Report on Road Safety: Supporting a Decade of Action. Geneva. p. 99.

3 World Health Organization. 2013. Global Status Report on Road Safety: Supporting a Decade of Action. Geneva. p. 255. Fatality rates average 21.5 per 100,000 population in low-income countries, 19.5 in middle-income countries, and 10.3 in high-income countries.

4 National Bureau of Statistics of China. 2013. *Shaanxi Statistical Yearbook 2013*. Beijing.

5 Vulnerable road users include pedestrians, cyclists, or motorcyclists.

6 X. Zhang et al. 2013. Basic Characteristics of Road Traffic Deaths in China. *Iranian Journal of Public Health*, Vol. 42, No.1, pp. 7–15.

(28%), pedestrians (26%), cyclists (17%), and other (1%). As motorcycles and nonmotorized transport modes are most commonly used by the poor, reducing road crashes and related impacts will contribute to poverty reduction and inclusive economic growth.

7. The project area—Xunyang, Hanyin, and Shangnan counties in Ankang and Shangluo—contains many high-risk trunk and rural roads with significant traffic volume and a mix of heavy vehicles, automobiles, motorcycles, nonmotorized vehicles, and pedestrians. Many of the crashes in the area are attributed to driver error aggravated by the steep, mountainous terrain. In many cases, dangerous road conditions can be addressed by modest design interventions at relatively low cost. The development and institutionalization of modern road safety design and management approaches will lead to a sustainable reduction in road deaths and injuries.

8. **Trunk roads.** The highways in the Qinba Mountains area are narrow, with inadequate sight distances, very tight curves, and low axle load limits. Vehicle ownership in the area has grown rapidly, and ongoing major construction projects have led to increased heavy truck traffic leading to accelerated pavement deterioration. Traffic has grown at nearly 10% per year and sections of the network will reach capacity within 5 years. Rehabilitation and upgrading of the trunk road network is required to ensure that adequate capacity can facilitate economic development, and improve accessibility for the local population. On the three project trunk roads, the annual cost per km of road crash fatalities and injuries per km are several times higher than the national averages, resulting in a combined total cost of $40 million. [7] By incorporating best road safety design practices on the trunk road upgrades, the incidence and cost of road crashes can be significantly reduced.

9. **Rural roads.** The unpaved rural road network constrains agricultural development and limits access to (i) markets for sale of produce and purchase of agricultural inputs; (ii) collection or processing stations for the sale of cash crops; (iii) towns and cities for employment opportunities; and (iv) important social services such as schools, health facilities, and administrative services. During the wet season, the existing unpaved rural roads become impassable because of landslides or poor road surfaces, leading to perishable crops being lost and reducing access to employment and social services. Rural roads in the project area exhibit a range in level of safety. Road fatalities, and injuries on the most unsafe rural road included in the project cost up to $6 million annually. Targeted strategic investments on the rural road network will improve both access and transport safety.

10. **Road safety management and education.** On road rehabilitation and road upgrade projects, the Shaanxi Provincial Transport Department (SPTD) ensures that safety provisions address known hazardous road sections. To guide this responsibility, the Highway Safety Enhancement Project[8] was launched in 2004. The department of traffic police conducts road safety publicity and education programs for middle and primary schools. A determined focus on improving education and community awareness programs will help raise awareness of the public health threat posed by dangerous driving behavior and hazardous road conditions.

11. **Strategic relevance.** The PRC is a signatory of the United Nations Decade of Action for

[7] ADB. 2015. *Shaanxi Mountain Road Safety Demonstration: Final Road Safety Report Part 1*. Consultant's report. Manila (TA 8440-PRC).

[8] The Highway Safety Enhancement Project involved a CNY25.34 billion investment over 10 years on 366,000 km of roads to remedy safety problems. The successful preparation of this Shaanxi Mountain Road Safety Demonstration Project influenced the Ministry of Transport to adopt the ChinaRAP road safety design methodology on phase 2 of the Highway Safety Enhancement Project, which will be considered by the State Council in 2015.

Road Safety, 2011–2020, the goal of which is to stabilize and reduce the forecast level of road traffic deaths around the world. The Asian Development Bank (ADB) is committed to supporting the implementation of the Decade of Action in its developing member countries.[9] As the largest developing member country, the PRC continues to experience rapid motorization growth and suffers the greatest road crash fatality and serious injury toll. The obvious need for urgent action is a key rationale for this as ADB's first road safety demonstration project. The project aligns with ADB's country partnership strategy for the PRC, 2011–2015[10] and its sustainable transport initiative,[11] in the areas of road safety and social sustainability, and the Midterm Review of Strategy 2020[12] giving emphasis to infrastructure financing in underdeveloped areas.

12. ADB's participation in the project will help the PRC mobilize resources with international expertise to demonstrate innovative design solutions. ADB participation will introduce international road safety management practices to help build local and national road safety capability, and encourage the use of performance-tracking tools to benchmark and monitor road safety performance over time. ADB has supported three road projects in Shaanxi since 2001 to improve institutional frameworks and the performance of the road subsector.[13] This project represents a new strategic direction for ADB's support to the PRC road subsector. Successful project implementation and subsequent promotion of the road safety project approach will encourage replication in other provinces of the PRC and serve ADB's sustainable transport initiative goal to promote road safety and social sustainability as key strategic agenda.

13. The impacts will be the reduction of road crash fatalities and serious injuries, and the provision of efficient and safe all-weather accessibility in southeast Shaanxi Province. The outcome will be a safer and more efficient trunk and rural road network in southeast Shaanxi Province, in line with the demonstration project objectives and the Twelfth Five-Year Plan.

14. **Outputs.** The proposed project will include 4 outputs for ADB financing:

15. **Output 1: Trunk roads upgraded.** Three trunk roads (approximately 187 km) in the cities of Ankang and Shangluo will be upgraded from class III/IV to class II/III standard incorporating major safety design enhancements.[14]

16. **Output 2: Rural roads upgraded.** Eight rural roads (approximately 140 km) in poor agricultural areas will be upgraded from earthen roads to paved class IV standards, including improved safety design enhancements.

17. **Output 3: Crash Reduction Program.** Road safety only investments will be made on

[9] ADB. 2012. *Implementation of Sustainable Transport Initiative: Mainstreaming Road Safety in ADB Operations Action Plan*. Manila.
[10] ADB. 2012. *Country Partnership Strategy: People's Republic of China, 2011–2015.* Manila.
[11] ADB. 2010. *Sustainable Transport Initiative Operational Plan*. Manila.
[12] ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific.* Manila.
[13] ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Xi'an Urban Road Network Improvement Project*. Manila; ADB. 2003. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Xi'an Urban Transport Project*. Manila; and ADB. 2001. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Shaanxi Roads Development Project. Manila*.
[14] People's Republic of China Road Classification Information (accessible from the list of linked documents in Appendix 2).

25 additional rural roads (approximately 570 km).[15]

18. **Output 4: Institutional development.** The capacity of the SPTD road safety unit and local traffic bureaus will be strengthened, particularly in road safety management, implementation, and enforcement; the use of road safety equipment, software, and training; and public awareness building. A road safety education and community awareness campaign will be conducted.

[15] Examples of road safety only investments include amongst others the provision of enhanced road marking, roadside safety barriers, minor re-alignments to improve sight distances, and lay-bys and over taking lanes on steep inclines. No pavement repairs or upgrades are involved on these roads.

II. IMPLEMENTATION PLANS

A. Project Readiness Activities

Table 1: Project Readiness Activities

	Indicative Activities	Months												Who is responsible
		2015									2016			
		Q2			Q3			Q4			Q1			
		4	5	6	7	8	9	10	11	12	1	2	3	
1.	Advance contracting actions													SPTD, AKTB, SCG
2.	Retroactive financing actions													SPTD, AKTB, SCG
3.	Establish project implementation arrangements													SPTD, AKTB, SCG
4.	ADB Board approval													ADB
5.	Loan signing													SPTD, MOF
6.	Government legal opinion provided													SPTD
7.	Government budget inclusion													SPTD, MOF
8.	Loan effectiveness													SPTD, MOF

ADB = Asian Development Bank, AKTB = Ankang City Traffic Bureau, MOF = Ministry of Finance, SCG = Shangnan County Government, SPTD = Shaanxi Provincial Transport Department.

B. Overall Project Implementation Plan

Table 2: Overall Project Implementation Plan

ID	Task Name	2015				2016				2017				2018				2019				2020			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	**Trunk Roads Upgraded**																								
	G316 - Xunyang to Ankang																								
1.1	Detailed Design																								
1.2	EMP, RP updated																								
1.3	Procurement																								
1.4	Civil Works																								
1.5	Resettlement																								
	S102 - Xunyang to Xiaohe																								
1.6	Detailed Design																								
1.7	EMP, RP updated																								
1.8	Procurement																								
1.9	Civil Works																								
1.10	Resettlement																								
	S224 - Shangnan to Yunxian																								
1.11	Detailed Design																								
1.12	EMP, RP Updated																								
1.13	Procurement																								
1.14	Civil Works																								
1.15	Resettlement																								
2	**Rural Roads Upgraded**																								
2.1	Detailed Design																								
2.2	EMP, RP Updated																								
2.3	Procurement																								
2.4	Civil Works																								
2.5	Resettlement																								
3	**Crash Reduction Program**																								
3.1	Detailed Design																								
3.2	EMP, RP Updated																								
3.3	Procurement																								
3.4	Civil Works																								
4	**Institutional Development**																								
4.1	Consultant recruitment																								
4.2	Project Management																								
4.3	Road Safety Programme																								
4.4	Road Safety Awareness																								

ID	Task Name	2015				2016				2017				2018				2019				2020			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4.5	Ext Monitor – Environment																								
4.6	Ext Monitor - Resettlement																								
4.7	Social and Gender Monitoring																								

Preparation/Finalization Implementation Maintenance Bid Period

EMP = environmental management plan, Ext = external, RP = resettlement plan.
Source: Asian Development Bank.

III. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Stakeholders – Roles and Responsibilities

19. The SPTD will be the executing agency of the project. Shaanxi Provincial Highway Bureau (SPHB), on behalf of SPTD, will be in charge of overall project organization, coordination, guidance and supervision. The Foreign Financed Project Office (FFPO) has responsibility for day-to-day work during the project preparation stage, and project coordination and liaison with ADB during the implementation stage in order to ensure that the project will be implemented in accordance with ADB's guidance and requirements. Ankang City Traffic Bureau (AKTB) and Shangnan County Government (SCG), as the implementing agencies, will respectively manage the implementation of trunk roads, rural roads and road safety component located inside Ankang City and Shangnan County. For this, daily management responsibility will be assigned to the four sub-Project Management Offices (sub-PMOs) under jurisdiction of AKTB and SCG.

20. Under the leadership of AKTB, the Ankang PMO will manage the construction of trunk roads S102 and G316, 7 rural roads and several additional rural roads for safety improvements. Dedicated construction management offices will be established for G316 Xunyang-Ankang (36.3 km) and S102 Xunyang-Xiaohe (64.1 km). The Hanyin District PMO and Xunyang PMO will manage construction of local rural roads and road safety projects in their area of administrative authority. The SCGPMO will manage construction of trunk road S224, one rural road (#8) and six of the additional road safety improvement roads.

21. SCG will establish a Project Management Office in charge of management and overall coordination for the construction of trunk road S224, one rural road (#8) and six (6) of the additional road safety improvement roads.

Table 3: Project Implementation Organizations – Roles and Responsibilities

Project Implementation Organizations	Management Roles and Responsibilities
Shaanxi Provincial Transport Department (SPTD), the executing agency	• Responsible for overall project implementation and coordination; • Signing the on-lending Agreement for the project; • Provide guidance to the implementing agencies on project implementation so as to ensure compliance with the loan covenants; • Supervising and perfecting financial management system inside the implementing agencies, and conduct financial audits as per agreed timeframe; • Coordinating and supervising the progress of approval procedures; • Monitoring and evaluating the project development outcome and activities, and proposing the recommendations and suggestions; • Organizing and implementing the training program.
Shaanxi Provincial Highway Bureau (SPHB) (Industry Regulatory Agency)	• Responsible for, on behalf of executing agency, overall project organization, coordination, guidance and oversight, etc.; • Reviewing and approving the project design and budgets in the light of its administrative authority; • Review bidding documents submitted by the implementing agencies, oversee the procurement activities, and ensure the bidding document preparation, bid opening, bid evaluation and contract award are in compliance with guidelines; • Regularly reviewing and checking work quality, progress, safety, land acquisition and resettlement, fund utilization, and implementation of environment protection measures in the light of administrative authority so as to ensuring compliance with agreements; • Reviewing project monthly reports (including progress, quality, safety, land acquisition and resettlement, environment protection, design variation, etc.), project completion report, and their timely submission to Asian Development Bank (ADB); • Reviewing work statement, and ensuring timely allocation of counterpart funds; and • Provide overall supervision for the implementation of the resettlement plans (RP) and oversee the land acquisition and confirm demolition to ensure it is undertaken in a timely manner and in accordance with the laws and policies outlined in the RP; ensure budgetary arrangements for land acquisition and resettlement (LAR) implementation are made in a timely manner; ensure the implementation of the RPs are monitored and reported as prescribed in the plans; and ensure compliance with loan covenants and project agreements.
Foreign Fund Financed Project Office (FFPO) of SPTD (Project coordinative and liaison agency)	• Responsible for the activities at the project preparation stage, and the project coordination and liaison with ADB and project related sectors under SPTD's oversight and guidance; • In charge of development of Environmental Impact Assessment (EIA) and RP for the project and their timely submission to ADB; • Coordinate and engage IAs and design institutes to complete designs and budgets and to submit to ADB in timely manner; • Assist in the preparation activities of signing loan agreement and project agreement; • Recruit procurement agent; • Provide guidance to the IAs to develop and update procurement plan in accordance with ADB's Guidelines, loan agreement (LA) and

Project Implementation Organizations	Management Roles and Responsibilities
	project agreement (PA), and its submission to ADB for review and approval; • Assist implementing agencies for the timely submission of progress reports, monitoring reports and implementation completion reports to ADB; • Prepare withdrawal applications; • Cooperate with related departments to conduct financial audits as per agreed timeframe; and • Offer help for post evaluation of the project as needed.
Ankang City Traffic Bureau, the implementing agency (IA-1)	• Responsible for organizing the construction and management of the Ankang City's trunk roads, rural roads and comprehensive road safety components under the project; • Oversee day-to-day activities of the Ankang project management office (PMO); • Coordinate the activities between the sub-PMOs (Hanyin District PMO and the Xunyang PMO); • Responsible for approvals of the project, EIA, LAR, recruitment of design institute and other domestic approval procedures; • Review and approve the design for rural roads and road safety project in accordance with its administrative authority; • Assist FFPO in submission of necessary materials and documents to ADB at the project preparation stage; • Develop proposals to update the agreed procurement plan for submission to ADB through FFPO; • Recruit design institute, contractors and construction supervision company; • Prepare bid documentation and maintain records of bid opening, bid evaluation, contract award and contract negotiation, etc.; • Responsible for implementation and acceptance of completed works of the project components located within Ankang City; • Responsible for work progress, quality, safety, land acquisition and resettlement, environment protection, contract payment, design variation, closure of the project final accounts, and the handover of works at completion; • Timely preparation of progress reports, monitoring reports, evaluation reports and implementation completion report for submission to ADB; • Establish strong financial management system and fund utilization control systems, and process withdrawal applications to ensure timely payments to contractors, suppliers and consultants; • Review interim payment certificates, variation orders, prepare statement and payment certification, and process payments within the periods defined in the Works contract documents; • Accept and take action on the findings and recommendations of the project audit conducted by ADB and/or authorized Government departments; • Oversee the sub-PMOs at Hanyin District (Hanyin District PMO) and Xunyang County (Xunyang County PMO) to implement project components, and provide assistance as needed; • Monitor the work quality, safety and management activities during the implementation period; and providing coordination and facilitation as

Project Implementation Organizations	Management Roles and Responsibilities
	needed; and • Take overall responsibility of implementation of the RPs including updating and finalization of the RPs prior to the contract award; establishing coordination among various line agencies involved in implementation of RPs; ensuring that LAR implementation is being undertaken in accordance with the laws and policies outlined in the RPs; ensuring timely monitoring and reporting of RP implementation by an external monitoring agency; ensuring that the resettlement funds are properly managed and disbursed and no land acquisition and resettlement takes place without the affected people being compensated as per the RPs; ensuring that the project is compliant with the PA and ensure that corrective action plans are prepared and approved from the ADB in case a non-compliance is identified; ensuring the public consultation and grievance redress mechanisms are being implemented as outlined in the RPs.
Shangnan County Government (SCG), the implementing agency (IA-2)	• Responsible for organizing the construction and management of Shangnan County's trunk road, rural roads and comprehensive road safety components under the project; • Oversee day-to-day activities of the PMO; • Responsible for approvals of the project, EIA, LAR, recruitment of design institute and other domestic approval procedures; • Review and approve the design for rural roads and road safety project in accordance with its administrative authority; • Assist FFPO in submission of necessary materials and documents to ADB at the project preparation stage; • Develop proposals to update the agreed procurement plan for submission to ADB through FFPO; • Recruit design institute, contractors and construction supervision company; • Prepare bid documentation and maintain records of bid opening, bid evaluation, contract award and contract negotiation, etc.; • Responsible for implementation and acceptance of completed works within Shangnan County; • Responsible for work progress, quality, safety, LAR, environment protection, contract payment, design variation, closure of the project final accounts, and handover of works at completion; • Timely preparation of progress reports, monitoring reports, evaluation reports and implementation completion report for submission to ADB; • Establish strong financial management system and fund utilization control systems, and process withdrawal applications to ensure timely payments to contractors, suppliers and consultants; • Review interim payment certificates, variation orders, prepare statement and payment certification, and process payments within the periods defined in the Works contract documents; • Accept and take action on the findings and recommendations of the project audit conducted by ADB and/or authorized Government departments; and • Take overall responsibility of implementation of the RPs including updating and finalization of the RPs prior to contract award; establishing coordination among various line agencies involved in implementation of RPs; ensuring that LAR implementation is being

Project Implementation Organizations	Management Roles and Responsibilities
	undertaken in accordance with the laws and policies outlined in the RPs; ensuring timely monitoring and reporting of RP implementation by an external monitoring agency; ensuring that the resettlement funds are properly managed and disbursed and no land acquisition and resettlement takes place without the affected people being compensated as per the RPs; ensuring that the project is compliant with the PA and ensure that corrective action plans are prepared and approved from the ADB in case a non-compliance is identified; ensuring the public consultation and grievance redress mechanisms are being implemented as outlined in the RPs.
Shaanxi Provincial Department of Finance (SPDOF)	• Entering into the on lending arrangements for the project; • Monitoring the financial aspects of project implementation and providing respective coordination and facilitation; • Endorsing to ADB the authorized staff with approved signatures for withdrawal applications processing; and • Processing and submitting to ADB withdrawal applications and reimbursement requests and, if required, requests for reallocating the loan proceeds.
Ministry of Finance (MOF)	• Borrower representative; • Signing the Loan Agreement; • Primarily responsible for supporting SPG in the implementation of the project; and • Practical training of SPG and SPTD on ADB financial documentation requirements, as needed.
Asian Development Bank (ADB)	• Provide guidance to the executing agency and implementing agencies at each stage of the project for smooth implementation in accordance with the agreed implementation arrangements; • Conducting regular loan review missions, including midterm and project completion review missions; • Review and approve procurement actions; • Monitor compliance with all loan covenants including safeguards; • Timely processing of withdrawal applications and releasing eligible funds; • Review annual audit reports and follow-up on audit recommendations; • Regularly update the project performance review reports in coordination with both the executing agency and the implementing agencies; and • Regularly update the project information documents for public disclosure at ADB website, including the safeguard documents.
Project Management Consultant	• Responsible for assisting the IAs on all aspects of project implementation.
Road Capacity Building Consultant	• Responsible for coordinating and implementing the road safety capacity building component

B. Key Persons Involved in Implementation

Government	
Shaanxi Provincial Transport Department (SPTD)	Mr. Yang Yusheng Deputy Director General Tel/Fax:+86 29 88869031 Email address: No.6 Tangyan Road, Xi'an 710068 Shaanxi Province, People's Republic of China
Shaanxi Provincial Department of Finance (SPDOF)	Mr. Liu Yongqiang Deputy Director of International Cooperation Division Fax: +86 29 87620709 Email address: zwyang2007@163.com
Foreign Fund Financed Project Office of SPTD (FFPO)	Mr. Nan Haolin Director General, Fax: +86 29 85233105 Mobile: +13572986096 Email Address: wzbadb300@126.com
Asian Development Bank	
Transport Division, East Asia Department	Mr. Robert Guild Director Tel: + 63 2 632 6383 (local)/Fax:+ 63 2 636 2426 Email address: rguild@adb.org 6 ADB Avenue, Mandaluyong City 1550 Metro Manila, Philippines
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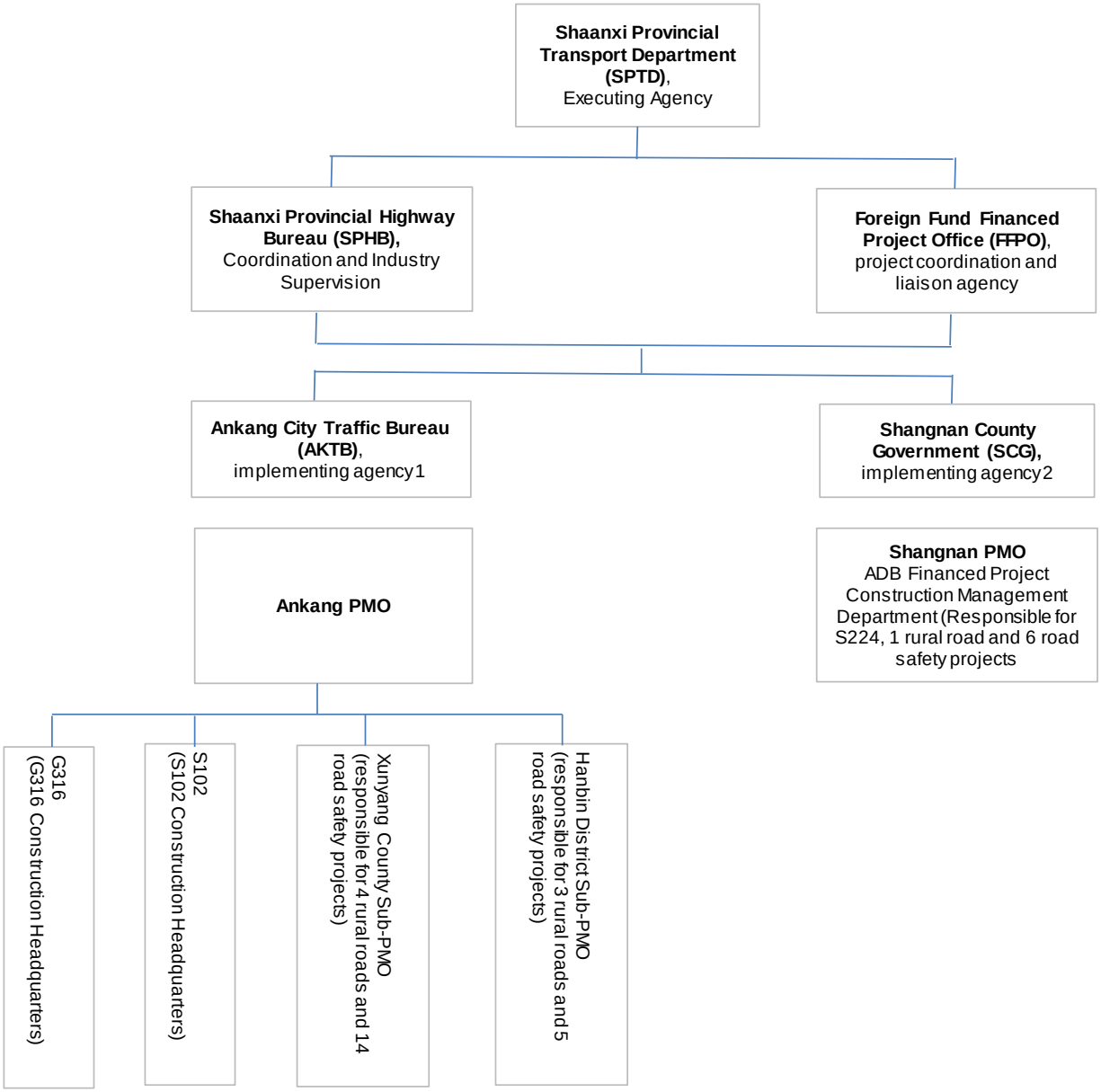
C. Project Organization Structure



IV. COSTS AND FINANCING

22. The government has requested a loan of $200 million from ADB's ordinary capital resources to help finance the project. The loan will have a 25 year term, including a grace period of 5 years, and will follow the 10% annuity repayment method, will have an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, a commitment charge of 0.15% per year (the interest and other charges during construction to be capitalized in the loan), and such other terms and conditions set forth in the draft loan and project agreements. The average maturity is 18.31 years, and the maturity premium payable to ADB is 0.20% per annum. The Government will finance contingencies to cover any shortfall in the finances that may arise during implementation.

23. The Borrower is the PRC. The SPTD will assume the foreign exchange and interest rate risks for the ADB loan. The Borrower has provided ADB with: (i) the reasons for its decision to borrow under ADB's LIBOR-based lending facility based on these terms and conditions; and (ii) assurances that these choices were its own independent decision and not made in reliance on any communication or advice from ADB.

24. The Borrower will relend the proceeds of the loan to the Shaanxi provincial government upon terms and conditions acceptable to ADB, and the Shaanxi provincial government will make the proceeds of the loan available to the SPTD pursuant to on lending arrangements on terms and conditions satisfactory to ADB, with the provision of a guarantee of the obligation to repay being issued by the SPTD to the Borrower. Except as ADB may otherwise agree, the terms for such on lending arrangements shall include: (i) commitment charge and interest at the rates identical to those applied to the loan; (ii) a grace period and a principal repayment period identical to those applied to the loan; and (iii) the SPG bearing the foreign exchange and interest rate variation risks.

25. The Borrower shall cause the Shaanxi Provincial Government (SPG) and SPG shall cause the SPTD to apply the proceeds of the loan to the financing of expenditures on the project in accordance with the provisions of the Loan Agreement and the Project Agreement.

26. Counterpart funding sources comprise Ministry of Transport (MOT) subsidies that will be allocated to SPTD by SPG, with the balance provided from Ankang and Shangnan local government revenues. MOT subsidies are granted for upgrading projects which implement parts of the national road network and serve national priorities such as providing paved road access to administrative villages. No domestic bank loans are involved. The contribution from each financing source is detailed in Table 8.

A. Summary Cost Estimates and Financing Plan

Table 4: Summary Cost Estimates
($ million)

Item		Amount[a]
A.	**Base Cost**[b]	
1	Trunk Roads Upgraded	294.61
2	Rural Roads Upgraded	36.60
3	Crash Reduction Program	13.11
4	Institutional Development	2.36
	Subtotal (A)	**346.68**
B.	**Contingencies**[c]	**40.91**
C.	**Financing Charges During Implementation**[d]	**12.37**
	Total (A+B+C)	**399.96**

[a] Includes taxes and duties of $16.9 million to be financed by the PRC and ADB. ADB financing of taxes and duties is deemed acceptable as the (i) amount is within the reasonable threshold identified during preparation of the country partnership strategy, (ii) amount does not represent an excessive share of the project investment plan, (iii) taxes and duties apply only to ADB-financed expenditures, and (iv) financing of taxes and duties is material and relevant to the success of the project.
[b] In prices as at March 2015.
[c] Physical contingencies are 5% of base cost. Price contingencies computed on foreign exchange costs at 2.3%, 1.0%, 1.4%, 1.4% and 1.4% in 2015, 2016, 2017, 2018 and 2019 respectively. Price contingencies computed on local currency costs at 2.7%, 3.0%, 3.0%, 3.0%, and 3.0% in 2015, 2016, 2017, 2018 and 2019 respectively.
[d] Includes interest and commitment charges. Interest during construction for OCR loan(s) has been computed at the 5-year US dollar (USD) fixed swap rate plus an effective contractual spread of 0.5% and maturity premium of 0.2%. Commitment charges are 0.15% per year to be charged on the undisbursed loan amount.
Source: Asian Development Bank estimates.

Table 5: Financing Plan

Source	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank		
Ordinary capital resources (loan)	200.00	50.01
Counterpart funds from Shaanxi Provincial Transport Department, Ankang City Traffic Bureau, and Shangnan County Government	199.96	49.99
Total	**399.96**	**100.00**

Source: Asian Development Bank estimates.

B. Detailed Cost Estimates by Expenditure Category

Table 6: Detailed Cost Estimates by Expenditure Category

Item	(CNY Million)			(US$ Million)			
	Foreign Currency	Local Currency	Total Cost	Foreign Currency	Local Currency	Total Cost	% of Total Base Cost
A. Base Costs							
1 Civil Works[a]	**265.74**	**1,505.85**	**1,771.59**	**43.43**	**246.08**	**289.51**	**72.4**
Trunk Roads Upgraded	207.65	1,258.67	1,466.32	33.93	205.69	239.62	59.9
Rural Roads Upgraded	29.98	169.91	199.90	4.90	27.77	32.67	8.2
Crash Reduction Program	11.49	65.09	76.58	1.88	10.64	12.51	3.1
2 Goods and Equipment	**16.62**	**12.18**	**28.79**	**2.72**	**1.99**	**4.71**	1.2
3 Land Acquisition and Resettlement[b]	**0.00**	**170.46**	**170.46**	**0.00**	**27.86**	**27.86**	7.0
4 Consultants	**4.72**	**179.41**	**184.13**	**0.00**	**29.32**	**29.32**	7.3
Project Management	2.75	1.84	4.59	0.45	0.30	0.75	**0.2**
Road Safety Capacity Building	1.30	5.20	6.50	0.21	0.85	1.06	0.3
Road Safety Education	0.00	1.84	1.84	0.00	0.30	0.30	0.1
External Monitors	0.67	0.82	1.49	0.11	0.13	0.24	0.1
Design, Procurement, Supervision	0.00	165.00	165.00	0.00	26.96	26.96	6.7
Subtotal (A) =Total Base Cost	**270.46**	**1,855.72**	**2,126.18**	**43.43**	**303.26**	**346.68**	86.7
B. Contingencies							
1 Physical[c]	*12.10*	*68.55*	80.64	*1.98*	*11.20*	13.18	3.3
2 Price[d]	*169.69*	*0.00*	169.69	*27.73*	*0.00*	27.73	6.9
Subtotal (B)	**181.79**	**68.55**	**250.34**	**29.71**	**11.20**	**40.91**	**10.2**
C. Financing Charges during Implementation[e]							
1 Interest During Implementation[f]	*73.90*	*0.00*	73.90	*12.08*	*0.00*	12.08	3.0
2 Commitment Charges	*1.77*	*0.00*	1.77	*0.29*	*0.00*	0.29	0.1
Subtotal (C)	**75.67**	**0.00**	**75.67**	**12.37**	**0.00**	**12.37**	**3.1**
Total (A+B+C)	**527.92**	**1,924.27**	**2,452.19**	**85.50**	**314.46**	**399.96**	**100.0**

[a] Includes taxes and duties of $16.9 million to be financed by the PRC and ADB. ADB financing of taxes and duties is deemed acceptable as the (i) amount is within the reasonable threshold identified during preparation of the country partnership strategy, (ii) amount does not represent an excessive share of the project investment plan, (iii) taxes and duties apply only to ADB-financed expenditures, and (iv) financing of taxes and duties is material and relevant to the success of the project.

[b] The LAR cost does not include external monitoring costs and contingencies, which are shown as separate line items in the cost estimate tables.

[c] In prices as at March 2015.

[d] Physical contingencies are 5% of base cost. Price contingencies computed on foreign exchange costs at 2.3%, 1.0%, 1.4%, 1.4% and 1.4% in 2015, 2016, 2017, 2018 and 2019 respectively. Price contingencies computed on local currency costs at 2.7%, 3.0%, 3.0%, 3.0%, and 3.0% in 2015, 2016, 2017, 2018 and 2019 respectively.

[e] Includes interest and commitment charges. Interest during construction for OCR loan(s) has been computed at the 5-year US dollar (USD) fixed swap rate plus an effective contractual spread of 0.5% and maturity premium of 0.2%. Commitment charges are 0.15% per year to be charged on the undisbursed loan amount.

[f] IDI based on 2.164% of disbursed balance.

Source: Asian Development Bank estimates.

C. Allocation and Withdrawal of Loan Proceeds

Table 7: Allocation and Withdrawal of Loan Proceeds

CATEGORY				ADB Financing
No.	**Item**	**Total Amount Allocated for ADB Financing (US$)**		**Percentage and Basis for Withdrawal from the Loan Account**
		Category	**Subcategory**	
1	Civil Works	182,776,195		
1A	Trunk Roads Upgraded		132,495,147	57.7% of total expenditure
1B	Provincial Trunk Road Rehabilitation (S224)		10,000,000	100% of total expenditure
1C	Rural Roads Upgraded		27,766,647	85% of total expenditure
1D	Crash Reduction Program		12,514,401	100% of total expenditure
2	Goods	2,706,000		
2A	Tunnel Equipment Supply and Installation		2,706,000	57.7% of total expenditure
3	Consulting Services and Training	2,152,213		
3A	Project Management		750,000	100% of total expenditure
3B	Road Safety Capacity Building		1,062,213	100% of total expenditure
3C	Road Safety Awareness Program		300,000	100% of total expenditure
3D	External Monitor - Environment		40,000	100% of total expenditure
4	Interest and Commitment Charges	12,365,592		100% of total expenditure
	Total	**200,000,000**		

D. Detailed Cost Estimates by Financier

Table 8: Detailed Cost Estimates by Financier

Item	ADB Loan			MoT Subsidy			Local Government			Total Cost
	Ankang	Shangnan	% of Cost Category	Ankang	Shangnan	% of Cost Category	Ankang	Shangnan	% of Cost Category	
A. Base Cost										
1. Civil Works[a]										
Trunk Roads Upgraded	100.41	32.08	57.7	50.02	32.31	35.9	14.80	0.00	6.4	229.62
Provincial Trunk Road Rehabilitation (S224)	0.00	10.00	100.0	0.00	0.00	0.00	0.00	0.00	0.0	10.00
Rural Roads Upgraded	17.48	10.28	85.0	0.00	0.00	0.00	3.09	1.82	15.0	32.67
Crash Reduction Program	9.63	2.89	100.0	0.00	0.00	0.00	0.00	0.00	0.0	12.52
2. Goods and Equipment	0.00	2.72	57.7	0.00	0.00	0.00	0.00	1.99	42.3	4.71
3. Land Acquisition and Resettlement	0.00	0.00	0.0	0.00	9.94	35.7	14.10	3.82	64.3	27.86
4. Consultants										
Project Management	0.53	0.22	100.0	0.00	0.00	0.0	0.00	0.00	0.0	0.75
Road Safety Capacity Building	0.75	0.31	100.0	0.00	0.00	0.0	0.00	0.00	0.0	1.06
Road Safety Awareness Program	0.21	0.09	100.0	0.00	0.00	0.0	0.00	0.00	0.0	0.30
External Monitors[b]	0.04	0.00	16.7	0.00	0.00	0.0	0.20	0.00	83.3	0.24
Design, Procurement, Supervision	0.00	0.00	0.0	0.00	0.00	0.0	19.01	7.95	100.0	26.96
Subtotal (A) = Total Base Cost	**129.05**	**58.59**	**54.0**	**50.02**	**42.25**	**26.6**	**51.20**	**15.58**	**19.0**	**346.69**
B. Contingencies										
1. Physical[c]	0.00	0.00	0.0	0.00	0.00	0.0	9.29	3.89	100.0	13.18
2. Price[d]	0.00	0.00	0.0	0.00	0.00	0.0	19.55	8.18	100.0	27.73
Subtotal (B)	**0.00**	**0.00**	**0.0**	**0.00**	**0.00**	**0.0**	**28.84**	**12.07**	**100.0**	**40.91**
C. Financing Charges During Implementation[e]										
1. Interest During Implementation	9.09	2.98	100.0	0.00	0.00	0.0	0.00	0.00	0.0	12.07
2. Commitment Charges	0.22	0.07	100.0	0.00	0.00	0.0	0.00	0.00	0.0	0.29
Subtotal (C)	**9.31**	**3.05**	**100.0**	**0.00**	**0.00**	**0.0**	**0.00**	**0.00**	**0.0**	**12.36**
Total (A+B+C)	**138.36**	**61.64**	**50.0**	**50.02**	**42.25**	**23.1**	**80.04**	**27.65**	**26.9**	**399.96**
% of Project Cost			**50%**			**23.1%**			**26.9%**	

[a] Includes taxes and duties of $16.9 million to be financed by the PRC and ADB. ADB financing of taxes and duties is deemed acceptable as the (i) amount is within the reasonable threshold identified during preparation of the country partnership strategy, (ii) amount does not represent an excessive share of the project investment plan, (iii) taxes and duties apply only to ADB-financed expenditures, and (iv) financing of taxes and duties is material and relevant to the success of the project.

[b] ADB financing covers only the environmental monitoring cost. The government will finance other monitoring costs.

[c] In prices as at March 2015.

[d] Physical contingencies are 5% of base cost. Price contingencies computed on foreign exchange costs at 2.3%, 1.0%, 1.4%, 1.4% and 1.4% in 2015, 2016, 2017, 2018 and 2019 respectively. Price contingencies computed on local currency costs at 2.7%, 3.0%, 3.0%, 3.0%, and 3.0% in 2015, 2016, 2017, 2018 and 2019 respectively.

[e] Includes interest and commitment charges. Interest during construction for OCR loan(s) has been computed at the 5-year US dollar (USD) fixed swap rate plus an effective contractual spread of 0.5% and maturity premium of 0.2%. Commitment charges are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

E. Detailed Cost Estimates by Outputs

Table 9: Detailed Cost Estimates by Outputs ($ million)

Item		Trunk Roads Upgraded		Rural Roads Upgraded		Crash Reduction Program		Institutional Development	
	Total Cost	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category
A. Base Costs									
1. Civil Works[a]	**284.80**	**239.62**	**84.1**	**32.67**	**11.3**	**12.51**	**4.3**	**0.00**	**0.0**
Trunk Roads Upgraded	**229.62**	229.62	100.0	0.00	0.0	0.00	0.0	0.00	0.0
Provincial Trunk Road Rehabilitation (S224)	**10.00**	10.00	100.0	0.00	0.0	0.00	0.0	0.00	0.0
Rural Roads Upgraded	**32.67**	0.00	0.0	32.67	100.0	0.00	0.0	0.00	0.0
Crash Reduction program	**12.51**	0.00	0.0	0.00	0.0	12.51	100.0	0.00	0.0
2. Goods and Equipment	**4.71**	**4.71**	**100.0**	**0.00**	**0.0**	**0.00**	**0.0**	**0.00**	**0.0**
3. Land Acquisition and Resettlement	**27.86**	**27.86**	**100.0**	**0.00**	**0.0**	**0.00**	**0.0**	**0.00**	**0.0**
4. Consultants	**29.32**	**22.93**	**78.2**	**3.43**	**11.7**	**0.60**	**2.1**	**2.36**	**8.0**
Project Management	**0.75**	0.00	0.0	0.00	0.0	0.00	0.0	0.75	100.0
Road Safety Capacity Building	**1.06**	0.00	0.0	0.00	0.0	0.00	0.0	1.06	100.0
Road Safety Education	**0.30**	0.00	0.0	0.00	0.0	0.00	0.0	0.30	100.0
External Monitors	**0.24**	0.00	0.0	0.00	0.0	0.00	0.0	0.24	100.0
Design, Procurement, Supervision	**26.96**	22.93	85.0	3.43	12.7	0.60	2.2	0.00	0.0
Subtotal (A) =Total Base Cost	**346.68**	**295.11**	**85.1**	**36.10**	**10.4**	**13.12**	**3.8**	**2.36**	**0.7**
B. Contingencies									
1. Physical[b]	**13.18**	11.39	**86.5**	1.18	**9.0**	0.60	**4.6**	0.00	**0.0**
2. Price[c]	**27.73**	23.90	**86.2**	2.61	**9.4**	1.02	**3.7**	0.20	**0.7**
Subtotal (B)	**40.91**	**35.30**	**86.3**	**3.79**	**9.3**	**1.62**	**4.0**	**0.20**	**0.5**
C. Financing Charges during Implementation[d]									
1. Interest During Implementation	**12.08**	8.99	74.4	2.03	16.8	0.92	7.7	0.13	1.1
2. Commitment Charges	**0.29**	0.14	50.0	0.10	33.3	0.04	13.2	0.01	3.5
Subtotal (C)	**12.37**	**9.13**	**73.9**	**2.13**	**17.2**	**0.96**	**7.8**	**0.14**	**1.1**
Total (A+B+C)	**399.96**	**339.54**	**84.9**	**42.01**	**10.5**	**15.71**	**3.9**	**2.70**	**0.7**
% Total Project Cost	**100.0**								

[a] Includes taxes and duties of $16.9 million to be financed by the PRC and ADB. ADB financing of taxes and duties is deemed acceptable as the (i) amount is within the reasonable threshold identified during preparation of the country partnership strategy, (ii) amount does not represent an excessive share of the project investment plan, (iii) taxes and duties apply only to ADB-financed expenditures, and (iv) financing of taxes and duties is material and relevant to the success of the project.

[b] In prices as at March 2015.

[c] Physical contingencies are 5% of base cost. Price contingencies computed on foreign exchange costs at 2.3%, 1.0%, 1.4%, 1.4% and 1.4% in 2015, 2016, 2017, 2018 and 2019 respectively. Price contingencies computed on local currency costs at 2.7%, 3.0%, 3.0%, 3.0%, and 3.0% in 2015, 2016, 2017, 2018 and 2019 respectively.

[d] Includes interest and commitment charges. Interest during construction for OCR loan(s) has been computed at the 5-year US dollar (USD) fixed swap rate plus an effective contractual spread of 0.5% and maturity premium of 0.2%. Commitment charges are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

F. Detailed Cost Estimates by Year

Table 10: Detailed Cost Estimates by Year ($ million)

Item	Total Cost	2015	2016	2017	2018	2019	2020
A. Base Costs							
1. Civil Works[a]							
Trunk Roads Upgraded / Provincial Trunk Road Rehabilitation (S224)	**244.33**	0.00	61.08	81.08	81.08	21.08	0.00
Rural Roads Upgraded	**32.67**	0.00	14.00	18.67	0.00	0.00	0.00
Crash Reduction Program	**12.51**	0.00	2.50	10.01	0.00	0.00	0.00
2. Goods and Equipment	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3. Land Acquisition and Resettlement	**27.86**	**5.26**	**17.35**	**5.26**	**0.00**	**0.00**	**0.00**
4. Consultants							
Project Management	**0.75**	0.00	0.15	0.20	0.20	0.20	0.00
Road Safety Capacity Building	**1.06**	0.00	0.27	0.27	0.27	0.25	0.00
Road Safety Education	**0.30**	0.00	0.04	0.15	0.11	0.00	0.00
External Monitors	**0.24**	0.02	0.07	0.07	0.07	0.01	0.00
Design, Procurement, Supervision	**26.96**	0.00	17.03	3.31	3.31	3.31	0.00
Subtotal (A) =Total Base Cost	**346.68**	**5.28**	**112.49**	**119.02**	**85.04**	**24.85**	**0.00**
B. Contingencies							
1. Physical[b]	13.18	2.75	2.82	4.37	3.24	0.00	0.00
2. Price[c]	27.73	0.72	5.13	10.38	10.94	0.56	0.00
Subtotal (B)	**40.91**	**3.47**	**7.95**	**14.75**	**14.18**	**0.56**	**0.00**
C. Financing Charges during Implementation[d]							
1. Interest During Implementation	12.08	0.00	1.11	2.86	4.05	4.06	0.00
2. Commitment Charges	0.29	0.00	0.20	0.09	0.00	0.00	0.00
Subtotal (C)	**12.37**	**0.00**	**1.31**	**2.94**	**4.05**	**4.06**	**0.00**
Total (A+B+C)	**399.96**	**8.75**	**121.75**	**136.72**	**103.27**	**29.47**	**0.00**

[a] Includes taxes and duties of $16.9 million to be financed by the PRC and ADB. ADB financing of taxes and duties is deemed acceptable as the (i) amount is within the reasonable threshold identified during preparation of the country partnership strategy, (ii) amount does not represent an excessive share of the project investment plan, (iii) taxes and duties apply only to ADB-financed expenditures, and (iv) financing of taxes and duties is material and relevant to the success of the project.

[b] In prices as at March 2015.

[c] Physical contingencies are 5% of base cost. Price contingencies computed on foreign exchange costs at 2.3%, 1.0%, 1.4%, 1.4% and 1.4% in 2015, 2016, 2017, 2018 and 2019 respectively. Price contingencies computed on local currency costs at 2.7%, 3.0%, 3.0%, 3.0%, and 3.0% in 2015, 2016, 2017, 2018 and 2019 respectively.

[d] Includes interest and commitment charges. Interest during construction for OCR loan(s) has been computed at the 5-year US dollar (USD) fixed swap rate plus an effective contractual spread of 0.5% and maturity premium of 0.2%. Commitment charges are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

Table 11: Project Contract Awards and Disbursements
(by quarter)

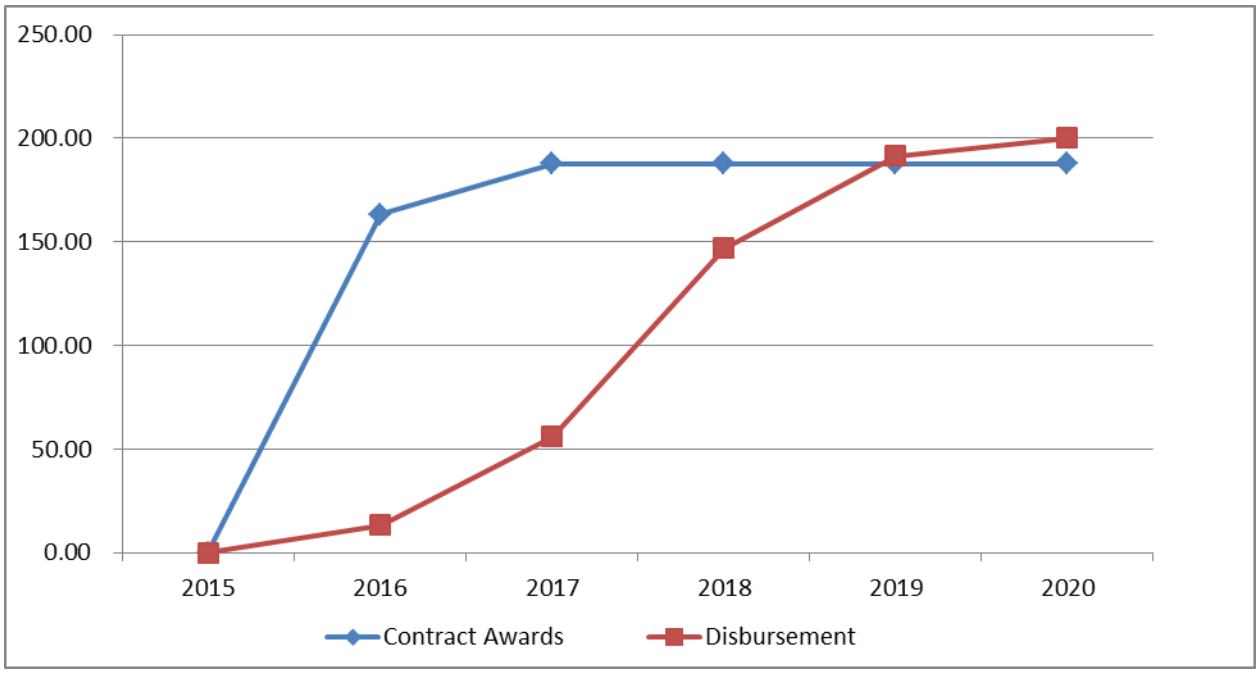
Year	Projected Contract Awards (in USD million)					Projected Disbursement (in USD million)				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
2015	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**
2016	0.00	99.57	33.08	30.50	**163.15**	0.00	0.00	0.00	13.26	**13.26**
2017	0.00	24.49	0.00	0.00	**24.49**	0.00	3.05	0.00	39.79	**42.84**
2018	0.00	0.00	0.00	0.00	**0.00**	0.00	16.61	53.06	21.13	**90.80**
2019	0.00	0.00	0.00	0.00	**0.00**	0.00	19.91	12.72	12.00	**44.63**
2020	0.00	0.00	0.00	0.00	**0.00**	0.00	8.47	0.00	0.00	**8.47**
TOTAL					**187.64**					**200.00**

Table 12: Project Contract Awards and Disbursements
(cumulative)

	2015	2016	2017	2018	2019	2020
Contract Awards	0.00	163.15	187.64	187.64	187.64	187.64
Disbursement	0.00	13.26	56.10	146.90	191.53	200.00

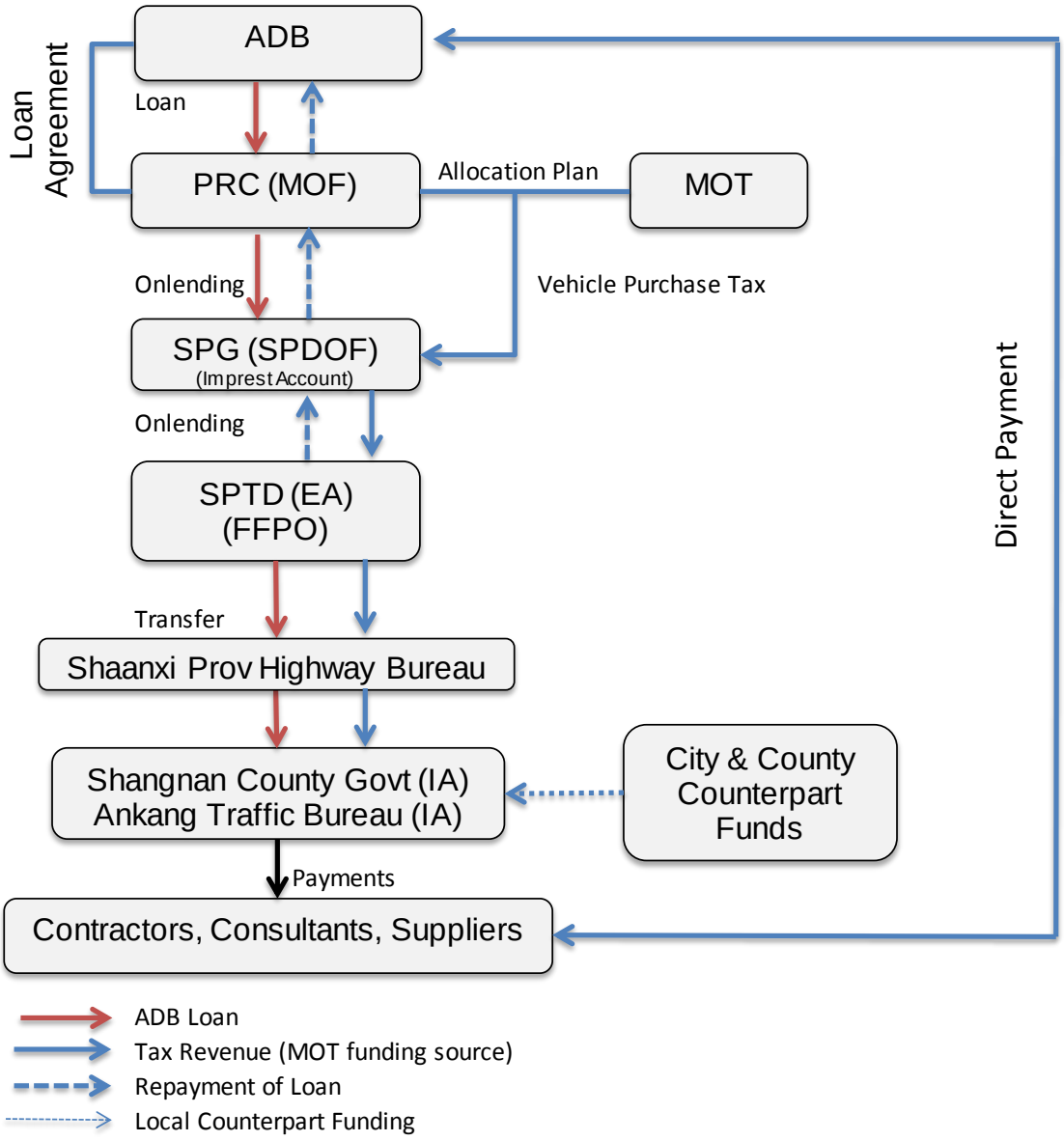
Note: With IDC of $12.36 million.

Figure 1: Contract and Disbursement Projections



G. Fund Flow Diagram

Figure 2: Fund Flow Diagram



ADB = Asian Development Bank, EA = executing agency, FFPO = Foreign-fund Financed Project Office, IA = implementing agency, MOF = Ministry of Finance, MOT = Ministry of Transport. SPG = Shaanxi Provincial Government, PMO = project management office, SPTD = Shaanxi Provincial Transport Department, PRC = People's Republic of China, SPDOF = Shaanxi Provincial Department of Finance.
Note: SPTD, Shaanxi Provincial Highway Bureau and the implementing agencies will use pass through accounts to facilitate transfer of payments.

V. FINANCIAL MANAGEMENT

A. Financial Management Assessment

27. The financial management assessment (FMA) was conducted in March 2015 in accordance with ADB's Guidelines for the Financial Management and Analysis of Projects and Financial Due Diligence: a Methodology Note. The FMA considered the capacity of Foreign Fund Financed Project Office (FFPO) – the project coordination and liaison agency, and the Ankang City Transport Bureau (AKTB) and the Shangnan County Government (SCG) - the two key implementing agencies. The FMA considered the adequacy of the proposed funds-flow arrangements, staffing levels, the accounting and financing reporting systems, the internal and external auditing arrangements, and the financial information systems.

28. The assessment concluded that the Shaanxi Provincial Department of Finance Department (SPDOF), which will operate and administer the imprest account, and FFPO have extensive experience administering foreign-financed (World Bank and ADB) projects. The FFPO will take a lead role in ensuring financial management compliance. While FFPO and AKTB have general experience in managing foreign-financed projects, training and support will be required on ADB policies and procedures, including procurement, disbursement, and project management. The assessment indicated that (i) there are established financial management policies in the PRC, which are followed strictly by FFPO and the implementing agencies; and (ii) one implementing agency (AKTB) has sound financial management capability and is experienced in managing large projects.

29. The key financial management risks identified were a lack of knowledge on ADB financial management policies, inadequate staffing levels, and inadequate budget planning processes. It was concluded that the overall pre-mitigation financial management risk related to the executing agency and implementing agencies is moderate. It was recommended that the implementing agencies strengthen their financial management capability to manage the project, including (i) undertaking training, particularly on ADB policy and procedural requirements; (ii) establishing internal audit arrangements; and (iii) seeking external financial management assistance as needed. Adequate preparatory training will mitigate the risks. The executing agency and implementing agencies have agreed to implement the action plan in Table 1 to improve the FM capacity of the implementing agencies. The identified financial management risks will be closely monitored during project implementation.

Table 13: Financial Management Action Plan

Key Risks	Activities to Mitigate Risks	Responsible	Timeline
County and city implementing staff not qualified	Develop written job descriptions including knowledge, skills, and ability required for the positions	FFPO	Prior to loan effectiveness
Implementing staff not familiar with ADB FM requirements	Conduct training on ADB's procurement, accounting, disbursement and financial reporting requirements	ADB, FFPO and MOF	Q3 2015
Inadequate standardized procedures at implementing agency level	Develop a system of written financial policies and manuals to guide IA and PMO staff	FFPO	Q1 2016
Inadequate budget planning at implementing agency level	IAs to prepare annual project implementation budgets	PMOs, implementing agencies, and FFPO	Last quarter of each fiscal year

Key Risks	Activities to Mitigate Risks	Responsible	Timeline
Changes in FFPO / implementing agency/PMOs staffing	Hire replacements according to updated job descriptions; provide initial training	FFPO, implementing agency, and PMOs	During implementation
Staff forget procedures	Establish refresher training programs based upon audit findings	FFPO and implementing agencies	During implementation
Financial records are lost	Develop back-up procedures for electronic files, establish security procedures to protect information, and establish archive plans for paper (hard) documentation;	FFPO, implementing agencies, and PMOs	Prior to loan effectiveness
Accuracy of financial records	Regular and timely reporting to ADB; periodic external audits and timely corrective actions	FFPO, implementing agencies, and PMOs	Annual during implementation

ADB = Asian Development Bank, FFPO = Foreign-fund Financed Project Office, MOF = Ministry of Finance, Q = quarter.

B. Disbursement

1. Disbursement Arrangements for ADB Funds

30. The Loan proceeds will be disbursed in accordance with the procedures set out in ADB's Loan Disbursement Handbook (2015, as amended from time to time),[16] and detailed arrangements agreed upon between the Government and ADB. Online training for project staff on disbursement policies and procedures is available at: http://wpqr4.adb.org/disbursement_elearning. Project staff are encouraged to avail of this training to help ensure efficient disbursement and fiduciary control.

31. The FFPO on behalf of SPTD will be responsible for (i) collecting supporting documents and (ii) preparing and sending withdrawal applications from the SPDOF to ADB.[17]

32. **Imprest Fund Procedure.** To facilitate project implementation through timely release of loan proceeds, SPDOF, on behalf of Shaanxi Provincial Government, established an imprest account that was established for the last ADB fund project at a commercial bank acceptable to ADB. The imprest account is assigned for the exclusive use of the project. The currency of the imprest account(s) is the U.S. dollar. The imprest account is to be used exclusively for ADB's share of eligible expenditures. The executing agency who established the imprest account in its name is accountable and responsible for proper use of advances to the imprest account.

33. The total outstanding advance to the imprest account should not exceed the estimate of ADB's share of expenditures to be paid through the imprest account for the forthcoming 6 months. The executing agency may request for initial and additional advances to the imprest account based on an Estimate of Expenditure Sheet[18] setting out the estimated expenditures to be financed through the accounts for the forthcoming six (6) months. Supporting documents should be submitted to ADB or retained by the borrower (executing agency or implementing agency as appropriate) in accordance with ADB's Loan Disbursement Handbook (2015, as amended from time to time) when liquidating or replenishing the imprest account.

34. Funds will be disbursed in line with implementation progress. The implementing agencies will submit disbursement requests to the executing agency and SPDOF; and on

[16] Available at: http://www.adb.org/Documents/Handbooks/Loan_Disbursement/loan-disbursement-final.pdf.
[17] Follow the format provided in Appendixes 7A and 10A of the *Loan Disbursement Handbook.*
[18] ADB. 2015. *Loan Disbursement Handbook*. 10B.

approval, loan and counterpart funds will be disbursed to the implementing agency for on payment to the contractors.

35. **Statement-of-expenditure (SOE) procedure.** The SOE procedure may be used for reimbursement of eligible expenditures or liquidation of advances to the imprest accounts. The ceiling of the SOE procedure is the equivalent of $200,000 per individual payment. Supporting documents and records for the expenditures claimed under the SOE should be maintained and made readily available for review by ADB's disbursement and review missions, upon ADB's request for submission of supporting documents on a sampling basis, and for independent audit.[19] Reimbursement and liquidation of individual payments in excess of the SOE ceiling should be supported by full documentation when submitting the withdrawal application to ADB.

36. Before the submission of the first withdrawal application, the borrower should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the borrower, together with the authenticated specimen signatures of each authorized person. The minimum value per withdrawal application is $100,000 equivalent. Individual payments below this amount should be paid by the executing agency/ implementing agency and subsequently claimed from ADB (i) through reimbursement; or (ii) from the imprest account, unless otherwise accepted by ADB.

2. Disbursement Arrangements for Counterpart Fund

37. For the domestic funds, Central Government and SPG will provide subsidy for highway and rural road. SPTD and FFPO have submitted a five-year plan for MOT subsidies, and funds will be allocated according to annual plan. FFPO will allocate the designated funding for the project and monitor the provision of the funds, and disbursements to contractors, consultants, suppliers, etc., according to project progress.

C. Accounting

38. The SPTD will maintain, or cause to be maintained, separate books and records by funding source for all expenditures incurred on the project. Project financial statements will be prepared on an accrual basis. The SPG through its down-line agencies will prepare consolidated project financial statements in accordance with the government's accounting laws and regulations, which are consistent with international accounting principles and practices.

D. Auditing and Public Disclosure

39. The SPTD, through FFPO, will cause the detailed consolidated project financial statements to be audited in accordance with International Standards on Auditing and with the Government's audit regulations, by an independent auditor acceptable to ADB. The audited project financial statements will be submitted in the English language to ADB within six months of the end of the fiscal year by the SPG.

40. The annual audit report for the project accounts will include an audit management letter and audit opinions which cover (i) whether the project financial statements present a true and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting framework; (ii) whether loan and grant proceeds were used only for the purposes of the project or not; (iii) the level of compliance for each financial covenant contained

[19] Checklist for SOE procedures and formats are available at: http://www.adb.org/documents/handbooks/loan_disbursement/chap-09.pdf

in the legal agreements for the project; (iv) use of the imprest fund procedure; and (v) the use of the statement of expenditure procedure certifying to the eligibility of those expenditures claimed under SOE procedures, and proper use of the SOE and imprest procedures in accordance with ADB's Loan Disbursement Handbook and the project documents.

41. Compliance with financial reporting and auditing requirements will be monitored by review missions and during normal program supervision, and followed up regularly with all concerned, including the external auditor.

42. The Government, SPTD and FFPO have been made aware of ADB's approaches and procedures regarding delayed submission, and the requirements for satisfactory and acceptable quality of the audited project financial statements.[20] ADB reserves the right to require a change in the auditor (in a manner consistent with the constitution of the borrower), or for additional support to be provided to the auditor, if the audits required are not conducted in a manner satisfactory to ADB, or if the audits are substantially delayed. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures.

43. Public disclosure of the project financial statements, including the auditor's opinion on the project financial statements, will be guided by ADB's Public Communications Policy (2011).[21] After review, ADB will disclose the audited project financial statements for the project and the opinion of the auditors on the financial statements no later than 14 days of the date of ADB's confirmation of their acceptability by posting them on ADB's website. The management letter, additional auditor's opinions, and audited entity financial statements will not be disclosed.[22]

[20] ADB's approach and procedures regarding delayed submission of audited project financial statements:
- When audited project financial statements are not received by the due date, ADB will write to the executing agency advising that (i) the audit documents are overdue; and (ii) if they are not received within the next six months, requests for new contract awards and disbursement such as new replenishment of imprest accounts, processing of new reimbursement, and issuance of new commitment letters will not be processed.
- When audited project financial statements are not received within 6 months after the due date, ADB will withhold processing of requests for new contract awards and disbursement such as new replenishment of imprest accounts, processing of new reimbursement and issuance of new commitment letters. ADB will (i) inform the executing agency of ADB's actions; and (ii) advise that the loan may be suspended if the audit documents are not received within the next six months.
- When audited project financial statements are not received within 12 months after the due date, ADB may suspend the loan.

[21] Available from http://www.adb.org/documents/pcp-2011?ref=site/disclosure/publications

[22] This type of information would generally fall under public communications policy exceptions to disclosure. ADB. 2011. *Public Communications Policy*. Paragraph 97(iv) and/or 97(v).

V. PROCUREMENT AND CONSULTING SERVICES

A. Advance Contracting and Retroactive Financing

44. All advance contracting will be undertaken in conformity with ADB's *Procurement Guidelines* (2015, as amended from time to time)[23] and ADB's *Guidelines on the Use of Consultants* (2015, as amended from time to time).[24] Under advance contracting, the issuance of invitations to bid, bidding documents and bid evaluation reports will be subject to ADB approval. The borrower, executing agency, and implementing agency have been advised that approval of advance contracting does not commit ADB to subsequently approve the project or to finance the procurement costs; and ADB will not finance expenditures paid by the borrower prior to loan effectiveness, even if advance contracting is approved, unless retroactive financing has also been approved by ADB.

45. **Advance contracting.** Advance contracting will include advertisement, issuance of bidding document and evaluation of bids and up to the recommendation of contracts award. Advance contracting may apply to categories 1A (Trunk Roads Upgraded) and 3 (Consulting Services).

46. **Retroactive financing.** Retroactive financing could only apply up to the equivalent of 20% of the total ADB loan, with respect to expenditures incurred during loan effectiveness but not more than 12 months before the signing of the Loan Agreement. The contracts proposed for advance contracting and retroactive financing are shown in the procurement plan (Appendix 1).

47. The SPTD has requested to use advance contracting and retroactive financing for the procurement of the trunk roads subgrade contracts and the recruitment of the PMC. This will ensure that SPG secure the MOF works subsidies conditional on contract award in 2015.

48. **Trunk road procurement.** SCG will manage nine contracts for the upgrade and rehabilitation of S224, of which there are 5 subgrade contracts, 2 pavement contracts, 1 landscaping, safety facility and traffic engineering contract and 1 pavement contract for the rehabilitation-only road section. AKTB will manage nine contracts for the upgrading of G316 and S102, of which there are 4 subgrade contracts, 2 pavement contracts, 2 landscaping contracts and 1 tunnel equipment and tunnel fit out contract. All contracts will be procured using national competitive bidding (NCB) procedures.

B. Procurement of Goods, Works, and Consulting Services

49. All procurement of goods and works where there is any ADB funding will be undertaken in accordance with ADB's *Procurement Guidelines* (2015, as amended from time to time). International competitive bidding (ICB) procedures will be used for civil works contracts estimated to exceed $40 million, and goods contracts estimated to exceed $3 million. Contract estimated at less than the ICB thresholds would be procured following national procedures in accordance with the PRC Tendering and Bidding Law (1999), subject to modifications as agreed with ADB and consigned in the NCB annex to the procurement plan (Appendix 1). Contracts for works estimated to cost less than the ICB threshold values above, but more than $200,000 and contracts for goods estimated to cost less than the ICB threshold values above, but more than $100,000 will be procured on the basis of national competitive bidding (NCB)

[23] Available at: http://www.adb.org/Documents/Guidelines/Procurement/Guidelines-Procurement.pdf.
[24] Available at: http://www.adb.org/Documents/Guidelines/Consulting/Guidelines-Consultants.pdf.

procedures. Shopping will be used for contracts for procurement of works estimated at less than $200,000 and equipment estimated at less than $100,000.

50. Procurement under ICB procedures will use the single-stage one-envelope modality. Procurement shall use the latest ADB standard bidding documents which can be downloaded from ADB's website.

51. For procurement under NCB, the following provisions will apply (i) the advertisement may be limited to the national press, an official gazette or an open access website; (ii) bidding shall follow the standard bidding documents issued by MOF and approved by ADB; and (iii) bidding documents may be only in the Chinese language, and CNY may be used for the purpose of bidding and payment. Procurement under NCB and shopping will be subject to the provisions of the NCB annex of the procurement plan (Appendix 1).

52. All consultants will be recruited according to ADB's *Guidelines on the Use of Consultants* (2013, as amended from time to time). The outline terms of reference (TOR) for consulting services are provided in Appendix 2.

53. **Eligibility of state-owned enterprises.** Under the ADB Procurement Guidelines, bidders that are state-owned enterprises must meet related eligibility requirements of ADB's *Procurement Guidelines*. In order to establish eligibility, the state-owned enterprises or institutions shall demonstrate, *inter alia*, that they are (i) legally and financially autonomous, (ii) operate under commercial law, and (iii) are not dependent agencies of the SPG or SPTD.

C. Procurement Plan

54. An 18-month procurement plan indicating threshold and review procedures, goods, works, and consulting service contract packages and national competitive bidding guidelines is in Appendix 1.

VI. SAFEGUARDS

A. General

55. **Safeguards classification**. The project is classified as A for environment, A for involuntary resettlement, and C for indigenous peoples.

56. **Grievance redress mechanism.** SPTD through the FFPO will establish the project safeguards grievance redress mechanism (GRM), as detailed in the RPs and EMP, within 60 days of the loan effectiveness date, or before implementation of land acquisition and resettlement activities, whichever is the earliest. The GRM sets out procedures for managing public concerns and safeguard issues (environment, involuntary resettlement and land acquisition) which may arise during project implementation. The GRM will be established prior to any land acquisition and resettlement and prior to any advance construction works. The GRM comprises a set of clear procedures developed by FFPO to receive, record, and address any concerns or complaints raised; specific contact details of individuals from the FFPO, AKTB, SCG and contractors teams and other relevant safeguard authorities and stakeholders in Ankang and Shangluo. All contractors and work staff will be briefed by the FFPO on the project safeguards GRM. Multiple entry points to the GRM will be available including face-to-face meetings, written complaints, hotline number and telephone conversations, anonymous drop-boxes for written comments, and/or e-mail. During implementation and prior to the project completion review, FFPO will report complaints and their resolution to ADB in quarterly project progress reports and/or semi-annual safeguard monitoring reports.

57. **Prohibited investment activities.** Pursuant to Asian Development Bank's (ADB Safeguard Policy Statement (2009) (SPS),[25] ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS.

B. Environment

58. **Environmental safeguards.** The project environmental impact assessment (EIA) and EMP identify the environmental mitigation and monitoring measures needed during project implementation to address identified environmental risks and impacts. These documents comply with the PRC's regulatory requirements and ADB's Safeguard Policy Statement (2009) and were disclosed on the ADB website in April 2015.[26] The domestic environmental assessment reports have been disclosed to potentially affected people in the project area. Public consultation informed the project design and EIA process, and will continue throughout project implementation. The EMP outlines potential impacts, mitigation and monitoring measures, institutional arrangements, training requirements and implementation budget.

59. **Environmental impacts.** Anticipated environmental impacts and risks are mostly modest and can be limited to an acceptable level through EMP implementation and compliance with loan covenants. The main potential impacts are on water quality of rivers and noise and pollution impacts on sensitive receptors that are within or close to the project road corridors. The trunk road, G316, runs parallel to the north bank of the Shaanxi Han River wetland, but does not cross the designated provincial wetland. This triggers Safeguard Policy Statement (SPS 2009) for legally protected areas. The responsible authority has confirmed that the section of reserve within the project area of influence is designated for water quality objectives and there are no critical, valuable natural or modified habitats. The proposed EMP control measures are in line

[26] http://www.adb.org/projects/documents/prc-shaanxi-mountain-road-safety-demonstration-project-eia

with the Shaanxi Wetland Protection Regulation and the collection of road run-off in sedimentation tanks will have benefits for water quality, as run-off is currently unmanaged. Total carbon dioxide emissions from all the project roads are approximately 79,000 tons per annum in the medium term (year 2023) and 112,000 tons per annum in the long term (year 2031). Economic analysis demonstrates that project road improvements, will result in a net reduction of carbon emissions, although these savings are likely to be off-set by induced traffic and embodied carbon during construction.

60. **Climate change risk.** A climate risk and vulnerability analysis study was carried out and it was determined that there will be an increased risk of extreme rainfall events and flooding as a result of climate change.[27] A range of hard and soft adaptation measures have been proposed for the project roads.

61. **Implementation.** The responsible parties for environmental management and supervision are outlined in Table 12. The executing agency, the SPTD will have overall responsibility for implementation and compliance with loan assurances and the EMP. The FFPO and implementing agencies have committed to appoint suitably qualified environmental and social specialists within their organizations. The FFPO will be responsible for recruiting the Project Management Consultant (PMC) and environmental monitoring stations. An external national environmental consultant (Loan Implementation Environmental Consultant or LIEC) will be recruited through the loan implementation consultancy services. The LIEC to provide ongoing technical support for the FFPO, to develop and deliver environmental training for the FFPO and their contractors, to review compliance with EMP and support preparation of semi-annual environmental monitoring reports and the project completion report. The Ankang and Shangluo Environmental Monitoring Stations will be contracted to carry out environmental quality monitoring.

62. **Environmental monitoring and reporting.** The LIEC will prepare environmental monitoring reports on a semi-annual basis for submission by FFPO to ADB. ADB will review this environmental monitoring report and disclose it on the ADB website within 14 calendar days of receipt from the Borrower in line with ADB Public Communications Policy (2011). The FFPO will also prepare environmental inputs for the project completion report.

63. **Bidding documents and contracts.** The executing agency and implementing agencies will ensure that all bidding documents and contracts for Works contain provisions that require contractors to: (a) comply with the measures set out in the EIA and the EMP, and; (b) any corrective or preventative actions identified in semi-annual environmental monitoring reports. The Contractor will be responsible for preparing a specific environmental management plan (Contractor's Environmental Management Plan) based on the EMP prior to the commencement of construction activities. The contract should specify that the contractor should report monthly on the implementation of Contractor's Environmental Management Plan.

64. **Change of project scope or unanticipated impacts and risks.** If there are any changes in Project scope or unanticipated environmental and/or social risks and impacts that arise during construction, implementation or operation of the project that were not considered in the EIA and the EMP, the PMO should promptly inform ADB so updates can be made and/or a corrective action plan implemented.

[27] Project Climate Risk Assessment and Management (accessible from the list of linked documents in Appendix 2 of the Report and Recommendation of the President to the Board of Directors).

Table 14: EMP Environmental Management Responsibility

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	**Engineering Detailed Design**	**Tendering & Pre-construction**	**Construction**	**Operation**
SPTD	The executing agency for the project responsible for overall implementation and compliance with loan assurances and the EMP.				
FFPO	Established by the executing agency to be responsible for the day-to-day management of the project. Has overall responsibility delegated by the EA for supervising the implementation of environment mitigation measures, coordinating the project level GRM and reporting to ADB				
	• Engage LDI to prepare FSR, EIR, RP and SWCR	• Engage LDI • Review updated EMP • Confirm that mitigation measures have been included in engineering detail design	• Appoint at least one environmental specialist on staff • Incorporate EIA/EMP clauses in tender documents and contracts • Manage the procurement process • Establish the project complaint center with hot-line • Engage LIEC as part of the Loan Implementation Consulting Services	• Supervise EMP implementation to ensure effectiveness • Inspect implementation of mitigation measures. • Operate the project complaint center and coordinate the project environment GRM. • Prepare quarterly project progress reports and semi-annual environment monitoring reports and submit them to ADB • Conduct information disclosure and public consultation	• Instruct the O&M units on environmental management requirements • Prepare quarterly project progress reports and semi-annual environmental monitoring reports until a PCR is issued
AMTB SCG	The implementing agency for the Project to implement project components, administer and monitor contractors and suppliers, and take responsibility for construction supervision and quality control. Will ensure that the EMP is implemented proactively and will respond to any adverse impact beyond those foreseen in the EIA and ensure that if there are any changes in scope the EIA/EMP will be updated, as needed. Will also attend to requests from relevant agencies and ADB regarding the mitigation measures and environmental monitoring program.				
			• Incorporate EIA/EMP clauses in tender documents and contracts • Appoint at least one environmental specialist on staff (recommendation) • Engage AEMS and SEMS for environmental monitoring	• Supervise contractors and ensure compliance with the EMP • Approve contractors' SEMPs and method statements • Coordinate construction supervision and quality control • Coordinate environmental monitoring according to	• Coordinate environmental monitoring according to the approved EMP until a PCR is issued

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	Engineering Detailed Design	Tendering & Pre-construction	Construction	Operation
			• Engage ESE for independent compliance monitoring	the environmental monitoring program in the approved EMP • Act as a local entry point for the project GRM • Submit monthly monitoring results to FFPO, AEPB and SEPB	
Design institutes	• Prepare project FSRs, EIRs, RPs, SWCRs • Conduct public consultation	• Incorporate mitigation measures defined in the approved EIRs and this EMP into engineering detailed designs • Update the EMP in cooperation with the LIEC			
AEPB SEPB	• Review and approve the project EIRs			• Review project environmental quality monitoring results • Conduct mandated inspection and monitoring	
PPTA consultant	• Provide technical assistance • Review EIRs and other relevant documents • Prepare EIA report and EMP				
LIEC		• Review updated EMP, confirm that mitigation measures have	• Review bidding documents to ensure that the EIA/EMP clauses are	• Advise on mitigation measures • Provide technical support to FFPO, AMTB and SCG	• Conduct EMP compliance review • Support FFPO in instructing O&M units on

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	**Engineering Detailed Design**	**Tendering & Pre-construction**	**Construction**	**Operation**
		been included in engineering detailed design	incorporated • Confirm project's readiness in respect of environmental management.	for environmental management • Conduct environmental training • Conduct semi-annual EMP compliance review • Support FFPO in preparing quarterly project progress reports and semi-annual environmental monitoring reports. • Review domestic environmental acceptance reports • Prepare environmental completion report.	environmental management requirements • Support FFPO in preparing quarterly project progress reports and semi-annual environmental monitoring report until a PCR is issued • Coordinate environmental monitoring until a PCR is issued
Contractors			• Ensure sufficient funding and human resources for proper and timely implementation of required mitigation and monitoring measures in the EMP throughout the construction phase	• Appoint an environment, health and safety (EHS) officer to oversee EMP implementation related to environmental, occupational health and safety on construction site • Ensure health and safety • Implement mitigation measures • Prepare site specific EMP (SEMP) containing method statements on the implementation of pollution control and mitigation measures listed in Table EMP-2, and submit to AMTB or SCG,	

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	Engineering Detailed Design	Tendering & Pre-construction	Construction	Operation
				and ESE for review and approval • Act as a local entry point for the project GRM	
AEMS SEMS				• Undertake environmental quality monitoring according to the environmental monitoring program in the approved EMP (*contracted by AMTB and SCG*) • Report monitoring data to ESE, AMTB and SCG monthly	• Undertake environmental monitoring until a PCR is issued (*contracted by the O&M units*) • Submit monitoring results to the O&M units
ESE				• Conduct independent verification of project's environment performance and compliance with the EMP (*contracted by AMTB and SCG*) • Review monthly monitoring data submitted by AEMS and SEMS, and conduct compliance checking against applicable environmental standards • Provide advice to contractors for resolving on-site environmental problems when monitoring data shows non-compliance. • Submit quarterly compliance monitoring	

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	**Engineering Detailed Design**	**Tendering & Pre-construction**	**Construction**	**Operation**
				results to FFPO, AMTB and SCG	
O&M units: SPHB XCTB HDTB SCTB					• Ensure proper operation of component facilities according to design standards • Conduct follow up medium term (2023) noise monitoring to determine need for mitigation • Implement mitigation measures if needed
ADB	• Review and approve the EIA and EMP and disclose on ADB website 120 days before Board consideration.	• Approve updated EMP and disclose on ADB website	• Review bidding documents • Confirm project's readiness • Review, approve and disclose environmental assessment reports for replacement rural roads	• Review quarterly project progress reports, semi-annual environmental monitoring reports and project completion report • Undertake review missions • Advise on compliance issues, as required • Disclose semi-annual environmental monitoring reports on ADB website.	• Review and approve environmental monitoring reports and disclose on ADB website • Undertake project completion review mission and prepare Project Completion Report for approval by Board and disclosure on ADB website.

ADB = Asian Development Bank; AEMS = Ankang Environmental Monitoring Station; AEPB = Ankang Environmental Protection Bureau; AMTB = Ankang Municipal Transport Bureau; EA = executing agency; EHS = Environmental, Health & Safety; EIA = Environmental Impact Assessment; EIR = Environmental Impact Report; EMP = Environmental Management Plan; ESE = Environmental Supervision Engineer; FFPO = Foreign-fund Finance Project Office; FSR = Feasibility Study Report; GRM = Grievance Redress Mechanism; HDTB = Hanyin District Transport Bureau; IA = implementing agency; LDI = local design institute; LIEC = Loan Implementation Environmental Consultant; PCR = Project Completion Report; PPTA = Project Preparation Technical Assistance; O&M = Operation and Maintenance; RP = Resettlement Plan; SCG = Shangnan County Government; SCTB = Shangnan County Transport Bureau; SEMP = site specific environmental management plan; SEMS = Shangluo Environmental Monitoring Station; SEPB = Shangluo Environmental Protection Bureau; SPTD = Shaanxi Provincial Transport Department; SPHB = Shaanxi Provincial Highways Bureau; SWCR = Soil and Water Conservation Report; XCTB = Xunyang County Transport Bureau

C. Resettlement

65. **Land acquisition and demolition impacts.** The project is category A for involuntary resettlement. Land acquisition and resettlement (LAR) impacts are attributable mainly to the trunk roads component. Rural road improvements will result in minor LAR. The estimated permanent land acquisition for the project roads is 3,429 mu[28] including dry farm land, garden land, forest land, house plots and barren land. The total area of house and building demolition is 62,934 m^2 involving residential houses and other structures. An estimated 15,527 persons in 3,341 rural households will be affected, including 3,013 households affected by land acquisition and 328 households by both land acquisition and house demolition. The project roads are existing roads and most impacts are partial in terms of land loss, building loss and income loss.

[28] 1 mu = (1/15) or 0.0667 hectare

Table 15: Land Acquisition and Demolition Impacts

Item/component name			Unit	Xunyang Trunk Road	Hanyin Trunk Road	Shangnan Trunk Road	Xunyang Village Roads	Hanyin Village Roads	Road Safety Component	Total
affected county/District			nos	1	2	1	1	1	3	3
affected township			nos	4	4	5	2	1	14	10
Affected village			nos	22	11	19	7	3	59	121
affected enterprise			nos	0	0	0	0	0	0	0
permanent land acquisition	collective land		mu	1,162.29	464.0	1,563.5	169	70	0	3,428.76
	including: farmland		mu	453.53	132.9	217.7	34.2	3.3	0	841.59
temporary land occupation			mu	NA	29	NA	NA	NA	NA	29
Housing demolition*			㎡	31,441.6	11,887	18,543	882	180	0	62,933.6
directly affected persons	affected village	affected by LA only	HH	1139	599	1,177	50	48	0	3013
			person	3,905	2,234	4,644	196	193	0	11,172
		affected by LA and HD	HH	153	59	114	0	2	0	328
			person	607	251	488	0	9	0	1355
		subtotal	HH	1,292	658	1,291	50	50	0	3341
			person	4,512	2,485	5,132	196	202	0	12,527
	enterprise	affected by LA only	HH	0	0	0	0	0	0	0
			person	0	0	0	0	0	0	0
		affected by LA and HD	HH	0	0	0	0	0	0	0
			person	0	0	0	0	0	0	0
		subtotal	HH	0	0	0	0	0	0	0
			person	0	0	0	0	0	0	0
	Total		HH	1,292	658	1,291	50	50	0	3341
			person	4,512	2,485	5,132	196	202	0	12,527
resettlement budget			0,000 Yuan	9,357.2	3,577.1	5,614	285.6	52.2	0	18,886.1

Item/component name	Unit	Xunyang Trunk Road	Hanyin Trunk Road	Shangnan Trunk Road	Xunyang Village Roads	Hanyin Village Roads	Road Safety Component	Total
LA = land acquisition, HD = house demolition, HH = household Affected Person is the same as Displaced Person. ADB Safeguard Policy Statement (2009) trigger for involuntary resettlement changed the terminology of “affected person” to “displaced person”, which is defined as a person who is physically or economically displaced as a result of involuntary acquisition of land or involuntary restrictions on land use or on access to legally designated parks and protected areas. In the PRC, the resettlement plans maintain the original terminology of “affected person” and the definition is equivalent to ADB’s definition of “displaced person”. Since this Project is in the PRC, this Report uses the term Affected Person. *Xunyang village road will not involve residential house demolition but simple ground attached structures such as fences, shelters with 19 affected HH 77 APs								

66. **Resettlement plans.** Plans have been prepared that adequately address the LAR impacts. Five draft resettlement plans (RPs) based on project preliminary design have been prepared. The road safety component is unlikely to result in any LAR impacts. However, to deal with any unanticipated LAR impacts a RF has been prepared to assess any potential LAR impacts of implementation of road safety features on 25 rural roads with a length of 570 km). The draft RPs and RF are prepared in accordance of ADB's Safeguard Policy Statement (SPS) (2009), SR–2 on involuntary resettlement (IR) and relevant national and provincial/local policies of the PRC. The draft plans have been endorsed by the executing agency and disclosed to the project-affected persons (APs) and on the ADB website. Compensation for lost assets and resettlement allowance will be paid to the APs prior to the land acquisition and demolition. The focus of resettlement planning is to ensure that the APs are adequately compensated, their livelihood restored and they benefit from the new employment and income generation opportunities. Households affected by permanent land acquisition will be compensated in cash. Households affected by relocation will be compensated for the losses at the replacement cost and will be resettled within their original villages to ensure that their social and community characteristics and networks remain functional.

67. **Resettlement plan finalization.** SPTD will ensure that prior to the commencement of LAR the RPs are updated based on the final designs of the project roads. Updating of plans will be based on conducting a detailed measurement survey (DMS) that will include undertaking a full census of the affected peoples and preparation of an inventory of the losses. Various parties will be on site during DMS and recording, including APs, leaders of local communities, representatives of government organizations and project construction unit, supervision unit. DMS and recording should be transparent and detailed, and it should ensure that no items lost as a result of LAR are missing from the DMS records. The detailed list of loss for each household should be signed and confirmed by various parties and a copy should be kept in file by each party who signed the document. Final RPs will be submitted to ADB for review and approval, prior to commencement of any LAR activity. The finalized RPs will be disclosed to the APs and on the ADB website. SPTD will ensure that no civil work is awarded prior to the finalization of the RP and clearance of the related RP by ADB.

68. **Policy Framework and Implementation Arrangements.** The resettlement principles established for the project include (i) avoid involuntary resettlement wherever possible; (ii) minimize involuntary resettlement by exploring project and design alternatives; (iii) enhance, or at lease restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; (iv) improve the standards of living of the displaced poor and other vulnerable groups (at least to minimum standards); (v) compensation will be based on replacement cost of lost assets; (vi) compensation and entitlements provided to APs will be adequate to improve their living standard; (vii) all APs will be provided with resettlement assistance and fair compensation; (viii) all APs will be informed of the eligibility, compensation standards, livelihood, and income restoration plans, and project schedule to ensure that they will be able to participate in the RP implementation process; (ix) no land should be acquired unless replacement land or sufficient compensation for resettlement is provided to AP; (x) the implementing agency and an independent third party will monitor compensation and resettlement work; (xi) vulnerable groups should receive special assistance to ensure they can live a better life and the APs will benefit from the project; and (xii) the resettlement budget covers all aspects of compensation and rehabilitation assistance and is part of the overall project budget. SPDT will ensure that these policy requirements are complied with through an effective implementation of the resettlement plans and resettlement framework. Any significant changes in project scope/design will be reported to the ADB. For proposed changes to the project scope or design, the related

resettlement plan will be updated and submitted for ADB's approval prior to award of works and/or the commencement of civil works.

69. **Entitlements and compensation standards.** For people affected by the project, the resettlement objective is to achieve equal or better income and living standards in line with the PRC Land Administration Law (2004), and the ADB's Safeguard Policy Statement (2009). Any people losing land, housing, other assets or income sources will be assisted to fully restore their income and living standards. The entitlements are based on the principle of "replacement cost" for lost assets. Land compensation standards are determined by the relevant national and local policies and existing social and economic conditions of the project affected areas. The permanent land acquisition will be compensated in cash based on the multiples of average annual output value (AAOV) which are deemed to be adequate to replace income losses.

70. The main LAR impacts of the project result from house demolition. A number of relocation options have been provided to the affected households under the RPs. Compensation for residential house demolition will be based on 'replacement cost'. The 'replacement cost' principle does not take into account the depreciated value. The affected people are also entitled to salvage free of cost the material from the house affected by demolition. APs will also be entitled to compensation for decoration, movement subsidies, transition subsidies, and compensation for auxiliaries. There are no affected enterprises. The relocation options detailed in the RPs will be negotiated with the affected households with their preferred option to be nominated in the signed agreements. The FFPO and/or the respective PMO will ensure that the "rebuild prior to demolition" principle is followed and house demolition will only start once the affected households are properly settled in their new houses.

71. The compensation standards, as per the entitlement matrix of the various RPs, are provided in Table 16.

Table 16: Resettlement Entitlement Matrix

	Types	Scope	Entitled No. of AP and Households	Entitlements	Compensation Polices
1.	Permanent land acquisition	All affected land by trunk and rural road development in the project	62 affected villages and 3,341 households with 12,527 affected persons who used land before specified deadline (cut-off date)	100% of compensations for ground attachments and young crops shall be paid to direct AHs. At least 70% of compensation for LA shall be paid to direct APs or distributed to all registered population of the affected village group averagely at one time, while remaining 0-30% (varying from village group to village group subject the agreement reached among APs) of compensation for LA is retained by the village committee for infrastructure construction, public welfare and poverty relief. Preferential job opportunities shall be offered to APs (women included) with priority by FFPO, implementing agency, local government and village-running enterprises. Skill training: A total amount of CNY 700,000 has been budgeted to provide skill training to APs.	The compensation rates and subsidies are shown in each RP. The flat standard will be used. The compensation rate for permanent land acquisition is CNY 1,137-1,200/mu per year.
2.	Temporary land acquisition	To be identified during construction	None identified during RP preparation. To be confirmed during construction	All affected persons shall obtain compensations. A fee will be paid to land owners yearly, up to maximum of two years. In case occupation period needs to be extended, negotiation with owners in advance required. After completion, temporarily occupied land will be restored by the contractors to the original quality and will be handed back to the landowners.	The compensation rate for temporary land acquisition is CNY 1,137-1,300/mu per year.

	Types	Scope	Entitled No. of AP and Households	Entitlements	Compensation Polices
3.	Residential housing demolition	All 328 households of 62 villages and 13 townships	328 households with about 1,335 persons in 62 villages	The APs may choose options such as cash compensation, economically affordable house or exchange residential buildings. House owners without certificate of title shall receive compensation according to the house replacement cost (excluding land price) without any depreciation. The village committees will provide the house plot free for the new building construction. House relocation subsistence allowances will be paid for the full duration of the period of disruption and re-establishment subject to agreement with each affected. Compensation for structures and all other lost assets is paid in full before relocation. Vulnerable groups will be assisted to find suitable housing.	The resettlement costs are determined in accordance with the relevant regulations, with reference to the actual cost analysis of the main categories of the affected houses, and through the consultation with the local government officials and non-government organization representatives. Compensation for rural residential buildings shall be the replacement cost for structures plus the house site location price. Compensation for unlicensed buildings the project owner shall pay replacement price to the owner of unlicensed buildings without depreciation, but no house site location price shall be paid for unlicensed buildings.
4.	Ground attachments	All types of ground attachments	Proprietor	All will be compensated at replacement cost, and paid directly to the proprietors. Affected public facilities will be reconstructed by the owner according to the original size, standard and function. Cost is included in the resettlement budget.	Types of ground attachments identified during field surveys and their approximate replacement cost. Special facilities will be negotiated case by case.
5.	Public facilities (structures)	Public facilities	Proprietor	All affected property owners will be provided with satisfactory relocated land on the basis of the land area of the structure to be demolished.	Types of ground attachments identified during field surveys and their approximate replacement cost. Cost is included in the resettlement

	Types	Scope	Entitled No. of AP and Households	Entitlements	Compensation Polices
				The demolished structure will be compensated at replacement cost in cash (including compensation for loss of facilities and labor on the basis of replacement cost) to a similar size, standard and function	budget.
6.	Income rehabilitation measures	Losing more than 10% of productive land and/or house relocation, or Seriously affected by house demolition	28 households with 99 persons in 62 villages, and 328 households with 1,355 persons affected by house demolition	Supplement cash compensation together with preferential job opportunities for at least one person from the affected family for project generated unskilled employment. Skill training: A total amount of 0.5% of basic resettlement fee has been budgeted to provide skill training. The affected persons will obtain resettlement subsidy and to restore their income and living standard, and advance moving incentive. The local government will provide employment assistance (i.e., training and job arrangements) for the affected persons in the local enterprises.	Non-land-adjustment income-generating options might be more appropriate to the APs. With some technical assistance from the resettlement agency and NGOs, the fund might be invested in development projects. The APs have the right to choose the income restoration options; the income restoration plan must be fully consulted with the APs and must be agreed with the APs.
		Special supporting measures for affected vulnerable groups	Affected vulnerable groups (Verified during DMS)	Special fund for the vulnerable (2% of resettlement cost). All resettlement programs should consider the women's special needs. The women will be fully informed. The vulnerable groups especially the women have priority to obtain the project-related employment opportunities. Labor support for the vulnerable groups	

	Types	Scope	Entitled No. of AP and Households	Entitlements	Compensation Polices
				in the house reconstruction will be provided.	
			Women	Local government will promote improved sanitation in new houses. Contractors will give preference to hire women. Encourage APs and women in particular to participate in monitoring and evaluation. Every resettlement office must hire at least one female worker to responsible for women's affairs in the process of resettlement.	Local government and village leaders should provide guidance to invest funds to improve household incomes, with specific options in local areas geared to women.
7	Complaints and Grievances	Compensation rate, payment of compensation and relocation measures	The affected persons who lodge a complaint on land acquisition and relocation matters	Various expenses related to relocation complaints put forward by the affected persons and management expenses will be exempted. Every resettlement office must hire at least one female worker to responsible for women's affairs in the process of resettlement.	

AH = affected household, AP = affected person, FFPO = Foreign Fund Financed Project Office, IA = implementing agency, LA = land acquisition, NGO = non-government organization.

72. **Resettlement budget.** The cost of LAR under this Project, including contingencies and related taxes and duties, is estimated to be CNY 188,861,000. The cost of LAR has been included in the project budget. The SPTD will ensure that adequate counterpart funding will be made available for land acquisition and resettlement. At the implementation stage, the compensation contract will be negotiated and signed with the affected villages and affected households. Therefore, the final resettlement cost may be subject to further adjustment. SPTD will ensure that additional funds will be arranged in a timely manner.

73. **Resettlement and income restoration.** Losses resulting from LAR for affected villages and households have been checked in detail and negotiations on income restoration plan have been conducted with the APs. Findings and results of participation have been incorporated in the RPs. To ensure successful resettlement of APs and restore their living standards, detailed rehabilitation plans are developed and included in the RPs. For land loss impacts, rehabilitation measures include distribution of cash compensation among village groups, promotion of cash crops, offering various skill training and job introduction for APs; and offering pension program for APs who have no land or per capita farmland below 0.3 mu. During project construction, efforts will be made to provide temporary employment opportunity to APs in order to increase their income. The overall project LA impacts are modest in terms of cultivated land loss (less than 10%) and involve only slight income loss, so if the cash compensation is used to improve existing crop patterns, or introduce other cash crops, these measures will easily restore the losses incurred as a result of land acquisition.

74. Persons affected by house relocations are entitled to either: (i) cash compensation, (ii) the purchase a new house in a new rural village development program, or (iii) individual reconstruction on a government allocated housing site. No demolition of existing structures is permitted before alternative arrangements, deemed acceptable by the affected person, are in place. Affected households will be entitled to salvage material from the demolished house without cost and will be entitled to a moving subsidy as detailed in the entitlement matrix of the respective RP. The EA will ensure these conditions are effectively met.

75. **Vulnerable groups.** These are defined as consisting of poor families, disabled people, the elderly, and woman headed households. During the DMS, the people belonging to the vulnerable groups will be further verified and confirmed. During the course of resettlement implementation, the project proponent will give priority support and help in to rehabilitate and improve the lives of these vulnerable persons, including giving priority of introduction of employment and jobs generated by the project. SPTD will ensure that each implementing agency provides funds for supporting the vulnerable groups (1% of basic resettlement cost) as included in the RP budget.

76. **Implementation arrangement and schedule.** In order to implement the RPs in a smooth and effective manner, a resettlement organizational network from higher to lower governmental levels will be established and will be responsible for detailed planning, coordination, implementation and monitoring of resettlement activities. The SPTD will set up a PMO that will have adequate trained staff for overseeing and coordinating the overall implementation of the RPs and will ensure that the resettlement process is in accordance to the RPs. The implementing agencies will establish a social safeguards implementation unit (SSIU). The SSIU will be responsible for implementation of the LAR in accordance with the provisions specified in the RPs as well as developing coordination with various other agencies working on resettlement implementation. The SSIU requires capacity building on ADB procedures and policies and a capacity building expert will be engaged under the ADB's consultancy support

towards project management (ToR for Capacity Development Specialist is attached in Appendix 2).

77. The SSIU will be responsible for timely reporting (on a quarterly basis) of the progress of resettlement plan implementation. SPTD will compile and analyze these reports from the implementing agencies and will forward consolidated quarterly LAR implementation progress reports to the ADB as part of the PPMS reporting system. SPTD through the FFPO will ensure that the project implementation follows the implementation schedule prepared for land acquisition and resettlement activities.

78. **Affected persons' participation and consultation.** SPTD through the SSIU of both the IAs will ensure that the APs are informed and consulted about the project benefits, project adverse impacts, compensation and entitlements, livelihood restoration programs, and the procedures set out to redress affected peoples' grievances and will follow consultation and participation schedule (C&P) as outlined in the RPs indicating timings, methods, objective, documentation procedures and incorporation of APs opinions on resettlement and implementation. Sex-disaggregated data of public participation and consultation will be recorded and reported as part of the internal progress reports and external monitor's reports. SPTD will ensure that the genuine outcomes of the public consultation are integrated in the resettlement plan implementation.

79. **Bidding documents and contracts.** SPTD shall cause the project IAs to ensure that all bidding documents and contracts for Works contain provisions that require contractors to: (a) comply with the measures relevant to the contractor set out in the RP, and any corrective actions and (b) all the employment targets for project affected people including the targets specified for women with a requirement of maintaining sex-disaggregated database of project employment are adhered to.

80. **Grievance redress mechanism.** SPTD will ensure that an effective mechanism is established prior to the commencement of LAR, to deal with project related grievances of the affected persons. Such grievances may derive from measurement of asset losses; surveying, statistics and computation errors; compensation standards and entitlements including the methodology used for calculating these entitlements; preparedness and suitability of resettlement sites; and delays faced during the implementation of RPs. The agreed GRM will provide a clear and transparent mechanism and will be publicized to the affected persons prior to the commencement of LAR. If the GRM process does not meet the requirements of APs, at any time they may take their case to the civil courts, in accordance with the Civil Procedures Act. The GRM process may be utilized for other project related grievances. SPTD will ensure that a record of such grievances received (both written and oral) and resolved will be kept by the PMO and upon request will be made available for review to the external monitors and ADB review missions.

81. **Record keeping.** SPTD will ensure that the PMO keeps the relevant records of the resettlement plan implementation process. These include records of household agreements signed on land acquisition demolition, records of compensation paid, public participation and consultation records and integration of outcomes of these consultation process, grievances received and resolved. On request these records will be made available for review to external monitor and ADB missions. Additionally, the SPTD through the project implementing agencies will develop a database of the project affected persons and will keep the database updated till the evaluation of the LAR impacts and effectiveness of implementation of the RPs.

82. **Monitoring and evaluation.** The plan for external M&E is included in the RP. The RP implementation will be monitored and its effectiveness evaluated by an external monitor. SPTD will ensure that both the implementing agencies engage an independent external monitor in accordance with the ADB procedures. The detailed TOR for the external monitor is included in the RPs. The resettlement budget includes funds for external monitoring. The external monitor will be engaged prior to the commencement of land acquisition and resettlement activities. The monitor will conduct a baseline survey prior to resettlement and will provide ADB and PMO copies of the M&E reports twice a year during resettlement implementation and once a year after resettlement completion for two years. These reports will be disclosed on ADB website and made available to the APs.

D. Indigenous Peoples

83. The project will not adversely impact any ethnic minority communities and remains a Category C for indigenous peoples' safeguards. No further actions are required.

VII. GENDER AND SOCIAL DIMENSIONS

A. Social Development Action Plan (SDAP)

84. To enhance benefits for local affected communities and to address potential negative impacts caused by the project a SDAP has been prepared jointly by SPTD in coordination with the two implementing agencies and related government agencies, and local governments. The SDAP has been reviewed by key stakeholders including various government agencies, such as local labor bureau, social security bureau, health bureau, poverty alleviation office, and local women's association.

85. The purpose of the SDAP is to ensure that (i) the project design is inclusive and is developed to maximize the project benefits particularly to the poorer sections within the project impact zone, (ii) measures are developed to address important social and poverty issues identified during project preparation and these measures are implemented; (iii) potential possible adverse impacts are avoided or mitigated; and (iii) project benefits are equitable and inclusive. Measures formulated to address these issues are based on poverty and social analysis (PSA) and consultation with stakeholders. SPTD has overall responsibility to ensure that the activities outlined in the SDAP are implemented, monitored and reported. The PMO through the SSIUs will be responsible for implementation of SDAP. The SDAP will be internally monitored by the PMO and progress will be reported annually. SPTD shall ensure that the SDAP report data is sex disaggregated.

86. **HIV/AIDS and Other Communicable Diseases.** Project assurances require dissemination of information about HIV/AIDS transmission and prevention to be carried out on construction sites for the employees at time of their mobilization. SPTD will be responsible that the provision is included in the award of contract agreements with the contractors.

87. **Labor market impact.** It is estimated that approximately 1,500 unskilled jobs will be generated from the civil works during construction. SPTD will collaborate with Labor and Social Security Bureau to ensure the contractors employ local labor and target percentages of poor and women. SPTD will ensure that the contractors meet core labor standards as outlined in national, provincial and municipal laws and regulations specified in project assurances. SPTD shall ensure that the principle of 'equal pay for equal standard of work' is implemented and no discrimination is made on the basis of gender. SPTD shall also ensure that no child labor is allowed during implementation and operation of the project. Specific targets for employment have been included in the SDAP.

88. Various activities planned under the SDAP are shown in the Table 17.

Table 17: Social Development Action Plan

Proposed Actions	Target Group(s)	Agencies Involved	Timing	Funding Needs & Source (CNY)	Monitoring Indicators & Source
A. PROJECT BENEFITS AND ENHANCEMENT MEASURES					
1. Design Features: Shaanxi mountain Roads Safety Demonstration ➢ Rehabilitation of 3 trunk roads (186.95 km) and 8 rural road upgrading with road safety improvement (139.7 km) ➢ Rural road safety improvement for 25 sections rural road totaling 570 km. ➢ Installation of road safety measures such as signage, traffic calming strips, pedestrian crossings ➢	Communities along the road. Around 62,718 people including 33.8% of poor or low income population and about 50% of female.	FFPO and County/District PMOs, contractors	2016-2019	$ 374 million as Project budget	• 36 sections totaling 896.3 km of roads reconstructed and safety improved. • Number of easy-identifiable roads safety signs installed • Number of effective measures taken for speed limitation. • % reduction in traffic accident • Number of village road spots fixed
2. Walk Wise：Improved Road Safety Awareness and Behavior of Road User[29] (i) Setting up road safety working groups (RSWG) (ii) school-based education and awareness building (iii) community education and awareness building (iv) law enforcement on safe road behaviour (v) Establishing road crash database	Communities and schools along the project roads	RSWG with members from FFPO and County/District PMOs, WF, Village communities and Schools along the project roads	2017 onwards	$ 300,000 in project road safety budget	• No. of RSWG established • No. of awareness building material prepared and distributed. • No. of local communities covered by road safety training. • No. of schools conduct road safety education program • No. of villages conduct road safety awareness building program • No. of women participated the activities • Annual database for accidents established.

[29] The program will be further developed and refined during implementation with the support of international and national consultancies.

Proposed Actions	Target Group(s)	Agencies Involved	Timing	Funding Needs & Source (CNY)	Monitoring Indicators & Source
3. Project Economic Benefits: • 50% of unskilled jobs (estimated number of jobs 2,700 in total with 1500 unskilled and 1200 skilled) for poor, women, project affected, and local people • Use of local resources and local construction materials	Villages along road, priorities given to poor, women, and project affected people	FFPO, and County/district PMO, and Contractors	2016–2019	Project budget	• Provisions included in the bidding documents • Number of unskilled jobs provided to local people (sex disaggregated data) • Average purchase of local products and other resources (contractor camps details) in Yuan • Number of establishments (houses/space) rented • Source of construction materials – money spent and % of total procurement (contractor camp details)
4. Capacity development measures (poor, women) • Technical training for cash crop growing and non-farming job skills for local population including people affected by land acquisition and house demolition.	All 62 villages with APs, beneficiary villages along the road. Priorities give to poor, women and villagers, total target trainees 3000 person	FFPO, and County/district PMO, Local PRADO	2017-2019	Project budget In RP (CNY 599,940), local government annual budget (about 300,000) to cover non-affected HH	• Number of training sessions held • Number of topics covered by training • Number of participants trained (training report) –sex disaggregated data
5. Consultation and Participation • Ensuring public participation in project design and implementation • Ensuring public participation in project monitoring and completion reporting, particularly regarding local facility recovery	Communities along the project roads (50% of female representatives 30% of poor participants)	County/District PMO, WF, and village committee	2015-2019	Included in project management costs	• No. of participants (disaggregated by sex, poor and non-poor) in three counties/district separately • No. of suggestions and comments from public representatives (disaggregated by sex, poor and non-poor) in three counties separately • No. of suggestions and

Proposed Actions	Target Group(s)	Agencies Involved	Timing	Funding Needs & Source (CNY)	Monitoring Indicators & Source
					comments to be considered and accepted • Clearance letter from affected villages regarding facility recovering.
B. MITIGATION MEASURES TO ADDRESS SOCIAL RISKS					
1. Minimizing risk of communicable diseases: **HIV/AIDs and STI awareness** • Local CDC provide TOT training to health focal point of the contractor teams • Trained contractors' focal point to provide training to all workers and managers in accordance with the provision under bid contracts • Distribute educational pamphlets and posters at contract sites and local communities • Awareness building and education on anti-drug human trafficking and drug using, especially targeting youths	Contractor staff, construction workers, local communities and villagers	FFPO and County/district PMO, contractors and County CDC, village committee	2016–2019	CNY 110,000 included in project management	• Contractors bids include provision for HIV/AIDS awareness training to all workers • Number of focal points trained and workers provided awareness training • Number of training programs conducted for workers • Number of awareness raising material produced & distributed • Number of local communities provided awareness training • Number of condoms distributed • Number of awareness training programs on drug and human trafficking
2. Minimization of disturbances during construction • Avoidance of water sources contamination. • Avoidance of construction work at night nearby residential areas. • Minimization of dusts caused by	Villages close to the alignment corridors	FFPO and County/district PMO and contractors	2016–2019	Included in project budget (refer to EMP)	• Number of complaints received and resolved • Length of irrigation and drainage canals, percentage of recover ratio • Clearance from village committees upon

Proposed Actions	Target Group(s)	Agencies Involved	Timing	Funding Needs & Source (CNY)	Monitoring Indicators & Source
construction. • Site cleaning up on work completion • Provide temporary service during construction • reconstruction of irrigation, drainage systems and approach roads					completion
C. Monitoring and Evaluation					
1. Monitoring and Evaluation	All project counties and district with project components	FFPO, and County/district PMO	2016-2019	CNY 300,000 as part of project consultancy budget	• Annual monitoring reports

CDC = Center of Disease Control, DRB = Development and Reform Bureau, EMP = environmental management plan, FFPO = foreign fund financed project office, HH = household, LG= Local Government M=Million PRADO = Poverty Reduction and Development Office, PMO = Project Management Office, RP = resettlement plan, RSWG = road safety working group, TB = Tourism Bureau, LG =Local Government, and WF = Women's Federation.

Sources: Shaanxi provincial project management office in Communication Department, Ankang and Xunyang City Government, Hanyin, Xunyang and Shangnan county level PMO, County level of bureaus/office of transport, poverty alleviation office, civil affairs, labor and social insurance, and women's federation.

B. Gender Action Plan

89. The trunk roads improvement will facilitate economic development in the poverty designated counties. The rural road pavement will provide many poor farmers, increasingly represented by women as men go outside to take up migrant work, with improved access to economic opportunities, education, health and other services. The road safety improvement component will reduce road crashes and related impacts to contribute to inclusive economic growth and poverty alleviation in the region.

90. The proportion of female population in project counties was 46.3% in Xunyang, 46.8% in Hanyin and 47.5% in Shangnan respectively in 2012, of which the majority are rural women accounting for about 65% of total female population. Women play important roles both in agricultural sector and household activities.

91. Gender analysis and community consultations during poverty and social analysis (PSA) demonstrated that the project will have positive benefits for both women and men in terms of improved mobility, an easier access to jobs, social services and income generation opportunities. Women's transport activities are different from men's. Women's role in agriculture sector and in household shapes their transport patterns, frequency of women's mobility and travel costs. Women prefer using public transport such as buses or vans over motorcycles. Women are more likely to accompany family members to hospital as a part of their role of provider of primary family care. Women indicate that they have less time to travel than men, due to their heavy involvement in household and agricultural activities. Some work in enterprises and look after families as well. Women spend less on travel costs than men because they tend to walk within villages or take public transport. Due to their higher level of domestic responsibility, women assign greater importance to transport that is easier, faster, and safer and provides more mobility, as this in turn provides more home time for productive work. Women also expect more buyers to come to the village, which would in turn further reduce travel time and thus save more time.

92. During the project scope defining, a wide range of rural road upgrading and rural road safety improvement is included which will benefit women. First, women travel more locally, particularly on rural road. Secondly, women travel more rely on public transport which will be most likely available as the improved road will meet the public transport operation required road conditions.

93. In order to further maximize positive gender impact, the project has been designed to meet an ADB Effective Gender Mainstreaming (EGM) categorization, and a project gender action plan (GAP) has been prepared. GAP features will include a focus on: ensuring women's equitable participation in project-related public consultation; incorporating gender-responsive features in the project design; promoting increased employment opportunities for women; and building EA/implementing agency institutional capacity for gender mainstreaming. The GAP is presented in Table 18.

Table 18: Gender Action Plan

Project Outputs	Activities and Performance Indicator/targets	Responsibility
Output 1: Trunk roads	• Employ at least 20% local women in unskilled construction jobs • Include employment requirements in the Works bidding documents • Local women's federation to coordinate with contractors in (i) publicizing the project generated employment opportunities, and (ii) supporting local women to gain employment with project contractors • Ensure equal pay for female and male workers who undertake equal value of work	Project PMO and two IA's focal points to coordinate the implementation, monitoring and reporting. WF to coordinate the employment provisions. Contractors to ensure achieving employment targets as indicated in bidding documents. Gender specialist to provide overall guidance on implementation of activities and achieving targets.
Output 2: Rural Road Upgrading	• Employ at least 30% local women in unskilled construction jobs on rural roads • Include employment requirements in the Works bidding documents • Local women's federation to coordinate with contractors in (i) publicizing the project generated employment opportunities, and (ii) supporting local women to gain employment with project contractors • Ensure equal pay for female and male workers who undertake equal value of work • Ensure equal pay for female and male workers who undertake equal value of work (monitored through contractors' payrolls)	Project PMO and two IA's focal points to coordinate the implementation, monitoring and reporting. WF to coordinate the employment provisions. Contractors to ensure achieving employment targets as indicated in bidding documents. Gender specialist to provide overall guidance on implementation of activities and achieving targets.
Output 3 Road safety[30]	• Road safety: Community consultations and awareness building on road safety issues women (50% participants) federations. • 50% women personal for road safety capacity development training • Training for school/community road safety awareness building with at least 40% women facilitators • Women take lead role in community road safety	FFPO and county/district PMO gender focal point, WF, Gender specialist

[30] The ToR for Road Safety Education Pilot will ensure that 50% women participate in various activities undertaken under the Pilot.

Project Outputs	Activities and Performance Indicator/targets	Responsibility
	awareness building implementation. • Active involvement of local women's federation.	
Output 4: Institutional strengthening and capacity building	• Project PMO and two IA's will appoint a staff member each as focal points responsible for gender mainstreaming and GAP implementation and reporting • Procure a gender specialist to design and implement gender awareness training and to provide GAP orientation/training and support to key EA/IA staff • Gender sensitivity training for staff of project related government agencies (minimum of 50% men participants) • Collect sex-disaggregated data on project impacts	FFPO and county/district PMO, gender specialist
Gender responsive social safeguards measures	• Ensure at least 50% female participation in public consultation • Include 50% women in livelihood restoration training for affected people • Ensure that women and men are equally entitled to new house registration, and both names are reflected on titles • Provide additional support to women headed vulnerable households	FFPO and county/district PMO

CDC = Centre for Disease Control, EA = executing agency, GAP = gender action plan, IA = implementing agency, WF = Women's Federation.

94. SPTD will ensure that contractors' bidding documents clearly indicate implementation requirements of the gender sensitive project design features.

95. **Gender monitoring.** GAP indicators have been incorporated into the overall Monitoring and Evaluation (M&E) plan for the project. The gender specialist consultant(s) will work with the PMOs and their social safeguards implementation unit (SSIU) staff to orient them on GAP requirements and develop a detailed implementation and monitoring plan for gender activities. The PMO will assign a staff member gender focal point to be responsible for gender mainstreaming, and GAP implementation and reporting. The gender specialist consultant(s) will provide guidance to the PMO for drafting of the first project gender plan implementation progress report, and review the subsequent reports. Updated information on the status of GAP implementation should be included in all project progress reports. ADB staff with expertise in gender and social issues will participate in the midterm review.

VIII. PERFORMANCE MONITORING, EVALUATION, REPORTING, AND COMMUNICATION

A. Project Design and Monitoring Framework

96. The project design and monitoring framework for the project is shown below.

Impacts the Project is aligned with:
Road crash fatalities and serious injuries in southeast Shaanxi Province reduced (project derived). Efficient and safe all-weather accessibility in southeast Shaanxi Province provided (sector results framework).

Project Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources or Reporting Mechanisms**	**Risks**
Outcome Trunk and rural road network efficiency and safety in southeast Shaanxi is improved	a. Car VOC savings (CNY/km) by 2020 from 2014 baseline of G316 : 8% from 2.53 S102 : 11% from 2.47 S224 : 7% from 2.51	a. After-project survey	
	b. Car travel time savings by 2020 from 2014 baseline of G316: 15 from 86 minutes (17%) S102: 6 from 45 minutes (13%) S224: 10 from 132 minutes (7%)	b. After-project survey	
	c. Medium goods vehicle VOC savings (CNY/km) by 2020 from 2014 baseline of G316: 14% from 4.55 S102: 16% from 4.53 S224: 25% from 5.75	c. After-project survey	
	d. Medium goods vehicle travel time savings by 2020 from 2014 baseline of G316: 24 from 110 minutes (21%) S102: 12 from 61 minutes (19%) S224: 27 from 186 minutes (14%)	d. After-project survey	
	e. Crashes, fatalities, and injuries per vehicle km travelled on project roads, reduced by 25% in 2019 from 2011 baseline figures of 517 crashes; 96 deaths; 1,636 injuries.	e. Traffic police data	Traffic police may not provide data Anticipated driver and local residents behavioral change does not eventuate
	f. Average travel frequency per month for rural households increases from 16.4 in 2014 to 20 by 2020	f. PPTA survey and similar follow-up survey	Expected economic growth fails to materialize
	g. Rural roads are passable all year round by 2020	g. Executing agency project monitoring reports	Increased quality of road surface leads to higher speeds and, thus, more fatalities and traffic incidents
	h. Average travel speed on trunk roads increased from 40 km/hour to 60 km/hour by 2020	h. After-project survey	
	i. Percentage of three-star[a] rated project roads increases from 27% to 59% by 2020	i. Based on feasibility and final designs and ChinaRAP evaluation	

Projects Result Chain	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Risks
Outputs			Counterpart funding is not sufficient and/or is not available in a timely manner Project implementation consultants are not recruited in a timely manner Lack of adequate coordination between executing agency and local agencies Delay to project commencement affects Ministry of Transport subsidies Lack of local agency cooperation in relation to road safety awareness program Shaanxi Provincial Transport Department reluctant to embrace iRAP philosophy
1. Trunk roads upgraded	1a. 187 km of trunk roads upgraded from class III/IV to class II/III by 2019 1b. Trunk road iRAP three-star ratings targets by lengths are: Vehicle occupants: 79% Motorcyclists: 53% Pedestrians: 55% Bicyclists: 79% 1c. 20% of unskilled labor to be women	1a. ADB review missions and project management consultant progress reports 1b. ChinaRAP assessment reports 1c. SDAP	
2. Rural roads upgraded	2a. 139.6 km of rural roads upgraded to paved class IV standard by 2019 2b. 57% of these rural road lengths have three-star safety rating or better 2c. 30% of unskilled labor to be women	2a. ADB review missions and progress reports 2b. ChinaRAP assessment reports 2c. SDAP	
3. Crash reduction program implemented	3a. 24% of these road lengths now have three-star safety rating or better	3a. ChinaRAP assessment reports	
4. Institutional development enhanced	4a. Safety awareness campaign participants in three schools reporting enhanced knowledge of subject area(s) implemented 4b. Community safety awareness campaign should target 50% men and 50% women participation 4c. 110 iRAP training participants reporting enhanced knowledge of subject area(s) 4d. 100 of iRAP participants passing test	4a. Road safety consultant reports 4b. Road safety consultant report 4c. Road safety consultant report 4d. Road safety consultant report	

Key Activities with Milestones

1. Trunk roads rehabilitation (Q4 2018)
1.1 Complete detailed design (Q1 2015).
1.2 Commence land acquisition and resettlement activities (Q4 2015).
1.3 Complete construction of civil works (Q4 2018).
1.4 Implement and monitor environmental management plan (Q3 2015 to Q4 2019).
2. Rural Road Improvement (Q4/2017)
2.1 Complete detailed design (Q1 2015).

2.2 Commence land acquisition and resettlement activities (Q4 2015). 2.3 Complete construction of civil works (Q4 2017). 2.4 Implement and monitor the environmental management plan (Q1 2016 to Q4 2017). **3. Crash reduction program (Q4 2019)** 3.1 Complete project design (Q1 2015). 3.2 Complete construction and/or installation of road safety installations (Q4 2019). **4. Institutional development (Q1 2019)** 4.1 Complete implementation of the road safety program (Q4 2019). 4.2 Complete capacity building and iRAP training (Q1 2018).
Inputs ADB: $200,000,000 Government: $199,960,000
Assumptions for Partner Financing Not applicable

ADB = Asian Development Bank, iRAP = International Road Assessment Program, km = kilometer, Q = quarter, SDAP = social development action plan, VOC = vehicle operating cost.

[a] An explanation of the iRAP star rating system and the meaning of a three-star rating can be found in the Road Safety Demonstration (accessible from the list of linked documents in Appendix 2).

Source: Asian Development Bank.

B. Monitoring

97. **Project performance monitoring.** Within 3 months of loan effectiveness, the FFPO with support of the PMC will establish a project performance monitoring system (PPMS). The PPMS will monitor three levels of information:

(i) **Project progress.** The FFPO will monitor on a yearly basis data corresponding to the indicators and targets set in the DMF. The indicators will be submitted as part of the quarterly progress reports to ADB. They will provide information necessary to update ADB's PPMS.

(ii) **Component progress.** Information on the progress of each component under outputs 1, 2 and 3 will be monitored by the County Transport Bureaus and reported to the ADB FFPO; information includes (a) baseline social data; (b) procurement, physical and financial progress; and (c) status of implementation of EMP, RPs, GAP and SDAP. The FFPO will update the information on a quarterly basis and report in the quarterly progress reports. Within 6 months after the completion of a subproject, the FFPO will update social data, finalize physical and financial information, finalize information on the implementation of EMPs, RPs and SDAP, and reevaluate economic benefits based on new traffic count results.

98. **Compliance monitoring.** Status of compliance with loan covenants will be monitored and reported by the FFPO through the quarterly project progress and semi-annual environmental and resettlement monitoring reports. This includes commitments by the SPG and SPTD in financial, technical, managerial, safety, environment, resettlement and road safety areas.

99. **Safeguards and social dimension monitoring.** Status of the implementation progress of the EMPs, RPs, GAP and SDAP will be included in the quarterly project progress reports and the semi-annual safeguard monitoring reports and reviewed during ADB review missions. The semi-annual monitoring reports will be publicly disclosed locally. Environmental and IR semi-annual reports will also be disclosed on the ADB web site.

C. Evaluation

100. ADB will visit the project at least once a year to monitor performance during implementation. Within 18 months after the effectiveness, ADB will conduct a midterm review to identify problems and constraints encountered and suggest measures to address them, including appropriateness of scope, design, implementation arrangements, schedule of activities, and compliance with safeguard and other covenants. Within 6 months of physical completion of the project, the executing agency will submit a project completion report to ADB.[31]

D. Reporting

101. The executing agency's reporting requirements are detailed in Table 19:

[31] Project completion report format available at http://www.adb.org/Consulting/consultants-toolkits/PCR-Public-Sector-Landscape.rar.

Table 19: Executing Agency Reporting Requirements

Title	Timing/Frequency/Schedule	Note
Quarterly Progress Report	Quarterly	Refer template in Appendix 3
Environmental monitoring reports	Semi-annually	Refer template in Appendix 6. Refer to Appendix 5, Table EMP-6: Reporting Plan
GAP and SDAP	Quarterly	GAP and SDAP implementation progress reported in project Quarterly Progress Reports. PMO with support of Gender Specialist to submit annual consolidated reports on GAP implementation
Resettlement monitoring reports	Semi-annually	For RPs, monitoring to follow the External Monitor TOR included in the RPs
Project completion report	Within 6 months of physical completion of the project	In accordance with ADB standards
Audited project accounts and financial statements	End of June of each year	In accordance with national approved standards

E. Stakeholder Communication Strategy

102. Within 2 months from the loan effectiveness, the FFPO will commence disclosure of all key project-related information, including the scope, cost, and financial and institutional arrangements of the project, annual performance and sustainability report, and project progress such as procurement, contract award, and disbursement in a language culturally appropriate and easily understood by the project affected people.

103. Consultation is an important aspect of the project. The SPTD will ensure that local communities affected by the project are consulted before each subproject implementation under the provisions of the SDAP, RPs and EIA/EMP, and after subproject implementation, to assess and remedy any residual concerns. Public awareness programs for HIV/AIDS will be coordinated by the FFPO. The Walk Wise consultant will work closely with the implementing agencies and executing agency to develop key road safety messages and will develop a set of communication materials including: videos, billboards, banners, flyers, and posters. These materials will communicate the objectives of the program and the importance of safe, high-quality roads in their communities. The consultant will distribute these materials at public events, with the objective to educate the wider community on smart road user behavior and reinforce the messages taught in the target schools.

IX. ANTICORRUPTION POLICY

104. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project.[32] All contracts financed by ADB shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all project contractors, suppliers, consultants, and other service providers. Individuals/entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activity and may not be awarded any contracts under the project.[33]

105. To support these efforts, relevant provisions are included in the Loan Agreement and the bidding documents for the project. In particular, all contracts financed by ADB in connection with the project shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all contractors, suppliers, consultants, and other service providers as they relate to the project. In relation to the project, the executing agency will ensure that (i) a supervisory body is established for prevention of undue interference in business practices, and adequate resources are made available for its effective operation; (ii) a leading group of officials from the supervision division of the executing agency is located in offices involved in bidding, installation, and other operational activities under the project; and (iii) periodic inspections on the contractor's activities related to fund withdrawals and settlements are carried out. The executing agency shall also initiate liaison meetings with the Prosecutor's Office, as needed, to discuss any warnings about, or information on, alleged corrupt, fraudulent, collusive, or coercive practices relating to the project.

[32] Available at: http://www.adb.org/Documents/Policies/Anticorruption-Integrity/Policies-Strategies.pdf
[33] ADB's Integrity Office web site is available at: http://www.adb.org/integrity/unit.asp

X. ACCOUNTABILITY MECHANISM

106. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make a good faith effort to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.[34]

107. The ADB's Accountability Mechanism Policy has been explained to SPTD and the implementing agencies. SPTD and the implementing agencies understand their specific role and responsibilities in relation to the Accountability Mechanism and have agreed to cooperate in case of complaints made. The cooperation includes providing Compliance Review Mission access to the sites, complainants and relevant information and documents.

[34] For further information see: http://compliance.adb.org/.

XI. RECORD OF PAM CHANGES

108. All revisions/updates during the course of implementation are retained in this Section to provide a chronological history of changes to implemented arrangements recorded in the PAM.

No.	PAM Changes/Updates	Date	Remarks
1	Initial draft	9 Feb 2015	First draft provided to EA prior to tripartite mission
2	Second draft	13 Mar 2015	Loan Fact-Finding Mission
3	Third draft		

Updated and confirmed by:

Mr. David Fay
Transport Specialist, EATC
East Asia Department
Asian Development Bank

PROCUREMENT PLAN

Basic Data

Project Name: Shaanxi Mountain Road Safety Demonstration Project	
Project Number: 46042-002	**Approval Number:** TBD
Country: People's Republic Of China	**Executing Agency:** Shaanxi Provincial Transport Department Government (SPTD), represented by the Foreign Fund Financed Project Office (FFPO)
Project Financing Amount: $434.71 million **ADB Financing:** $200 million **Non-ADB Financing:** $234.71 million	**Implementing Agency:** Shangnan County Government, and Ankang Traffic Bureau (as joint implementing agency, responsible for projects in respective counties
Date of First Procurement Plan: 9 February 2015	**Date of this Procurement Plan:** 12 March 2015

A. Methods, Thresholds, Review and 18-Month Procurement Plan

(i) Procurement and Consulting Methods and Thresholds

1. Except as the Asian Development Bank (ADB) may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

Procurement of Goods and Works		
Method	**Threshold**	**Comments**
International Competitive Bidding (ICB) for Works	$40,000,000 and above	NA
International Competitive Bidding for Goods	$3,000,000 and above	NA
National Competitive Bidding (NCB) for Works	From $200,000 up to $40 million	Prior review for 1st bidding package, subject to capacity assessment of Procurement Agent
National Competitive Bidding for Goods	From $100,000 up to $3 million	Prior review for 1st bidding package, subject to capacity assessment of Procurement Agent
Shopping for Works	Up to $200,000	
Shopping for Goods	Up to $100,000	

Consulting Services	
Method	**Comments**
Quality and Cost Based Selection (QCBS)	90:10 with BTP
Consultants' Qualifications Selection (CQS)	
Single Source Selection (SSS)	
Individual Consultants' Selection (ICS)	

(ii) Goods and Works Contracts Estimated to Cost $1 Million or More

2. The following table lists goods and works contracts for which the procurement activity is either ongoing or expected to commence within the next 18 months.

To be procured by Ankang Traffic Bureau (implementing agency)

	Package Number	Location	Length (km)	General Description	Estimated Value $	Procurement Method	Review (Prior/Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
	G316 Trunk Roads Upgraded									
1	XALJ	K0+000-K34+800.507	34.357	Subgrade, Bridge (incl. bridges $4.7 million)	23,792,000	NCB	Prior	1S1E	Q3/2015	Advance contracting & retroactive financing
2	XALM	K0+000-K34+800.507	34.357	Pavement, Safety Facility and Traffic Engineering	9,424,000	NCB	Prior	1S1E	Q3/2016	
3	XALH	K0+000-K34+800.507	34.357	Landscape Engineering and Environment Protection	1,281,000	NCB	Prior	1S1E	Q3/2016	
	S102 Trunk Roads Upgraded									
4	XXLJ01	K0+000-K30+000	30	Subgrade, Bridge, Tunnel (incl. bridges $5.6 million, tunnels $21.3 million)	39,271,000	NCB	Prior	1S1E	Q3/2015	Advance contracting & retroactive financing
5	XXLJ02	K30+000-K45+000	15	Subgrade, Bridge, Tunnel (incl. bridges $6.3 million, tunnels $9.3 million)	34,780,000	NCB	Prior	1S1E	Q3/2015	Advance contracting & retroactive financing
6	XXLJ03	K45+000-K60+683.91	15.246	Subgrade, Bridge, Tunnel (incl. bridges $2 million, tunnels $18.9 million)	38,583,000	NCB	Prior	1S1E	Q3/2015	Advance contracting & retroactive financing
7	XXLM	K0+000-K60+683.91	60.246	Pavement, Safety Facility and Traffic Engineering	21,440,000	NCB	Prior	1S1E	Q3/2016	Civil Works
8	XXLH	K0+000-K60+683.91	60.246	Landscape Engineering and Environment Protection	1,820,000	NCB	Prior	1S1E	Q3/2016	Civil Works
	S102 Goods									
9	XXJD	K0+000-K60+683.91	60.246	Tunnel Equipment Purchase and Installations (Lighting, Ventilating, Monitoring, Fire Extinguishing, Electricity, etc.)	4,706,000	ICB	Prior	1S1E	Q3/2016	Goods
	Rural Roads Upgraded									
10	HB01	K0+000-K10+699	10.699	No.5 Yanba to Dongqiao Road (Y305)	3,737,000	NCB	Prior	1S1E	Q4/2015	Civil Works
11	HB02			Zaobao Road	1,714,000	NCB	Prior	1S1E	Q4/2015	Civil Works

	Package Number	Location	Length (km)	General Description	Estimated Value $	Procurement Method	Review (Prior/Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
	Lot 1	K0+000-K4+157	4.157	No.6 Zaobao to Youshengcun Road (CH69) (547,000)	547,000	NCB	Prior	1S1E	Q4/2015	Civil Works
	Lot 2	K0+000-K9+335	9.335	No.7 Zaobao to Wujiashan Road (CH39) (1,167,000)	1,167,000	NCB	Prior	1S1E	Q4/2015	Civil Works
12	XY01	K0+000-K18+000	18	No.1 Shuxiao Road Shangma to Xiaohe Section (X304)	5,501,000	NCB	Prior	1S1E	Q4/2015	Civil Works
13	XY02	K18+000-K38+405	20.405	No.2 Shuxiao Road Shangma to Xiaohe Section (X304)	6,236,000	NCB	Prior	1S1E	Q4/2015	Civil Works
14	XY03	K0+000-K7+879	7.879	No.2 Lijiaba to Baiguo Road (C347)	866,000	NCB	Prior	1S1E	Q4/2015	Civil Works
15	XY04	K0+000-K7.253+000	7.253	No.3 Beigou to Luojia Road (C559)	796,000	NCB	Prior	1S1E	Q4/2015	Civil Works
16	XY05	K0+000-K16+618	16.618	No.4 Yangpo to Liangheguan Road (C85)	1,716,000	NCB	Prior	1S1E	Q4/2015	Civil Works
	Crash Reduction Program									
17	HB04		166.984	Road Safety of Hanyin District (X213.X210.Y103.Y201.Y202)	4,125,000	NCB	Prior	1S1E	Q1/2016	Road Safety
18	XY		255.71	Road Safety of Xunyang County	5,546,000	NCB	Prior	1S1E	Q1/2016	Road Safety
	Lot 1 XY06		135.92	Part 1 X304.Y303.Y301.Y312.Y201.Y302.Y313 (2,883,000)	2,883,000	NCB	Prior	1S1E	Q1/2016	Road Safety
	Lot 2 XY07		119.79	Part 2 203.Y206.Y212.Y304.Y305.Y308.Y311 (2,633,000)	2,663,000	NCB	Prior	1S1E	Q1/2016	Road Safety

To be procured by Shangnan County (implementing agency)

	Package Number	Location	Length (km)	General Description	Estimated Value $	Procurement Method	Review (Prior/Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
	S224 Trunk Roads Upgraded									
19	SYLJ1	K4+901-K11+500	6.597	Subgrade, Bridge, Tunnel (incl. bridges $1 million, tunnels $2.1 million)	7,298,000	NCB	Prior	1S1E	Q3/2015	Advance contracting & retroactive financing
20	SYLJ2	K11+500-K23+500	12.041	Subgrade, Bridge, Tunnel (incl. bridges $.3 million, tunnels $2.1 million)	6,931,000	NCB	Prior	1S1E	Q3/2015	Advance contracting & retroactive financing
21	SYLJ3	K23+500-K33+000	9.504	Subgrade, Bridge, Tunnel (incl. bridges $.1 million, tunnels $2.7 million)	7,323,000	NCB	Prior	1S1E	Q3/2015	Advance contracting & retroactive financing
22	SYLJ4	K33+000-K45+000	12.009	Subgrade, Bridge (incl. bridges $.2 million)	7,658,000	NCB	Prior	1S1E	Q3/2015	Advance contracting & retroactive financing
23	SYLJ5	K45+000-K54+329	9.331	Subgrade, Bridge, Tunnel (incl. bridges $.2 million, tunnels $.6 million)	6,931,000	NCB	Prior	1S1E	Q3/2015	Advance contracting & retroactive financing
24	SYLM	K04+901-K54+329	49.4821	Pavement of S224	16,463,000	NCB	Prior	1S1E	Q1/2016	
	Lot 1	K04+901-K29+500	24.6421	Pavement Lot 1 (8,140,000)	8,140,000					Civil Works
	Lot 2	K29+500-K54+329	24.840	Pavement Lot 2 (8,323,000)	8,323,000					Civil Works
25	SYJALH	K0+000-K54+329	54.384	Landscape Engineering, Safety Facility and Traffic Engineering	2,991,000	NCB	Prior	1S1E	Q1/2016	Civil Works
	S224 Provincial Trunk Roads Rehabilitation									
26	SYDX	K54+329-K92+400	38.071	Pavement Rehabilitation	9,606,000	NCB	Prior	1S1E	Q1/2016	Civil Works
	Rural Roads Upgraded									
27	XS1	K0+000-K22+000	21.922	Xianghe to Shuigou Road (No. 8)	6,189,000	NCB	Prior	1S1E	Q4/2015	Civil Works
28	XS2	K22+000-K45+390.096	23.39	Xianghe to Shuigou Road (No. 8)	5,911,000	NCB	Prior	1S1E	Q4/2015	Civil Works
	Crash Reduction Program									
29	XY08		140.0	Road Safety of Shangnan County (X313, X316, Y206, Y335, Y338, Y339)	3,159,000	NCB	Prior	1S1E	Q4/2015	Road Safety

(iii) Consulting Services Contracts Estimated to Cost $100,000 or More

3. The following table lists consulting services contracts for which the recruitment activity is either ongoing or expected to commence within the next 18 months.

	General Description	Estimated Value ('000 $)	Recruitment Method	Review (Prior / Post)	Advertisement Date (quarter/year	Type of Proposal	Comments
30	Project Management	750	QCBS (90:10)	Prior	Q4/2015	BTP	International Assignment ADB Financed (100%), advance contracting
31	Road Safety Design and Audit Services	409	SSS	N/A	N/A	N/A	RIOH ChinaRAP Services, ADB Financed (100%)
32	Road Safety Capacity Building	654	CQS	N/A	N/A	N/A	iRAP Services ADB Financed (100%)
33	Walk Wise Pilot	300	SSS	N/A	N/A	N/A	AIP Foundation, ADB Financed (100%)
34	External Monitor - Environment	40	ICS	N/A	N/A	N/A	ADB Financed (100%)
35	Monitoring. - Resettlement	203	Govt. Procedures	Prior	Q3/2015	-	National Government-Financed (100%) under resettlement budget

(iv) Goods and Works Contracts Estimated to Cost Less than $1 Million and Consulting Services Contracts Less than $100,000 (Smaller Value Contracts)

4. The following table groups smaller-value goods, works and consulting services contracts for which the activity is either ongoing or expected to commence within the next 18 months.

Goods and Works								
Package Number	**General Description**	**Estimated Value**	**Number of Contracts**	**Procurement Method**	**Review** (Prior / Post)	**Bidding Procedure**	**Advertisement Date** (quarter/ year)	**Comments**

Consulting Services							
General Description	**Estimated Value**	**Number of Contracts**	**Recruitment Method**	**Review** (Prior / Post)	**Advertisement Date** (quarter/year)	**Type of Proposal**	**Comments**
External Monitoring – Environment	40,000	1	Govt. Procedures	Prior	Q3/2015	-	National Gov't-Financed (100%)

B. Indicative List of Packages Required Under the Project

5. The following table provides an indicative list of goods, works and consulting services contracts over the life of the project, other than those mentioned in previous sections (i.e., those expected beyond the current period).

Goods and Works							
Package Number	**General Description**	**Estimated Value (cumulative)**	**Estimated Number of Contracts**	**Procurement Method**	**Review** (Prior / Post)	**Bidding Procedure**	**Comments**
NOT APPLICABLE							

Consulting Services							
Package Number	**General Description**	**Estimated Value (cumulative)**	**Estimated Number of Contracts**	**Recruitment Method**	**Review** (Prior / Post)	**Type of Proposal**	**Comments**
NOT APPLICABLE							

C. List of Awarded and On-going, and Completed Contracts

6. The following tables list the awarded and on-going contracts, and completed contracts.

(i) Awarded and Ongoing Contracts

Package Number	**General Description**	**Estimated Value**	**Contract Value**	**Procurement Method**	**Advertisement Date** (quarter/ year)	**Date of ADB Approval of Contract Award**	**Comments**
NOT APPLICABLE							

Package Number	**General Description**	**Estimated Value**	**Contract Value**	**Recruitment Method**	**Advertisement Date** (quarter/year)	**Date of ADB Approval of Contract Award**	**Comments**
NOT APPLICABLE							

(ii) Completed Contracts

Goods and Works								
Package Number	**General Description**	**Estimated Value**	**Contract Value**	**Procurement Method**	**Advertisement Date** (quarter/ year)	**Date of ADB Approval of Contract Award**	**Date of Completion**	**Comments**
			NOT APPLICABLE					
Consulting Services								
Package Number	**General Description**	**Estimated Value**	**Contract Value**	**Recruitment Method**	**Advertisement Date** (quarter/ year)	**Date of ADB Approval of Contract Award**	**Date of Completion**	**Comments**
			NOT APPLICABLE					

D. Non-ADB Financing

7. The following table lists goods, works and consulting services contracts over the life of the project, financed by Non-ADB sources.

Goods and Works				
General Description	**Estimated Value (cumulative)**	**Estimated Number of Contracts**	**Procurement Method**	**Comments**
	NOT APPLICABLE			

Consulting Services				
General Description	**Estimated Value (cumulative)**	**Estimated Number of Contracts**	**Recruitment Method**	**Comments**
External Monitoring - Resettlement	203,000	1	Govt. Procedures	National Government-Financed (100%)

E. National Competitive Bidding

8. The Borrower's Law of Tendering and Bidding of the People's Republic of China promulgated by Order No. 21 of the President of the People's Republic of China on August 30, 1999, are subject to the following clarifications required for compliance with the Guidelines:

(i) All invitations to prequalify or to bid shall be advertised in the national press, or official gazette, or a free and open access website in the Borrower's country. Such advertisement shall be made in sufficient time for prospective bidders to obtain prequalification or bidding documents and prepare and submit their responses. In any event, a minimum preparation period of thirty (30) days shall be given. The preparation period shall count (a) from the date of advertisement, or (b) when the documents are available for issue, whichever date is later. The advertisement and the prequalification and bidding documents shall specify the deadline for such submission.

(ii) Qualification requirements of bidders and the method of evaluating the qualification of each bidder shall be specified in detail in the bidding documents, and in the prequalification documents if the bidding is preceded by a prequalification process.

(iii) If bidding is preceded by a prequalification process, all bidders that meet the qualification criteria set out in the prequalification document shall be allowed to bid and there shall be no limit on the number of pre-qualified bidders.

(iv) All bidders shall be required to provide a performance security in an amount sufficient to protect the Borrower/Project Executing Agency in case of breach of contract by the contractor, and the bidding documents shall specify the required form and amount of such performance security.

(v) Bidders shall be allowed to submit bids by mail or by hand.

(vi) All bids shall be opened in public; all bidders shall be afforded an opportunity to be present (either in person or through their representatives) at the time of bid opening, but bidders shall not be required to be present at the bid opening.

(vii) All bid evaluation criteria shall be disclosed in the bidding documents and quantified in monetary terms or expressed in the form of pass/fail requirements.

(viii) No bid may be rejected solely on the basis that the bid price falls outside any standard contract estimate, or margin or bracket of average bids established by the Borrower/Project Executing Agency.

(ix) Each contract shall be awarded to the lowest evaluated responsive bidder, that is, the bidder who meets the appropriate standards of capability and resources and whose bid has been determined (a) to be substantially responsive to the bidding documents and (b) to offer the lowest evaluated cost. The winning bidder shall not be required, as a condition of award, to undertake responsibilities for work not stipulated in the bidding documents or otherwise to modify the bid as originally submitted.

(x) Each contract financed with the proceeds of the Loan shall provide that the suppliers and contractors shall permit ADB, at its request, to inspect their accounts and records relating to the performance of the contract and to have said accounts and records audited by auditors appointed by ADB.

(xi) Government owned enterprises in the Borrower's country may be permitted to bid if they can establish that they (a) are legally and financially autonomous, (b) operate under commercial law and (c) are not a dependent agency of the Borrower/Project Executing Agency.

(xii) Re-bidding shall not be allowed solely because the number of bids is less than three (3).

CONSULTANTS' TERMS OF REFERENCE

1. International and national consultants will assist the executing agency (EA) and the implementing agency (IA) in ensuring that (i) remaining design activities are carried out to the appropriate engineering and road safety standards, (ii) all activities related to implementation of the project are carried out in an environmentally and socially sound manner, (iii) all reporting requirements of ADB are carried out in accordance with the Project Administration Memorandum (PAM), (iv) preparation and implementation of all projects are carried out in accordance with the loan documentation, and (v) SPTD is advised on all aspects of the implementation of the capacity development component. While carrying out their responsibilities, the international consultants will have as an objective to maximize technology transfer to and learning by the IAs and should take a pro-active approach to identify areas where international best practices could be applied and to advise and train IA's staff on such practices.

2. The project will finance (i) project management and training (international consulting firm (36 person-months); and (ii) national consultants for the external monitors.

A. Project Management Consultant (QCBS, 90:10, 18 person-months international, 16 person-months national)

3. **Objectives.** The project management consultant (PMC) will be recruited to assist the EA) and IA and train domestic consultant on systems, procedures and formats to provide all relevant reports, and also assist in ensuring that:

(i) the project civil works are carried out to appropriate engineering and road safety standards;
(ii) all activities related to implementation of the project are carried out in an environmentally and socially sound manner;
(iii) all reporting requirements of ADB are carried out in accordance with the Project Administration Memorandum (PAM); and
(iv) EA and IA personnel receive hands on training in environmental and social safeguards from PMC staff during the course of the project.

4. **Scope of work.** The services of the PMC will cover:

(i) project management support; and
(ii) assist the EA and SPTD in the implementation and reporting requirements for the EIA and EMP; and the RPs, SDAP and GAP.

a.) Key Tasks

- **Task 1: Project Management Support**
  - (i) Overall management support of the loan, funding, monitoring, and reporting, with assistance provided to FFPO.
  - (ii) Assistance and advice to the EA and IAs as Owner of the civil works to ensure that the project civil works are carried out efficiently and according to designs, including through site inspections.
  - (iii) Assist the EA in implementation, supervision and monitoring of the EMP, RPs, and the gender action plan.
  - (iv) Develop project performance and monitoring system (PPMS) and monitor indicators.
  - (v) Preparation of project progress quarterly reports (first two years) and draft completion report.
  - (vi) Liaise between the EA and ADB on all project matters.

b.) Team Requirement and Specific Tasks

Table 1: Team Requirement

Position Title	Type of Consultant		No. of person-months	
	International	National	International	National
Team Leader/Transport Planner	1	0	18	0
Environment Specialist	0	1	0	4
Capacity Development - Resettlement	0	1	0	6
Capacity Development - Gender	0	1	0	6
TOTAL	**1**	**3**	**18**	**16**

5. **Transport Planner/Team Leader (1 international, 18 person-months).** The consultant will (i) facilitate the implementation of the project; (ii) assist and advice the EA and IA as Owner of the civil works; (iii) assist EA for reporting to, and liaising with ADB; and (iv) development and implement a project performance monitoring system.

6. **External Loan Implementation Environment Consultant (1 national, 4 person-months).** Under the project management consultant services contracted by FFPO, a national environmental specialist will be included to support the project as an external monitor with the following tasks: The consultant will: monitor and advise on the implementation of the environmental management plans; conduct training as needed for the FFPO, IAs and consultants on ADB environmental safeguard requirements and procedures; visit the site once every six months to audit the Project site and review and incorporate the environmental quality monitoring results into the environmental monitoring report; and support the FFPO and Environmental Supervision Engineer in the preparation of the semi-annual environmental management and monitoring reports for ADB and verify the information presented. Detailed tasks include:

(i) assess the project components' environmental readiness prior to implementation based on the readiness indicators defined in Table EMP-3 in the EMP;
(ii) support FFPO in updating the EMP including environmental monitoring plan as necessary to revise or incorporate additional environmental mitigation and monitoring measures, budget and institutional arrangements, that may be required based on the detailed design; submit to ADB for approval and disclosure; ensure compliance with the PRC's environmental laws and regulations, ADB's Safeguard Policy Statement (2009) and Public Communications Policy (2011);
(iii) if required, update the EIA and EMP reports for changes in the project during detailed design or project implementation (for example if there is a minor or major scope change) that would result in adverse environmental impacts not within the scope of the approved EIA/EMP;
(iv) assist FFPO to establish a GRM;
(v) review monthly and quarterly environmental supervision and environmental quality monitoring reports to identify progress with implementation of EMP, key issues and actions and environmental performance over six month period;
(vi) develop a standardized audit form, undertake semi-annual site audits with FFPO, Environmental Supervision Engineer and environmental quality monitor;
(vii) identify environment-related non-compliance issues, highlight areas of good practice, maintain a photographic record of issues identified and actions and timescales agreed for resolution, and oversee implementation of necessary corrective actions;
(viii) assist FFPO to prepare quarterly project progress reports and semi-annual environmental monitoring reports in accordance with ADB requirements;
(ix) develop and deliver training on implementation, compliance monitoring and reporting requirements of the EIA and EMP, environmental laws, regulations and

policies, SPS 2009 and GRM to contractors, FFPO environmental staff, environmental supervision personnel, SPTD and county level Environmental Protection Bureau staff prior to the commencement of each construction package. Training will focus on the preparation and implementation of contractor's EMP, implementation plan, programme, method statements, environmental audit and reporting. On completion of the project, training will also be provided to O&M units and their contractors. Training will be carried out in accordance with the training plan defined in the EMP (Table EMP-7); and

(x) assist FFPO and IAs in conducting consultation meetings with relevant stakeholders as required, informing them of imminent construction works, updating them on the latest project development activities and GRM.

7. **Capacity Development–Resettlement (1 national, 6 person-months).** The consultant will:

(i) Assist the IA in implementing the RPs as endorsed by the EA and disclosed to the affected persons;
(ii) Assist the IAs in finalization of RPs after detailed design based on detailed measurement survey (DMS);
(iii) Provide training to the IA resettlement staff on ADB's involuntary resettlement policy requirements, especially the staff related to the implementation of the RPs;
(iv) Assist the IA to enhance the consultation and participation of APs including timely information disclosure on various resettlement related issues and policies;
(v) Provide guidance to the IA in internal monitoring of the RPs implementation and preparation of reports;
(vi) Provide guidance to the IA in coordinating with various other agencies involved in RP implementation;
(vii) Provide assistance to the IA in strengthening its organizational arrangements to effectively implement the RPs;
(viii) Assist the IA to identify gaps in RP implementation and suggest appropriate solutions in a timely manner;
(ix) Assist the IA on managing grievance redress mechanism, its publicity amongst the affected people and in record keeping of related grievances and redress measures taken;
(x) Provide guidance on enhancing the effectiveness of the livelihood restoration program implementation;
(xi) Assist the IA on assessing needs of vulnerable group of APs and those APs who are significantly affected by land acquisition and relocation and help develop and implement additional mitigation measures to ensure that they do not fall below the pre-project level;
(xii) Assist the IA in monitoring the LAR budget as well as to ensure that any budgetary overruns are quickly arranged;
(xiii) Assist the EA/IAs in preparation of resettlement completion report as part of the project completion report; and
(xiv) Provide guidance to the IAs on implementation of activities under the social development action plan (SDAP) and in record keeping and reporting.

8. **Capacity Development–Gender Specialist (1 national, 6 person-months).** Implementation of the project components offers opportunities for promoting gender equality and women's empowerment. Therefore, in order to maximize positive gender impacts of the project, it is designed to meet an ADB effective gender mainstreaming (EGM) categorization, and a project GAP is prepared, informed by gender analysis The national gender specialist will be positioned with the IAs to provide guidance and technical assistance to the assigned staff gender focal point for implementation, monitoring, and reporting on the GAP. This will include, but not be limited to, the key tasks below which will be carried out during project preparation and

consultation with key stakeholders.

9. GAP features include a focus on ensuring women's equitable participation in project-related public consultation; promoting increased employment opportunities for women; full participation of women in the road safety demonstration; and building EA/IA institutional capacity for gender mainstreaming. Negative gender impacts, such as livelihood impacts for female farmers from LAR, should be mitigated in accordance with the measures set out in the RPs.

10. Implementation of the GAP will be financed as a core part of the project budget. The GAP will be implemented over the life of the project. The PMO is responsible for coordinating implementation of the GAP and will appoint a staff gender focal point responsible for gender mainstreaming and GAP implementation and reporting.

11. The consultant's key tasks for GAP implementation, monitoring, and reporting are as follows:

(i) Provide GAP orientation training to key EA/IA staff to brief them on GAP requirements;
(ii) Coach, guide, and train the assigned staff gender focal point on how to effectively manage implementation, monitoring, and reporting on GAP implementation;
(iii) Provide guidance and assist delivery of GAP orientation training to contractors to ensure understanding on employment targets for female unskilled labor and reporting requirements;
(iv) Liaise with the local women's federation (ACWF) to coordinate with contractors in (a) publicizing the project generated employment opportunities, and (b) supporting local women to gain employment with project contractors;
(v) Develop a detailed implementation and monitoring plan for gender activities, including a standard template for monitoring and reporting GAP results;
(vi) Assist PMO to ensure adequate consultation and participation of women;
(vii) Work collaboratively with the road safety team and ensure that women are consulted proactively on road safety feature installation on the project roads;
(viii) Work collaboratively with the road safety team and ensure that women actively participate in the road safety awareness campaigns and trainings;
(ix) Ensure the collection of sex-disaggregated statistics for all project activities and guide IAs on how to collect and report with disaggregated data;
(x) Guide the drafting of the first gender plan implementation progress report, and review the subsequent reports prepared by the staff gender focal point, drawing from information provided by IAs;
(xi) Incorporate GAP performance targets/indicators into regular project monitoring tools/formats, and ensure collection of gender-related data for reporting against gender performance indicators/targets in the overall project design and monitoring framework;
(xii) Ensure that updated information on the status of GAP implementation is included in all project progress reports;
(xiii) Ensure that all project review missions include consideration of GAP progress, involve consultation with women and men beneficiaries, and include GAP reporting in mission reports, by providing technical support to mission teams and PMO. In particular, support and guide a detailed review of GAP as part of project midterm review;
(xiv) Assess and draw attention to any inadequacy of GAP provisions and identify remedial actions to revise or strengthen the GAP if required;
(xv) Liaise with wider consultant team to ensure that relevant GAP actions are integrated into their respective areas of responsibility; and

(xvi) Provide technical advice to the implementation of gender-specific resettlement mitigation measures (e.g., livelihood restoration support for displaced women farmers).

12. **Consultant specifications.** She/he shall have at least 10 years working experience, including at least 5 years as a gender specialist in similar project assignments in the PRC or other countries in the region, as well as formal qualifications in gender and development or closely related fields. She/he shall fully understand ADB's Gender Policy, gender and development theory and approaches, as well as the PRC policy and legislative commitments to gender equality and women's empowerment. She/he will have good English written and oral skills. Experience with gender mainstreaming in similar projects funded by ADB or other development partners is preferable.

13. The gender specialist will be recruited at the commencement of the project, and her/his inputs spread intermittently over the life of the project for a total of 6 person-months.

14. **Cost estimates and financing.** The estimated cost of the PMC contract is $0.75 million, which will be fully financed under the ADB loan. The assignment will require 18 person-months international consultant and 16 person-months local consultants.

Table 2: Cost Estimates ('000)

Item		Cost
1.	Consultants	
	(i) Remuneration and Per Diem	
	(a) International Consultants	492.5
	(b) National Consultants	118.4
	(ii) International Travel	21.5
	(iii) National Travel	9.5
	(iv) Reports and Communications	5.0
	(v) Office operations and translation	25.0
2.	Surveys	5.0
3.	Equipment	5.0
4.	Contingencies	68.1
	Total	**750.0**

a.) Implementation Arrangements

15. **Recruitment.** The PMC will be recruited by SPTD following ADB consultant recruitment procedures, i.e. using the quality and cost based selection method (QCBS), with a 90:10 quality to cost ratio.

16. **Implementation.** The PMC will report to the head of the project management office set up in the FFPO office. The PMC team leader will act as deputy team leader of the project management office.

17. **Scheduling.** The overall consultancy shall be provided throughout the project implementation period, which is anticipated to last until end 2019. Most of the project management assistance should be concentrated over the first 2 years of the project, in anticipation that the EA will gradually be able to carry out the project management tasks without consultant support.

18. **Reporting.** The consultant will help prepare a project inception, quarterly progress reports during the first two years of the assignment (the responsibility then shifting to the EA),

and a project completion report (PCR) that confirms the status of the project for discussion with ADB at related review missions. The reports should also include an assessment on the Consultants progress against program, an indication of any key outstanding issues, and an updated development program for key project activities. Six copies of each report will be submitted in print and electronic version to the IA in English and Chinese, and two copies in English language to ADB. The list of documents to be provided is in Table 3.

Table 3: List of Reports for Submission

Report	Timing
Inception Report	Within 1 month
Project Performance Monitoring System	Within 6 months
Environmental Monitoring Reports	Semi-annually
Quarterly Reports	Quarterly during first two years
Completion report	Draft–6 months before project completion

19. **Services and facilities provided to the consultant**. The executing agency and implementing agency will make the following available to the international consultants: Suitable office accommodation, and secretarial and clerical support; and local transportation, including a driver, at the various project sites. Counterpart staff and the number of vehicles will be agreed with EA's prior to the commencement of the services.

(i) Suitably qualified translation services with sufficient technical vocabulary to service the project demands.
(ii) Providing the complete, serviced and clear offices with the access to the tap water, telephone, broadband connection, facsimile and copy machine; the staff from Project Administration Office of the employer (PAO) will assist the consultants in procuring or leasing the necessary, adequate and suitable equipment which will be at the consultant' own costs. Such equipment may include the fax machine, computer, software, printer, scanner and etc. The maintenance and service charge such as communication fees and printing cost will also be borne by the consultant.
(iii) The eligible liaison officials with proficient English & Chinese skills to provide the coordination and support to the consultants for convenient implementation of the services.
(iv) Necessary assistance in applying the entry visa, residential and work permits and other possible certificate for the smooth implementation of the consulting services. The costs of all such government approvals will be reimbursed to the consultant at cost.
(v) Authorization to access to the available data, documents, reports, finance reports, drawings, maps and related offices and facilities.

B. Road Safety Design and Audit Services (SSS, 134 person-months, national)

20. National consultants will assist the Executing Agency (EA) and implementing agency (IA) in lifting road safety capacity within the SPTD and local governments. The project will involve: monitoring and advising on road safety during the road construction period; post-construction road safety evaluation; implementation of a road network safety and traffic management system; and road safety training.

21. **Justification for using SSS method.** The selected organization is the Research Institute of Highway (RIOH), Beijing. RIOH is proposed on a SSS basis in accordance with para. 2.30 of ADB's Consulting Guidelines, i.e. (i) for tasks that represent a natural continuation of previous work carried out by the firm – RIOH undertook the baseline road safety assessments

under PPTA and participated in the development of the road designs. It was not involved in the preparation of the TOR for this assignment; (ii) when only one firm has experience of exceptional worth for the assignment - it is the only organization in PRC with a government mandate to promote and implement iRAP (International Road Assessment Program). In addition, the very low national remuneration rates (average $2,350/month) proposed by RIOH presents another clear advantage over competition.

22. **Objectives.** The Consultant will be recruited to assist the IA and EA to lift road safety capacity within the SPTD and local governments. In particular:

(i) ensure that road safety demonstration facilities are installed according to design and opportunities to supplement the safety scheme with additional low-cost high-return improvements are secured;
(ii) evaluate the road safety impact of the road upgrades;
(iii) implement a road network safety and traffic management system; and
(iv) ensure that local stakeholders are capable of using the road network safety and traffic management system.

23. **Scope of work.** The services of the Consultant will cover:

(i) monitoring road safety during the construction period;
(ii) post-construction road safety evaluation;
(iii) developing and implementing a road network safety and traffic management software; and
(iv) training.

a.) Key Tasks

- **Task 1: Monitoring road safety during the construction period**
  (i) Review and monitor road safety aspects of traffic management during road construction period.
  (ii) Verification that during construction demonstration safety facilities are being implemented effectively.
  (iii) Identification of opportunities to supplement the scheme with additional low-cost high-return improvements, such as adjustments to sign and line marking types and locations.

- **Task 2: Post-construction road safety evaluation**
  (i) Detailed assessment of general crash indicators, crash risk level, highway risk level, social appraisal and the input-output situation before and after the implementation of the safety demonstration projects.
  (ii) Detailed data collection and observations before the start of construction, and corresponding investigations after more than 6 months of traffic operation on the new roads.
  (iii) Evaluation of the road safety effectiveness of the overall upgrades and evaluation of key countermeasures at the micro level, generating knowledge and experience for the use and improvement of such facilities in the future.

- **Task 3: Developing and implementing a road network safety and traffic management system**
  (i) Development of a road network safety and traffic management system in SPTD. The system will combine ChinaRAP risk assessment, crash, traffic and asset / maintenance data, and will assist the SPTD in long term road safety planning.
  (ii) Collection and compilation of system baseline data, including risk

assessment, crash, traffic and asset / maintenance data.

(iii) Implementation of the road network safety and traffic management system in SPTD.

- **Task 4: Demonstration project experience training**
  - (i) Training shall be provided to local stakeholders as an integral part of Tasks 1-3 above.
  - (ii) Training will be provided to local stakeholders on the demonstration project experience training: including: collection of data, the Star Rating and Investment Plan methodology, Star Rating road designs.

b.) Team Requirement and Specific Tasks

Table 4: Team Requirement

Position Title	Type of Consultant		No. of person-months	
	International	National	International	National
Team Leader / Traffic Safety Specialist		1		18
Traffic Safety Specialist		1		22
Software Development Specialist		1		22
Traffic Safety Engineer		3		43
Software Development Engineer		1		15
Software Test Engineer		1		9
Data Analyst		2		6
TOTAL	**0**	**10**	**0**	**134**

24. **Team Leader/ Traffic Safety Specialist (1 national, 18 person-months).** The consultant will (i) coordinate the consulting tasks in general (ii) ensure that the safety visions are fully incorporated during the consulting period, and (iii) coordinate the delivery of the reports and deliverables. The consultant should have a university degree in engineering or a related field, and 10 years or more of experience in the field of road engineering safety is preferred. A knowledge of English in Writing, speaking is a must. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage

25. **Traffic Safety Specialist (1 national, 22 person-months).** The consultant will (i) ensure that the traffic safety visions and schemes are incorporated during the construction phase, (ii) encourage continual improvement of traffic safety countermeasures (iii) design the traffic safety post-evaluation scheme, and (iv) develop reporting and demonstration project communications. The consultant should have a university degree in engineering or a related field, and 5 years or more of experience in the field of road engineering safety is preferred. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

26. **Software Development Specialist (1 national, 22 person-months).** The consultant will (i) Specoft software requirements analysis for road network safety and traffic management software, (ii) Develop the software structure design of road network safety and traffic management software, and (iii) develop the system application report. The consultant should have a university degree in Computer Science, Software Engineering or a related field and 5 years or more experience in undertaking large or medium-sized software project. Experience with traffic safety related software projects is preferred, and excellent communication skills, organizing ability, will be an advantage.

27. **Traffic Safety Engineer (3 national, 43 person-months).** The consultants will (i)

conduct field surveys and data collection, (ii) perform general data analysis (iii) undertake regular reporting. The consultants should have a university degree in engineering or a related field, and 5 years or more of experience in the field of road engineering safety in the field of road engineering safety is preferred. Previous work experience with national development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

28. **Software Development Engineer (1 national, 15 person-months).** The consultant will develop the road network safety and traffic management software. The consultant should have a university degree in Computer Science, Software Engineering or a related field, and more than 3 years software development experience, familiarity with programming tools such as the Java, Html, JavaScript, EXT, Jquery, Spring, with SQL Server database development experience, and a good sense of team work will be an advantage.

29. **Software Test Engineer (1 national, 12 person-months).** The consultant will test the road network safety and traffic management software during and after the software development process. The consultant should have a university degree in Computer Science, Software Engineering or related field, and more than 3 years' experiences in software testing and familiarity with the main software testing tools will be an advantage.

30. **Data analyst (2 national, 2 person-months).** The consultant will analyze the various types of data including but not limited to: traffic, safety assessment coding data, road video, and crash data. The consultants should have a university degree in engineering or a related field, and 3 years or more of data processing experience is preferred. Experiences in the field of data analysis in China in the field of road engineering safety will be an advantage.

31. **Cost estimates and financing.** The estimated cost of the Consultant contract is $0.414 million, which will be fully financed under the ADB loan. The assignment will require 134 person-months local consultant.

Table 2: Cost Estimates

Item		Cost ($ 000)
1.	Consultants	
	(i) Remuneration and Per Diem	
	a.) National Consultants	313.0
	(ii) National Travel	61.0
	(iii) National Travel Allowance	10.0
2.	Report Preparation, production and transmission	3.0
3.	Communications	2.0
4.	Land Transport and Vehicle Hire	16.0
5.	Software	4.0
6.	Contingencies	4.0
Total		**414.0**

c.) Implementation Arrangements

32. **Recruitment.** The Consultant will be recruited by the transport bureau following ADB consultant recruitment procedures, i.e. using single source selection.

33. **Implementation.** The Consultant will report to the head of the project management office set up in the transport bureau.

34. **Scheduling.** The consultancy shall be provided throughout the project implementation period, which is anticipated to start at June-2015 and last until June-2018. The Consultant shall start the services during the construction period, and continue through to post-construction road safety evaluation.

35. **Reporting.** The consultant will help prepare a project Inception, Road Safety during the Construction Period Report, Post-Construction Road Safety Evaluation Report, and Training and Training Report. Six copies of each report will be submitted in print and electronic version to the in English and Chinese, and two copies in English language to ADB. The software will be installed at the county-level traffic bureaus with assistance from the Consultant. The list of deliverables to be provided is in Table 6.

Table 6: List of Reports for Submission

Report / Deliverable	Timing
Inception Report	Within 1 month
Road Safety during the Construction Period Report	2017-12
Post-Construction Road Safety Evaluation Report	2017-12
Road Network Safety and Traffic Management Software	2018-08
Training and Training Report	2018-08

36. **Services and facilities provided to the consultant.** The executing agency and implementing agency will make the following available to the consultants:

(i) Assist software requirements survey, and software test at county-level traffic bureaus within the project scope. Provide software operational environment.
(ii) Assist the demonstration project communication;
(iii) Authorization to access to the available data, documents, reports, finance reports, drawings, maps and related offices and facilities.

A. Road Safety Capacity Building (CQS, 5.5 person-months international, 9.75 person-months national)

37. International and national consultants will assist the SPTD, city and county traffic bureaus and design institutes. This project will involve training that lays a foundation for a road safety management model that results in significant reductions in deaths and serious injuries in Shaanxi.

38. The training will expose participants to each of the five pillars of the United Nations Road Safety Collaboration Global Plan for the Decade of Action for Road Safety 2011-2020. However, given the nature of Shaanxi Mountain Road Safety Demonstration Project, the training will focus in particular on building capacity in road safety management (pillar one) and improving the safety of road infrastructure (pillar 2) within the project stakeholder organizations.

39. The training will involve four parts: Safe road design training in PRC; international safe road design training; International safety leadership, strategy and planning; and road safety and transport management integration.

40. The Consultant will leverage its significant expertise in international road safety, existing training materials and linkages with governments, institutes and civil society in the delivery of the training.

41. **Justification for using CQS Method.** CQS method is proposed for this assignment in accordance with para. 2.28 of ADB's Consulting Guidelines, i.e. (i) highly specialized expertise is required for the assignment and recruitment of "boutique" consulting firms that provide depth of expertise in specific areas is contemplated. There are very few organizations that have substantial experience in road safety planning, management and training. One of them is International Road Assessment Programme (iRAP). iRAP worked very closely with RIOH, the Shaanxi Province Transport Department and design institutes on road safety analysis and design, capacity assessment and training during PPTA.

42. **Objectives.** The Consultant will be recruited to ensure that participants in the training:
- (i) Understand the five pillars of the United Nations Road Safety Collaboration Global Plan for the Decade of Action for Road Safety 2011-2020.
- (ii) Have a comprehensive understanding of best practices in safe road design.
- (iii) Have a comprehensive understanding of best practice road safety strategy, planning and management and the science that underpins it.

43. **Scope of work.** The services of the Consultant will cover:
- (i) Safe road design training in PRC.
- (ii) International safe road design training.
- (iii) International safety leadership, strategy and planning.
- (iv) Road safety and transport management integration.

a.) Key Tasks

- **Task 1: Safe Road Design Training in PRC**

44. The Consultant will develop a plan for comprehensive training in PRC, including consultation with project stakeholders to ensure that the plan captures all training requirements. It is envisaged that participants would be project stakeholder staff involved in road safety, design and maintenance.

45. At the end of the training, trainees will be familiar with and master safety assessment methods and be familiar with advanced road engineering safety measures in China and abroad that can be adopted to strengthen safety on roads in Shaanxi. The training should at minimum include the following topics: the concept of "forgiving roads"; how the "Safe System" can be incorporated into designs; best practice design in China; design for vulnerable road users; safe roadside design; safe intersection design; safe urban and village design; work zone safety; and road safety audits and risk assessments.

46. The Consultant will deliver the training for up to 80 participants over a period of one week.

- **Task 2: International Safe Road Design Training**

47. The Consultant will develop a plan for comprehensive international training in safe road design, including consultation with project stakeholders to ensure that the plan captures all training requirements. The training shall include visits to a country(ies) leading in road safety, and may, for example, involve participation in the IRF Safer Roads By Design: Across Six Continents Certified training course. It is envisaged that the participants would be project stakeholder staff involved in road construction, management, safety, design and maintenance.

48. At the end of the training, trainees will be familiar with and master the new road safety audit approaches, and be familiar road design processes that use advanced safety measures with at home and abroad that can be adopted to improve road safety in Shaanxi. The training should expose participants to international best practice and at minimum include the following topics: the concept “forgiving roads”; how the Safe System can be incorporated into designs; best practice designs; design for vulnerable road users; safe roadside design; safe intersection design; and safe urban and village design; work zone safety; and road safety audits and risk assessments.

49. The Consultant will manage the training for up to 30 people for a period of approximately 20 days.

- **Task 3: Road safety leadership, strategy and planning**

50. The Consultant will develop a plan for comprehensive international training in road safety leadership, strategy and training, including consultation with project stakeholders to ensure that the plan captures all training requirements. The training shall include visits to a country(ies) leading in road safety, and may, for example, involve participation in the MUARC-CASR Road Safety Management Leadership Program in Melbourne, Australia. It is envisaged that the participants would be leaders, department heads and managers from SPTD.

51. At the end of the training, trainees will be familiar with and understand international approaches to develop and implement sustainable road safety strategies and plans that significantly reduce road trauma and can be adopted in Shaanxi. The training should expose participants to international best practice and at minimum include the following topics: core elements of a highly effective road safety management system; the scientific evidence base and technological innovations that underpin effective road safety interventions and related public policy challenges; how to introduce effective change; strategy development; target setting and monitoring; and laws, standards and rules.

52. The Consultant will manage the training for up to 6 people over approximately 7 days.

- **Task 4: Road safety and transport management integration**

53. The Consultant will develop a plan for comprehensive international training in the integration of road safety and transport management, including consultation with project stakeholders to ensure that the plan captures all training requirements. The training shall include visits to a country(ies) leading in road safety. It is envisaged that the participants would be leaders, department heads and managers from SPTD.

54. By the end of the training, trainees will be familiar with and understand the laws, standards and rules that are used by countries leading in road transport (especially road safety), and can underpin the development of integrated transport policies and practices that will enhance transport sustainability in Shaanxi.

55. The Consultant will manage the training for up to 6 people over approximately 7 days.

b.) Team Requirement and Specific Tasks

Table 7: Team Requirement

Position Title	Type of Consultant		No. of person-months	
	International	National	International	National
Road safety specialist /	1		3.50	

Position Title	Type of Consultant		No. of person-months	
	International	National	International	National
Team leader				
Road safety design engineer		2		4.50
Road safety management specialist	1	1	2.00	5.25
	2	**3**	**5.5**	**9.75**

56. **Road Safety Specialist/Team Leader (1 international, 3.5 person-months, intermittent).** The consultant will (i) facilitate implementation of the project; (ii) lead development of training plans; (iii) coordinate delivery of training and international tours; and (iv) oversee reporting. The consultant should have a university degree in engineering or a related field, and at least 10 years or more of international experience in the field of road engineering safety is preferred. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

57. **Road Safety Design Engineers (1 National, 4.5 person-months, intermittent)**. The consultants will: (i) develop training plans; (ii) deliver training; (iii) participate in study tours; (iv) assist with translations; and (v) prepare reports. The consultants should have a university degree in engineering or a related field, and at least 5 years or more of experience in the field of road engineering safety in China and 2 years or more of international experience in the field of road engineering safety is preferred. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

58. **Road Safety Management Specialist (1 International, 2 person-months, intermittent; 1 National, 5.25 person-months, intermittent).** The consults will: (i) develop training plans; (ii) deliver training; (iii) participate in study tours; and (iv) prepare reports. The national consultant will assist in translations. The international consultant should have a university degree in a field related to road safety management, and at least 10 years or more of international experience in the field of road safety strategy, planning and management is preferred. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage. The national consultant should have a university degree in a field related to road safety management, and at least 5 years or more of experience in the field of road safety strategy, planning and management in China is preferred. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

59. **Other experts who may receive honoraria or payments (national, 2 person-months, intermittent).** Additional resource persons and task-specific experts will be engaged to carry out well-defined tasks, including preparing case study papers, training presentations, presenting papers in training, and reviewing draft reports and training materials. The national resource persons and experts will have extensive experience in their respective fields of specialization and will have expertise in (i) training and capacity building, (ii) institutional development, (iii) road safety policy making, regional cooperation, and (vii) other areas identified as strategic thrusts in this project.

60. **Cost estimates and financing.** The estimated cost of the Consultant contract is $0.65 million, which will be fully financed under the ADB loan. The assignment will require 5.5 person-months for an international consultant and 9.75 person-months for local consultants on intermittent basis.

Table 8: Cost Estimates

Item			Cost ($ 000)
1		Consultants	
	(i)	Remuneration and per diem	
	a)	International consultants	130.0
	b)	National consultants	66.0
	(ii)	International and local travel	30.0
	(iii)	Reports and translations	10.0
	(iv)	Miscellaneous support and office costs	5.0
	(v)	Local surface travel	2.0
2		Workshops, Training / Seminars & Conferences *	372.0
4		Goods, equipment & services **	2.0
5		Contingencies	33.0
Total			**650.0**

* Includes stakeholder and training workshops as well international workshops and seminars.
This includes 2 person-months equivalent of resource persons (national).
** Includes software and computer devices for use in project

c.) Implementation Arrangements

61. **Recruitment.** The Consultant will be recruited by the transport bureau following ADB consultant recruitment procedures using SSS.

62. **Implementation.** The Consultant will report to the head of the project management office set up in the EA.

63. **Scheduling.** The consultancy shall be provided throughout the project implementation period, which is anticipated to start in 2016 and be complete by 2018.

64. **Reporting.** The consultant will prepare reports listed in Table 3. Six copies of each report will be submitted in print and electronic version to the in English and Chinese, and two copies in English language to ADB. The list of deliverables to be provided is in Table 9.

Table 3: List of Reports for Submission

Report	Timing
Inception Report	Within 1 month
Safe Road Design Training in PRC training strategy and action plan	Within 3 months
Report on Safe Road Design Training in PRC	Within 6 months
International Safe Road Design training strategy and action plan	Within 12 months
Report on International Safe Road Design Training	
Road safety leadership, strategy and planning training strategy and action plan	Within 18 months
Report on Road safety leadership, strategy and planning training	Within 24 months

Report	Timing
Road safety and transport management integration strategy and action plan	Within 30 months
Report on the implementation of road safety and transport management integration Plan	Within 24 months
	Within 30 months

65. **Services and facilities provided to the consultant.** The EA will:
(i) Assist the Consultants to organize training in PRC.
(ii) Provide facilities for training in the PRC.
(iii) Provide logistical assistance in execution of the tasks, such as liaison with stakeholder organisations and obtaining necessary approvals and documentation for domestic and international travel.

B. Walk Wise Pilot/Road Safety Education Consultant (SSS, 7.9 person-months international, 26.25 person-months national)

66. International and national consultants will assist the Executing Agency (EA) and implementing agency (IA) in implementing a pilot road safety education component of the *Walk Wise* project. The pilot will focus on three schools in one of the two counties (Shangluo or Ankang) in the Shaanxi Trunk Roads Improvement Project area.

67. The program will be based on the *Walk Wise* project [35] which was developed to prevent road traffic injuries and fatalities in vulnerable communities through a focus on road safety education and awareness. The program will improve the skills and confidence of primary school teachers to train their students in road safety skills, and provide schools with quality curricula and teaching materials that have undergone extensive development and revision in China. Further, the program will emphasize building a supportive network among local stakeholders, promoting community-wide awareness, and encouraging community ownership to ensure long-term sustainability and impact.

68. The *Walk Wise* project was successfully implemented in 37 primary schools in Chongqing province in 2015 and in 2016 it will reach approximately 80,000 students at 80 primary schools in Chongqing and Sichuan provinces. The implementation of this road safety education component in Shaanxi Province will leverage curriculum, materials, and experience that have been developed during the application of the program in neighboring provinces.

69. **Justification for using SSS Method.** The selected organization is the Asia Injury Prevention (AIP) Foundation, a non profit business with the mission to provide life saving traffic safety knowledge and skills to the developing world with the goal of preventing road traffic fatalities and injuries. AIP Foundation is proposed on a SSS basis in accordance with para. 2.30 of ADB's Consulting Guidelines, i.e. (i) when only one firm has experience of exceptional worth for the assignment - it has used its own resources to develop, implement and evaluate the "Walk Wise" curriculum and teaching program in Chongqing and Sichuan Provinces and it has intellectual property rights over materials for which it is not seeking payment. In addition, as a U.S.-registered non-profit organization, it does not have an interest in profiting from this project, which presents another clear advantage over competition.

[35] Information about *Walk Wise* project can be found at: http://asiainjury.org/our-reach/china/

70. **Objectives.** The Road Safety Education Consultant will be recruited to assist the Executing Agency (EA) and Implementing Agency (IA) to implement a pilot road safety education and community awareness program in Shaanxi Province. The objectives of the program are:

(i) To improve awareness and knowledge on road safety of road users; and
(ii) To improve road safety behaviors of road users.

71. **Scope of work.** The services of the Road Safety Education Consultant will include, but not be limited to:

(i) design and implement school-based education;
(ii) design and implement community education;
(iii) ownership and capacity building; and
(iv) monitoring and evaluation.

a.) Key Tasks

- **Task 1: School-Based Education**

72. **Adaption of the primary school curriculum.** This project will draw on existing comprehensive Chinese road safety curricula developed for the rural, mountainous road context in Kai County, Chongqing Province under *Walk Wise*, for primary students; grade one through six. The curricula will include students' and teacher's handbooks and teaching aids such as posters and games. A traffic simulation corner will be established on each school ground so students can practice the skills they learn in the classroom. The material will be modified where necessary by adapting to the local context/circumstances and responding to requests from the IA and EA.

73. This will also include the establishment of a baseline data survey, which should include but not be limited to the project areas e.g., Shangluo and Ankang counties. The baseline survey should capture and reflect the reality of the road conditions/context in the target communities of Shaanxi Province. The survey should also include discussion with the teachers, students, parents, communities and government authorities before revising the curriculum and implementing the detailed project activities.

74. **Adaptation of the E-learning module.** An interactive E-learning module will be introduced to complement the classroom curricula outlined above, with focus on three key road safety topics: *pedestrian safety, car safety, and motorcycle safet*y. These modules will be used at primary school grade level, and each module will build on the skills taught in previous grades.

75. By 2016, this E-learning curriculum will have been piloted in Kai County, Chongqing province as part of the *Walk wise* project. It will have undergone a thorough evaluation and revision process to ensure it meets the needs of primary school students in a rural, mountainous road environment. The E-learning will be further revised and tailored to the target communities under this program.

76. **Teachers' training program.** The consultant shall develop a training program aimed at primary school level teachers. The consultant will also be responsible for delivering the training to all primary school teachers. It will comprise of formal training on how to implement the road safety curricula in their classrooms and techniques for best communicating road safety skills and knowledge to children, amongst others. A teachers' training workshop will be held at each primary school before implementing the curricula, and teachers will receive ongoing support from field staff throughout the year.

77. In addition, the consultant will also implement the Master Trainers program, where highly-motivated and qualified teachers and/or related motivated stakeholders will be trained to teach other teachers how to use the road safety curricula and best practices for teaching road safety to children. It is expected that the network of Master Trainers will serve as an important source of program support in the local communities, and will contribute to its long-term sustainability.

78. **Information workshops for parents.** The consultant will be responsible for actively engaging parents and/or guardians throughout the program. Parents and/or guardians are recognized as key players in improving the road safety knowledge and behavior of children. The parents will participate in the baseline study before the implementation, the consultant will be responsible in delivering information workshops for parents and/or guardians at each primary school, where they will receive training on important road safety skills which they can transfer to and encourage in their children. The consultant will also be responsible for gathering parents' feedback and suggestions regularly during project implementation, including evaluating the program throughout its life. In addition, the consultant will also develop special communication tools for parents that will be used under the curricula. These include, but are not limited to, parent flyers and parent videos. These tools will be provided to all participants of the parents' workshop during the training.

- **Task 2: Community Education**

79. The consultant will work closely with the IA and EA to develop key messages related to the project and will develop a set of communication materials, including, but not limited to: videos, billboards, banners, flyers, and posters. These materials will be used as tools to communicate to the communities about the program and the importance of safe, high-quality roads in their communities. The consultant will distribute these materials at public events, which aim to educate the wider community on smart road user behavior and reinforce the messages taught in the target schools.

80. The consultant will hold at least three public awareness events in the local communities, which at minimum will include a project launch event, Road Safety Week celebration, and December 2nd National Traffic Safety Day celebration. The consultant shall integrate road safety education sessions and messages in these events.

81. Public awareness events: Public events held in the local communities may include but are not limited to a project launch event, Road Safety Week, road safety-themed concerts or performances, and other public awareness activities. Road safety education sessions and messages will be integrated in these events.

- **Task 3: Ownership and Capacity Building**

82. The consultant will assist in the establishment of a Road Safety Working Group (RSWG), which will support the project in its efforts to: 1) increase road safety knowledge, 2) promote smart road user behavior, and 3) educate the community on the strategic objectives of the project. The RSWG will provide complementary services that will enhance the overall road environment in the target communities.

83. The consultant will conduct a stakeholder assessment to determine all potential stakeholders in the target communities and work closely with IA and EA and the local county government to formalize the group. Once established, the consultant will assist the RSWG to formulate a strategic plan to support the pilot program with clearly define the roles and responsibilities of each stakeholder, and to ensure strong coordination and a successful partnership.

84. The RSWG's stakeholders will, at minimum, include: representatives from the Foreign Finance and Policy Office (FFPO), Shaanxi Province Department of Transport (SPTD), local county government, local education department, local traffic police department, NGOs, schools, communities and the media. A representative from the FFPO and SPTD will be involved with the RSWG with the goal to provide high level coordination support and leadership. The RSWG will meet on quarterly basis while ad-hoc meetings can be organized upon request of key stakeholders.

85. The consultant will organize at minimum five formal stakeholder workshops at period intervals throughout the program to align goals, encourage progress, and discuss lessons learned gathered throughout the implementation of program activities. At least one workshop will be to establish the RSWG, review project objectives and roles of the RSWG; one for the middle term evaluation; one to review the middle-term evaluation results and provide suggestions for the new semester; one for the final evaluation and one for sharing the final evaluation results and discuss the next stage.

86. The consultant will be responsible for coordinating and facilitating a study tour to Chongqing, where the Walk Wise project was established. The consultant is expected to provide a report of the study tour, and develop a knowledge product that can be used in future projects.

- **Task 4: Monitoring and Evaluation**

87. **Monitoring and evaluation plan.** The consultant will develop a monitoring and evaluation plan at the commencement of the project, including consultation with IA, EA and RSWG and other project stakeholders to ensure that the plan captures all reporting requirements and data needs. The plan will at minimum outline the monitoring and evaluation activities for the duration of the project, and will include a program logic model, selected indicators, and plans for external evaluations.

88. **Progress reporting.** The consultant will provide quarterly updates to the IA and EA on project progress, including the latest internal monitoring data on outputs.

89. **Process evaluation.** The consultant will conduct a mid-term review at the mid-point of the school year. This mid-term review will include workshops with key stakeholders to review progress-to-date, as well as interviews with school principals, teachers, and community members to discuss their perceptions of the program. This mid-term review shall provide information on how the program is being received by the community, and provide an opportunity to reflect and plan for any program improvements recommended for the second half.

90. **Final evaluation.** The consultant will engage external evaluators to conduct an overall evaluation of the program's outcomes and provide recommendations for future phases of the program.

b.) Team Requirement and Specific Tasks

Table 10: Team Requirement

Position Title	Type of Consultant		No. of person-months	
	International	National	International	National
Project Director	1		2.3	
Project Lead / Deputy Project Director		1		4.5
Field Coordinator		1		18
M&E Coordinator	1		3.2	

Position Title	Type of Consultant		No. of person-months	
	International	National	International	National
Road Safety Education Expert		1		2
Local Partnership Consultant		1		1.75
Specialist Resource Person	3		2.4	
Total	**5**	**4**	**7.9**	**26.25**

91. **Team Leader/Program Director (1 international, 2.3 person months, intermittent).** The Team Leader/Program Director will: (i) coordinate the general tasks, (ii) ensure resolution of key project issues; (iii) attend key stakeholder meetings / events, and (iv) be responsible for managing key stakeholder relationships.

92. The consultant should have a university degree in social science, public health, development studies or a related field, and 10 years or more of experience in the field of road safety is preferred. A knowledge of English in Writing, speaking is a must. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

93. **Project Lead (1 national, 4.5 months, intermittent).** The Project Lead will: (i) design and manage the program, (ii) manage the implementation of the program; (iii) be responsible for the general administration and daily human resources management of the project, (v) coordinate with stakeholders and partners, and (iv) be responsible for overall project reporting.

94. The consultant should have a university degree in social science, public health, development studies or a related field, and 10 years or more of experience in the field of road safety is preferred. A knowledge of English in Writing, speaking is a must. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

95. **Field Coordinator (1 national, 18 months, intermittent).** The Field Coordinator will: (i) manage and implement the day-to-day project activities and local engagement; (ii) develop and manage databases; and (iv) maintain project documentation. This role will be appointed as part of the grant. The field coordinator will have a university degree in social sciences, transportation, public health, or development studies, at least 5 years of work experience in road safety or relevant fields. A knowledge of English in writing and speaking is a must.

96. The consultant should have a university degree in social science, public health, development studies or a related field, and 5 years or more of experience in the field of road safety is preferred. A knowledge of English in Writing, speaking is a must. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

97. **Monitoring & Evaluation Coordinator (1 international, 3.2 months, intermittent).** In conjunction with the Project Team, the Monitoring & Evaluation (M&E) Coordinator will: (i) design the logic model and M&E framework; and (ii) implement the M&E plan in the field, including data collection and analysis.

98. The consultant should have a university degree in monitoring and evaluation, public health or a related field, and 10 years or more of experience in the field of road safety is preferred. A knowledge of English in Writing, speaking is a must. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

99. **Road Safety Education Consultant (1 national, 2 months, intermittent).** In conjunction with the Project Team, a local Road Safety Education consultant will: (i) assist the project team to adapt the curriculum and teachers training manual to local requirements; and (ii) lead teacher training.

100. The consultant should have a university degree in social sciences, transportation, public health, development studies or a related field, and 10 years or more of experience in the field of road safety is preferred. A knowledge of English in Writing, speaking is a must. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

101. **Local Partnerships Consultant (1 National, 1.75 months, intermittent).** In conjunction with the Project Team, the Partnerships Consultant will: (i) develop a stakeholder and partner engagement plan, (ii) implement the stakeholder and partner engagement plan, and (iii) communicates with stakeholders and partners throughout the course of the project.

102. The consultant should have a university degree in social sciences, public policy, public health, development studies or a related field, and 10 years or more of experience in the field of road safety is preferred. A knowledge of English in writing and speaking is a must. Previous work experience with international development and financial institutions on a regional scope, and in developing road safety studies and publications, will be an advantage.

103. **Specialist Project Support Officers (3 International, 0.8 month each, intermittent).** Additional resource persons and task-specific experts will be engaged to carry out well-defined tasks, including: (i) design communications materials and media engagement plans and materials; (ii) oversee and report project finances; and (iii) complete project reporting.

104. The international resource persons and experts will have extensive experience in their respective fields of specialization and will have expertise in (i) communication, (ii) training and capacity building, (iii) road safety policy making, (iv) social development, (v) regional cooperation, (vi) financial management and (vii) other areas identified as strategic thrusts in this project.

105. **Cost estimates and financing.** The total cost of the Road Safety Education Consultant contract is $0.3 million, which will be fully financed under the ADB loan. The assignment will require 7.9 person-months international consultant and 26.25 person-months local consultant.

Table 11: Cost Estimates

Item			Cost ($ 000)
1		Consultants	
(i)		Remuneration and per diem	
	a)	International consultants	29.5
	b)	National consultants	85.1
(ii)		International Travel	7.0
(iii)		National Travel	28.4
(iv)		Reports and Communications	6.2
(v)		Office Operation and Translation	20.5
2		Workshops, Training / Seminars & Conferences*	75.0
3		Surveys	29.0
4		Goods, equipment, and services**	12.6
5		Contingencies	6.7
Total			**300.0**

* Includes stakeholder and training workshops as well national study tours, workshops and seminars.

* Includes software and computer devices for use in project.

c.) Implementation Arrangements

106. **Recruitment.** The Consultant will be recruited by the transport bureau following ADB consultant recruitment procedures using SSS.

107. **Implementation.** The Consultant will report to the head of the project management office in the IA.

108. **Scheduling.** The project shall be conducted during a defined 18-month period, from March 2016 to August 2017. Detailed schedule for the tasks shall be agreed between the IA and EA at the outset of the project.

109. **Reporting and deliverables.** The Consultant will prepare reports and deliverables listed in Table 3. Six copies of each report will be submitted in print and electronic version to the IA and EA in English and Chinese, and two copies in English language to ADB.

Table 12: List of Reports and Deliverables for Submission

Task	Target group	Deliverables / reports
School-based education	• Primary students • Teachers • Parents • School communities	• Curricula for grades 1 – 6 • Traffic simulation corners on school grounds • E-learning • Master Trainers' training • Teachers' trainings • Parents' workshops
Community education	• Wider communities surrounding trunk roads	• Communication materials • Public events • Giveaways (reflective caps, billboards etc.)
Ownership and capacity building	• Government agencies • Wider communities surrounding trunk roads • Media	• Workshops and coordination meetings • Visit tours for key partners in our project site of other project countries • Media seminar
Monitoring and evaluation	• Government agencies • School communities • Wider communities surrounding trunk roads • AIP Foundation staff • ADB and SPTD	• Monitoring and evaluation plan • Progress reports • Mid-term review report • Final evaluation report

110. **Services and facilities provided to the consultant.** The executing agency and implementing agency will make the following available to the Road Safety Education Consultants:

(i) suitable office accommodation;
(ii) eligible liaison officials with proficient English and Chinese skills to provide the coordination and support to the consultants for convenient implementation of the services;
(iii) assistance in liaising with local county government, and facilitating the first stakeholder coordination meeting before the and implementation;

(iv) necessary assistance in applying the entry visa, residential and work permits and other possible certificate for the smooth implementation of the consulting services. The costs of all such government approvals will be reimbursed to the consultant at cost; and

(v) authorization to access to the available data, documents, reports, finance reports, drawings, maps and related offices and facilities.

PROCUREMENT RISK ASSESSMENT AND MANAGEMENT PLAN

Risk Description	Risk Assessment	Mitigation Measures or Risk Management Plan
Lack of IAs and Procurement Agent's (PA) experience with ADB procurement procedures may result in delayed procurement processes.	Medium	Training on ADB procurement procedures will be provided to Ankang and Shangnan IAs and PA (in Xian) soon after engagement of PA. OSFMD staff outposted to PRCM will provide ad hoc support to the EA (Foreign Fund Financed Project Office) on procurement related issues.
Multiple number and geographic spread of contracts may exceed capacity of IAs and the supervision consultant to monitor contract implementation.	Medium	1. Project Implementation Units at district and county level will have dedicated staff for monitoring implementation of ADB project. They will be financed by transport bureaus at district lever and rural road management bureaus at county level. 2. Independent Traffic Construction Engineering Quality Supervision Stations at city and county level will monitor contract implementation. 3. Ankang Transport Construction Quality Supervision Station, Xunyang County Transport Construction Quality Supervision Station and Hanyin District Transport Construction Quality Supervision Station will be engaged in addition to the supervision consultant to ensure quality of construction. 4. In addition, Bureau for Letters and Calls at city level and a Complain Office under EA will be responsible for receiving and responding to any complaint regarding quality of construction.
Relatively short contract implementation period (1 year for trunk roads and 2 years for rural roads) and impossibility to carry out civil works during winter (December-February) may affect timely completion of civil work contracts and achievement of project outcomes.	Medium	Through bidding documents, contractors will be advised to prepare construction program based on winter conditions. Contracts will include bonuses for early completion (under provisional sum) to provide incentives for contractors to complete works ahead of schedule and optimize works during winter season, i.e. schedule concrete and pavements works outside of winter season.
Overall Risk Level	**Medium**	

OUTLINE OF QUARTERLY PROGRESS MONITORING REPORT

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Appendices

ENVIRONMENTAL MANAGEMENT PLAN

August 2015

PRC: Shaanxi Mountain Road Safety Demonstration Project

Prepared by the Shaanxi Provincial Government for the Asian Development Bank

A. Introduction

1. This Environmental Management Plan (EMP) is developed for the Shaanxi Mountain Road Safety Demonstration Project (the project). It identifies the potential project environmental impacts and defines mitigation measures and monitoring requirements for the design, construction, and operational stages of the project. It also defines the institutional arrangements and mechanisms, the roles and responsibilities of different institutions, procedures and budgets for implementation of the EMP. The EMP seeks to ensure environmental protection activities during preconstruction, construction, and operation continuously improve in order to prevent, reduce, or mitigate adverse environmental impacts and risks. The EMP draws on the findings of the project EIA, the domestic Environmental Impact Reports (EIR) and Environmental Impact Registration Forms (EIRF), Soil and Water Conservation Report (SWCR), the Project Preparation Technical Assistance (PPTA) reports, and discussions and agreements with relevant government agencies and the Asian Development Bank (ADB).

2. This EMP is based on proposed project designs as of July 2014. Detailed engineering designs are yet to be finalized and may require subsequent impact assessment and/or revisions to this EMP. The Shaanxi Provincial Transport Department (SPTD) will provide the detailed designs to ADB for review to determine if the EMP requires revision. The final EMP will be disclosed on the ADB website (www.adb.org) and included in the Project Administration Manual (PAM). The final EMP will also be included as a separate annex in all bidding and contract documents. The contractors will be informed of their obligations to implement the EMP, and to include EMP implementation costs in their bids for project works. The contractors are required to prepare site specific EMPs (SEMP) containing method statements for implementing environmental mitigation measures for each individual works package. These SEMPs will be submitted to the Implementing Agencies (IA) and Environmental Supervision Engineers (ESE) for approval.

3. This EMP consists of six components: (i) institutional arrangements and environmental responsibility, (ii) environmental mitigation measures, (iii) environmental monitoring, (iv) institutional strengthening and training, (v) public consultation, and (vi) grievance redress mechanism (GRM). Environmental monitoring consists of two types of monitoring: (i) environmental quality monitoring for assessing the extent and severity of impact and (ii) compliance monitoring by independent entities for verifying EMP implementation. This EMP also presents a section on contract clauses for environmental safeguards, which will be incorporated in all tender documents.

B. Institutional Arrangements and Responsibilities for EMP Implementation

4. **Executing Agency**. **Shaanxi Provincial Transport Department (SPTD)** will be the executing agency (EA) responsible for overall implementation and compliance with loan assurances and the EMP.

5. **Project Management Office**. The EA has established the **Foreign-Fund Finance Project Office (FFPO),** who will be responsible, on behalf of the EA, for the day-to-day management of the project. The FFPO will have the overall responsibility to supervise the implementation of environment mitigation and monitoring measures, coordinate the project GRM and report to ADB. FFPO will (i) appoint at least one environmental specialist on its staff

to coordinate and manage EMP implementation, (iii) engage the loan implementation consultants (LIC) services, and (iii) supervise the procurement process. The FFPO environmental specialist will (i) supervise contractors and their compliance with the EMP; (ii) conduct regular site inspections; (iii) act as local entry point for the project GRM; (iv) submit environmental quality monitoring results provided by the IAs to the FFPO for verification. FFPO will prepare quarterly project progress reports and semi-annual environment monitoring reports and submit them to ADB.

6. **Implementing Agency**. Implementing Agencies (IA) for the project will consist of (i) the **Ankang Municipal Transport Bureau (AMTB)** for trunk roads G316 and S102, and rural roads (RR) 1 to 7, and (ii) the **Shangnan County Government (SCG)** for trunk road S224 and RR8. They will implement project components, administer and monitor contractors and suppliers, and be responsible for construction supervision and quality control. To ensure that the contractors comply with the EMP provisions, the IAs will ensure that the environmental specification clauses listed in the EMP are incorporated into the bidding documents. Each IA will (i) contract the local Environmental Monitoring Station (EMS) to conduct environmental impact monitoring during the construction stage (in this case the Ankang EMS and Shangluo EMS), and (ii) contract an external Environmental Supervision Engineer (ESE) to conduct independent verification of EMP implementation and environmental impact monitoring results during the construction stage of the project. Each IA is recommended to have at least one environmental specialist on its staff to (i) supervise contractors and their compliance with the EMP, (ii) approval of contractors' SEMPs; (iii) conduct regular site inspections, and (iv) submit environmental quality monitoring results provided by the EMS to the FFPO and local Environmental Protection Bureau (EPB) (in this case the Ankang EPB and Shangluo EPB) for verification and confirmation.

7. **Construction contractors** will be responsible for implementing the mitigation measures during construction under the supervision of the IAs (through the ESE) and FFPO. In their bids, contractors will be required to respond to the environmental specifications in the bidding documents. Each contractor will be required to develop site specific EMPs and will assign a person responsible for environment, health and safety. After project completion, environmental management responsibilities will be handed over to the operation and maintenance units.

8. **Operation and maintenance** (O&M) Units for this project will consist of (i) Shaanxi Provincial Highways Bureau (SPHB) for trunk roads G316, S102 and S224; (ii) Xunyang County Transport Bureau (XCTB) for RR1 to RR4; (iii) Hanyin District Transport Bureau (HDTB) for RR5 to RR7; and (iv) Shangnan County Transport Bureau (SCTB) for RR8. During the operational phase, the IAs, Ankang EPB and Shangluo EPB will periodically verify and monitor (through a licensed monitoring entity) the environmental management and implementation of mitigation measures by the O&M Units. The O&M units for the three trunk roads will be responsible for follow-up monitoring of medium term (year 2013) traffic noise impacts to sensitive receptors to determine if noise mitigation measures will be needed and to implement the measures if needed. The cost of monitoring and implementing mitigation measures in this phase will be borne by the relevant O&M Units.

9. **Loan Implementation Environmental Consultant (LIEC)**. Under the loan implementation consultancy (LIC) services contracted by FFPO, a LIEC will be included to support the project. Terms of reference for this external environmental consultant is provided in the Project Administration Manual. The LIEC, as an external monitor, will:

- assess the project components' environmental readiness prior to implementation based on the readiness indicators defined in Table EMP-3 in the EMP;

- support FFPO in updating the EMP including environmental monitoring plan as necessary to revise or incorporate additional environmental mitigation and monitoring measures, budget and institutional arrangements, that may be required based on the detailed design; submit to ADB for approval and disclosure; ensure compliance with the PRC's environmental laws and regulations, ADB's Safeguard Policy Statement (2009) and Public Communications Policy (2011);
- if required, update the EIA and EMP reports for changes in the project during detailed design or project implementation (for example if there is a minor or major scope change) that would result in adverse environmental impacts not within the scope of the approved EIA/EMP;
- assist FFPO to establish a GRM;
- conduct regular EMP compliance assessments, undertake site visits as required, identify any environment-related implementation issues, and propose and oversee implementation of necessary corrective actions;
- assist FFPO to prepare quarterly project progress reports and semi-annual environmental monitoring reports for ADB;
- provide training to FFPO, IAs, O&M units and contractors on environmental laws, regulations and policies, SPS 2009, EMP implementation, and GRM in accordance with the training plan defined in the EMP (Table EMP-7); and
- assist FFPO and IAs in conducting consultation meetings with relevant stakeholders as required, informing them of imminent construction works, updating them on the latest project development activities and GRM.

10. **Environmental Supervision Engineer (ESE)**. Each IA will contract an independent ESE to verify environmental performance during construction and whether the implementation of EMP items complies with the plan. The ESE will review and approve the contractors' SEMPs, review EMP implementation, monitoring activities and results, assess EMP implementation performance, visit the project sites and consult potentially affected people, discuss assessment with the FFPO and the respective IA; and suggest corrective actions. The ESE will prepare monthly reports for submission to the IA which will be submitted to and reviewed by FFPO during the preparation of the quarterly project progress reports for ADB and by the LIEC during the preparation of the semi-annual environment monitoring reports for ADB.

11. Table EMP-1 outlines the overall environmental responsibilities.

C. Summary of Potential Impacts and Mitigation Measures

12. Potential environmental issues and impacts during pre-construction, construction and operation phases, and corresponding mitigation measures, are summarized in Table EMP-2, separated into those that are common to all project roads and those that are road specific. There are two types of mitigation measures:

- Measures that will permanently become part of the infrastructure such as landscape planting, road signage, road side noise barrier and retention/sedimentation ponds should be included within the main civil work contract costs, and are not double-counted as part of the EMP costs. The only exception for this project is the cost for installing double glazed windows at households affected by traffic noise on the three trunk roads (G316, S102 and S224).
- Temporary measures during the construction stage (e.g. dust suppression by watering, use of quiet / low noise powered mechanical equipment, flocculants used to facilitate sedimentation of suspended solids in construction site runoff,

etc) will need to be included in the tender documents to ensure that contractors include for them in their budgets.

Table EMP-1: Environmental Responsibility

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	**Engineering Detailed Design**	**Tendering & Pre-construction**	**Construction**	**Operation**
SPTD	The Executing Agency (**EA**) for the project responsible for overall implementation and compliance with loan assurances and the EMP.				
FFPO	Established by the EA to be responsible for the day-to-day management of the project. Has overall responsibility delegated by the EA for supervising the implementation of environment mitigation measures, coordinating the project level GRM and reporting to ADB				
	• Engage LDI to prepare FSR, EIR, RP and SWCR	• Engage LDI • Review updated EMP • Confirm that mitigation measures have been included in engineering detail design	• Appoint at least one environmental specialist on staff • Incorporate EIA/EMP clauses in tender documents and contracts • Manage the procurement process • Establish the project complaint center with hot-line • Engage LIEC as part of the Loan Implementation Consulting Services	• Supervise EMP implementation to ensure effectiveness • Inspect implementation of mitigation measures. • Operate the project complaint center and coordinate the project environment GRM. • Prepare quarterly project progress reports and semi-annual environment monitoring reports and submit them to ADB • Conduct information disclosure and public consultation •	• Instruct the O&M units on environmental management requirements • Prepare quarterly project progress reports and semi-annual environmental monitoring reports until a PCR is issued
AMTB SCG	The Implementing Agency (**IA**) for the Project to implement project components, administer and monitor contractors and suppliers, and take responsibility for construction supervision and quality control. Will ensure that the EMP is implemented proactively and will respond to any adverse impact beyond those foreseen in the EIA and ensure that if there are any changes in scope the EIA/EMP will be updated, as needed. Will also attend to requests from relevant agencies and ADB regarding the mitigation measures and environmental monitoring program.				
			• Incorporate EIA/EMP clauses in tender documents and contracts • Appoint at least one environmental specialist on staff (recommendation) • Engage AEMS and SEMS for environmental monitoring • Engage ESE for independent compliance monitoring	• Supervise contractors and ensure compliance with the EMP • Approve contractors' SEMPs and method statements • Coordinate construction supervision and quality control • Coordinate environmental monitoring according to the environmental monitoring program in the approved EMP • Act as a local entry point for	• Coordinate environmental monitoring according to the approved EMP until a PCR is issued

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	**Engineering Detailed Design**	**Tendering & Pre-construction**	**Construction**	**Operation**
				the project GRM • Submit monthly monitoring results to FFPO, AEPB and SEPB	
Design institutes	• Prepare project FSRs, EIRs, RPs, SWCRs • Conduct public consultation	• Incorporate mitigation measures defined in the approved EIRs and this EMP into engineering detailed designs • Update the EMP in cooperation with the LIEC			
AEPB SEPB	• Review and approve the project EIRs			• Review project environmental quality monitoring results • Conduct mandated inspection and monitoring	
PPTA consultant	• Provide technical assistance • Review EIRs and other relevant documents • Prepare EIA report and EMP				
LIEC		• Review updated EMP, confirm that mitigation measures have been included in engineering detailed design	• Review bidding documents to ensure that the EIA/EMP clauses are incorporated • Confirm project's readiness in respect of environmental management.	• Advise on mitigation measures • Provide technical support to FFPO, AMTB and SCG for environmental management • Conduct environmental training • Conduct semi-annual EMP compliance review • Support FFPO in preparing quarterly project progress reports and semi-annual environmental monitoring	• Conduct EMP compliance review • Support FFPO in instructing O&M units on environmental management requirements • Support FFPO in preparing quarterly project progress reports and semi-annual environmental monitoring report until a PCR is issued • Coordinate environmental monitoring until a PCR is issued

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	**Engineering Detailed Design**	**Tendering & Pre-construction**	**Construction**	**Operation**
				reports. • Review domestic environmental acceptance reports • Prepare environmental completion report.	
Contractors			• Ensure sufficient funding and human resources for proper and timely implementation of required mitigation and monitoring measures in the EMP throughout the construction phase	• Appoint an environment, health and safety (EHS) officer to oversee EMP implementation related to environmental, occupational health and safety on construction site • Ensure health and safety • Implement mitigation measures • Prepare site specific EMP (SEMP) containing method statements on the implementation of pollution control and mitigation measures listed in Table EMP-2, and submit to AMTB or SCG, and ESE for review and approval • Act as a local entry point for the project GRM	
AEMS SEMS				• Undertake environmental quality monitoring according to the environmental monitoring program in the approved EMP (*contracted by AMTB and SCG*) • Report monitoring data to ESE, AMTB and SCG monthly	• Undertake environmental monitoring until a PCR is issued (*contracted by the O&M units*) • Submit monitoring results to the O&M units
ESE				• Conduct independent verification of project's environment performance	

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	**Engineering Detailed Design**	**Tendering & Pre-construction**	**Construction**	**Operation**
				and compliance with the EMP (*contracted by AMTB and SCG*) • Review monthly monitoring data submitted by AEMS and SEMS, and conduct compliance checking against applicable environmental standards • Provide advice to contractors for resolving on-site environmental problems when monitoring data shows non-compliance. • Submit quarterly compliance monitoring results to FFPO, AMTB and SCG	
O&M units: SPHB XCTB HDTB SCTB					• Ensure proper operation of component facilities according to design standards • Conduct follow up medium term (2023) noise monitoring to determine need for mitigation • Implement mitigation measures if needed
ADB	• Review and approve the EIA and EMP and disclose on ADB website 120 days before Board consideration.	• Approve updated EMP and disclose on ADB website	• Review bidding documents • Confirm project's readiness • Review, approve and disclose environmental assessment reports for replacement rural roads	• Review quarterly project progress reports, semi-annual environmental monitoring reports and project completion report • Undertake review missions • Advise on compliance issues, as required • Disclose semi-annual environmental monitoring reports on ADB website.	• Review and approve environmental monitoring reports and disclose on ADB website • Undertake project completion review mission and prepare Project Completion Report for approval by Board and disclosure on ADB website.

Notes:
ADB = Asian Development Bank; **AEMS** = Ankang Environmental Monitoring Station; **AEPB** = Ankang Environmental Protection Bureau; **AMTB** = Ankang Municipal Transport Bureau; **EA** = Executing Agency; **EHS** = Environmental, Health & Safety; **EIA** = Environmental Impact Assessment; **EIR** = Environmental Impact Report; **EMP** = Environmental

Responsible Entity	Project Stage and Environmental Responsibility				
	Project Preparation	**Engineering Detailed Design**	**Tendering & Pre-construction**	**Construction**	**Operation**

Management Plan; **ESE** = Environmental Supervision Engineer; **FFPO** = Foreign-fund Finance Project Office; **FSR** = Feasibility Study Report; **GRM** = Grievance Redress Mechanism; **HDTB** = Hanyin District Transport Bureau; **IA** = Implementing Agency; **LDI** = local design institute; **LIEC** = Loan Implementation Environmental Consultant; **PCR** = Project Completion Report; **PPTA** = Project Preparation Technical Assistance; **O&M** = Operation and Maintenance; **RP** = Resettlement Plan; **SCG** = Shangnan County Government; **SCTB** = Shangnan County Transport Bureau; **SEMP** = site specific environmental management plan; **SEMS** = Shangluo Environmental Monitoring Station; **SEPB** = Shangluo Environmental Protection Bureau; **SPTD** = Shaanxi Provincial Transport Department; **SPHB** = Shaanxi Provincial Highways Bureau; **SWCR** = Soil and Water Conservation Report; **XCTB** = Xunyang County Transport Bureau

Table EMP-2: Summary of Potential Impacts and Mitigation Measures

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
A: Mitigation measures common to all project roads (both trunk roads and rural roads)						
A.1: Detailed Design Stage						
Conservation of natural resources	Soil resources	Loss of land and topsoil and increased risk of erosion	• Minimize permanent and temporary land take for development. • Retain/incorporate landscape features of interest in design. • Optimize balance between cut and fill and avoid deep cuts and high embankments to minimize earthworks. • Maximize reuse of spoil and old asphalt paving material within the construction or adjacent construction works. • Agree spoil disposal sites, management and rehabilitation plan with local Environment Protection Bureau • Specify removal and storage of topsoil (10-30cm) for restoration works prior to main earthworks. • Specify vegetation that serves specific bioengineering functions and is of local provenance. • Design appropriate drainage systems for slopes to reduce soil erosion.	Design Institute	FFPO	Included in design contract
	Materials	Efficient use of resources	• Specify energy efficient lighting systems. • Specify materials that are recycled, have recycled content or are from sustainable sources, particularly for street furniture and fixtures/fittings. • Specify the use of renewable energy (such as photovoltaic panels) for signs, lighting, where appropriate. • Specify the recycling and reuse of existing asphalt pavement for rehabilitating road sections.	Design Institute	FFPO	Included in design contract
Design of road alignment, road surface, drainage, flood control, lighting and construction staging areas	Extreme weather event due to climate change	Road surface cracking due to extreme hot or cold weather, landslide and flooding due to torrential rainfall	• Consider potential impacts from extreme weather events due to climate change in designing road subgrade, pavement, road-side slopes, drainage system, bridges and culverts. • Adopt appropriate protective measures such as vegetation cover, geotextiles, settling basins, permeable paving, infiltration ditches, stepped slopes, riprap, crib walls, retaining walls and intercepting ditches to reduce the speed of surface run-off.	Design Institute	FFPO	Included in design contract
	Ecology	Protected plant species	• Conduct a tree survey along the project road alignments to identify the locations of those tree species that are under international, national and provincial protection. Mark and fence off the protected trees	Botanist/Landscape Architect	FFPO	FFPO
		Loss of vegetation	• Technical design of new road sections will avoid intact mixed evergreen and deciduous broad-leaf woodland and deciduous broad-leaf woodland, as well as any trees that are on the international, national and provincial protection list. • If avoidance is not possible, design replanting schemes for compensation	Design Institute	FFPO	Included in design contract

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
	Health and safety	Protection of vulnerable road users	• Design must ensure public health and safety, especially pedestrians and school zones	Design Institute	FFPO	Included in design contract
	Air emissions	Construction emissions	• Specify local materials from licensed providers that minimize transport distance. • Locations for borrow areas, asphalt mixing and concrete batching stations must be at least 300 m downwind of the nearest household.	Design Institute	FFPO	Included in design contract
	Water quality	Polluted run-off into water bodies	• Technical design of road drainage to ensure that drainage design and discharge locations minimize risk of polluting nearby water bodies. Need for pollution interceptors and treatment should be considered. • Technical design of road drainage must include in the construction drawings the sedimentation tanks on G316 and S224 (see **Error! Reference source not found.** of the EIA) specified in the approved domestic Environmental Impact Reports. • Locations of borrow areas and spoil disposal sites must be at least 300 m from the nearest water body.	Design Institute	FFPO	Included in design contract
A.2: Pre-construction Stage						
Institutional strengthening	-	Lack of environmental management capacities within FFPO, AMTB, SCG and O&M units	• Appoint qualified environment specialist on staff within FFPO • Contract loan implementation environment consultant (LIEC) within loan implementation consultant (LIC) services within three months after loan approval; Conduct environment management training.	FFPO	ADB	SPTD
	-	Lack of environmental monitoring capability and qualification	• Contract Ankang Environmental Monitoring Station (AEMS) and Shangluo Environmental Monitoring Station (SEMS) to conduct environmental quality monitoring during construction.	AMTB, SCG	ADB	AMTB, SCG
			• Contract AEMS and SEMS upon acceptance approval of the project road to conduct environmental quality monitoring during the operational stage.	O&M units	FFPO	O&M units
EMP Update	-	-	• Review mitigation measures defined in this EMP, update as required to reflect detailed design, disclose updated EMP on project website.	FFPO, LIEC	ADB	FFPO, Loan implementation TA
Tender documents		Environmental safeguard contract clauses	• Put into tender documents the environmental clauses listed in Section J of this EMP	Design Institute	FFPO; LIEC	Included in tendering agency contract
Estimated cost for Design and Pre-construction stage: Included in detailed design and contract tender fees						
A.3: Construction Stage						
Construction site good practice	Soil resources	Spoil disposal and borrow area	• Strip and store topsoil in a stockpile for reuse in restoration. • Use spoil disposal sites approved by AEPB and SEPB and manage in accordance with approved plan. The contractors will only use material from borrow pits that have been licensed and approved. • Avoid side casting of spoil on slopes.	Contractors	AMTB, SCG, ESE, LIEC	Included in the implementation of the approved

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
			• Co-ordinate with water resources bureau monitoring station on effectiveness of soil erosion prevention measures and any need for remedial action. • Spoil disposal sites and borrow areas shall be at least 300 m from any water body. Borrow areas should be sited at least 500m from residential areas so as to reduce dust and noise from these areas. • Borrow areas and spoil disposal sites with long, steep slopes, susceptible to erosion should be avoided and should include small level cut-off drains to break up and redirect run-off. • The contractors should plan their work in borrow areas and spoil disposal sites so that the open area is minimised and rehabilitation can be completed progressively • Restoration of spoil disposal sites and borrow areas will follow the completion of works in full compliance with all applicable standards and specifications, and will be required before final acceptance and payment under the terms of contracts. • Conduct project completion audit to confirm that spoil disposal site and borrow area rehabilitation meets required standard, contractor liable in case of non-compliance.			SWCR
		Soil erosion	• Ensure contractors aware of all soil erosion requirements as set out in the approved plan in the Soil and Water Conservation Report (SWCR) and have developed appropriate method statements and management proposals. • Avoid rainy season. If necessary, construct berms to direct rainwater runoff away from exposed surface. • Install drainage ditches and sedimentation tanks in temporary construction areas to prevent soil erosion and to manage run-off. • Stabilize all cut slopes, embankments and other erosion-prone working areas while works are ongoing. Implement permanent stabilization measures as soon as possible, at least within 30 days. • Pay close attention to drainage provision and establishment of vegetation cover on backfilled areas to prevent soil erosion. • If restoration is carried out during periods of hot or extreme weather, ensure adequate aftercare to maximize survival.	Contractor	AMTB, SCG, ESE, LIEC	Included in the implementation of the approved SWCR
		Soil contamination	• Develop spill response plan. Keep a stock of absorbent materials (e.g. sand, earth or commercial products) on site to deal with spillages and train staff in their use. • If there is a spill take immediate action to prevent entering drains, watercourses, unmade ground or porous surfaces. Do not hose the spillage down or use any detergents. Use oil absorbents and dispose of	Contractor	AMTB, SCG, ESE, LIEC	Included in the implementation of the approved SWCR

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
			used absorbents at a waste management facility. • Record any spill events and actions taken in environmental monitoring logs and report to LIEC. • Properly store petroleum products, hazardous materials and waste in clearly labeled containers on an impermeable surface in secure and covered areas, preferably with a containment tray for any leaks.			
	Air quality	Dust (TSP) during construction	• Provide dust masks to operating personnel. • Spray water regularly on hauling and access roads (at least once a day dependent on local conditions, increase/decrease frequency as required) to suppress dust; and erect hoarding around dusty activities. • Minimize the storage time of construction and demolition wastes on site by regularly removing them off site. • Mount protective canvasses on all trucks which transport material that could generate dust. • Build access and haulage roads at sufficient distances from residential areas, in particular, from local schools and hospitals. • Assign haulage routes and schedules to avoid transport occurring in the central areas, traffic intensive areas or residential areas. Vehicle speed on unpaved haul roads will be restricted to 10 km/h or less. • Keep construction vehicles and machinery in good working order, regularly service and turn off engines when not in use. • Vehicles with an open load-carrying case, which transport potentially dust-producing materials, shall have proper fitting sides and tail boards. Dust-prone materials shall not be loaded to a level higher than the side and tail boards, and shall always be covered with a strong tarpaulin. • Install wheel washing equipment or conduct wheel washing manually at each exit of the works area to prevent trucks from carrying muddy or dusty substance onto public roads. • In periods of high wind, dust-generating operations shall not be permitted within 200 m of residential areas. Special precautions need to be applied in the vicinity of sensitive areas such as schools, kindergartens and hospitals. • Equip material stockpiles and concrete mixing equipment with dust shrouds. For the earthwork management for backfill, measures will include surface press and periodical spraying and covering. The extra earth or dreg should be cleared from the project site in time to avoid long term stockpiling. • Unauthorized burning of construction and demolition waste material and refuse shall be subject to penalties for the Contractor, and withholding of payment.	Contractor	AMTB, SCG, ESE, LIEC	$279,000 (contractor bid)

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
			• Keep the public informed of construction schedules, dusty and noisy activities, and access to the grievance redress mechanism. Post the complaint hotline number at all work site and construction camp entrances.			
		Fumes and particulate matter from asphalt mixing plant, concrete batching plant and other equipment and machinery	• Site asphalt mixing stations at least 300 meters downwind of the nearest household. • Equip asphalt, hot mix and batching plants with fabric filters and/or wet scrubbers to reduce the level of dust emissions. • Regularly inspect and certify vehicle and equipment emissions and maintain to a high standard.			
	Noise and vibration	Noise from PME and vehicles	• During daytime construction, the contractor will ensure that: (i) noise levels from equipment and machinery conform to the PRC standard for Noise Limits for Construction Sites (GB12523-2011) and the WBG EHS Standards, and properly maintain machinery to minimize noise; (ii) equipment with high noise and high vibration are not used near village or township areas and only low noise machinery or the equipment with sound insulation is employed; (iii) sites for asphalt-mixing plants and similar activities will be located at least 300 m away from the nearest sensitive receptor; and (iii) temporary anti-noise barriers or hoardings will be installed around the equipment to shield residences when there are residences within 80 m of the noise source. • For all new road sections including new tunnels and new bridges, there will be no night time (between 22:00 and 06:00 hours) construction. • For existing road sections, night time construction shall be avoided. Yet, recognizing that construction occasionally would require some works to be conducted at night to take advantage of less road traffic or to avoid worsening day time traffic conditions, night time construction work if needed should prevent using high sound power level equipment and nearby residents should be notified of such night time activities well beforehand. • Regularly monitor noise at sensitive areas (refer to the monitoring plan). If noise standards are exceeded by more than 3 dB, equipment and construction conditions shall be checked, and mitigation measures shall be implemented to rectify the situation. • Provide the construction workers with suitable hearing protection (ear muffs) according to the worker health protection law of the PRC. • Control the speed of bulldozer, excavator, crusher and other transport vehicles travelling on site, adopt noise reduction measures on equipment, ensure regular equipment repair and maintenance to keep them in good working condition.	Contractor	AMTB, SCG, ESE, LIEC	$45,700 (contractor bid)

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
			• Limit the speed of vehicles travelling on construction sites and haul roads (less than 8 km/h), forbid the use of horns unless absolutely necessary, minimize the use of whistles. • Maintain continual communication with the villages and communities along the road alignments and ensure GRM is accessible and effective.			
		Blasting	• A pre-construction dilapidation survey of properties within blasting zone of influence (area to be determined by contractor based on level of charge) should be carried out to confirm existing structural condition. All prominent defects in the form of cracks, settlement, movement, water seepage, spalling concrete, distortion, subsidence and other building defects should be recorded in photographs and supporting notes. • Monitor noise and vibration at Hongyantan, Xiaohe Town, Yujiawan and Goujiashan during blasting for the construction of tunnels Hongyantan #1, Hongyantan #2, Yujiawan and Goujiashan on S102. Based on monitoring results, reduce the charge for each blast if necessary.			
	Water quality	Construction site runoff and wastewater discharge	• Portable toilets and small package wastewater treatment plants and or septic tanks will be provided on construction sites for the workers. If there are nearby public sewers, interim storage tanks and pipelines will be installed to convey wastewater to public sewers. Construction sites and construction camps shall also have drainage provisions to collect and treat site runoff. • Sedimentation tanks will be installed on construction sites (including tunneling sites) to treat process water (e.g. concrete batching for bridge construction) and muddy runoff with high concentrations of suspended solids. If necessary, flocculants such as polyacryl amide (PAM) will be used to facilitate sedimentation. • Construction of river crossing road bridge foundations will avoid the rainy season from July to September to minimize potential water quality impact. Mitigation measures such as placement of sandbags or berms around foundation and shoreline works to contain muddy water runoff will be adopted. Slurry from pile drilling in the river bed will be pumped to shore and properly disposed of. This will reduce the disturbance of sediments and the impact on water quality. • Construction machinery will be repaired and washed at designated locations. No onsite machine repair and washing shall be allowed. Storage and refueling facilities for fuels, oil, and other hazardous materials will be within secured areas on impermeable surfaces, and provided with bunds and cleanup kits. If refueling in the field is required, it will be done from road-licensed fuel trucks away from watercourses or other environmentally sensitive areas. • The contractors' fuel suppliers must be properly licensed, follow proper	Contractor	AMTB, SCG, ESE, LIEC	$32,800 (contractor bid)

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
			protocol for transferring fuel, and must be in compliance with *Transportation, Loading and Unloading of Dangerous or Harmful Goods* (JT 3145-88). ● Material stockpiles will be protected against wind and runoff waters which might transport them to surface waters. There shall be no storage of materials and equipment in river channels or close to sensitive receptors. Temporary storage of materials and equipment on river banks, if necessary, shall be short-term and protected to prevent run-off polluting river water. ● Any spills are to be cleaned up according to PRC norms and codes within 24 hours of the occurrence, with contaminated soils and water treated according to PRC norms and codes. Records must be handed over without delay to the FFPO and local EPB. An emergency spill contingency plan shall be prepared by the Contractor as part of the SEMP and personnel will be trained in its use. ● Mitigation of water quality impact during river crossing bridge construction will be based on water quality monitoring results. At each river crossing bridge construction location, upstream and downstream monitoring stations will be set up and SS levels monitored. When the SS levels at the downstream impact station is 130% higher than the SS levels at the upstream control station, the contractor shall adopt alternative construction methods or additional mitigation measures until the downstream SS level is less than 130% above the upstream SS level.			
	Solid waste	Construction site refuse and construction and demolition (C&D) waste disposal	● Temporary storage and permanent disposal of C&D waste at designated sites only. These sites shall be at least 300 m from any water body. ● Attempts will be made to maximize the re-use of earth cut materials and C&D wastes on the project, including the re-use of old asphalt or concrete road pavements. Asphalt waste must be disposed of at approved hazardous waste treatment center. ● Transport construction waste in enclosed containers; ● Establish enclosed waste collection points on site, with separation of domestic, construction and recyclable waste streams;; ● Set up centralized domestic waste collection point and transport offsite for disposal regularly by sanitation department.	Contractor	AMTB, SCG, ESE, LIEC	$20,000 (contractor bid)
	Ecology	Destruction of vegetation	● Conduct a tree survey along the road alignments and mark and fence off all the protected tree species within the project area of influence. Avoid damage to the protected tree species during construction. If unavoidable, transplant these trees to safe location. ● Construction workers are prohibited from capturing any wildlife during	Contractor	AMTB, SCG, ESE, LIEC	$245,000 (contractor bid)

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
			construction; ● Preserve existing vegetation where no construction activity is planned; ● Protect existing trees and grassland during construction; where a tree has to be removed or an area of grassland disturbed, replant trees and re-vegetate the area after construction in particular existing mountain gullies underneath the project bridges; ● Remove trees or shrubs only as the last resort if they impinge directly on the permanent works or necessary temporary works.			
	Physical cultural resources	Destruction of buried cultural relics	● Contractor must comply with PRC's *Cultural Relics Protection Law* and *Cultural Relics Protection Law Implementation Regulations* if such relics are discovered, stop work immediately and notify the local cultural authority, adopt measures to protect the site.	Contractor	AMTB, SCG, ESE, LIEC	None
	Overall disturbance to communities	Excessive disturbance to communities due to prolonged construction times	● Contractors to identify and adhere to strict schedule for completion of each section and to avoid prolonged construction, disturbance	Contractor	AMTB, SCG, ESE, LIEC	Covered in above costs
Health and Safety	Occupational health and safety	Construction site sanitation	● Effectively clean and disinfect the site. During site formation, spray with phenolated water for disinfection. Disinfect toilets and refuse piles and timely remove solid waste; ● Exterminate rodents on site at least once every 3 months, and exterminate mosquitoes and flies at least twice each year; ● Minimise the risk of fly- or mosquito-borne diseases by maintaining well-drained and hygienic project sites; ● Remove standing water bodies and cover drums and other containers to avoid formation of stagnant water; ● Ensure personnel are aware of potential disease risks; ● Enforce on-site hygiene regulations to prevent litter; ● Provide public toilets in accordance with the requirements of labor management and sanitation departments in the living areas on construction site, and appoint designated staff responsible for cleaning and disinfection. ● Work camp wastewater shall be discharged into the municipal sewer system or treated on-site with portable system to the required standard.	Contractor	AMTB, SCG, ESE, LIEC	$26,000 (contractor bid)
		Occupational safety	● Provide safety hats and shoes to all construction workers and enforce their use by the workers; ● Provide appropriate ear defenders to workers working near noisy PME and blasting activities	Contractor	AMTB, SCG, ESE, LIEC	$10,000 (contractor bid)
		Food safety	● Inspect and supervise food hygiene in cafeteria on site regularly. Cafeteria workers must have valid health permits.	Contractor	AMTB, SCG, ESE, LIEC	None

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
			• If food poisoning is discovered, implement effective control measures immediately to prevent it from spreading.			
		Disease prevention and safety awareness	• Construction workers must have physical examination before start working on site. If infectious disease is found, the patient must be isolated for treatment to prevent the disease from spreading. From the 2nd year onwards, conduct physical examination on 20% of the workers every year. • Establish health clinic at location where workers are concentrated, which should be equipped with common medical supplies and medication for simple treatment and emergency treatment for accidents. • Specify the persons responsible for health and epidemic prevention, education on food hygiene, and disease prevention, to raise the awareness of workers.	Contractor	AMTB, SCG, ESE, LIEC	$10,000 (contractor bid)
	Community health and safety	Temporary traffic management	• A traffic control and operation plan will be prepared together with the local traffic management authority prior to any construction. The plan shall include provisions for diverting or scheduling construction traffic to avoid morning and afternoon peak traffic hours, regulating traffic at road crossings with an emphasis on ensuring public safety through clear signs, controls and planning in advance.	Contractor, local traffic police	AMTB, SCG, ESE, LIEC	Local traffic police department
		Information disclosure	• Residents and businesses will be informed in advance through media and community posting of the construction activities, given the dates and duration of expected disruption.	Contractor	AMTB, SCG, ESE, LIEC	None
		Access to construction sites	• Clear signs will be placed at construction sites in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials, excavations etc and raising awareness on safety issues. • All sites will be made secure, discouraging access by members of the public through appropriate fencing whenever appropriate.	Contractor	AMTB, SCG, ESE, LIEC	None
		Utility services interruptions	• Assess construction locations in advance for potential disruption to services and identify risks before starting construction. • If temporary disruption is unavoidable, develop a plan to minimize disruption with relevant authorities e.g. power company, water supply company, communication company, and communicate dates and duration in advance to all affected people.	Contractor, local service providers	AMTB, SCG, ESE, LIEC	None
Grievance redress mechanism	Social & environmental	Handling and resolving complaints on contractors	• Establish a GRM, appoint a GRM coordinator within FFPO • Brief and provide training to GRM access points (FFPO, AMTB, contractors). • Disclose GRM to affected people before construction begins at the main entrance to each construction site. • Maintain and update a Complaint Register to document all complaints.	Contractor, FFPO, AMTB, SCG, ESE, LIEC	AEPB, SEPB	FFPO budget, Loan implementation consulting service
Estimated cost for the Construction Stage: $668,500						

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
A.4: Operational Stage						
Project roads	Climate change	Increased flood risk	Co-ordinate with reservoir operators on flood storage to help ensure road infrastructure is protected during periods of heavy rainfall.	SPHB, XCTB, HDTB, SCTB	FFPO	O&M Unit's operation budget
	Traffic	Road and drainage condition	Regularly inspect and maintain the road surface and drainage system.	SPHB, XCTB, HDTB, SCTB	FFPO	O&M Unit's operation budget
		Road safety and traffic accidents	Strictly enforce traffic law to improve road safety and reduce traffic accidents.	Local traffic police	FFPO	O&M Unit's operation budget
						Estimated cost for the Operational Stage: $5,000
B: Trunk Road G316 Xunyang - Ankang						
B.1: Detailed Design Stage						
Design of spoil disposal sites and construction staging areas	Protected area	Impact on Shaanxi Han River Wetland	No spoil disposal site and construction staging area shall be located within the Shaanxi Han River Wetland boundary.	Design Institute	FFPO	Included in design contract
Design of retention/ sedimentation tanks	Water quality	Road runoff during rainfall event polluting Category II Han River	Detailed design to include 70 retention/sedimentation tanks along the alignment in accordance with the sizes and locations specified in the approved EIR for trunk road G316 and this EIA (**Error! Reference source not found.**). (construction cost to be included in the civil works contract)	Design Institute	FFPO	Included in design contract
B.2: Construction Stage						
Disposal of solid waste	Protected area	Impact on Shaanxi Han River Wetland	No solid waste generated during construction shall be disposed of within the boundary and up to 1 km from the boundary of the Shaanxi Han River Wetland	Contractor	AMTB	None
Wastewater discharge	Water quality	Impact on Category II Han River	No wastewater from the construction sites and temporary land take areas shall be discharged into Category II Han River	Contractor	AMTB	None
Ecology	Habitat protection and restoration	Tree planting using local species	• Road side tree planting shall use local species such as Black Locust, fruit trees and plants in accordance with the surrounding plant community, with the exception of areas located within the towns. • Plant shrubs and trees in nearby empty land to attract bird species such as the Yellow Breasted Bunting and Red-billed Blue Magpie. These include the Chinese Pistache *Pistaca chinensis*, Caprifoliacease plants such as the Linden Viburnum *Viburnum dilatatum* and Amur Honeysuckle *Lonicera maackii*, and Shrubby Bush-clover *Lespedeza bicolor*. Crops such as grains and corns are also favorite food for these two bird species.	Contractor	AMTB	Included in contractor bid
		Restoration of	Restoration measures for the temporary staging areas shall comply with the	Contractor	AMTB	Included in

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
		temporary land take areas	former land cover type to maximize native biodiversity: ● For temporary land take areas in gullies (the four spoil disposal sites at chainages K3+250, K18+650, K21+100 and K21+940; and on pre-casting yard at chainage K6+010), plant local tree and shrub species with fruits to provide food for birds ● For the asphalt mixing station at chainage K2+250, restore the Black Locust woodland similar to the original land cover ● For the asphalt mixing station at chainage K18+100, restore the orchard landscape to match with the surrounding land cover ● For the other pre-casting yards, restore the farmland land cover			contractor bid
		Avoid damage to protected plant species	Construction workers shall avoid damage to and removal of the Gingko Trees and Camphor Trees which are nationally protected species: ● Gingko Trees in the gully underneath the medium bridge between chainage K6+215 to K6+301 ● Camphor Trees on both sides of G316 from the Guanmiaogou Bridge (chainage K33+559.7) to the end point (chainage K34+801)	Contractor	AMTB	None
B.3: Operational Stage						
Installation of double glazed windows	Traffic noise	Traffic noise affecting existing sensitive receptors	Install double glazed windows at sensitive receptors identified in the approved EIR for trunk road G316 and this EIA (**Error! Reference source not found.**)	SPHB	FFPO	$872,000 SPHB
C: Trunk Road S102 Xunyang - Xiaohe						
C.1: Detailed Design Stage						
Design flood heights of bridges	Climate change	Risk of flood	Raise Liangheguan Bridge by 0.3m.	Design institute	FFPO	Included in design contract
Design noise barrier	Traffic noise	Traffic noise affecting schools	Detailed design to include the following road-side noise mitigation measures as specified in the approved EIR for trunk road S102 and this EIA (**Error! Reference source not found.**) ● 100-m long, 3-m high boundary wall at Tangxing Primary School (K46+480-K46+550)塘兴小学 ● 150-m long, 3-m high noise barrier at Liangheguan Primary School (K53+650-K53+700)两河关小学 (construction cost to be included in the civil works contract)	Design institute	FFPO	Included in design contract
C.2: Pre-construction Stage						
Tender document	Noise	Blasting noise and vibration	Put the following into the tender document for S102 as shown in Section J of this EMP: Specific Clause for blasting on S102 (i) A pre-construction dilapidation survey of properties within blasting zone of influence (area to be determined by contractor based on level of	Design institute	FFPO	Included in design contract

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
			charge) shall be carried out to confirm existing structural condition. All prominent defects in the form of cracks, settlement, movement, water seepage, spalling concrete, distortion, subsidence and other building defects will be recorded in photographs and supporting notes. (ii) Noise and vibration shall be monitored at Hongyantan, Xiaohe Town, Yujiawan and Goujiashan during blasting for the construction of tunnels Hongyantan #1, Hongyantan #2, Yujiawan and Goujiashan on S102. Based on monitoring results, reduce the charge for each blast if necessary.			
C.3: Operational Stage						
Installation of double glazed windows	Traffic noise	Traffic noise affecting existing sensitive receptors	Install double glazed windows at sensitive receptors identified in the approved EIR for trunk road S102 and this EIA (**Error! Reference source not found.**)	SPHB	FFPO	$1,511,000 SPHB
D: Trunk Road S224 Shangnan - Yunxian						
D.1: Detailed Design Stage						
Design of retention/ sedimentation tanks	Water quality	Road runoff during rainfall event polluting Category II rivers and drinking water collection sumps	• Detailed design to include 40 retention/sedimentation tanks along the alignment in accordance with the sizes and locations specified in the approved EIR for trunk road S224 and this EIA (**Error! Reference source not found.**). • Detailed design to include protective guardrails along the alignment at locations specified in the approved EIR for trunk road S224 and this EIA (**Error! Reference source not found.**) to protect Category II rivers and drinking water collection sumps (construction cost to be included in the civil works contract) • Detailed design to include a sealed cover over the drinking water collection sump at Weijiatai Village	Design Institute	FFPO	Included in design contract
D.2: Pre-construction Stage						
Tender document	Water quality	Protection of drinking water collection sumps	Put environmental specifications for protection of water quality into the tender document for S224 as shown in Section J of this EMP:	Design institute	AMTB	Included in design contract
D.3: Construction Stage						
Drinking water collection sumps	Water quality	Protection of drinking water collection sumps	• Road side hoarding will be placed at the three locations of drinking water collection sumps on trunk road S224 as barriers to prevent contamination of these drinking water sources by construction materials and wastes. • No stockpiling of construction materials and aggregates is permitted within 300 m from these sumps. • All wastewater generated from road construction within 300 m of these sumps will be treated and diverted to downstream of these sumps for discharge. • Cut-off and diversion drains will be installed at these locations and other			$3,000 (contractor bid)

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Implementing Entity	Supervising Entity	Source of funds
			sensitive receptors, as required, to divert run-off away.			
Wastewater	Water quality	Protection of Category II rivers	No wastewater from the construction sites shall be discharged into the Xian River, Dan River, Xiang River and Tao River	Contractor	AMTB	None
D.4: Operational Stage						
Installation of double glazed windows	Traffic noise	Traffic noise affecting existing sensitive receptors	Install double glazed windows at sensitive receptors identified in the approved EIR for trunk road S224 and this EIA (**Error! Reference source not found.**)	SPHB	FFPO	$967,000 SPHB

Key: **ADB** = Asian Development Bank; **AEMS** = Ankang Environmental Monitoring Station; **AMTB** = Ankang Municipal Transport Bureau; **EIA** = Environmental Impact Assessment; **EIR** = Environmental Impact Report; EMP = environmental management plan; **ESE** = Environmental supervision engineer; **FFPO** = Foreign-Fund Finance Project Office; **HDTB** = Hanyin District Transport Bureau; **LIC** = Loan Implementation Consultant; **LIEC** = Loan implementation environmental consultant; **O&M** = operation & maintenance; **PME** = powered mechanical equipment; **SCG** = Shangnan County Government; **SCTB** = Shangnan County Transport Bureau; **SEMS** = Shangluo Environmental Monitoring Station; **SPHB** = Shaanxi Provincial Highways Bureau; **SS** = suspended solid; **TSP** = total suspended particulates; **XCTB** = Xunyang County Transport Bureau

13. The mitigation measures defined in the EMP will be (i) checked and where necessary updated by the design institutes; (ii) incorporated into tender documents (where appropriate), construction contracts, and operational management plans; and (iii) implemented by contractors and IAs under supervision of FFPO. The effectiveness of these measures will be evaluated based on the results of the environmental quality monitoring conducted by AEMS and SEMS, and through EMP compliance verification conducted by the ESE and LIEC.

D. Monitoring and Reporting

14. Three types of project monitoring will be conducted under the EMP. [36]

i. Project readiness monitoring. To be conducted by the LIEC.

ii. Project impact monitoring (also known as environmental quality monitoring). To be conducted by: (a) the Ankang Environmental Monitoring Station (EMS) contracted by AMTB for trunk roads G316 and S102 and rural roads RR1 to RR7; (b) the Shangluo EMS contracted by SCG for trunk road S224 and RR8; and (c) the contractors, who will be required to conduct frequent noise and air quality monitoring around construction sites and to report monitoring results in their weekly progress reports to FFPO, AMTB, SCG and ESE.

iii. Independent evaluation (also known as compliance monitoring). To be conducted by the ESE and LIEC (from loan implementation consulting services) to verify EMP compliance during project implementation. There will be two ESEs, one contracted by AMTB for the trunk and rural roads implemented by AMTB; and one contracted by SCG for the trunk and rural roads implemented by SCG. The LIEC will function as an external monitor for ADB.

15. ADB will oversee project environmental compliance on the basis of the semi-annual environmental monitoring reports provided by FFPO and site visits (generally 1-2 times/year). Monitoring and reporting arrangements defined for this project are described below.

16. **Project Readiness Monitoring.** Before construction, the LIEC will assess the project's readiness in terms of environmental management based on a set of indicators (Table EMP-3) and report it to ADB and FFPO. This assessment will demonstrate that environmental commitments are being carried out and environmental management systems are in place before construction starts, or suggest corrective actions to ensure that all requirements are met.

Table EMP-3: Project Readiness Assessment Indicators

Indicator	Criteria	Assessment	
EMP update	• EMP was updated after technical detailed design & approved by ADB	Yes	No
Compliance with loan covenants	• The borrower complies with loan covenants related to project design and environmental management planning	Yes	No
Public involvement effectiveness	• Meaningful consultation completed	Yes	No
	• GRM established with entry points	Yes	No

[36] In addition to project-specific monitoring, Ankang and Shangluo Environmental Monitoring Stations will conduct independent ambient and/or enforcement monitoring as per national requirements. This is separate to, and not funded by, the project.

Indicator	Criteria	Assessment
Environmental Supervision in place	• Loan implementation environmental consultant (LIEC) is in place	Yes No
	• Staff environment specialists appointed by FFPO, AMTB and SCG	Yes No
	• Environmental supervision engineer (ESE) contracted by AMTB and SCG	Yes No
	• Environment monitoring stations contracted by AMTB and SCG	Yes No
Bidding documents and contracts with environmental safeguards	• Bidding documents and contracts incorporating the environmental activities and safeguards listed as loan assurances	Yes No
	• Bidding documents and contracts incorporating the impact mitigation and environmental management provisions of the EMP	Yes No
	• EMP environmental specifications included in contract documents for construction contracts	Yes No
	• Contractors' site specific EMP (SEMP) containing method statements on the implementation of pollution control and mitigation measures	Yes No
EMP financial support	• The required funds have been set aside for EMP implementation	Yes No

17. **Project Impact Monitoring.** Table EMP-4 shows the internal environmental quality monitoring program designed for this project, defining the scope, location, parameter, duration and frequency, and responsible agencies, for monitoring during the construction and operational stages. Environmental quality monitoring will include monitoring of air quality, noise and water quality during construction, and noise monitoring during operation. These will be conducted by Ankang EMS (contracted by AMTB for the construction phase and APHB for the operational phase) and the Shangluo EMS (contracted by SCG for the construction phase and APHB for the operational phase). The selection of monitoring locations is based on distances from the road alignments, number of households and populations affected, and the extent of sensitivity to air and noise impacts (e.g. schools and health clinics).

18. For monitoring of bridge construction impacts on water quality, a control station versus impact station approach will be adopted. The monitoring station upstream of the bridge alignment will function as the control station as it will not be impacted by construction activities. The monitoring station downstream of the bridge alignment will function as the impact station. Any increase in the level of water quality parameter (such as suspended solids SS) at the impact station compared to the control station is indicative of potential impact due to construction activities. If the level of the water quality parameter (mainly SS) at the impact station is >130% of the control station, mitigation measures such as using sand bags, berms or silt curtain to enclose the works areas will need to be adopted.

19. The monitoring results will be compared with relevant PRC performance standards (Table EMP-5). Non-compliance with these standards will be highlighted in the monitoring reports. Monitoring results will be submitted by AEMS to AMTB and ESE, and by SEMS to SCG and ESE on a monthly basis. In turn, AMTB and SCG will submit the data to FFPO also on a monthly basis. FFPO will then submit to ADB in semi-annual environmental monitoring reports (prepared with the support of the LIEC–Table EMP-6).

Table EMP-4: Internal Environmental Quality Monitoring Program

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
G316 Xunyang - Ankang					***Estimated cost: $23,000***
Construction Stage					
Dust and noise	TSP, L_{Aeq}	At boundaries of all construction sites	2 times per day, 3 days per week during the construction period	Contractor (included in contractor budget)	AMTB
Air quality	TSP; (SO_2 & NO_2 only if there is asphalt mixing within 500 m)	14 locations 1. Duanjiahe Town Health Clinic 段家河镇卫生院 (K5+800) 2. Duanjiahe Junior High School 段家河初级中学 (K6+200) 3. Mingde Primary School 明德小学 (K6+250) 4. Duanjiahe Town Kindergarten 段家河镇幼儿园 (K6+350) 5. Longquan Village Health Clinic 龙泉村卫生院 (K20+900) 6. Zaoyang Town 早阳镇 (K25+500 – K25+700) 7. Dongzhan Village First Group 东站村一组 (K32+800) 8. Chuangxin Vocational Training School 创新职业培训学校(K33+000) 9. Dongzhan Village Second Group东站村二组 (K33+850) 10. Ankang City Children's Welfare Institute安康市儿童福利院(K34+500) 11. Guanmiao Town Central Health Clinic关庙镇中心卫生院(K34+850) 12. Jinxing Village金星村 (K35+000-K36+000) 13. Tuanjie Primary School 团结小学 (K35+750) 14. Hualian Vocational Training School 华联职业培训学校 (K36+370)	1 day (24-hr) per month (Monitor only when road section has construction activities within 500 m)	AEMS	AMTB, ESE
Noise	L_{Aeq}	14 locations 1. Duanjiahe Town Health Clinic 段家河镇卫生院 (K5+800) 2. Duanjiahe Junior High School 段家河初级中学 (K6+200) 3. Mingde Primary School 明德小学 (K6+250) 4. Duanjiahe Town Kindergarten 段家河镇幼儿园 (K6+350) 5. Longquan Village Health Clinic 龙泉村卫生院 (K20+900) 6. Zaoyang Town 早阳镇 (K25+500 – K25+700) 7. Dongzhan Village First Group 东站村一组 (K32+800) 8. Chuangxin Vocational Training School 创新职业培训学校(K33+000) 9. Dongzhan Village Second Group东	2 times per day (day time and night time); 1 day per month (Monitor only when road section has construction activities within 500 m)	AEMS	AMTB, ESE

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
		站村二组 (K33+850) 10. Ankang City Children's Welfare Institute安康市儿童福利院(K34+500) 11. Guanmiao Town Central Health Clinic关庙镇中心卫生院(K34+850) 12. Jinxing Village金星村 (K35+000-K36+000) 13. Tuanjie Primary School 团结小学 (K35+750) 14. Hualian Vocational Training School 华联职业培训学校 (K36+370) [*Note: night time monitoring not needed at #4, #13 and #14]*			
Water quality	DO, SS, TPH	Set up 2 stations for water quality monitoring at each river/stream crossing bridge locations as follows: 1. Control station: 50 m upstream of the bridge alignment 2. Impact station 100m downstream of the bridge alignment (Note: if downstream impact station data > 130% of upstream control station data (DO <130%), mitigation measures are needed)	1 time per day; 1 day per month during bridge construction	AEMS	AMTB, ESE
Operational Stage					
Air quality	PM_{10}, NO_2	8 locations: 1. Xuejiawan First Group薛家湾一组 (K5+300-K5+600) 2. Duajiahe Town Health Clinic段家河镇卫生院 (K5+800) 3. Duanjiahe Town Kindergarten 段家河镇幼儿园 (K6+350) 4. Longquan Village Health Clinic 龙泉村卫生院 (K20+900) 5. Zhoujiahe周家河 (K21+900-K22+350) 6. Zaoyang Town 早阳镇 (K25+500 – K25+700) 7. Dongzhan Village First Group 东站村一组 (K32+800) 8. Dongzhan Village Second Group东站村二组 (K33+850)	7 consecutive days every 3 months (until a PCR is issued)	AEMS	SPHB
Noise	L_{Aeq}	5 locations: 1. Duajiahe Town Health Clinic段家河镇卫生院 (K5+800) 2. Duanjiahe Town Kindergarten 段家河镇幼儿园 (K6+350) 3. Longquan Village Health Clinic 龙泉村卫生院 (K20+900) 4. Guanmiao Town Central Health Clinic关庙镇中心卫生院(K34+850) 5. Hualian Vocational Training School 华联职业培训学校 (K36+370) [Note: no night time needed at #2 and #5]	2 times per day (day time and night time), 2 consecutive days every 3 months (until a PCR is issued)	AEMS	SPHB
S102 Xunyang - Xiaohe					***Estimated cost : $26,000***
Construction Stage					

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
Air quality	TSP; (SO_2 & NO_2 only if there is asphalt mixing within 500 m)	20 locations 1. Petrol Station Staff Dormitory小河北加油站家属区 (K0+050) 2. Fengjingjiayuan 枫景花园 (K1+200=K1+600) 3. Liuwan刘湾 (K1+850-K2+550) 4. Kanghuayuan康华园 (K2+350) 5. Lido Estate丽都小区 (K3+500) 6. Wangpo王坡 (K5+350-K5+700) 7. Caoping Village草坪村 (K6+350-K7+250) 8. Qingniwan 清泥湾 (K7+650-K9+600) 9. Liu Village Primary School 柳村小学 (K11+620-K11+650)) 10. Muzhutan母猪滩 (K14+750-K15+600) 11. Ganxitang甘溪淌 (K19+250-K19+520) 12. Jijiaping季家坪 (K21+150-K21+870) 13. Hongyantan Primary School红岩滩小学 (K34+220-K34+260) 14. Luduba 碌碡坝 (K37+250-K38+250) 15. Zhaowan Primary School赵湾小学 (K39+380) 16. Tangxin Primary School 塘兴小学 (K46+480-K46+550) 17. Liangheguan Primary School 两河关小学 (K53+650-K53+700) 18. Kangjiaping 康家坪 (K54+520-k54+850) 19. Xiaohe Town 小河镇 (K56+800-K57+500) 20. Xiaohe Middle School 小河中学 (K57+080-K57+200)	1 day (24-hr) per month (Monitor only when road section has construction activities within 500 m)	AEMS	AMTB, ESE
Noise	L_{Aeq}	20 locations 1. Petrol Station Staff Dormitory小河北加油站家属区 (K0+050) 2. Fengjingjiayuan 枫景花园 (K1+200=K1+600) 3. Liuwan刘湾 (K1+850-K2+550) 4. Kanghuayuan康华园 (K2+350) 5. Lido Estate丽都小区 (K3+500) 6. Wangpo王坡 (K5+350-K5+700) 7. Caoping Village草坪村 (K6+350-K7+250) 8. Qingniwan 清泥湾 (K7+650-K9+600) 9. Liu Village Primary School 柳村小学 (K11+620-K11+650) 10. Muzhutan母猪滩 (K14+750-K15+600)	2 times per day (day time and night time); 1 day per month (Monitor only when road section has construction activities within 500 m)	AEMS	AMTB, ESE

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
		11. Ganxitang甘溪淌 (K19+250-K19+520) 12. Jijiaping季家坪 (K21+150-K21+870) 13. Hongyantan Primary School红岩滩小学 (K34+220-K34+260) 14. Luduba 碌碡坝 (K37+250-K38+250) 15. Zhaowan Primary School赵湾小学 (K39+380) 16. Tangxin Primary School 塘兴小学 (K46+480-K46+550) 17. Liangheguan Primary School 两河关小学 (K53+650-K53+700) 18. Kangjiaping 康家坪 (K54+520-k54+850) 19. Xiaohe Town 小河镇 (K56+800-K57+500) 20. Xiaohe Middle School 小河中学 (K57+080-K57+200) [*Note: night time monitoring needed at all the school locations*]			
	L_{Aeq} and vibration	4 locations during blasting for construction of tunnels Hongyantan #1, Hongyantan #2, Yujiawan and Goujiashan 1. Hongyantan 红岩滩 (K34+050-K34+400) 2. Xiaohe Town 小河镇 (K56+800-K57+500) 3. Yujiawan 俞家湾 (K60+150-K60+250) 4. Goujiashan 苟家山 (K62+680)	Once per day during blasting.	AEMS	AMTB, ESE
Water quality	DO, SS, TPH	Set up 2 stations for water quality monitoring at each river/stream crossing bridge location as follows: 1. Control station: 50 m upstream of the bridge alignment 2. Impact station 100m downstream of the bridge alignment (Note: if downstream impact station data > 130% of upstream control station data (DO <130%), mitigation measures are needed)	1 time per day; 1 day per month during bridge construction	AEMS	AMTB, ESE
Operational Stage					
Air quality	PM_{10}, NO_2	11 locations 1. Fengjingjiayuan 枫景花园 (K1+200=K1+600) 2. Lido Estate丽都小区 (K3+500) 3. Caoping Village草坪村 (K6+350-K7+250) 4. Liu Village Primary School 柳村小学 (K11+620-K11+650) 5. Ganxitang甘溪淌 (K19+250-K19+520) 6. Hongyantan Primary School红岩滩小学 (K34+220-K34+260)	7 consecutive days every 3 months (until a PCR is issued)	AEMS	SPHB

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
		7. Luduba 碌碡坝 (K37+250-K38+250) 8. Zhaowan 赵湾 (K38+750-K40+500) 9. Tangxin Primary School 塘兴小学 (K46+480-K46+550) 10. Liangheguan Primary School 两河关小学 (K53+650-K53+700) 11. Xiaohe Town 小河镇 (K56+800-K57+500)			
Noise	L_{Aeq}	<u>8 locations</u> 1. Fengjingjiayuan 枫景花园 (K1+200=K1+600) 2. Lido Estate丽都小区 (K3+500) 3. Liu Village Primary School 柳村小学 (K11+620-K11+650) 4. Yuanxigou 院寺沟 (K23+380-K23+650) 5. Liangshuiquan 凉水泉 (K29+850-K30+380) 6. Luduba 碌碡坝 (K37+250-K38+250) 7. Tangxin Primary School 塘兴小学 (K46+480-K46+550) 8. Liangheguan Primary School 两河关小学 (K53+650-K53+700) [*Note: night time monitoring needed at all the school locations*]	2 times per day (day time and night time); 2 consecutive days every 3 months (until a PCR is issued)	AEMS	SPHB
	L_{Aeq}	<u>Follow up noise monitoring in 2023 at the following 3 locations</u> 1. Danjiawan 单家湾 (K17+150-K17+350) 2. Xiaohe Middle School 小河中学 (K57_080-K57+200) 3. Yujiawan 俞家湾 (K60+150-K60+250)	2 times per day (day time and night time); 2 consecutive days every 6 months in year 2023	AEMS	SPHB
S224 Shangnan - Yunxian					***Estimated Cost: $21,000***
Construction Stage					
Air quality	TSP; (SO_2 & NO_2 only if there is asphalt mixing within 500 m)	<u>10 locations</u> 1. Xiangnan County Estate 商南县小区 (K0+100-K0+400 2. Erdaohe Village 二道河村 (K0+500 – K1+100) 3. Dongfan Estate 东畈小区 (K3+700-K3+800) 4. Sanjiaochi Primary School 三角池小学 (K7+700-K7+800) 5. Dagudong Primary School 打鼓洞小学 (K31+100-K31+200) 6. Xianghe Town Center Kindergarten 湘河镇中心幼儿园 (K37+260) 7. Xianghe Central Health Clinic 湘河中心卫生院 (K39+510-K39+560) 8. Dongyuepo Village 东岳坡村 (K67+230-K69+300) 9. Qianchuan Village 前川村 (K77+400-	1 day (24-hr) per month (Monitor only when road section has construction activities within 500 m)	SEMS	SCG, ESE

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
		K79+100) 10. Bujiagou Village Nongtai Group 布家沟村弄台组(K82+420-K83+120)			
Noise	L_{Aeq}	10 locations 1. Xiangnan County Estate 商南县小区 (K0+100-K0+400 2. Erdaohe Village 二道河村 (K0+500 – K1+100) 3. Dongfan Estate 东畈小区 (K3+700-K3+800) 4. Sanjiaochi Primary School 三角池小学 (K7+700-K7+800) 5. Dagudong Primary School 打鼓洞小学 (K31+100-K31+200) 6. Xianghe Town Center Kindergarten 湘河镇中心幼儿园 (K37+260) 7. Xianghe Central Health Clinic 湘河中心卫生院 (K39+510-K39+560 8. Dongyuepo Village 东岳坡村 (K67+230-K69+300) 9. Qianchuan Village 前川村 (K77+400-K79+100) 10. Bujiagou Village Nongtai Group 布家沟村弄台组(K82+420-K83+120)	2 times per day (day time and night time); 1 day per month (Monitor only when road section has construction activities within 500 m)	SEMS	SCG, ESE
Water quality	DO, SS, TPH	Set up 2 stations for water quality monitoring at each river/stream crossing bridge location as follows: 1. Control station: 50 m upstream of the bridge alignment 2. Impact station 100m downstream of the bridge alignment (Note: if downstream impact station data > 130% of upstream control station data (DO <130%), mitigation measures are needed)	1 time per day; 1 day per month during bridge construction	SEMS	SCG, ESE
Operational Stage					
Air quality	PM_{10}, NO_2	10 locations 1. Xiangnan County Estate 商南县小区 (K0+100-K0+400 2. Erdaohe Village 二道河村 (K0+500 – K1+100) 3. Dongfan Estate 东畈小区 (K3+700-K3+800) 4. Sanjiaochi Primary School 三角池小学 (K7+700-K7+800) 5. Dagudong Primary School 打鼓洞小学 (K31+100-K31+200) 6. Xianghe Town Center Kindergarten 湘河镇中心幼儿园 (K37+260) 7. Xianghe Central Health Clinic 湘河中心卫生院 (K39+510-K39+560) 8. Dongyuepo Village 东岳坡村 (K67+230-K69+300) 9. Qianchuan Village 前川村 (K77+400-K79+100) 10. Bujiagou Village Nongtai Group 布家沟	7 consecutive days every 3 months (until a PCR is issued)	SEMS	SPHB

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
		村弄台组(K82+420-K83+120)			
Noise	L_{Aeq}	8 locations 1. Xiangnan County Estate 商南县小区 (K0+100-K0+400 2. Dongfan Estate 东畈小区 (K3+700-K3+800) 3. Nanwan Village 南湾村 (K5+100-K5+700) 4. Huayuan Village Second Group 花园村二组 (K14+570 – K14+740) 5. Matidian Fifth Group 马蹄店五组 (K22+500-K23+100) 6. Sanguanmiao Village Baishegou Group 三官庙村白蛇沟组 (K25+340) 7. Xianghe Town Center Kindergarten 湘河镇中心幼儿园 (K37+260) 8. Xianghe Central Health Clinic 湘河中心卫生院 (K39+510-K39+560)	2 times per day (day time and night time); 2 consecutive days every 3 months (until a PCR is issued)	SEMS	SPHB
	L_{Aeq}	Follow up noise monitoring in 2023 at the following 14 locations 1. Erdaohe Village 二道河村 (K0+500-K1+100) 2. Zhangjiagang Village Xiahe Group 张家岗村下河组 (K6+460-K6+520) 3. Zhangjiagang Village First Group 张家岗村一组 (K7+360-K7+510) 4. Qingshan Town Resettlement Estate 青山镇移民小区 (K16+100) 5. Matidian Seventh Group 马蹄店七组 (K23+600-K24+620) 6. Sanguanmiao Village Sanlibian Group 三官庙村三里碥组(K30+300) 7. Hongyu Village First Group 红鱼村一组 (K36+500-K36+900) 8. Xianghe Town Junior High School 湘河镇初级中学 (K37+300) 9. Lianhua Estate 莲花小区 (K39+340-K39+400) 10. Xianghejie Group 湘河街组 (K40+000-K40+300) 11. Liushubian 柳树边 (K52+320-K52+410) 12. Weijiatai Town 魏家台镇 (K53+900-K54+720) 13. Bujiagou Village Nongtai Group 布家沟村弄台组 (K82+420-K83+120) 14. Buijiagou Village Tudiling Group 布家沟村土地岭组 (K83+400)	2 times per day (day time and night time); 2 consecutive days every 6 months in year 2023	SEMS	SPHB
Rural Roads 1 - 7					***Estimated cost: $26,000***
Construction Stage					
Air quality	TSP	17 locations on the following rural roads (RR): 1. RR1: Longwantan Seventh Group 龙王滩七组 (K83+200)	1 day (24-hr) per month (Monitor only when road section has construction	AEMS	AMTB, ESE

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
		2. RR1: Kangjiaping Fourth Group 康家坪四组 (K76+100) 3. RR1: Zhangliang Fourth Group 张良四组 (K66+400) 4. RR1: Xiaohe Town Junior High School 小河镇初级中学 5. RR1: Xiaohe Town Center Primary 'School 小河镇中心小学 6. RR2: Baiguoshu Fifth Group 白果树五组 (K7+200) 7. RR3: Beigou Village First Group 北沟村一组 (K0+000) 8. RR4: Pinghuai Second Group 坪槐二组 (K0+000 9. RR4: Zhangjiagou Third Group 张家沟三组 (K6+700) 10. RR4: Caoling Primary School 曹玲小学 (K8+200) 11. RR4: Shuangni Primary School 双泥小学 (K11+750) 12. RR5: Yanba Town Center Primary School 晏坝镇中心小学(K0+000) 13. RR5: Yanba Town Center Kindergarten 晏坝镇中心幼儿园(K0+300) 14. RR5: Yanba Town Junior High School 晏坝镇初级中学 (K0+400) 15. RR6: Zaoyang Town Qianjin Primary School 早阳镇前进小学 (K0+000) 16. RR6: Lianghe Village Sixth Group 两河村六组 (K6+300) 17. RR7: Maliu Village Eleventh Group 麻柳村十一组 (K0+000)	activities within 500 m)		
Noise	L_{Aeq}	17 locations on the following rural roads (RR): 1. RR1: Longwantan Seventh Group 龙王滩七组 (K83+200) 2. RR1: Kangjiaping Fourth Group 康家坪四组 (K76+100) 3. RR1: Zhangliang Fourth Group 张良四组 (K66+400) 4. RR1: Xiaohe Town Junior High School 小河镇初级中学 5. RR1: Xiaohe Town Center Primary 'School 小河镇中心小学 6. RR2: Baiguoshu Fifth Group 白果树五组 (K7+200) 7. RR3: Beigou Village First Group 北沟村一组 (K0+000) 8. RR4: Pinghuai Second Group 坪槐二组 (K0+000 9. RR4: Zhangjiagou Third Group 张家沟三组 (K6+700) 10. RR4: Caoling Primary School 曹玲	2 times per day (day time and night time); 1 day per month (Monitor only when road section has construction activities within 500 m)	AEMS	AMTB, ESE

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
		小学 (K8+200) 11. RR4: Shuangni Primary School 双泥小学 (K11+750) 12. RR5: Yanba Town Center Primary School 晏坝镇中心小学(K0+000) 13. RR5: Yanba Town Center Kindergarten 晏坝镇中心幼儿园 (K0+300) 14. RR5: Yanba Town Junior High School 晏坝镇初级中学 (K0+400) 15. RR6: Zaoyang Town Qianjin Primary School 早阳镇前进小学 (K0+000) 16. RR6: Lianghe Village Sixth Group 两河村六组 (K6+300) 17. RR7: Maliu Village Eleventh Group 麻柳村十一组 (K0+000)			
Water quality	DO, SS, TPH	Set up 2 stations for water quality monitoring at each of the river crossings as follows: 1. Control station: 50 m upstream of the river crossing 2. Impact station 100m downstream of the river crossing (Note: if downstream impact station data > 130% of upstream control station data (DO <130%), mitigation measures are needed)	1 time per day; 1 day per month when road construction activity is within 500 m of the river	AEMS	AMTB, ESE
Rural Road 8					***Estimated Cost: $20,000***
Construction Stage					
Air quality	TSP	5 locations on the following rural roads (RR): 1. RR8: Hongyu Village Eighth Group 红鱼村八组 (K4+100) 2. RR8: Lianhuatai Primary School 莲花台小学 (K5+900) 3. RR8: Shuigou Village Second Group 水沟村二组 (K11+800) 4. RR8: Balipo Primary School 八里坡小学 (K30+800) 5. RR8: Qianjiaping Primary School 千家坪小学 (K39+600)	1 day (24-hr) per month (Monitor only when road section has construction activities within 500 m)	SEMS	SCG, ESE
Noise	L_{Aeq}	5 locations on the following rural roads (RR): 1. RR8: Hongyu Village Eighth Group 红鱼村八组 (K4+100) 2. RR8: Lianhuatai Primary School 莲花台小学 (K5+900) 3. RR8: Shuigou Village Second Group 水沟村二组 (K11+800) 4. RR8: Balipo Primary School 八里坡小学 (K30+800) 5. RR8: Qianjiaping Primary School 千家坪小学 (K39+600)	2 times per day (day time and night time); 1 day per month (Monitor only when road section has construction activities within 500 m)	SEMS	SCG, ESE
Water quality	DO, SS, TPH	Set up 2 stations for water quality monitoring at each of the river crossings as follows: 1. Control station: 50 m upstream of the river crossing	1 time per day; 1 day per month when road construction activity	SEMS	SCG, ESE

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency & Duration	Implementing Entity	Supervising Entity
		2. Impact station 100m downstream of the river crossing (Note: if downstream impact station data > 130% of upstream control station data (DO <130%), mitigation measures are needed)	is within 500 m of the river		
					Total estimated cost: $116,000

Notes: **AEMS** = Ankang Environmental Monitoring Station; **AMTB** = Ankang Municipal Transport Bureau; **ESE** = Environmental Supervision Engineer; **FFPO** = Foreign Fund Finance Project Office; **PCR** = Project Completion Report;; **TSP** = total suspended particulates; **PM_{10} =** particulate matter with diameter ≥10 micron; **SO_2** = sulfur dioxide; **NO_2** = nitrogen dioxide; **L_{Aeq}** = A-weight equivalent sound pressure level; **DO** = dissolved oxygen; **SCG** = Shangnan County Government; **SEMS** = Shangluo Environmental Monitoring Station; **SPHB** = Shaanxi Provincial Highways Bureau; **SS** = suspended solids; **TPH** = total petroleum hydrocarbon;

Table EMP-5: Monitoring Indicators and Applicable PRC Standards[37]

Phase	Indicator	Standard
Construction	TSP	Class II *Ambient Air Quality Standard* (GB 3095-1996)
	Noise limits of PME at boundary of construction site	*Emission Standard of Environmental Noise for Boundary of Construction Site* (GB 12523-2011)
	Water quality during river crossing bridge construction (SS, DO, TPH)	Use control station and impact station approach. If the level at the impact station is >130% of the control station, mitigation measures such as reducing the dredging rate or changing the dredging equipment will be implemented.
Operation	NO_2, PM_{10}	Class II *Ambient Air Quality Standard* (GB 3095-2012)
	Noise	E*nvironmental Quality Standard for Noise* (GB 3096-2008) for noise function area Categories 4a and 2.

Note: **DO** = dissolved oxygen, **NO_2** = nitrogen dioxide, PM_{10} = particulate matter with diameter ≤ 10 μm, **PME** = powered mechanical equipment, **SS** = suspended solids, **TPH** = total petroleum hydrocarbon, **TSP** = total suspended particulates.

20. **Independent Evaluation**. Independent evaluation of EMP implementation will be undertaken by the ESE and LIEC. The budget for the ESE is estimated at $600,000. The budget for the LIEC will be included in the Loan Implementation Consulting services ($40,000). FFPO will report the LIEC's independent evaluation to ADB on the project's adherence to the EMP, information on project implementation, environmental performance of the contractors, and environmental compliance through quarterly project progress reports and semi-annual environmental monitoring reports (Table EMP-6). The LIEC will support FFPO in developing the semi-annual environmental monitoring reports. The reports should confirm the project's compliance with the EMP and local legislation (including the PRC's EIA requirements), the results of independent evaluation (both contractor compliance with the EMP and the results of environmental quality monitoring by AEMS and SEMS), identify any environment related implementation issues and necessary corrective actions, and reflect these in a corrective action plan. Operation and performance of the project GRM, environmental institutional strengthening and training, and compliance with all covenants under the project will be included in the report.

[37] The project applies PRC standards. A comparison of PRC standards with internationally accepted standards (as defined in the World Bank's Environment Health and Safety Guidelines) was conducted for the EIA. The comparison confirmed that PRC standards are either internationally accepted, or have comparable standard limits with most of the international standards.

21. **Monitoring by ADB**. Besides reviewing the semi-annual environment monitoring reports from FFPO and the verification reports from the LIEC, ADB missions will inspect the project progress and implementation on site at least once a year. For environmental issues, inspections will focus mainly on (i) monitoring data; (ii) the implementation status of project performance indicators specified in the loan documents for the environment, environmental compliance, implementation of the EMP, and environmental institutional strengthening and training; (iii) the environmental performance of contractors, LIEC, and FFPO; (iv) operation and performance of the project GRM; and (v) any changes in proposed works and/or EMP measures. The performance of the contractors in respect of environmental compliance will be recorded and will be considered in future bid evaluations.

22. **Environmental Acceptance Monitoring and Reporting**. Following the PRC Regulation on Project Completion Environmental Audit (MEP, 2001), within three months after the completion of each project component, an environmental acceptance monitoring and audit report for the component shall be prepared by a licensed environmental monitoring institute. The report will be reviewed and approved by the local EPB, and the outcomes reported to ADB (Table EMP-6). The environmental acceptance reports will indicate the timing, extent, effectiveness of completed mitigation and any need for additional mitigation measures and monitoring during operation.

Table EMP-6: Reporting Plan

Reports		From	To	Frequency
Construction Phase				
Internal progress reports by contractors	Internal project progress report by construction contractors, including monitoring results	Contractors	FFPO, AMTB, SCG, ESE	Monthly
Internal environmental quality monitoring	Environmental monitoring report	AEMS, SEMS	AEPB, SEPB, AMTB, SCG, FFPO, ESE	Monthly
	Environment progress and monitoring reports	FFPO	ADB	Semi-annual
Acceptance report	Environmental acceptance monitoring and audit report	Licensed institute	AEPB, SEPB	Once; within 3 months of completion of physical works
Operational Phase				
Internal environmental quality monitoring	Environmental monitoring report (until a PCR is issued)	AEMS, SEMS	AEPB, SEPB, SPHB, FFPO	Quarterly
	Environment progress and monitoring report (until a PCR is issued)	FFPO	ADB	Semi-annual

Notes: **ADB** = Asian Development Bank; **AEMS** = Ankang Environmental Monitoring Station; **AEPB** = Ankang Environmental Protection Bureau; **AMTB** = Ankang Municipal Transport Bureau; **ESE** = Environmental supervision engineer; **FFPO** = Foreign-fund Finance Project Office; **SCG** = Shangnan County Government; **SEMS** = Shangluo Environmental Monitoring Station; **SEPB** = Shangluo Environmental Protection Bureau; **SPHB** = Shaanxi Provincial Highways Bureau.

E. Institutional Capacity Building and Training

23. The capacity of FFPO, AMTB, SCG, O&M units and contractors' staff responsible for EMP implementation and supervision will be strengthened as they lack the staff and experience in implementing environmental mitigation measures, grievance redress mechanism and environmental monitoring. All parties involved in implementing and supervising the EMP must have an understanding of the goals, methods, and practices of project environmental

management. The project will address the lack of capacities and expertise in environmental management through (i) institutional capacity building, and (ii) training.

24. **Institutional Strengthening**. The capacities of FFPO, AMTB, SCG, O&M units to coordinate environmental management will be strengthened through a set of measures:

(i) The appointment of at least one qualified environment specialist within the FFPO staff to be in charge of EMP coordination, implementation and site inspections including GRM.
(ii) The commissioning of an independent ESE by AMTB and SCG respectively to provide independent monitoring and verification of EMP implementation
(iii) The appointment of LIEC under the loan implementation consultancy to guide FFPO, AMTB and SCG in implementing the EMP and ensure compliance with ADB's Safeguard Policy Statement (SPS 2009).

25. **Training**. FFPO, AMTB, SCG, contractors and O&M units will receive training in EMP implementation, supervision, and reporting, and on the Grievance Redress Mechanism (Table EMP-7). Training will be facilitated by the LIEC with support of other experts under the loan implementation consultant services. The budget for training is estimated to be $15,000.

Table EMP-7: Training Program

Training	Attendees	Contents	Times	Period (days)	No. of persons	Cost ($/person /day)	Total Cost
EMP adjustment and implementation	FFPO, AMTB, SCG, O&M units, contractors	Development and adjustment of the EMP, preparation of the site specific EMP, roles and responsibilities, monitoring, supervision and reporting procedures, review of experience (after 12 months)	Twice - Once prior to, and once after the first year of project implementation	2	20	100	$8,000
Grievance Redress Mechanism	FFPO, AMTB, SCG, contractors, AEPB, SEPB	Roles and responsibilities, Procedures, review of experience (after 12 months)	Twice - Once prior to, and once after the first year of project implementation	1	15	100	$3,000
Environmental protection	FFPO, AMTB, SCG, contractors	Pollution control on construction sites (air, noise, wastewater, solid waste)	Once (prior to construction commencing)	2	15	100	$3,000
Environmental monitoring	FFPO, AMTB, SCG, O&M units, contractors	Monitoring methods, data collection and processing, reporting systems	Once (at beginning of project construction)	1	10	100	$1,000
						Total estimated cost:	**$15,000**

Notes: **AEPB** = Ankang Environmental Protection Bureau, **AMTB** = Ankang Municipal Transport Department, **FFPO** = Foreign-fund Finance Project Office, **SCG** = Shangnan County Government, **SEPB** = Shangluo Environmental Protection Department, **O&M** = operation and maintenance.

26. **Capacity Building**. In addition to training for EMP implementation, the project will provide consulting services and training to assist and train the staff of FFPO, AMTB and SCG in

project management, environmental management, land acquisition and resettlement, procurement, as well as external resettlement and environmental monitoring. The institutional components of the project will also involve training by loan implementation consultants in operation and maintenance of completed facilities. Part of this training will focus on teaching staff how to use a set of indicators to monitor performance of the completed facilities. These indicators will be designed by loan implementation consultants prior to operation start-up.

F. Consultation, Participation and Information Disclosure

27. **Consultation during Project Preparation**. Chapter VII of the EIA describes the public participation and consultation implemented during project preparation.

28. **Future Public Consultation Plan**. Plans for public involvement during construction and operation stages were developed during project preparation. These include public participation in (i) monitoring impacts and mitigation measures during the construction and operation stages; (ii) evaluating environmental and economic benefits and social impacts; and (iii) interviewing the public after the project is completed. These plans will include several types of public consultation, including site visits, workshops, investigation of specific issues, interviews, and public hearings (Table EMP-8). The budget for public consultation is estimated to be $9,000.

Table EMP-8: Public Consultation Plan

Organizer	Format	No. of Times	Subject	Attendees	Budget
Construction Stage					
FFPO	Public consultation & site visit	4 times: 1 time before construction commences and 1 time each year during construction	Adjusting of mitigation measures, if necessary; construction impact; comments and suggestions	Residents adjacent to components, representatives of social sectors	$4,000
FFPO	Expert workshop / press conference	As needed based on public consultation	Comments / suggestions on mitigation measures, public opinions	Experts of various sectors, media	$2,000
FFPO	Resettlement survey	As required by relevant resettlement plan	Comments on resettlement, improvement of living conditions, livelihood, and poverty reduction; comments and suggestions	Persons affected by resettlement and relocation	Included in the resettlement plan update survey budget
Operational Stage					
FFPO, O&M Units	Public consultation and site visits	Once in the first year	Effectiveness of mitigation measures, impacts of operation, comments and suggestions	Residents adjacent to component sites, social sectors	$1,500
FFPO, O&M Units	Expert workshop or press conference	As needed based on public consultation	Comments and suggestions on operational impacts, public opinions	Experts of various sectors, media	$1,500
				Total budget:	**$9,000**

Notes: **FFPO** = Foreign-fund Finance Project Office; **O&M** = operation and maintenance.

G. Grievance Redress Mechanism

29. A Grievance Redress Mechanism (GRM) will be established for the project to receive and manage any public concerns and safeguard issues which may arise during project

implementation. The GRM comprises: (i) a set of clear procedures developed by FFPO to receive, record, and address any concerns or complaints raised; (ii) specific contact details of individuals at the FFPO, AMTB, SCG and the contractors, and (iii) the Ankang and Shangluo EPBs.

30. All contractors and work staff will be briefed by the FFPO on the project safeguards GRM. Contractors and workers will be instructed to be courteous to local residents and, in the event they are approached by the general public with an issue, to immediately halt their work and report the issue to the foreman. The foreman will immediately report the issue to the IAs (AMTB or SCG) or FFPO for action and advise affected person of how their issue will be handled.

31. Multiple means of using this mechanism, including face-to-face meetings, written complaints, hotline number and telephone conversations, anonymous drop-boxes for written comments, and/or e-mail, will be available. All concerns received will be treated confidentially and professionally. The identity of individuals will not be circulated among project agencies or staff and will only be shared with senior staff, and then only when there is clear justification. In the construction period and the initial operational period covered by loan covenants, FFPO will report progress to ADB, and this will include reporting complaints and their resolution.

32. Basic steps for resolving complaints are as follows and illustrated in Figure EMP-1.

- Step 1: For environmental problems during the construction stage, the affected person (AP) can register his/her complaint directly with the contractors, or through GRM entry points (FFPO complaint center hotline, AMTB, SCG, and Ankang and Shangluo EPB hotlines). Contractors are required to designate a person in charge of handling complaints, and advertise their contact telephone number at the main entrance to each construction site, together with the hotline number of the FFPO complaint center. The contractors are required to maintain and update a Complaint Register to document all complaints. The contractors are also required to respond to the complainant in writing within 7 calendar days on their proposed solution and how it will be implemented. If the problem is resolved, FFPO will follow up to ensure that the complainant is satisfied with the solution. The contractors are required to report complaints received, handled, resolved and unresolved to the FFPO complaint center immediately, and to AMTB/SCG and FFPO monthly (through progress reporting). The quarterly project reports and semi-annual environmental monitoring reports for ADB should also highlight any significant issues raised through the GRM and their resolution.
- Step 2: If no appropriate solution can be found during step 1, the contractor has the obligation to forward the complaint to the FFPO complaint center. The AP may also decide to submit a written or oral complaint to the FFPO complaint center directly, by-passing step 1. A joint safeguards hotline for resettlement and environment issues will be established within FFPO. For an oral complaint, proper written records will be made. Once a complaint is registered and put on file, the FFPO complaints center will notify ADB. The FFPO complaint center will assess the eligibility of the complaint, identify the solution and provide a clear reply for the complainant within one week. Complaints related to land acquisition and resettlement issues will be directed to the relevant agencies in accordance with the resettlement GRM. The LIEC will assist the FFPO complaint center in addressing the complaint, and replying to the affected person. The FFPO complaint center will also inform the ADB project team and submit all relevant documents. Meanwhile, the FFPO complaint center will immediately convey the

complaint/grievance and suggested solution to the contractors, AMTB or SCG, and/or operator. The contractors during construction and the operator (until issuance of PCR) will implement the agreed upon redress solution and report the outcome to the FFPO complaint center within fifteen (15) working days.

- Step 3: In case no solution can be identified by the FFPO complaint center, or the complainant is not satisfied with the proposed solution, the FFPO complaint center will organize, within two (2) weeks, a multi-stakeholder hearing (meeting) involving all relevant stakeholders (including the complainant, AMTB or SCG, contractors, facility operator, Ankang or Shangluo EPB, and FFPO). The hearing shall identify a solution acceptable to all, and formulate an action plan.

33. The tracking and documenting of grievance resolution by FFPO will include the following elements: (i) tracking forms and procedures for gathering information from project personnel and complainant(s); (ii) regular updating of the GRM database by the FFPO Environment and/or Social Specialist; (iii) processes for informing stakeholders about the status of a case; and (iv) procedures to retrieve data for reporting purposes, including the periodic reports to the ADB.

34. At any time, an affected person may contact ADB (East Asia Department), ADB Resident Mission in the PRC.

35. If the above steps are unsuccessful, persons who are, or may in the future be, adversely affected by the project may submit complaints that are eligible under the ADB Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make a good faith effort to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they consider the Accountability Mechanism.[38]

[38] See: http://compliance.adb.org/

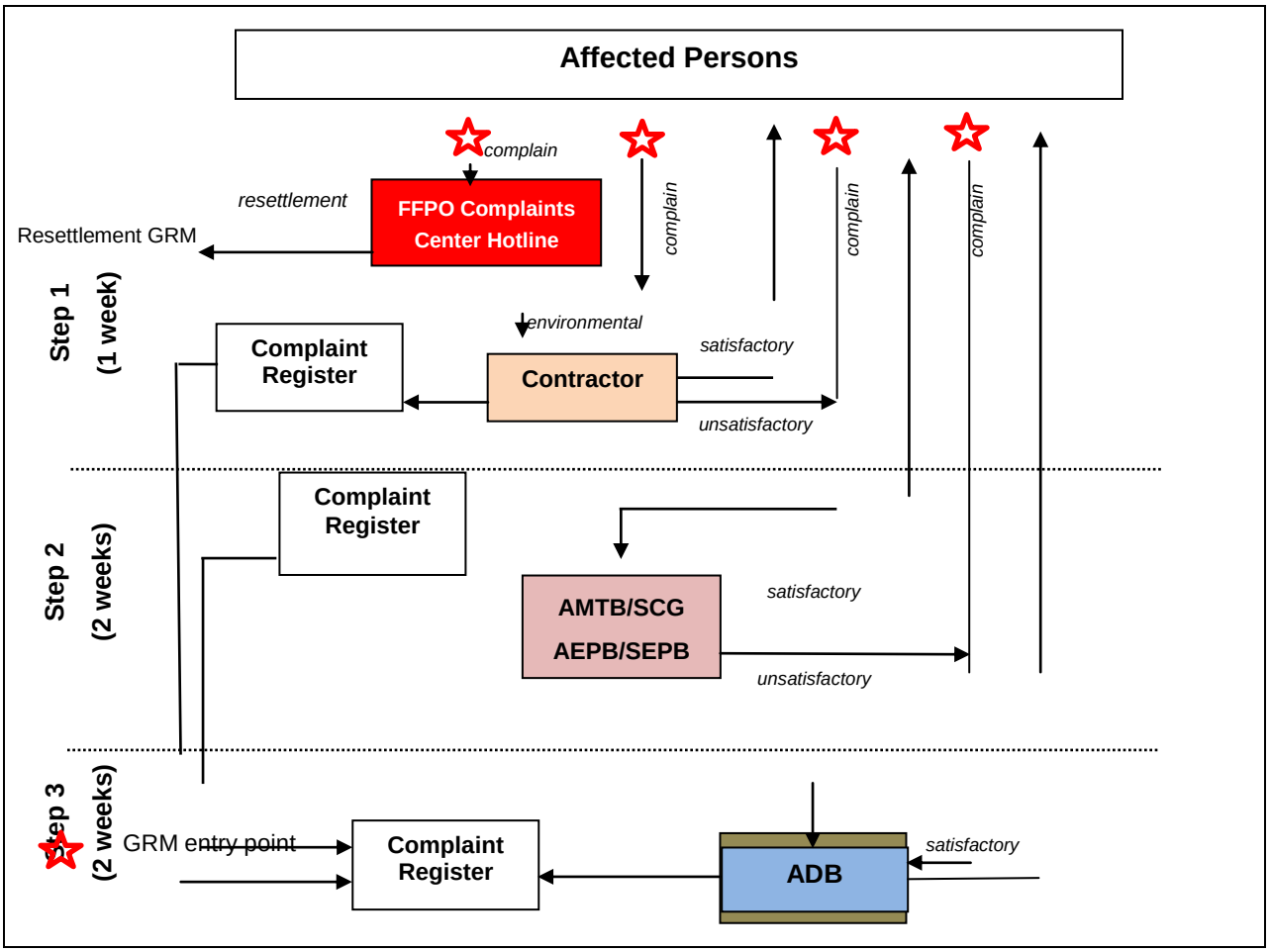

Figure EMP-1: Proposed Grievance Redress Mechanism

H. Cost Estimates

36. The total cost for EMP implementation comprises six items: (i) mitigation measures (Table EMP-2), (ii) internal environmental quality monitoring by AEMS and SEMS (Table EMP-4), (iii) external independent EMP compliance monitoring by ESE, (iv) public consultation (Table EMP-7), (v) training (Table EMP-8), and (vi) the LIEC. The total cost of $4,806,500 is summarized in Table EMP-9 and is $4,806,500.

37. The mitigation cost of $4,026,500 includes a cost of $3,350,000 for implementation of traffic noise mitigation measures including installation of double glazed windows. The remaining costs are for mitigating construction impacts by the contractor, which should have already been included in the bid package of the contractors. Nevertheless, this amount indicates that the contractors have to spend above their business as usual practice to protect the environment.

38. The LIEC cost of $40,000 will be funded by the Loan Implementation Consulting services under the ADB loan, while the EA will bear the remaining cost of $4,766,500. (including the amount included in the bid packages of the contractors).

Table EMP-9: Estimated Budget for Environmental Management Plan Implementation

EMP Item	Estimated Cost	
	EA Funded	ADB Funded
Mitigation measures	4,026,500	0
Internal environmental quality monitoring (by AEMS & SEMS)	116,000	0
External EMP compliance monitoring by ESE	600,000	0
External monitoring by LIEC	0	40,000
Training	$15,000	0
Public consultation	$9,000	0
Subtotal:	4,766,500	40,000
Total:	4,806,500	
Note: $4,026,500 for mitigation measures includes $3,350,000 for installation of double-glazed windows to mitigate traffic noise.		

39. Excluded from the budget are (i) infrastructure costs which relate to environment and public health but which are already included in the project direct costs, such as the noise barriers on S102 and sedimentation tanks on G316 and S224, and (ii) remuneration for the FFPO environment specialist and consulting packages for the non-structural sub-components, (covered elsewhere in the project budget).

40. The IAs, AMTB and SCG will bear all internal environmental quality monitoring costs during the construction stage and contracting of ESE for independent monitoring and verification of EMP implementation. The O&M units will bear all internal environmental quality monitoring costs during the operational stage. Contractors will bear the costs for all mitigation measures during construction, including those specified in the tender and contract documents as well as those to mitigate unforeseen impacts due to their construction activities. The O&M units will bear the costs related to mitigation measures during operation.

I. Mechanisms for Feedback and Adjustment

41. The EMP is a living document. The need to update and adjust the EMP will be reviewed when there are design changes, changes in construction methods and program, unfavourable environmental monitoring results or inappropriate monitoring locations, and ineffective or inadequate mitigation measures. Based on environmental monitoring and reporting systems in place, FFPO (with the support of the LIEC) shall assess whether further mitigation measures are required as corrective action, or improvement in environmental management practices are required. FFPO will inform ADB promptly on any changes to the project and needed adjustments to the EMP. The updated EMP will be submitted to ADB for review and approval, and will be disclosed on the ADB and SPTD project website.

J. Environmental Contract Clauses

42. The following contract clauses for safeguarding the environment during construction will be incorporated into all tender documents, except the last three clauses which are only applicable to S102, S224 and G316, respectively.

a.) <u>Site specific environmental management plan (SEMP):</u>

(i) The contractors shall prepare a site-specific environmental management plan prior to the commencement of construction works, and shall submit the plan to the implementing agency and the environmental supervision engineer for review and approval. The plan shall include method

statements on the implementation of pollution control and mitigation measures, as well as an emergency spill contingency plan for containing and cleaning up accidental chemical spills on construction sites. The SEMP shall be updated as needed as and when environmental issues not covered by the plan arise. SEMPs should be prepared for each individual work package.

b.) Siting of construction facilities:

(i) Locations of all spoil disposal sites shall be at least 300 m from the nearest water body.

(ii) No spoil disposal site and construction staging areas shall be located within the boundary of the Shaanxi Han River Wetland.

(iii) Locations of asphalt mixing stations, and concrete batching plants shall be at least 300 m upwind of the nearest household

(iv) Locations of borrow areas shall be at least 500 m from residential areas.

(v) Borrow areas and spoil disposal sites with long, steep slopes, susceptible to erosion shall be avoided and shall include small level cut-off drains to break up and redirect run-off.

(vi) Access and haul roads shall be constructed at sufficient distances from residential areas, in particular, local schools and hospitals.

c.) Construction time:

(i) For all new road sections including new tunnels and new bridges, there shall be no night time (between 22:00 and 06:00 hours) construction.

(ii) For existing road sections, night time construction shall be avoided. Yet, recognizing that construction occasionally would require some works to be conducted at night to take advantage of less road traffic or to avoid worsening day time traffic conditions, night time construction work if needed shall prevent using high sound power level equipment and nearby residents shall be notified of such night time activities well beforehand.

d.) Protection of air quality

(i) To suppress dust, hauling and access roads shall be sprayed with water regularly (at least once a day but frequency to be responsive to season and local conditions) and hoarding shall be erected around dusty activities

(ii) The storage time of construction and demolition wastes on site shall be minimized by regularly removing them off site.

(iii) Asphalt, hot mixing and batching plants shall be equipped with fabric filters and/or wet scrubbers to reduce the level of dust emissions.

(iv) Vehicles with an open load-carrying case, which transport potentially dust-producing materials, shall have proper fitting sides and tail boards. Dust-prone materials shall not be loaded to a level higher than the side and tail boards, and shall always be covered with a strong tarpaulin.

(v) Vehicle speed on unpaved haul roads shall be restricted to 10 km/h or less.

(vi) Construction vehicles and machinery shall be kept in good working order, regularly serviced and with engines turned off when not in use.

(vii) Wheel washing equipment shall be installed or manual wheel washing will be conducted at each exit of the works area to prevent trucks from carrying muddy or dusty substance onto public roads.

(viii) In periods of high wind, dust-generating operations shall not be permitted within 200 m of residential areas. Special precautions need to be applied in the vicinity of sensitive areas such as schools, kindergartens and hospitals.

(ix) Material stockpiles shall be covered with dust shrouds. For the earthwork management for backfill, measures shall include surface press and periodical spraying and covering. The extra earth or dreg shall be cleared from the project site in time to avoid long term stockpiling.

(x) Unauthorized burning of construction and demolition waste material and refuse on site shall be strictly prohibited, and shall be subject to penalties for the Contractor, and withholding of payment.

e.) Protection of the acoustic environment

(i) During daytime construction, the contractor shall ensure that: (i) noise levels from equipment and machinery conform to the PRC standard for Noise Limits for Construction Sites (GB12523-2011) and the World Bank Group's Environmental Health and Safety Standards, and machinery properly maintained to minimize noise; (ii) equipment with high noise and high vibration are not used near village or township areas and only low noise machinery or the equipment with sound insulation or exhaust muffling devices is employed.

(ii) Temporary noise barriers or hoardings shall be deployed around the equipment to shield residences when there are residences within 80 m of the noise source.

(iii) Noise levels at the construction site boundaries shall be monitored regularly. If noise standards are exceeded by more than 3 dB, equipment and construction conditions shall be checked, and mitigation measures shall be implemented to rectify the situation.

(iv) The speed of bulldozer, excavator, crusher and other transport vehicles travelling on site shall be controlled. Noise reduction measures on equipment shall be adopted, with regular equipment repair and maintenance to keep them in good working condition.

(v) The speed of vehicles travelling on construction sites and haul roads shall be limited to 10 km/h or less. The use of horns shall be forbidden unless absolutely necessary. The use of whistles shall be minimized.

(vi) Construction activities shall be planned in consultation with local communities so that activities with the greatest potential to generate noise and vibration are planned during periods of the day that will result in least disturbance.

f.) Protection of water quality

(i) Portable toilets and small package wastewater treatment plants and/or septic tanks shall be provided on construction sites and construction camps for the workers. If there are nearby public sewers, interim storage tanks and pipelines will be installed to convey wastewater to public sewers. Construction sites and construction camps shall also have drainage provisions to collect and treat site runoff.

(ii) Sedimentation tanks shall be installed on construction sites (including tunneling sites) to treat process water (e.g. concrete batching for bridge construction) and muddy runoff with high concentrations of suspended solids. If necessary, flocculants such as polyacryl amide shall be used to

facilitate sedimentation.

(iii) Construction of river crossing road bridge foundations shall avoid the rainy season from May to October to minimize potential water quality impact. Mitigation measures such as placement of sandbags or berms around foundation and shoreline works to contain muddy water runoff shall be adopted. Slurry from pile drilling in the river bed shall be pumped to shore and properly disposed of.

(iv) Construction machinery shall be repaired and washed at designated locations. No onsite machine repair and washing shall be allowed.

(v) Storage and refueling facilities for fuels, oil, and other hazardous materials shall be within secured areas on impermeable surfaces, and provided with bunds and cleanup kits. If refueling in the field is required, it shall be done from road-licensed fuel trucks away from watercourses or other environmentally sensitive areas.

(vi) The contractors' fuel suppliers must be properly licensed, follow proper protocol for transferring fuel, and must be in compliance with Transportation, Loading and Unloading of Dangerous or Harmful Goods (JT 3145-88).

(vii) Material stockpiles shall be protected against wind and runoff waters which might transport them to surface waters. There shall be no storage of materials and equipment in river channels or close to sensitive receptors. Temporary storage of materials and equipment on river banks, if necessary, shall be short-term and protected to prevent run-off polluting river water.

(viii) Any spills shall be cleaned up according to PRC norms and codes within 24 hours of the occurrence, with contaminated soils and water treated according to PRC norms and codes. Records must be handed over without delay to the FFPO and local EPB. An emergency spill contingency plan shall be prepared by the Contractors as part of the SEMP and personnel shall be trained in its use.

(ix) Mitigation of water quality impact during river crossing bridge construction shall be based on water quality monitoring results. At each river crossing bridge construction location, upstream and downstream monitoring stations will be set up and SS levels monitored. When the SS levels at the downstream impact station is 130% higher than the SS levels at the upstream control station, the contractor shall adopt alternative construction methods or additional mitigation measures until the downstream SS level is less than 130% above the upstream SS level.

g.) <u>Protection of biological resources and wildlife</u>

(i) Construction workers are prohibited from capturing any wildlife during construction.

(ii) Existing vegetation where no construction activity is planned shall be preserved.

(iii) Existing trees and grassland shall be protected during construction. Where a tree has to be removed or an area of grassland disturbed, replant trees and re-vegetate the area after construction.

(iv) Trees or shrubs shall be removed only as the last resort if they impinge directly on the permanent works or necessary temporary works.

h.) <u>Solid waste management and material re-use</u>

(i) Prior to main earthworks, the top soil (10-30 cm) shall be removed and stored temporarily, which shall be re-used on site for restoration works.
(ii) Attempts shall be made to maximize the re-use of earth cut materials and construction and demolition wastes on the project, including the re-use of old asphalt or concrete road pavements.
(iii) Old asphalt waste is a hazardous waste and shall only be transported by licensed companies and disposed of at approved hazardous waste treatment facilities.
(iv) Contractors shall develop spoil disposal site management and restoration plans, to be approved by the local EPBs. The contractors shall only use material from borrow pits that have been licensed and approved.
(v) Construction activities in borrow areas and spoil disposal sites shall be planned so that the open area is minimized and rehabilitation shall be completed progressively.
(vi) Restoration of spoil disposal sites and borrow areas shall follow the completion of works in full compliance with all applicable standards and specifications, and shall be required before final acceptance and payment under the terms of contracts.

i.) Construction site sanitation

(i) Contractor shall provide adequate and functional systems for sanitary conditions, toilet facilities, waste management, labor dormitories and cooking facilities. The site shall be effectively cleaned and disinfected. During site formation, the site shall be sprayed with phenolated water for disinfection. Toilets and refuse bins shall be disinfected and timely removal of solid waste shall be ensured.
(ii) Rodents on site shall be exterminated at least once every 3 months. Mosquitoes and flies shall be exterminated at least twice each year.
(iii) Public toilets shall be provided in accordance with the requirements of labor management and sanitation departments in the living areas on construction site, and designated staff responsible for cleaning and disinfection shall be appointed.
(iv) Work camp wastewater shall be discharged into the municipal sewer system or treated on-site using portable systems or septic tanks.

j.) Occupational safety

(i) A person responsible for environmental, health and safety during construction shall be appointed for the project.
(ii) Personal protective equipment (safety hats and shoes and high visibility vests) shall be provided to all construction workers.
(iii) Ear defenders for hearing protection shall be provided to workers operating and working near noisy power mechanical equipment.
(iv) Safety goggles and respiratory masks shall be provided to workers doing asphalt road paving.
(v) Method statements shall be prepared and approvals obtained for hazardous activities such as blasting, tunnel works, excavation and working near water.

k.) Food safety

(i) Food hygiene in canteens on site shall be inspected and supervised regularly. Canteen workers must have valid health permits.

(ii) If food poisoning is discovered, effective control measures shall be implemented immediately to prevent it from spreading.

l.) Disease prevention and health services

(i) All contracted labor shall undergo a medical examination which shall form the basis of an (obligatory) health/accident insurance and welfare provisions to be included in the work contracts. The contractors shall maintain records of health and welfare conditions for each person contractually engaged.

(ii) Health clinic shall be established at location where workers are concentrated, which shall be equipped with common medical supplies and medication for simple treatment and emergency treatment for accidents.

(iii) A person responsible for health and epidemic prevention and education and training on food hygiene and disease prevention shall be specified (by the IA and contractors) to raise the awareness of workers.

(iv) Induction and training by local health departments on prevention and management of communicable diseases shall be provided.

m.) Social conflict prevention

(i) The following shall be prioritized: (i) employ local people for works, (ii) ensure equal opportunities for women and men, (iii) pay equal wages for work of equal value, and to pay women's wages directly to them; and (iv) not employ child or forced labor.

n.) Community health and safety

(i) A traffic control and operation plan shall be prepared together with the local traffic police prior to any construction. The plan shall include provisions for diverting or scheduling construction traffic to avoid morning and afternoon peak traffic hours, regulating traffic at road crossings with an emphasis on ensuring public safety through clear signs, controls and planning in advance. Haulage routes and schedules shall be assigned to avoid transport occurring in the central areas, traffic intensive areas or residential areas.

(ii) Residents and businesses shall be informed in advance of the road improvement activities, given the dates and duration of expected disruption, dusty and noisy activities, and access to the grievance redress mechanism. Local communities shall be alerted of the time and location of hazardous activities such as blasting. Construction billboards, which include construction contents, schedule, responsible person and complaint hotline number, will be erected at each construction site.

(iii) Clear signs shall be placed at construction sites in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials, excavations etc. and raising awareness on safety issues. Heavy machinery shall not be used at night, where possible, and all such equipment shall be returned to its overnight storage area/position before night. All sites shall be made secure, discouraging access by members of the public through appropriate fencing, signage and/or security personnel, as appropriate.

(iv) Continual communication with the villages and communities along the road alignments shall be maintained and the grievance redress

mechanism shall be accessible and effective.

o.) Utility interruption

(i) Contractors shall assess construction locations in advance and identify potential for disruption to services and risks before starting construction. Any damage or hindrance/disadvantage to local businesses caused by the premature removal or insufficient replacement of public utilities shall be subject to full compensation, at the full liability of the contractor who causes the problem.

(ii) If temporary disruption is unavoidable the contractor shall, in collaboration with relevant local authorities such as power company, water supply company and communication company, develop a plan to minimize the disruption and communicate the dates and duration in advance to affected persons.

p.) Specific Clause for blasting on S102

(i) A pre-construction dilapidation survey of properties within blasting zone of influence (area to be determined by contractor based on level of charge) shall be carried out to confirm existing structural condition. All prominent defects in the form of cracks, settlement, movement, water seepage, spalling concrete, distortion, subsidence and other building defects will be recorded in photographs and supporting notes.

(ii) Noise and vibration shall be monitored at Hongyantan, Xiaohe Town, Yujiawan and Goujiashan during blasting for the construction of tunnels Hongyantan #1, Hongyantan #2, Yujiawan and Goujiashan on S102. Based on monitoring results, reduce the charge for each blast if necessary.

q.) Specific Clause for protection of drinking water sources on S224

(i) Road side hoarding shall be placed at the three locations of drinking water collection sumps on trunk road S224 as barriers to prevent contamination of these drinking water sources by construction materials and wastes. No stockpiling of construction materials and aggregates shall be permitted within 300 m from these sumps. All wastewater generated from road construction within 300 m of these sumps shall be treated and diverted to downstream of these sumps for discharge. Cut-off and diversion drains shall be installed at these locations and other sensitive receptors, as required, to divert run-off away.

r.) Specific Clause for protection and restoration of valuable tree and shrub species on G316:

(i) Construction workers shall avoid damage to and removal of the Gingko Trees and Camphor Trees which are nationally protected species:

a) Gingko Trees in the gully underneath the medium bridge between chainage K6+215 to K6+301.

b) Camphor Trees on both sides of G316 from the Guanmiaogou Bridge (chainage K33+559.7) to the end point (chainage K34+801).

(ii) Road side tree planting shall use local species such as Black Locust, fruit trees and plants in accordance with the surrounding plant community, with the exception of areas located within the towns.

(iii) Plant shrubs and trees in nearby empty land to attract bird species such as the Yellow Breasted Bunting and Red-billed Blue Magpie. These

include the Chinese Pistache Pistaca chinensis, Caprifoliacease plants such as the Linden Viburnum Viburnum dilatatum and Amur Honeysuckle Lonicera maackii, and Shrubby Bush-clover Lespedeza bicolor. Crops such as grains and corns are also favorite food for these two bird species.

(iv) Restoration measures for the temporary staging areas shall comply with the former land cover type to maximize native biodiversity:

a) For temporary land take areas in gullies (the four spoil disposal sites at chainages K3+250, K18+650, K21+100 and K21+940; and on pre-casting yard at chainage K6+010), plant local tree and shrub species with fruits to provide food for birds;

b) For the asphalt mixing station at chainage K2+250, restore the Black Locust woodland similar to the original land cover;

c) For the asphalt mixing station at chainage K18+100, restore the orchard landscape to match with the surrounding land cover; and

d) For the other pre-casting yards, restore the farmland land cover.

TEMPLATE FOR SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT
Guidance on Format and Content for
Semi-Annual Environmental Monitoring Report

[The notes in italics are to provide a guide for the content for each section, however, this can be adapted to meet specific Project requirements]

I. INTRODUCTION

1.1 Background
[Introduction to ADB-Funded Project, overall Project, development context]

1.2 Description of the Project
[*Brief general Project Summary – Location Map/Plan showing Project components, brief summary of each Project component funded by ADB, Project cost and counterpart funding]*

1.3 Description of the Environment
[Brief summary of main environmental (physical, biological, socio-economic and cultural heritage) issues, mitigation measures and monitoring requirements as identified in the EIA/IEE/EMP, distinguish for each sub-component]

1.4 Purpose of this Report
[*ADB requirements, loan covenants, time period report covers, previous environmental reports]*

1.5 Report Format
[Scope of report, identify any missing information/gaps]

1.6 Report Preparation
[Who prepared this Report, who else was involve/consulted during preparation, who has reviewed and approved prior to submission to ADB]

II. PROJECT PROGRESS

1.7 Project Implementation Organization
[Project Organigram identifying roles and responsibilities for Implementation – EA/IA and their Consultants/Contractors and reporting lines]

1.8 Project Implementation Progress

1.8.1 Overall Project Progress
[Contract award and engineering works in relation to Project Schedule, projections for next 6 months]

1.8.2 Project Component Progress
[Contract award and engineering works for each Project Component in relation to Project Schedule, projections for next 6 months]

1.9 Updated Implementation Schedule
[Updated Project Schedule – document any reasons for change]

III. IMPLEMENTATION OF THE EMP and Monitoring Plan

1.10 EMP and Monitoring Plan Objectives
[Project environmental objectives highlighting protection of any particularly sensitive environmental receptors and value addition components]

1.11 Roles and Responsibilities for EMP and Monitoring Implementation
[Appointed and designated environmental management and monitoring staff for each component, term of contracts, allocated person days on site/off-site, roles and responsibilities, lines of communication, reporting structure and frequency (communication flow chart for management of environmental incidents), training and institutional capacity building requirements]

1.12 Environmental Management and Monitoring Records and Reporting
[*EMP and Monitoring audits carried out and documents and reports that have been produced during the six month period that the Environmental Monitoring Report covers]*

1.13 EMP and Monitoring Implementation Progress

1.13.1 Project Component xxx

[If the Project includes several components, then the following sections should be produced for each component]

1.13.1.1 Corrective Actions identified during Previous Review

[What corrective actions were identified in previous review, what actions have been taken, has compliance been achieved? Any further follow-up?]

1.13.1.2 Implementation of Mitigation Measures

[Key dates, progress of implementation for each environmental mitigation measure, good practice and compliance issues identified during environmental site audits, include photos of good/bad practice from site audits, progress with resolution of compliance issues, reasons for delay in implementation, changes in measures, requirement for additional measures/revision of EMP/Monitoring Plan]

1.13.1.3 Implementation of Environmental Monitoring Plan

[What monitoring has been carried out during 6 month period, include locations, method, review compliance with Monitoring Plan, discussion of monitoring results and compliance with relevant national standards, identify reasons for non-compliance and implications, identify reasons for any delay in implementation, requirement for additional measures/revision of EMP/Monitoring Plan]

1.13.1.4 Implementation of Environmental Institutional Capacity Building and Training

1.13.1.4.1 Institutional Requirements

[What requirements were set out in the EIA/IEE/EMP/Loan Covenants]

1.13.1.4.2 Implementation Progress

[What requirements have been fulfilled during 6 month period, what requirements will be fulfilled in next 6 month period, reasons for any delays in fulfilling requirements, provide details of courses/events/persons attending]

1.13.1.5 Public Consultation and Disclosure and Grievance Redress Mechanism

1.13.1.5.1 Public Consultation and Disclosure

[Consultation and Disclosure requirements, consultation and disclosure activities during period that report covers]

1.13.1.5.2 Project Grievance Records and Resolution

[Overview of Grievance Redress Mechanism, Detail any complaints, resolution, follow-up]

IV. CONCLUSION AND RECOMMENDATIONS

1.14 Compliance with EMP Requirements

1.14.1 EMP Implementation

[If Project has multiple components, separate review by component]

[Review implementation status of each mitigation measure – most applicable method may depend on completion status of Project. For early stages, brief commentary may be enough, during later stages most effective way may be to add two columns to EMP mitigation tables – one for implementation status and one for corrective actions]

1.14.2 Training and Capacity Building

[If Project has multiple components, separate review by component]

1.15 Corrective Actions

1.15.1 Required Corrective Actions

[Corrective actions required to comply with EMP]

1.15.2 Delivery of Corrective Actions

[Agreed course of action to deliver corrective actions, timescales, responsible parties, reporting requirements]

V. APPENDIXES

[Detailed results of environmental monitoring, environmental training materials, other supporting information that demonstrates compliance with requirements]