

ASIAN DEVELOPMENT BANK

TAR: PNG 34122

TECHNICAL ASSISTANCE
(Financed from the Japan Special Fund)

TO

PAPUA NEW GUINEA

FOR PREPARING THE

SOUTHERN ROAD MAINTENANCE AND UPGRADING PROJECT

September 2001

CURRENCY EQUIVALENTS

(as of 14 September 2001)

Currency Unit	–	Kina (K)
K1.00	=	\$0.29
\$1.00	=	K3.40

ABBREVIATIONS

ADB	–	Asian Development Bank
DOWT	–	Department of Works and Transport
DNPM	–	Department of National Planning and Monitoring
km	–	kilometer
NTDP	–	National Transport Development Plan
PNG	–	Papua New Guinea
RAMS	–	Road Asset Management System
TA	–	technical assistance

NOTES

- (i) The fiscal year (FY) of the Government corresponds to the calendar year.
- (ii) In this report, "\$" refers to US dollars.

I. INTRODUCTION

1. The Government of Papua New Guinea (PNG) has requested from the Asian Development Bank (ADB) technical assistance (TA) for preparing to maintain and upgrade southern PNG roads.¹

2. Fact-finding for the TA was conducted during ADB's Implementation Review Mission in March 2001 for the Road Maintenance and Upgrading (Sector) Project.² The Mission reached an understanding with the Government on the objectives, scope, cost estimates, financing plan, implementation arrangements, and terms of reference for the proposed consultant services. These are recorded in a memorandum of understanding. The TA is included in the 2001 PNG Country Assistance Plan. This TA report was prepared based on the Mission's observations in the field and discussions with the Government.

II. BACKGROUND AND RATIONALE

3. The transport system of PNG is multimodal, comprising about 27,000 kilometers (km) of roads; 22 ports; numerous wharves, jetties, and landings; and 46 airports and hundreds of airstrips. The road network is characterized by subnetwork concentrations around the major population centers with weak linkages between the population centers.

4. The National Transport Development Plan 2001-2010 (NTDP) provides strategic guidance for the sector's development. The objectives of the overall strategy are to strengthen regular maintenance upgrading and restructuring of transport infrastructure; construct required new assets in all three transport modes; and revitalize safety conditions and standards. In the road sector, the NTDP focuses on maintaining existing transport infrastructure by installing a new maintenance management system that will use the new road asset management system (RAMS)³ to provide an objective analysis of maintenance needs, cost these, and prioritize the maintenance works. The strategy calls for raising required funds directly from road users, through a system of user charges including a special levy on fuel and through special vehicle registration and license fees placed in a road fund.⁴ The NTDP also outlines support for establishing the road sector under an autonomous road authority.⁵

5. The NTDP furthermore calls for substantial investments in road and bridge rehabilitation, reconstruction, and building to meet the Government's overall objectives to provide adequate access to transport services through all provinces. In the land transport subsector, these investments need to be integrated intermodally within the provinces and to generate a minimum economic rate of return of 12 percent. Under this plan the southern region is proposed to receive 28 percent by value of the nationwide rehabilitation, upgrading, and road construction program (Table 1).

¹ The TA first appeared in *ADB Business Opportunities* in March 2001.

² Loan 1709-PNG: *Road Maintenance and Upgrading (Sector) Project*, for \$63.0 million, approved on 16 November 1999.

³ TA 3004-PNG: *Road Asset Management System*, for \$1.0 million, approved on 3 April 1998 and TA 3378-PNG: *Road Asset Management System in the Provinces*, approved for \$581,000, approved on 28 December 1999.

⁴ TA 3191-PNG: *Road Sector Cost Recovery Improvement*, for \$350,000, approved on 6 May 1999.

⁵ Planned TA for *Road Authority Development Project* under the PNG Country Strategy and Program 2001.

Table 1: Priority Roads for Investment During NTDP 2001-2010

Region	Province	Road	Estimated Share of Regional Total (%)	Estimated Share of National Total (%)
Highlands	All	Highlands Highway	35	6
	Southern Highlands	Mendi Road	25	4
	Western Highlands	Baiyer Road	16	3
	Eastern Highlands	Enga Highway	13	2
	Enga	Kandep Road	11	2
	Subtotal		17	
Islands	North Solomons	Mope Road	52	3
	West New Britain	New Britain Highway	48	3
	Subtotal		6	
Momase	West Sepik	Border Road	20	4
	Madang	Coastal Highway	17	3
	Morobe	Wau Road	16	3
	East Sepik	Sepik Highway	16	3
	Morobe	Bukawa Road	11	2
	Madang	Simbai Road	10	2
	West Sepik	Coastal Highway	10	2
	Subtotal		19	
Southern	Gulf	Kerema–Kikori	31	9
	Gulf	Trans-Island Road	19	5
	Western	Sou Kiunga–Aiambak Road	16	4
	Milne Bay	Magi Highway	15	4
	Central	Magi Highway	12	3
	Central	Hiritano Highway	7	2
	Subtotal		28	
Other roads			31	
	Total			100

6. Responsibility for the road network is shared between the national Government and the 19 provincial administrations since 1976. The Road Act of 1980 specifies that the Department of Works, headed by a Secretary, will manage implementation of road and bridge projects, maintenance of national road network, and provision of technical advice to provincial administrations and other government departments. Under its latest proposal, the Government has eliminated the administrative road classification and placed responsibility for the entire road network nominally with the provincial administrations. Funding for maintenance is proposed to come from pooled resources of the national and provincial governments, rural development funds, and other funds aiming to support community development. The current Department of Works and Transport (DOWT) through its provincial offices and largely by using local contractors, delivers maintenance services.

7. The RAMS set up at the Road Maintenance Coordination Branch includes data for about 1,700 km of national roads in the southern region (Table 2). The survey data provides that half of the national roads are in poor or fair condition. The condition of the provincial roads in the region is being surveyed. Poor road conditions constrain mobility and economic growth, which

inhibits social development and poverty reduction efforts. Enhanced mobility can yield significant economic benefits. Road improvement and maintenance facilitates commerce and improves access to jobs, education, health care, and other services. Effective transport lowers prices and production costs, and hence leads to broad economic benefits for the population at large, but in particular to its disadvantaged remote segments. The poor road conditions result in annual road users' costs estimated in excess of \$62 million (K200 million) per annum through shortened vehicle life; excessive fuel, tire, and vehicle spare part use; and increased travel time.

Table 2: Classification and Condition of the National Roads in the Southern Region

Province	Length					Condition		
	National Routes km	Main Roads km	District Roads km	Institutional Roads km	Total km	Poor (%)	Fair (%)	Good (%)
Central	383	70	249	53	755	36	27	37
Gulf	135	0	60	1	196	17	38	45
Milne Bay	125	0	138	25	288	30	17	53
Oro	83	80	39	111	313	2	13	85
Western	0	127	0	13	140	0	39	61
Total/Average	726	277	486	203	1,692	24	24	53

8. ADB has supported the Government's program to improve road sector management through technical assistance (TA) and loan programs. It approved Loan 1709-PNG: Road Maintenance and Upgrading (Sector) Project (footnote 2) to enable the road sector contribute to export growth and integrate the highlands subsistence population into the mainstream economy. This target improvement of critical road links establishment of a sustainable and effective road maintenance operation in the region with improvement of the RAMS. Similar support is required for the southern region.

9. The southern region is scheduled to receive road sector support from the Australian Agency for International Development (AusAID) and the World Bank. AusAID programs are planned for regravelling of roads in Oro and Milne Bay provinces and the World Bank's Road Maintenance and Rehabilitation in six provinces includes works on defined road sections in the Central Province. The proposed comprehensive maintenance and rehabilitation (sector) program will be prepared under this TA in a close association with these programs, to improve the total network.

10. ADB-led policy dialogue with the Government and DOWT has progressed to agreements on (i) establishing a road fund for sustainable road maintenance financing through user charges; (ii) implementing the road maintenance planning instrument, RAMS; (iii) enforcing axle load restrictions; and (iv) establishing core professional road maintenance groups in each region to manage the delivery of maintenance services; and (v) assessing the feasibility of an effective road asset management delivery mechanism through an autonomous road authority. These strategies for sector improvement will be reinforced under this TA.

11. This policy dialogue agenda has been supported by ADB-funded technical assistance (footnote 2 and 3) and has enhanced the technical capacity to plan for maintenance. The Road Maintenance and Upgrading (Sector) Project in the highland region includes a focus on delivery of maintenance services and establishment of an effective contracting regime. With this, DOWT aims to upgrade its technical capability and to enable migration of this function to the planned

road authority. This capacity building process is ongoing for the highlands and needs to be commenced in the southern region.

12. The Government has recognized the central role of physical access to mainstream markets for social development among a poor rural population that lacks income generating opportunities. The TA supports the Government's effort to improve delivery of essential services and opportunities to the rural communities in the southern region, in order to reduce poverty, enhance employment, and improve marketing possibilities among its population. With the support of the TA, the Government aims to establish reasonable transport conditions with effective road maintenance to induce development of the remote areas.

13. The ensuing Project, for which the feasibility study will be prepared under the TA, is envisaged to lead to (i) more frequent and reliable transport services with more comfortable and faster travel; (ii) greater mobility, especially for rural and disadvantaged people; and (iii) reduced operating costs for vehicles, making these services increasingly available and cheaper. The improvements in transportation will facilitate access by the rural poor to markets in larger villages and district centers. This is especially important for women, as they are the major producers and sellers of market produce. Also, the ensuing project is expected to benefit those in the cash economy, who will be more readily able to transport their crops to the buyers in towns, or to they sell directly at the point of production to travelling buyers. The delivery of health, education, and agricultural extension services in major towns will be improved in the region if the road network is upgraded to a functional standard. The standards of all of these services have seriously declined during the past decade, but remain better in towns than in the rural areas. Access to health services for women and children, in particular, has become difficult due to inadequate transport.

III. THE TECHNICAL ASSISTANCE

A. Rationale

14. The southern PNG comprises provinces of Western, Gulf, Central, Milne Bay, and Oro. This region has about 1,700 km of national roads with about 755 km in Central, 196 km in Gulf, 288 km in Milne Bay, 313 km in Oro, and 140 km in Western provinces. Detailed data on the provincial roads will be available once survey work under RAMS in the provinces will be completed in the third quarter of 2001. The poor condition of road infrastructure in the southern region constraints development and poverty alleviation. Delivery of the Government's extension services, education, health, and policing has become difficult, and in some areas inaccessible due to the road conditions. Access to employment and markets have left many areas in the region in subsistence situations, which has resulted in poor social and health conditions among the rural inhabitants. This has, in turn, led to challenging peace and security conditions, and increasing urbanization in Port Moresby. The TA will prepare a feasibility study and a program for maintaining and upgrading the road network in the southern region. The road development program will aim to enhance the capacity of the road sector to contribute to poverty reduction and economic growth by increasing access of the remote communities to employment and marketing opportunities in the mainstream markets of PNG.

B. Objectives and Scope

15. The objective of the TA is to prepare a feasibility study for road upgrading and maintenance in the southern region of PNG. It will (i) assess the demand for the road network and the role of the roads for the disadvantaged communities, (ii) prepare an investment program

for road upgrading and maintenance, and (iii) identify a policy framework to ensure sustainable and effective maintenance delivery as intended in conjunction with the newly adopted RAMS. The TA will seek solutions that target poverty reduction and maximum involvement of the private sector. A framework for the TA is provided in Appendix 1.

16. The TA will (i) identify the demand for, and beneficiaries of, improved road conditions; (ii) prepare a prioritized program of road works for a sector program, to facilitate reduced maintenance and user costs, generate employment, and reduce poverty; (iii) identify domestic and external cofinancing possibilities; (iv) prepare a sustainable, streamlined, nationwide, management mechanism for road maintenance; (v) confirm the economic viability of the proposed programs in accordance with ADB's *Guidelines on Economic Analysis of Projects* and prepare subproject proposals; (vi) prepare project implementation and collaborative interagency arrangements; (vii) establish pragmatic instruments for implementing institutional and policy framework reform; and (viii) carry out social and environmental analysis of the proposed civil works as required under ADB's *Guidelines for Incorporation Social Dimensions in Bank's Operations* and *Environmental Guidelines for Selected Infrastructure Projects*. The TA will conduct series of workshops and consultations with inhabitants of the southern region to ascertain the demand of stakeholders in the ensuing Project for transport services, determine the role transport services potentially play in poverty reduction, and identify small-scale poverty reduction projects constrained by lack of transport services.

C. Cost Estimates and Financing Plan

17. The total cost of the TA is estimated at \$570,500 equivalent, of which the foreign exchange component is \$335,650 and the local currency component is \$234,850 equivalent. The Government has requested ADB to finance \$400,000 equivalent, covering the entire foreign exchange cost and \$64,350 equivalent of the local currency costs. The TA will be financed by the ADB on a grant basis from the Japan Special Fund, funded by the Government of Japan. The Government will finance the balance of the local currency cost. The Government has been advised that approval of this TA does not commit ADB to finance any ensuing project. Detailed cost estimates are provided in Appendix 2.

D. Implementation Arrangements

18. **Consulting Services.** About 12 person-months of international consultant services are required from an international firm, in the fields of civil engineering for rural roads, poverty analysis, micro-scale project development, economic analysis, and social and environmental analysis. The consultants must have a profound knowledge of PNG environment. These consulting services will be engaged in accordance with the ADB's *Guidelines on the Use of Consultants*. The outline terms of reference for the consultant services are in Appendix 3.

19. **Executing Agency.** DOWT will be the Executing Agency for the TA with the Department of National Planning and Monitoring (DNPM) providing close oversight of the TA. DOWT will closely coordinate with DNPM and the affected provincial administrations to ensure effective liaison, data gathering, and discussion during TA implementation. It will also coordinate the progress of the feasibility study with the National Executive Council and other important decision making institutions at the highest levels in PNG. A steering committee comprising the heads of DOWT, DNPM, Department of Finance, Office of the Prime Minister, and Department of Provincial Administrations, and representatives of road users will be established to guide the TA and to consider its progress. The steering committee will appoint a qualified project manager to work with the consultants and to provide coordination among the agencies.

20. **Deliverables.** The TA will be carried out over a six months commencing in October 2001 and ending in April 2002. The consultants will submit an inception report, a draft final report, and a final report. The consultants will organize two tripartite meetings, convening the authorities responsible for the TA, the consultants, and ADB to consider the reports and proposals. The consultants will also convene coordination meetings among relevant external funding agencies in connection with the scheduled two tripartite meetings.

IV. THE PRESIDENT'S DECISION

21. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance, on a grant basis, to the Government of Papua New Guinea in an amount not exceeding the equivalent of \$400,000 for the purpose of preparing the Southern Road Maintenance and Upgrading Project, and hereby reports such action to the Board.

TECHNICAL ASSISTANCE FRAMEWORK

Design Summary	Targets	Project Monitoring Mechanism	Risk/Assumptions
Sector Goal Prepare a road improvement and maintenance project to enable the road sector release its capacity and contribute to poverty reduction and economic growth by inducing access of the remote communities to employment and marketing opportunities in the mainstream markets in the southern Papua New Guinea.	Prepare of a feasibility study and an ensuing project that will support upgrading and maintaining the road networks in the southern region. The ensuing project will improve road conditions in the southern region through road rehabilitation and upgrading subprojects.	1. Project management 2. Project reviews and reports 3. Consultations with communities and authorities	1. Timely implementation of the technical assistance (TA). 2. Timely preparation and implementation of the ensuing project
Purpose/Objectives A feasibility study for upgrading and maintaining the road networks in the southern region.	1. Identify a prioritized program of road works to reduce maintenance and user costs, generate employment, and reduce poverty. 2. Prepare a sustainable management delivery mechanism. 3. Establish pragmatic policy reforms enhancing delivery of transport and maintenance service delivery. 4. Environmental, social, and poverty analyses of the proposed civil works and reform program.	1. Periodic project reports 2. Project review missions 3. Tripartite meetings	1. Timely contracting of consultants 2. Availability of counterpart personnel and funding 3. Effective TA implementation
Activities 1. Identification of critical road improvement needs. 2. Preparation a prioritized program of road works. 3. Preparation of subproject proposals. 4. Identification of cofinancing.	1. Feasibility study with all Asian Development Bank due diligence requirements prepared by January 2002. 2. Project implementation and policy framework by January 2002.	1. Review meetings and missions 2. Project reports	1. Consultants' and counterparts' efforts 2. Timely TA implementation

Design Summary	Targets	Project Monitoring Mechanism	Risk/Assumptions
5. Identification of a sustainable, streamlined, management mechanism for road maintenance. 6. Preparation of project implementation and interagency arrangements. 7. Establishment of pragmatic institutional and policy framework reform. 8. Preparation of environmental, social, and poverty analyses of the proposed civil works.	3. Stakeholder workshops and consultations conducted and documented by December 2001. 4. Consultations with transport industry and public authorities on project scope and arrangements conducted and documented by December 2001.		
Inputs International consultant services.	International consultant services to undertake the terms of reference under the TA selected by September 2001 (\$0.35 million).	Consultant contract	1. Timely deployment of competent consultants 2. Timely tender process

COST ESTIMATES AND FINANCING PLAN
(\\$)

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank Financing^a			
1. International Consultants	295,200	20,000	315,200
a. Remuneration	228,000	0	228,000
b. Per Diem	43,200	0	43,200
c. International Travel	24,000	0	24,000
d. Local Air Travel	0	20,000	20,000
2. Miscellaneous	0	38,500	38,500
a. Communications	0	2,500	2,500
b. Report Preparation	0	4,000	4,000
c. Office Supplies	0	2,000	2,000
d. Local Vehicle Transport		10,000	10,000
e. Workshops	0	20,000	20,000
3. Government Participant in Contract Negotiations	5,000	0	5,000
4. Contingencies	35,450	5,850	41,300
Subtotal (A)	335,650	64,350	400,000
B. Financed by the Government			
1. Office Space and Logistical Support	0	50,000	50,000
2. Office Support	0	20,000	20,000
3. Surveys and Transport to Remote Locations	0	85,000	85,000
4. Contingencies	0	15,500	15,500
Subtotal (B)	0	170,500	170,500
Total	335,650	234,850	570,500

^a Financed from the Japan Special Fund.

Source: Staff estimates.

OUTLINE TERMS OF REFERENCE

1. Objectives and Scope

1. The objective of the consultant services is to prepare a feasibility study for road improvement and maintenance program in the southern region of PNG that complies with ADB's requirements for feasibility documentation for transport projects. The Consultants will prepare comprehensive information on all aspects of the proposed project including technical, financial, economic, social, environmental, poverty, and transport policy matters. The consultants will visit project sites; consult a cross-section of project beneficiaries; identify project implementation capacities and arrangements; project costs utilizing the Road Asset Management System (RAMS), and cofinancing arrangements; and systematically assess the Project and the sector including developing a project framework, analyzing constraints, opportunities, demands; and doing social surveys, and an environmental evaluation.

2. The consultants will carry out the assignment in an inclusive manner meaningfully consulting with the national and provincial government officials, road users, national planners, affected communities, and involved external agencies. The consultants will focus on identifying and alleviating the immediate constraints that the roads sector poses to poverty alleviation and economic development without neglecting the long-term economic rationale of the sector services. The consultants will take note of all existing assessments and reports available on the sector. In particular, the economic analysis will rely on the use of RAMS.

2. Technical Review-Project Identification

3. The consultants' assignment will include, but not be limited to, the following tasks:

- (i) Review existing national, provincial, and local investments proposals, policies, and plans in the road subsector and review demand for all proposed investments, (a) assessing traffic movements and needs of rural communities; (b) obtaining data on commerce, micro-trading, and delivery of social services; (c) assessing the nature and volume of traffic; and (d) estimating demand for road network improvement.
- (ii) Review the impact of transportation and freight prices on remote communities, and the impact of road infrastructure and services on poverty, determining constraints on regular transport services.
- (iii) Review the capacity of the private sector transport operators, service delivery, and private sector involvement in the envisaged Project.
- (iv) Validate and update the proposals for road sector investments, assessing their viability and feasibility, and update design documents, reviewing the technical solutions and specifications, and land acquisition issues.
- (v) Prepare options for road improvement investment programs and organizing road maintenance to improve access of the remote communities to mainstream markets and to alleviate poverty and improve the standard of living in these communities.

- (vi) Assess intermodal implications of the proposed investment program and whether the non-land (maritime, river, or air) transport modes should be accommodated under the proposed program within an integrated transport system in the region. Prepare all due diligence requirements for such components of the proposed program in accordance with ADB's requirements for feasibility documentation for transport project components under these terms of reference.
- (vii) Prepare a detailed technical program for addressing the low traffic and remote rural road transport issue. Outline an investment program prioritizing investment proposals for external financing, preparing technical specifications including terms of reference of the proposed prioritized program, civil works, equipment, and consulting services required. Establish the contract packages for civil works, equipment, and consulting services, under the *Guidelines for Procurement of the Asian Development Bank (ADB)*.
- (viii) Assess the capacity of Department of Works and Transport (DOWT) and the provincial administrations to provide project management and contract administration for the investment program, identifying appropriate implementation arrangements for the proposed program, including (a) project management and administration arrangements for effective project implementation; (b) schedules, roles, and tasks for agencies and people involved; (c) action programs for establishing project implementation resources, including counterpart resources; (d) the steering committee, to coordinate between DOWT; provincial administrations; and the departments of treasury, finance, planning, and lands.
- (ix) Prepare delivery mechanisms for the maintenance program addressing the organizational, technical, financial, human resources aspects and coordination. Involve DOWT and the provincial administrations, and other relevant agencies, as appropriate.
- (x) Help identify a land acquisition program, as required, in consultation with DOWT, the Department of Lands, and the provincial administrations. Prepare a specific land acquisition action plan for the proposed investment program. Determine a program of user, landowner, beneficiary, and affected community consultations. Develop a consultation mechanism, and help DOWT and the provincial administration execute an effective beneficiary consultation and public awareness program. Assess the requirements for land acquisition and resettlement in terms of loss of land, other assets, income, or common property resources. Review options to avoid or minimize such impacts through consultation with communities affected and viable changes in the technical design. Where such impacts are unavoidable, prepare measures for compensation and any other assistance necessary to restore incomes and living standards, by means of a resettlement plan in accordance with ADB's *Policy on Involuntary Resettlement* (1995) and the *Handbook on Resettlement: A Guide to Good Practice*.
- (xi) Using the RAMS, investigate and establish costs of locally available and imported materials required for construction; estimate construction, installation, and maintenance costs of the proposed facilities; and segregate cost estimates into foreign and local components, taxes and customs duties, equipment

depreciation, spare parts, materials, labor, and overhead, etc. as well as by general items, civil works, electric works, installation, and equipment.

- (xii) Using the RAMS, study the feasibility of investments for the facilities and programs proposed for the Project being prepared. The studies will include (a) an economic and financial evaluation, in accordance with *ADB's Guidelines for Economic Analysis of Projects*; (b) evaluation of the environmental and social costs and benefits for each subproject over the intended life of the investment; (c) preparation of the financial and economic net present values of the proposals and other feasibility indicators; and determination of the sensitivity tests for major parameters such as costs, demand, and benefits. This will include calculating financial and economic values for all parameters.
- (xiii) Review demand for all proposed investments assessing traffic movements and needs of rural communities, obtaining data including patterns of traffic, commerce, micro-trading, and delivery of social services. Assess the use of land transport and other transport possibilities and the best practices for improvement of transport service delivery. Review the impact of current transportation and freight prices on rural communities and the poor and the impact of current land transport infrastructure and services on poverty and compare these with the impacts associated with the implementation of the proposed program of investments. Identify issues that increase prices and prevent regular transport service provision. Review the demand for land transport, assessing the nature and volume of traffic, estimating the demand for expansion of infrastructure services are improved, assessing data from private service operators, and examining the reasons for the current limitations of their services.
- (xiv) Review and identify cofinancing arrangements for the program ensuring that a program-based approach to the region's infrastructure development is adopted with funding from multiple sources. Establish a coordination framework acceptable to all relevant funding agencies and with the ensuing sector project proposal including coordination of such assistance, if appropriate.
- (xv) Prepare benchmark and performance monitoring indicators for the project and the improvement of transport and transport safety. Assign benchmark and target values to be achieved under the proposed programs.

3. Poverty Assessment

4. The consultants' duties will include the following:

- (i) Conduct a social assessment for the feasibility study in accordance with ADB's *Guidelines for Incorporation of Social Dimensions in Bank Operations*, identifying the road users and others who will benefit from the project, including their socioeconomic profiles, needs and demands, livelihoods, incomes, education, use of transportation and expenses incurred, and alternative means of transportation. Assess the needs of the target client groups for the roads and road transport services in relation to their other needs (hospital and health clinics, schools, livelihood opportunities, agricultural extension services, access to communities, and water supply systems) and the problems with the current transportation conditions. Determine the preferred improvements and willingness

of the users to pay for the improvements suggested under the feasibility study. Organize meetings and ensure that participatory practices are implemented, enabling all stakeholder groups to review and have an impact on the proposed programs.

- (ii) Prepare specific project-related poverty analyses in accordance with ADB's *Policy on Poverty Reduction* and related guidelines. Prioritize and quantify poverty reducing project benefits. Recommend management structures to target poverty reduction under the project management and its components. Identify associated programs for poverty reduction, including benefits accruing to the poor. Identify project beneficiaries by location and income group. Identify institutional mechanisms to target in particular poor beneficiaries. Prepare specific features or measures for the proposed project design to maximize poverty reduction under the Project. Consultative and participatory approaches will be used to ensure the poor participate in project design.
- (iii) Analyze beneficiaries with a breakdown by socioeconomic group and income. Identify beneficiaries by habitat (urban, rural, mountainous, and lowland). Identify design features that ensure that the poor, vulnerable groups, and lower income beneficiaries will be targeted. Recommend and determine project delivery mechanisms for targeting these groups. Conduct summary poverty mapping to show how proximate project outputs are to the locations of the poor and where the disadvantaged groups live. Demonstrate how the disadvantaged groups will benefit from the Project and describe the social measures integral to the project design, including a thorough analysis of the Project's design and social measures, tools, approaches, and methods used in the design to maximize the impact on the poor.
- (iv) Describe the expected impact of the Project on the beneficiaries at large, and in particular, on the poor. For each project component, describe the overall, direct, and indirect impacts on the disadvantaged and low income groups, changes in accessibility of these groups to markets, and the possible impact of any needed mitigation measures. Prepare a clear discussion and a summary table of the impact assessments.

4. Environmental Assessment

5. The consultants' duties will include the following:

- (i) Identify economic, environmental, social, and poverty alleviating benefits of each component under the proposed Project.
- (ii) Review project sites and verify that all impacts on the environment are minimized and can be mitigated. Prepare environmental costs and benefits related to the Project, in accordance with ADB guidelines. Include, for each project component over the study period (20 years), full justifications, explanation of assumptions, and analysis.
- (iii) Prepare an initial environmental examination and/or an environmental impact assessment, if required, including a detailed benefit-cost analysis. Prepare summaries of these reports in accordance with the Government's environmental

assessment guidelines and the *Environmental Assessment Requirements of the Asian Development Bank (March 1998)*. Liaise with the national environmental authorities and all relevant district and nongovernment agencies and individuals to incorporate their views into the feasibility study. Help prepare required documentation for the Government's environmental clearance, if needed; for the feasibility study; and for organizing meetings to consult the affected people and interested organizations. Incorporate environmental considerations in the feasibility study and a summary initial environmental examination and/or an environmental impact assessment as a stand-alone document.

- (iv) Prepare environmental loan covenants and conditions to support project implementation, as required under ADB's relevant guidelines.

5. Reports

6. For the feasibility study for the Southern Road Maintenance and Upgrading Project, the consultants will submit, in English, to the Government (10 copies to the provincial and national governments) and ADB (3 copies) of the following reports:

- (i) **Inception Report.** This brief report will be submitted within four weeks of the start of the TA. It will outline, in accordance with the terms of reference, a program and milestone targets; the consultants' approach, methodology, and work plan; cost implications for consulting services; and recommendations for changes in the implementation arrangements. The report will provide a bar chart of all activities and personnel inputs under the technical assistance (TA) team.
- (ii) **Draft Final Report.** This report will be submitted one month prior to the completion of the services. It will summarize the TA activities and recommendations and provide detailed recommendations on each item under the terms of reference, in detail and with action plans. It will include environmental and social examination in accordance with applicable ADB guidelines, description of the detailed design work, and the additional micro-scale project profiles for the poor to benefit from the project.
- (iii) **Final Report.** After the national and provincial governments and ADB have reviewed the draft final report, they will meet in Papua New Guinea with the consultants to assess the consultants' findings and recommendations. The consultants will submit, within one month of the receipt of such comments, a final report, taking into account comments from the Governments and ADB.