



Technical Assistance Report

Project Number: 40173
June 2007

Papua New Guinea: Preparing the Highlands Highway (Southern Highlands and Enga Provinces Network) Rehabilitation Project (Financed by the Japan Special Fund)

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 30 April 2007)

Currency Unit	–	kina (K)
K1.00	=	\$3.077
\$1.00	=	K0.325

ABBREVIATIONS

ADB	–	Asian Development Bank
AusAID	–	Australian Agency for International Development
DNPM	–	Department of National Planning and Monitoring
DOT	–	Department of Transport
DOW	–	Department of Works
HDM-4	–	Highway Development and Management Model
MTDS	–	Medium-Term Development Strategy
NTDP	–	National Transport Development Plan
PNG	–	Papua New Guinea
RAMS	–	road asset management system
TA	–	technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

Targeting Classification	–	General intervention
Sector	–	Transport and communications
Subsector	–	Roads and highways
Theme	–	Sustainable economic growth
Subthemes	–	Fostering physical infrastructure development, developing rural areas

NOTE

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

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I. INTRODUCTION

1. The Government of Papua New Guinea (PNG) has requested Asian Development Bank (ADB) technical assistance (TA) for preparing the Highlands Highway (Southern Highlands and Enga Network) Rehabilitation Project¹ for possible ADB financing. Discussions with the Department of National Planning and Monitoring (DNPM), Department of Works (DOW), and Department of Transport (DOT) on the scope, implementation arrangements, cost estimates, and outline terms of reference were conducted during the Fact-Finding Mission on 6–15 March 2007. The TA is included in the nonlending program for 2007 in the 2006–2010 PNG country strategy and program (CSP).² The proposed ensuing project is included in the lending program for 2008 in the CSP. The design and monitoring framework is in Appendix 1.

II. ISSUES

2. PNG is an archipelago consisting of rugged mountain ranges, fertile upland valleys, coastal plains, and extensive swamps. It has a coastline of over 17,000 kilometers (km) and 17 million hectares of reef-covered coastal waters. Of 19 mainland provinces, 13 are coastal provinces. Due to PNG's geography, the population lives in widely dispersed pockets, limiting mobility and opportunities to develop the domestic markets. For example, its capital Port Moresby is not connected by road to any other major city.

3. Infrastructure in all three subsectors (land, air and water) of PNG's multimodal transport system has fallen steadily into a state of disrepair in the past two decades. The resulting poor condition of facilities hinders access to markets and social services for much of the population, imposes high costs on business activities, and constrains both labor employment and expansion in investment in the country.

4. In the roads subsector, thousands of kilometers of minor rural roads built between 1950 and 1970, roads connecting rural areas with the main road networks, are now in an advanced stage of deterioration. About half of all feeder roads in the country are impassable to vehicles carrying significant loads. Sealed roads have degenerated to poor gravel roads; gravel roads have been reduced to earth tracks; and some routes have closed altogether. Only about 37% of the national road network (about 8,400 km) is in a maintainable condition (i.e., can receive routine maintenance attention). About half the network requires some significant rehabilitation, restoration, or reconstruction to make the roads trafficable. Much of the past investment in road rehabilitation and upgrading has been lost through neglect of subsequent maintenance.³

5. The major factors contributing to the poor state of the road infrastructure have been (i) large shortfalls in the funding provided for maintenance, and (ii) weaknesses in managing and delivering maintenance services. To reverse these impediments to the development of a soundly functioning road subsector, a program of financing, structural, and institutional reforms need to be adopted and successfully implemented.

6. The Government recognizes that the decline in the quality of the country's transport infrastructure has had "a major adverse impact on service delivery and the capacity of Papua

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

² ADB. 2006. *Country Strategy and Program (2006-2010): Papua New Guinea*. Manila.

³ ADB. *Midterm Report, Technical Assistance to Papua New Guinea for Road Authority Development*. Manila (TA 3716-PNG para. 24).

New Guineans to earn cash incomes.”⁴ Accordingly, in its 2005–2010 Medium-Term Development Strategy (MTDS),⁵ the Government states that maintenance and rehabilitation programs for roads, wharves, and airstrips, particularly in rural areas, will be a powerful force for economic growth and development by linking markets and reducing costs.⁶ Consistent with this analysis, the rehabilitation and maintenance of transport infrastructure are identified in the MTDS as the first-listed sectoral expenditure priority for 2005–2010.

7. Building on this theme, PNG’s National Transport Development Plan (NTDP)⁷ for 2001–2010 was revised in 2005, and approved by the Government in 2006, to “ensure [that] it appropriately reflects and articulates MTDS direction and priorities.”⁸ Hence, the first of the NTDP’s four major strategies is “to maintain and improve the existing infrastructure and services.”⁹ Moreover, the NTDP recognizes the importance of and need for institutional strengthening to enable the realization of its strategies.¹⁰ Thus, the NTDP (i) provides for expenditure on maintenance works in each of the three modes, and (ii) anticipates progress with the structural reforms. The NTDP specifies particular parts of the transport infrastructure for rehabilitation and reconstruction, and lists 15 roads of national importance for improvement. The Highlands Highway is the first.

8. The approval of the revised NTDP provides a significant opportunity to enhance the effectiveness of partnerships between the Government and its main development partners, many of whom are currently working on developing new programs. Opportunities exist to harmonize or better coordinate program planning, project and program management arrangements and processes and procedures such as financial management, reporting, and procurement. Particular opportunities exist as the Australian Agency for International Development (AusAID) shifts from stand-alone project-based assistance to a Transport Sector Support Program (TSSP), which will operate through DOW—a transition is under way. Ideally, progress on these issues should be led by the Government. As an initial step, the Government, AusAID, ADB, and World Bank are conducting a transport sector harmonization study that is expected to be completed by mid-2007.

9. The Highlands Region is strategically important for the country, as it is richly endowed with natural and tourism resources, ecological conditions for farming, and is home to almost half of the population. Developing the infrastructure network in this region will have a significant impact on PNG’s overall economic and social performance. The country’s most significant road, the Highlands Highway, runs through the region, bringing to Lae Port copper, coffee, and tea (the country’s major export items) and distributing in the region imports ranging from heavy

⁴ Ministry of National Planning and Monitoring, Government of Papua New Guinea. 2004. *Medium Term Development Strategy 2005–2010*. Port Moresby.

⁵ Ministry of National Planning and Monitoring, Government of Papua New Guinea. 2004. *Medium Term Development Strategy 2005–2010*. Port Moresby.

⁶ Ministry of National Planning and Monitoring, Government of Papua New Guinea. 2004. *Medium Term Development Strategy 2005–2010*. Port Moresby (Section 3.2.1).

⁷ Department of Transport, Government of Papua New Guinea. 2006. *Review of the National Transport Development Plan 2001–2010, Document One*. Port Moresby.

⁸ Department of Transport, Government of Papua New Guinea. 2006. *Review of the National Transport Development Plan 2001–2010, Document One, Introduction*. Port Moresby.

⁹ Department of Transport, Government of Papua New Guinea. 2006. *National Transport Development Plan 2006–2010, Volume One (Policy), Summary*. Port Moresby. The Plan’s three other major strategies are: second: to upgrade, rehabilitate, and do new construction works only where economically feasible; third: to encourage the expanded and efficient provision of transport facilities and services by private sector operators; and fourth: to conduct business on “safety and security first” basis.

¹⁰ Department of Transport, Government of Papua New Guinea. 2006. *National Transport Development Plan 2006–2010*, Port Moresby.

machinery to food. All major gas and oil fields, and gold mines are located in the western areas of Southern Highlands and Enga provinces. The NTDP is proposing the upgrading and rehabilitation of the road to restore it to transit condition.

10. There are ongoing maintenance and rehabilitation efforts on the Highlands Highway from Lae Port in Morobe Province to Magarima in Southern Highlands Province. In 2005, the Government through DOW set aside K225 million for multiyear maintenance contracts until 2009. It is currently working on sections from the Chimbu-Eastern Highlands provinces' border to Mendi, capital of Southern Highlands Province. ADB is assisting the Government in improving the section from Mendi to Magarima.¹¹ With the support of AusAID, DOW is conducting routine maintenance on sections from the Chimbu-Eastern Highlands provinces' border to the port city of Lae, capital of Morobe Province. The Government has requested ADB to assist in rehabilitating the sections from Magarima to Koroba in Southern Highlands Province, along with other important links to the Highlands Highway in Enga Province. The proposed improvements will complete the missing sections of the main road network of the two provinces that are currently being rehabilitated with funding from ADB loans.¹²

11. The rehabilitation of the Highlands Highway, given its importance, is a unique opportunity for the Government and the funding partners to work together to achieve development results.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

12. The TA aims to prepare the Highlands Highway (Southern Highlands and Enga Provinces Network) Rehabilitation Project to support economic growth through increased exports and integration of the Highlands Region subsistence population into the mainstream economy by improving rural access to market centers. The TA outcome will be the agreed-upon design and feasibility study for a road improvement project suitable for ADB financing.

B. Methodology and Key Activities

13. The TA will prepare (i) a feasibility study that includes the project rationale and scope, technical and economic appraisal, assessment of environmental and social impacts; and (ii) project implementation arrangements, and costing and financing plan for ADB assistance. Road sections of about 250 km to be considered for improvement under the proposed project, are all located on the existing alignment. Land acquisition and resettlement are expected to be non-significant. No issues involving indigenous people are expected. The environmental impact of the project is expected to be minimal. The initial poverty and social analysis is presented in Appendix 2.

¹¹ ADB. 1999. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Papua New Guinea for the Road Maintenance and Upgrading (Sector) Project*. Manila (Loan 1709-PNG, for \$63 million, approved on 16 November).

¹² ADB. 1999. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Papua New Guinea for the Road Maintenance and Upgrading (Sector) Project*. Manila (Loan 1709-PNG, for \$63 million, approved on 16 November); and ADB. 2006. *Report and Recommendation of the President to the Board of Directors on Proposed Loans to Papua New Guinea for the Road Maintenance and Upgrading (Sector) Project (Supplementary Loans)*. Manila (Loans 2242/2243-PNG, for \$35 million, approved on 29 June).

14. The key activities will include (i) developing the project rationale; (ii) assessing institutional, engineering, economic, social, and environmental aspects; (iii) consulting with stakeholders to ensure community participation; (iv) preparing a preliminary engineering design and project cost estimates; (v) assessing economic viability and compliance with safeguards; (vi) preparing the financing plan; (vii) defining the project scope; and (viii) preparing the procurement plan and implementation arrangements. A team of consultants will be recruited to carry out the tasks. They will complete project documentation for further ADB loan processing

C. Cost and Financing

15. The total cost of the TA is estimated at \$500,000 equivalent. The TA will be financed on a grant basis by the Japan Special Fund, funded by the Government of Japan. The Government will finance the balance of the cost, equivalent to \$185,000, by providing office accommodation, support facilities, counterpart staff, surveys, local transportation, and other logistical support. The Government has been informed that approval of the TA does not commit ADB to finance any ensuing project. The detailed cost estimate is in Appendix 3.

D. Implementation Arrangements

16. DOW will be the Executing Agency for the TA and will provide counterpart staff to coordinate TA activities and work with the consultants on a daily basis. A steering committee with members from DNPM, DOW, and DOT will be established to oversee TA implementation. DOW will ensure that the services and facilities that the Government is committed to contribute, including counterpart staff, office accommodation, and administrative resources, are provided on time to the consultants. DOW through its Road Asset Management Systems (RAMS)¹³ Unit will also provide the consultant with prefeasibility information on the road sections to be considered for the study, including traffic counts, geometric and geotechnical survey data, preliminary costs. All equipment to be used under the TA will be procured by the consultants according to ADB's *Procurement Guidelines* (2007, as amended from time to time) and will be turned over to DOW upon completion of the TA.

17. The TA will require 15 person-months of international consulting services to carry out the tasks as described in the outline terms of reference (Appendix 4). The consultants will include a team leader/institutional/transport specialist (6 person-months), a road engineer (4 person-months), a social development specialist with experience in consultation and participation (3 person-months), and an environmental specialist (2 person-months). The TA will be implemented over 12 months, starting October 2007 and ending in September 2008. The consultants will work on an intermittent basis. The international consulting firm will be recruited by ADB in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time), using its fixed budget selection method. A simplified technical proposal will be used to invite and evaluate proposals from the international consulting firm.

¹³ ADB. 1998. *Technical Assistance to Papua New Guinea for the Road Asset Management System*. Manila (TA 3004-PNG, approved on 3 April for \$1.0 million JSF Financing); and ADB. 2000. *Technical Assistance to Papua New Guinea for the Road Asset Management System in the Provinces*. Manila (TA 3378-PNG approved on 28 December for \$581,000 JSF Financing).

IV. THE PRESIDENT'S DECISION

18. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$500,000 on a grant basis to the Government of Papua New Guinea for preparing the Highlands Highway (Southern Highlands and Enga Provinces Network) Rehabilitation Project, and hereby reports this action to the Board.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<p>Impact</p> <p>Improved road transport system integrating the Highlands Region into the mainstream economy</p>	<p>By 2010</p> <ul style="list-style-type: none"> • Reduced average travel time • Increased traffic volume as projected • Reduced vehicle operating costs • Increased rural income in project areas 	<ul style="list-style-type: none"> • Reports and records of PNG Department of Works (DOW) • Traffic counts and road user surveys • Project performance monitoring reports 	<p>Assumptions</p> <ul style="list-style-type: none"> • There is political stability. • There are more and better transport services after the Highlands Highway is rehabilitated. <p>Risk</p> <ul style="list-style-type: none"> • Ongoing maintenance and rehabilitation works on the Highlands Highway are not pursued due to lack of funding or implementation delays.
<p>Outcome</p> <p>Project design and feasibility study agreed upon by the Government and the Asian Development Bank</p>	<p>By 2008</p> <ul style="list-style-type: none"> • Memorandum of understanding signed by the Government and ADB during June 2008 Appraisal Mission 	<ul style="list-style-type: none"> • Memorandum of understanding 	<p>Assumptions</p> <ul style="list-style-type: none"> • Priorities of the Government's Medium Term Development Strategy (MTDS) do not change. • Government counterpart funding is sufficient.
<p>Outputs</p> <ol style="list-style-type: none"> 1. Technical assessments completed 2. Project design requirements accomplished 	<p>By 2008</p> <ul style="list-style-type: none"> • Draft final report submitted to Government and ADB 6 months after the start of consulting services 	<ul style="list-style-type: none"> • ADB document registration • Government document registration 	<p>Assumption</p> <ul style="list-style-type: none"> • Effective stakeholder participation and sense of ownership are developed. <p>Risks</p> <ul style="list-style-type: none"> • Access to proposed project sites is restricted. • Availability of and access to information and Government personnel are restricted.
<p>Activities with Milestones</p> <ol style="list-style-type: none"> 1.1 Submit an inception report 1 month after the start of consulting services. 1.2 Accomplish socioeconomic analysis, project economic analysis, poverty reduction and social strategy 3 months after the start of consulting services. 1.3 Complete the assessment of proposed road sections 3 months after the start of consulting services. 1.4 Accomplish cost estimates and financial plan 3 months after the start of consulting services. 1.5 Complete environmental assessment 4 months after the start of consulting services. 1.6 Submit a report on public consultation 3 months after the start of consulting services. 2.1 Submit an interim report 3 months after the start of consulting services. 2.2 Complete technical site investigations, technical feasibility study, and preliminary design including contract packages, procurement plan, and implementation schedule 5 months after the start of consulting services 2.3 Submit the draft final report 6 months after the start of consulting services, and the final report 1 month after receiving comments from the Government and ADB 			<p>Inputs</p> <ul style="list-style-type: none"> • ADB: 15 person-months of international consulting services, amounting to not more than \$500,000 • Government: \$185,000 contribution (transport, office accommodation, local counterpart staff); all relevant reports made available as needed

INITIAL POVERTY AND SOCIAL ANALYSIS

A. Linkages to the Country Poverty Analysis

Is the sector identified as a national priority in country poverty analysis?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the sector identified as a national priority in country poverty partnership agreement?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>Contribution of the sector or subsector to reduce poverty in Papua New Guinea:</p> <p>Papua New Guinea (PNG) ranks 68th in the United Nations Development Programme poverty index. World Bank projections in 2005 showed that the proportion of the poor living under the national poverty line was 53% in 2003. PNG's main social indicators, such as life expectancy and maternal and child mortality rates, are still well below averages for lower middle-income countries. PNG has limited health care and there are serious public health risks from endemic diseases such as malaria and a generalized HIV/AIDS epidemic. Participation in primary schooling has been improving, but the rate is still lower than that in other countries in the region.</p> <p>Although PNG has abundant natural resources including (i) mineral reserves, (ii) forestry and fishery assets, (iii) vast agricultural lands with potential for expansion, and (iv) several potential ecological and cultural tourism locations, its economic performance has remained below expected levels. Economic growth has not kept pace with population growth. Most of the population depends on subsistence farming supplemented by cash crops. Only 15–20% live in the main urban areas of Port Moresby, Lae, Madang, Mt. Hagan, and Goroka.</p> <p>The impact of road construction on poverty reduction can be measured by the (i) increased access of rural communities to basic social services such as education, health care, and local markets; (ii) increased employment opportunities for unskilled workers in the project area; (iii) indirect and induced economic growth in the project-affected regions and the nation as a whole; and (iv) anticipated reductions in transportation costs to road passengers, freight users, and vehicle operators. The poor condition of the roads has led to a decline in the availability of both public and private means of transport along them such that most people can no longer regularly access services and markets in urban centers. Rehabilitating the Highlands Highway and nearby corridors would significantly ease access to a wider range of services and stimulate economic activity, especially cash cropping. This, in turn, will directly contribute to reducing poverty in the target populations.</p> <p>The proposed Highlands Highway (Southern Highlands and Enga Provinces Network) Rehabilitation Project is in line with the Government's Medium-Term Development Strategy, which highlights the importance of export-driven economic growth, rural development, and poverty reduction, including the promotion of agriculture, forestry, fisheries, and tourism.</p>			

B. Poverty Analysis

Targeting Classification: General intervention

What type of poverty analysis is needed?

The project will reduce poverty in the short term by creating jobs for skilled and unskilled construction workers. The project will essentially improve access to markets for cash crops and other agricultural products.

The consultant for the project preparatory technical assistance will conduct a socioeconomic and poverty assessment among stakeholders and prepare poverty profiles for project stakeholders. Information to be gathered will include employment status, asset and resource ownership, income data, degree of skills and knowledge base, social cohesion, and community organization. The assessment will also identify vital needs and constraints faced by local communities in fully benefiting from the employment and business opportunities associated with the anticipated increase in road traffic and connectivity, as well as their ability to respond to the inherent health and/or HIV/AIDS risks associated with the road rehabilitation.

C. Participation Process

Is there a stakeholder analysis? Yes No

The stakeholders include central and local governments, communities, and the private sector. The consultant will conduct the stakeholder analysis.

Is there a participation strategy? Yes No

There will be consultations with various stakeholders including central and local governments, the private sector, communities, various nongovernment organizations, faith-based groups, women's associations, and community organizations. The consultant will follow good practice in line with the terms of reference during socioeconomic analysis, resettlement planning, and project design.

D. Gender Development**Strategy to maximize impacts on women:**

The project is not expected to cause any specific cultural or social impact on or exclude any socioeconomic group, including women, from benefiting from the project. The project will identify practical modalities to maximize benefits to communities (especially women and other vulnerable groups) and mitigate health risks associated with increased road traffic and connectivity. If women are adversely affected during resettlement, the resettlement plan will include ways to mitigate the adverse effects. All data collected will be gender-disaggregated.

Has an output been prepared? Yes No

E. Social Safeguards and Other Social Risks

Item	Significant/ Not Significant/ None	Strategy to Address Issues	Plan Required
Resettlement	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	The proposed project will rehabilitate sections of the Highlands Highway located on existing road alignment. Thus, there will be no need for a resettlement plan.	<input type="checkbox"/> Full <input type="checkbox"/> Short <input checked="" type="checkbox"/> None
Affordability	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	The proposed project will reduce the cost of transporting goods by providing direct access and connectivity to market centers.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Labor	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	The proposed project will generate job opportunities during project design, construction, and operation.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Indigenous Peoples	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	No issues involving indigenous people are expected.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Other Risks and/or Vulnerabilities	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	With the spread of HIV/AIDS and other sexually transmitted diseases in PNG, the technical assistance will assess the risks and propose prevention measures accordingly.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Total Cost
A. Asian Development Bank Financing^a	
1. International Consultants	
a. Remuneration and Per Diem	323.0
b. International and Local Travel	60.0
c. Reports and Communications	15.0
2. Office Equipment ^b	12.0
3. Surveys and Miscellaneous Administration and Support Costs	40.0
4. Contingencies	50.0
Subtotal (A)	500.0
B. Government Financing	
1. Office Accommodation and Transport	105.0
2. Remuneration and Per Diem of Counterpart Staff	60.0
3. Others	20.0
Subtotal (B)	185.0
Total	685.0

^a Financed by the Japan Special Fund, funded by the Government of Japan.

^b Computers, printers, and photocopying machine will be purchased.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The consultants will prepare a detailed road improvement plan for the proposed road sections, which will serve as the base for preparing a proposed Asian Development Bank (ADB) loan. The plan must include all necessary documentation for project processing.

A. Consultants' Tasks for Specific Aspects of the Road Improvement Plan

2. For the engineering aspect, the road engineer will undertake the following tasks.

- (i) Review available engineering data and study on the project roads. Survey the conditions of the roads identified for the proposed project.
- (ii) Review existing traffic data; validate or carry out, as needed, traffic counts, origin-destination and axle load surveys; and forecast traffic for each road section.
- (iii) Identify typical slope stability problems on the road network, analyze their cause, and develop recommendations for mitigating the problems.
- (iv) Propose a required level of improvement for each road section, and estimate the costs of civil works including foreign exchange and local components, separately identifying taxes and customs duties.
- (v) Prepare a summary of the technical approach and design standard, taking into account environment-friendly and community-based methods.
- (vi) Prepare the procurement plan for the proposed project.
- (vii) Propose appropriate contract packages, indicate for each package the suitable procurement method, and prepare draft standard bid documents accordingly.
- (viii) Prepare the proposed project implementation schedule.
- (ix) Prepare draft bid documents for an initial program of works to be procured by advance procurement and implemented immediately upon loan effectiveness.
- (x) In consultation with other specialists, develop draft terms of reference for consultants for detailed engineering design and construction supervision, and estimate the required resources (person-months and costs).

3. The team leader/institutional/transport specialist will undertake tasks that deal with economic and institutional analyses.

- (i) Review available data and the economic analysis of the project roads. Obtain the most recent available traffic and road condition data, required improvement, and estimated civil works and maintenance.
- (ii) Determine financial and economic vehicle operating costs for representative vehicle types.
- (iii) Undertake a financial analysis of the project and design a fund flow mechanism for road maintenance.
- (iv) Prepare an economic evaluation of the proposed improvements following ADB's *Guidelines for the Economic Analysis of Projects*, taking into account the reduction of travel time and transport costs in project areas, increase of agricultural production, and other net social benefits resulting from improved access. The social benefits will include quantified education and health benefits (e.g., reduced distance to health and education services, increased enrollment of students in primary and junior high schools in corridors of impact, reduced number of sick days and deaths because of improved access to health centers).
- (v) Develop optimum road improvement strategies using Highway Development and Management Model (HDM-4) for each road section.

- (vi) Carry out program optimization, considering likely budget constraints in developing a recommended program of works for the proposed project, including least-cost options, economic rates of return, and priority rankings.
- (vii) Undertake switching value calculations, and sensitivity analysis for variations in key parameters and budget constraints. Undertake risk analysis in accordance with ADB's *Handbook for Integrating Risk Analysis of Projects*.
- (viii) Identify the appropriate ADB disbursement procedure based on the project needs and the capacity of the executing and implementing agencies to manage funds flow and disbursement.
- (ix) Develop a draft project framework taking into account the performance indicators of other aspects. Develop the baseline indicators for monitoring the impact of the proposed project.
- (x) Recommend the proper institutional arrangement for project implementation, consistent with the recommendations of the Transport Sector Harmonization Study.

4. The social development specialist will undertake tasks involving poverty and social analysis.

- (i) Conduct poverty, social, and gender analyses in accordance with ADB's *Handbook on Poverty and Social Analysis* and *Policy on Gender and Development* (1998).
- (ii) Conduct poverty, socioeconomic, and gender mapping of the project districts, based on existing information and data, including household expenditure and income data.
- (iii) Organize a stakeholder consultation workshop at the very early stage of project design to present goals/objectives of the project; gain key stakeholders' understanding of and support for the project; receive recommendations, suggestions, concerns, and opinions to be used for socioeconomic analysis, social safeguards, and project design.
- (iv) Identify local facilitators, develop material for and oversee stakeholder consultations.
- (v) Document the consultation process and how stakeholders' views are considered in the project design.
- (vi) Carry out field consultations that include key informant interviews, and focus group discussions with relevant Government, nongovernment, and civil society stakeholders at the district, local level government, ward, and village/community levels. Key informant interviews will aim to gain local leadership's understanding and support and their insights; obtain overall socioeconomic information on the area, and gain insights into the local leaders' political perspectives and capacity. Focus group discussions (segregated by sex, as needed) will aim to: assess—in a discussion format facilitated by the project team's facilitator—villagers' perceptions on poverty, and potential road improvement, and also their gender-specific needs, issues, and concerns with respect to the social, gender, and health-related risks and impacts associated with the rehabilitation of the Southern Highlands and Enga Provinces Network.
- (vii) Design and conduct small sample surveys (local households, vehicle operators, passengers, freight shippers, and shops) as needed to obtain various data, including the degrees of usage of the transport infrastructure by various stakeholder groups and income levels.

- (viii) Consult with nongovernment organizations, and faith- and community-based organizations to assess the potential for increased community (and especially women's) involvement and participation in designing the loan and to ensure that local communities benefit from the employment opportunities to be derived from the road rehabilitation.
- (ix) Prepare a resettlement plan and/or an ethnic minority development plan, as required, in accordance with ADB's social safeguard policies and operations manuals.
- (x) Assess the possibility of designing a project-specific component on community-based road rehabilitation and maintenance, by assessing local communities' preparedness to be involved in rehabilitating and/or maintaining selected rural feeder roads adjacent to the Highlands' Highway, building on ADB's experience in the area of community-based, labor-intensive, and sustainable rehabilitation and maintenance of feeder roads.
- (xi) Prepare an overview of ethnic population characteristics in each road's zone of influence for both mainstream and minority groups. Identify the likely project impact on indigenous people or ethnic groups in the zone of influence and propose mitigation measures if needed.
- (xii) If required, prepare an involuntary resettlement and ethnic minority development plan according to ADB's *Handbook on Involuntary Resettlement: A Guide to Good Practice* and ADB's *Policy on Indigenous Peoples* (1998).
- (xiii) Incorporate any issues related to poverty and social risk, such as HIV/AIDS, into the project design and monitoring framework (DMF) and include gender-specific and/or gender-relevant indicators in the DMF and project performance monitoring system.
- (xiv) Identify institutions (Government and nongovernment) that may be associated in independently monitoring the social, gender, and poverty impacts of the project.
- (xv) Outline options for incorporating relevant social and gender design features into the loan design (i.e., loan project components).
- (xvi) Outline practical options for the design of the loan (i.e., loan component) to ensure that the poor and vulnerable groups have full and equal access to the opportunities and benefits derived under the loan.
- (xvii) Prepare the poverty reduction and social strategy (PRSS).

5. The environmental specialist will conduct an environmental assessment. The specific tasks are the following.

- (i) Gather and review all available environmental studies related to the project highways and feeder roads, and make a field survey to produce a comprehensive environmental assessment for the project roads.
- (ii) Prepare an environmental management plan to implement mitigation measures for each road section.
- (iii) Prepare an environmental assessment and its summary in accordance with ADB's and the Government's existing environmental assessment guidelines for road improvement.
- (iv) If the initial environmental examination recommends that a full environmental impact assessment (EIA) be undertaken, prepare the terms of reference acceptable to ADB and the Government. Conduct the EIA and prepare the report and its summary accordingly.
- (v) Assess the capacity of the Department of Works (DOW) to implement the proposed mitigation measures, and recommend necessary training or other

forms of activities to strengthen DOW's capacity to deal with environmental problems related to road sector development in general.

B. Reports

6. The consultant will submit the following reports in five copies to DOW and three copies to ADB:

- (i) inception report, giving initial findings and work program for the balance of the assignment, to be submitted 1 month after the start of services;
- (ii) interim report, 2 months after the inception report;
- (iii) draft final report covering all findings and recommendations, 6 months after the start of services; and
- (iv) final report incorporating comments from DOW and ADB, 1 month after the receipt of such comments.