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STAFF APPRAISAL REPORT

THE SOCIALIST REPUBLIC OF VIETNAM

RURAL TRANSPORT PROJECT

September 24, 1996

Agriculture and Environment Operations Division
Country Department I
East Asia and Pacific Regional Office

CURRENCY EQUIVALENTS

(as of January 31, 1996)

Currency Unit	=	Vietnamese Dong
US$1.00	=	Dong 11,018

WEIGHTS AND MEASURES

Metric System

FISCAL YEAR OF BORROWER

January 1 - December 31

ABBREVIATIONS AND ACRONYMS

CAS	Country Assistance Strategy
EFD	External Finance Department under the Ministry of Finance
GDDI	General Department for Development Investment
GDP	Gross Domestic Product
ICB	International Competitive Bidding
IDA	International Development Association
MOF	Ministry of Finance
MOT	Ministry of Transport
MPI	Ministry of Planning and Investment
NCB	National Competitive Bidding
OM	Operational Manual
PDOT	Provincial Department of Transport
PID	Project Implementation Division under PMU 18
PPMU	Provincial Project Management Unit
PMU 18	Project Management Unit 18 under the Ministry of Transport
SBV	State Bank of Vietnam
SOE	Statement of Expenditure

THE SOCIALIST REPUBLIC OF VIETNAM
RURAL TRANSPORT PROJECT

CREDIT AND PROJECT SUMMARY

Borrower:	The Socialist Republic of Vietnam
Implementing Agency:	The Ministry of Transport
Beneficiary:	Not applicable
Poverty:	Program of Targeted Interventions. The project will benefit 15 poor provinces with per capita income that are about half the country's average. About 5 million people will benefit directly or indirectly from the project. Investment in the least-cost rural transport infrastructure is most needed and will have the greatest impact on market integration and poverty reduction.
Amount:	SDR 37.8 million (US$55.0 million equivalent)
Terms:	Standard IDA terms, with 40 years' maturity
Commitment Fee:	0.5% on undisbursed credit balances, beginning 60 days after signing, less any waiver.
Financing Plan:	See paragraph 3.28
Economic Rate of Return:	32 percent
Map:	IBRD No. 27315
Project Identification No.:	39021

THE SOCIALIST REPUBLIC OF VIETNAM

RURAL TRANSPORT PROJECT

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TABLES IN TEXT

ANNEXES

THE SOCIALIST REPUBLIC OF VIETNAM

RURAL TRANSPORT PROJECT

1. BACKGROUND

A. Economic Growth and Rural Poverty

1.1 Although Vietnam has undergone a period of successful macroeconomic reform, its overall economic indicators still show a high incidence of poverty. Since the late 1980s the country has gone through a series of structural reforms and adjustments to external shocks occasioned by the collapse of the Soviet Union. The economic reform program led to signs of economic recovery and to rapid economic growth averaging more than 8 percent a year by 1992. Growth may increase to 9 percent a year for the rest of the decade. This continued economic growth is contributing to the reduction of poverty. However, according to IDA analyses, the country's poverty rate remains high, at a rate of 50 percent, although this rate is less than the 80 percent rate of a decade ago.

1.2 Vietnam has a population of 72 million people and a per capita GDP of US$250, with marked differences in living standards between urban and rural areas. The Vietnam Poverty Assessment and Strategy Report (Report No. 13442-VN) estimates that 26 percent of the urban population falls below the poverty line, whereas 57 percent of the rural population is below the minimum subsistence level. Moreover, urban areas are growing more quickly than rural areas, and thus poverty reduction will occur there more quickly. In addition to urban-rural differences, there are regional differences in Vietnam's poverty profile. In the southeast 33 percent of the population is in poverty, whereas the rate in the north central coast is 71 percent and in the northern uplands, 59 percent. Exacerbating the poverty problem, the poorest regions of the country have particularly low growth rates. So prospects for significant poverty reduction — without additional efforts — appear slim. Although some parts of Vietnam may be difficult to develop economically, many other areas could be highly productive if they received appropriate investments to encourage more dynamic participation in the market economy.

B. The Government's Strategy for Rural Development and Poverty Alleviation

1.3 Analysis of the 1995 Vietnam Living Standards Survey offers useful insights into the development of Vietnam's rural development strategy. First, areas where households are more economically diversified have higher living standards. Second, areas with higher agricultural productivity are more diversified. These findings are consistent with the experience of other East Asian countries — that is, higher agricultural productivity leads to higher farm income, stimulates demand for off-farm goods and services, and leads to greater off-farm employment opportunities. With an average of 900 people on each square kilometer of agricultural land, the long-term solution for rural employment will have to be

off the farm. The Living Standards Survey also indicates that people who live near an all-weather road have higher living standards than others. Rural roads facilitate access to better agricultural technology, more efficient marketing of agricultural surplus, and greater opportunity in other economic activities.

1.4 As a result of the poverty assessment report and the Living Standards Survey, the Government has placed development of rural areas at the forefront of its poverty alleviation effort, with particular emphasis on areas of solid growth potential within the poorest regions. One of the important initiatives to start the campaign for rural development is the provision of economic infrastructure, including rural transport infrastructure. Therefore, rehabilitation of the wide network of rural roads that exists throughout Vietnam — and that over decades of war and economic hardship has deteriorated badly — has recently become one of the Government's investment priorities.

C. Rationale for International Development Association Involvement

1.5 Because poor rural transport conditions are impeding rural development, the Government has requested Bank's assistance (through the International Development Association, or IDA) on a rural transport development program. This request is consistent with the Vietnam Poverty Assessment Strategy Report and with IDA's Country Assistance Strategy (CAS) for Vietnam discussed at the Board on November 21, 1995. The goal set forth in the CAS is to promote broadly based economic development and to combat poverty. Two of five areas of involvement strategy are to take the lead among donors in assisting the Government to plan and finance infrastructure development and to develop and implement a strategy for poverty alleviation.

1.6 IDA has a two-pronged approach to road development and upgrading in Vietnam. Nationally the priority for the country, IDA, the Asian Development Bank, and other bilateral donors is to rehabilitate the main trunk road network from China in the north to Cambodia in the south. The IDA-assisted Highway Rehabilitation Project (US$168 million) has been part of that joint effort. At the rural level the ultimate target of IDA assistance is to upgrade the core rural road network to all-weather roads.

1.7 The proposed Rural Transport Project contributes directly to infrastructure development and to the country's effort in rural development and poverty alleviation. The poverty-focused tasks included in the project are designed to ensure that the poor participate in the growth process. IDA's support to rural development in Vietnam will stand on four pillars that together provide the overall enabling environment for the rural economy: infrastructure, finance, technical support to agricultural diversification, and human resource development. The Rural Transport Project will focus primarily on road rehabilitation in some of the poorest parts of the country (see attached map). Because more than three-quarters of the poor (76 percent) in Vietnam are concentrated among the farming population, antipoverty interventions must give high priority to reaching agricultural households to achieve any significant impact. The poverty assessment report confirms that lack of rural infrastructure and inadequate access to markets and other essential support services are among the crucial factors contributing to the persistent poverty and widespread

malnutrition in rural Vietnam. The strategy for reducing poverty, therefore, includes rural infrastructure investment that will benefit the rural economy through improved access and lower transport cost; the proposed project is designed to do just that. These investments will be complemented by those in the education and health sectors as well as projects in rural finance and agricultural diversification, which are essential for improving the efficiency of rural labor and the welfare of Vietnamese families.

D. PAST IDA EXPERIENCE IN VIETNAM

1.8 So far, only one IDA-assisted project has been completed in Vietnam, the Dau Tieng Irrigation Project (Cr. 845-VN), which was approved in August 1978 and closed in 1986. The Dau Tieng Irrigation Project Completion Report emphasized that a project's major works should be adequately designed prior to project implementation and that external technical assistance in procurement and construction supervision is essential to overcome problems of inexperience with international procedures faced by a new borrower. Other lessons highlighted by IDA's experience in rural roads are indicated in Rural Roads Maintenance — Review of Completed IDA Operations (*Report 10794*). According to the report, routine and periodic maintenance should be an integral part of project components, including physical definitions, cost, financing plan, procurement, and disbursement, and that monitoring, evaluation, and reporting procedures should be upgraded.

1.9 Two other agriculture sector credits were approved in 1994-95, the Agriculture Development Project (Cr. 2561-VN) and the Irrigation Rehabilitation Project (Cr. 2711-VN). These two projects are in the early stages of implementation. Early lessons from these projects indicate a problem in the flow of funds among the different government agencies, and between the provincial and central governments.

1.10 The first IDA-financed road project in Vietnam, the Highway Rehabilitation Project (Credit 2549-VN) became effective in June 1994, and experienced initial problems in implementation of the agreed Resettlement Action Plan. These problems can be attributed to the lack of experience in dealing with IDA and to the difficulty in applying a new standard of compensation for resettlement. There were also budgetary concerns about the cost of resettlement. However, the establishment of a Project Management Unit and the appointment of international consultants to help train staff and provide technical advice through the initial phase have been helpful.

1.11 The proposed project would be the first IDA operation to support rural infrastructure in Vietnam. Therefore, the above lessons were incorporated in the project design by:

(a) developing technical design as well as procurement procedures and tender documentation ahead of project approval;

(b) providing for adequate technical assistance to support project implementation;

(c) setting up a framework to develop an effective maintenance system under the project to ensure that the investment under the project is properly and sustainably maintained after the project is completed;

(d) discussing with the Government early on the policy framework for compensation to be applied to any resettlement and land acquisition under the project, and obtaining Government approval before the project becomes effective; and

(e) ensuring that a computerized monitoring and evaluation system will be developed at an early stage of project implementation and that models of reports are included in the Operational Manual.

2. CHARACTERISTICS OF THE RURAL TRANSPORT SECTOR IN VIETNAM

2.1 Inadequate economic infrastructure has been identified as one of the main elements in the persistence of rural poverty because it hinders opportunities to seek additional off-farm income and greater participation in the market economy. Rural Vietnamese have less access to infrastructure than the rural inhabitants of neighboring countries, and fewer than one-third of Vietnam's rural population has access to all three key types of facilities: passable roads, public transport, and permanent markets.

2.2 In the past, central government budgets for transport covered only national and provincial transport networks, with an insignificant amount allocated to district and communal networks. Because of the limited budgets of most local governments, their self-help efforts to rehabilitate their local infrastructure are done on a piecemeal basis. The results are often of low quality and therefore short-lived. However, with the Government's recent focus on rural development, it has set an ambitious target to connect six isolated districts and at least 400 isolated communes by 2000. The Government also plans a large-scale rehabilitation program to upgrade the existing rural networks to nearly all-weather roads. The plan calls for substantial allocations from the central budget, or about US$60 million a year, earmarked for rural transport development. This amount is still relatively small compared with the actual needs for rehabilitation and extension of the rural transport network. The resources from IDA through the proposed project will provide timely assistance to the Government in its endeavor.

A. THE ROAD NETWORK

2.3 Vietnam's more than 105,000 kilometers of classified roads are defined as national, provincial, district, or communal roads. This network compares favorably with neighboring countries, although its condition is poorer with respect to surface condition, width, water crossing structures, and drainage system. Of the 105,000 kilometers, only 11,350 (11 percent) are national roads. Of the remainder, 14,000 kilometers (13 percent) are provincial roads and the rest (76 percent) are rural roads (district and communal roads). Most rural roads are in poor condition: drainage is inadequate, bridges are missing or in poor condition, and shoulders are not stable. This is confirmed by the fact that about 30 percent of the country's 25,000 kilometers of district roads and more than 50 percent of its 46,000 kilometers of communal roads are inaccessible during the wet season.

2.4 Road networks classified by jurisdiction and pavement type are shown in Table 2.1. Only 60 percent of national roads and 18 percent of provincial roads are paved; most district roads have earth or natural gravel surfaces. District roads, as defined by the Ministry of Transport (MOT), link district towns to provincial centers; the majority are in poor condition and most are inaccessible in the rainy season. Communal roads are classified as intercommunal roads, linking communal centers to district roads or to other communes; intervillage roads, linking villages within the same commune; and village roads, which are

located within village boundaries. These communal roads are for the most part built to low or no technical standards.

Table 2.1. Road Network by Jurisdiction and Pavement Type, June 1992 (Kilometers)

Jurisdiction	Total length	Paved	Gravel or Earth
National	11,353	7,274	4,079
Provincial	14,014	2,591	11,423
District	25,004	596	24,408
Commune	46,910	-	46,910
Urban	2,825	2,474	351
Special Purpose	5,451	-	-
Total	105,557	12,935	87,171

2.5 The Government has established general and detailed standards for the various classes of roads. Standard specifications for district roads are 6 meters in width with a 3.5-4.0 meter carriageway and, for communal roads, 4 to 5 meters in width with a 2.5-3.0 meter carriageway. Other design standards relating to gradients, radius of curves, and other features are in line with international practice and, therefore, major revisions to Vietnam's road standards are not necessary.

2.6 However, the same cannot be said for structural standards and techniques. In the north, road pavements consisting of a 30-50 centimeter depth of pitched large stones topped with a 10-12 centimeter layer of penetration asphalt macadam are somewhat overdesigned. In the south, pavements are more commonly built of natural and lathyritic gravel. Based on international experience, many roads with light traffic in rural areas could be more economically built with gravel pavements of 15-20 centimeter depths. The introduction of modern knowledge and technologies in this area would be useful.

2.7 Current standards for bridges in rural areas also need review and revision. Existing design standard for bridges are 6-ton axle loads for district roads and 2.5-ton axle loads for commune roads. Such structures are not adequate for modern trucks designed to carry loads of 8 tons per axle. Also, bridges built to existing light-load standards would not support the loads imposed by compactors and other heavy road machinery. Therefore, the axle load standards for bridges to be constructed under the project should be revised upward.

2.8 There is no reliable road inventory of the district and communal road networks. However, the detailed maps of the fifteen provinces selected, which were prepared by their respective Provincial Departments of Transport (PDOT) during project preparation, show a combined length of 33,100 kilometers of classified roads, of which 4,000 kilometers (12

percent) are part of the national network, 5,100 kilometers (15 percent) are provincial roads, 11,000 kilometers (33 percent) are district feeder roads, and 13,000 kilometers (40 percent) are communal access roads passable by four-wheel drive vehicles and homemade trucks. In addition, approximately 13,000 kilometers of tracks, trails, and paths serve communal and village travel and transport needs. The district roads and communal roads in the project area represent about 36 percent and 30 percent, respectively, of the country's total networks in those respective categories.

B. Rural Traffic

2.9 Transport in rural areas includes land and water transport. Land transport services use small to medium-sized trucks, cars, buses, bicycles, motorcycles, and animal-drawn carts in addition to walking with small loads. Water transport services use mainly small boats. Land and water transport complement each other very well and the interchange of traffic between them would be greatly facilitated by the construction of small landing stages or piers at strategic locations.

2.10 Bicycles are used to transport rice paddy along paths on the dikes between the fields and then along the roads to villages or homes. Bicycles are modified for the purpose by adding platforms on each side. Loads of 150 kilograms or more are common on these bicycles. Pedestrian traffic also forms a significant part of traffic movement in rural areas; pedestrians use shoulder poles with carriers or panniers on each end to transport a wide variety of freight and food products. Animal-drawn carts are also common; many of them use solid rubber tires or bandages that are damaging to road pavements. Motorcycle use is growing rapidly to replace other smaller vehicles.

2.11 The country's motorized vehicle fleet of 180,000 units, mainly trucks and buses (1992), is small but growing rapidly and is expected to increase sharply in the coming years. There are no statistics about how much of this fleet uses rural roads but, based on field observations, only a small portion of the motor vehicle fleet operates or provides services on district or communal roads. The most common commercial freight transport is by homemade trucks, Cong Nong, which are assembled in several provinces by small enterprises. The engines are manufactured in government factories and other parts are made locally. Truck capacity is about one ton, or up to one cubic meter of goods. Their price, approximately US$1,300-1,500, is affordable to some rural inhabitants. Medium-sized trucks are used mainly to transport freight between district and provincial capitals.

2.12 Traffic in rural areas, although not very high in volume, is chaotic because of the lack of traffic discipline and the failure to observe road rules and courtesy. This problem is compounded by nontraffic road uses. Roads, for example, can be the only relatively drained and flat area available for drying crops or laundry, and they are used for temporary storage of items awaiting pickup. Accordingly, improvements to road conditions and quality would not necessarily translate into faster and less costly travel without improved traffic behavior and universal observation of the rules of the road.

C. Administrative Structure of Provincial Government and its Relationship with Central Government

2.13 The 1992 Constitution of Vietnam provides for a unitary system of Government. At the highest level is the National Assembly, which meets twice a year and has a Standing Committee that acts on the Assembly's behalf in the interim period. The Assembly decides major economic policies and approves the national plan and state budget as well as major investment projects after they have been reviewed by the Office of Government. The National Assembly elects the prime minister, who is also head of the Office of Government. The Ministry of Planning and Investment prepares and submits to the Office of Government for approval investment plans and large project proposals based on input from sector ministries and the Ministry of Finance (MOF).

2.14 At the provincial level, provincial administration is subdivided into districts and municipalities. The political entities are the People's Councils at the provincial, district, and municipal (commune) levels. Each People's Council has a Standing People's Committee to act on its behalf between meetings. The People's Council elects a chairman to be the head of the People's Committee and forms the provincial government.

2.15 The administrative system is centralized. Provincial governments are considered part of the central government and are fully committed to implementing any policy issued by the central government. Financial allocation is also centralized. The People's Committee in each province prepares a provincial budget and investment plan for its province and submits them to the Government Office who will consolidate the state budget and obtain approval from the National Assembly. The approved plan is passed on to the MOF for budget allocation. Provincial expenditures are financed from two sources: internal revenue levies in the province and MOF funds to cover any shortfall. Only a few provinces have surplus revenue over expenditures. In such cases the surplus is remitted to the MOF for reallocation.

2.16 For the transport sector, each province has a Provincial Department of Transport (PDOT) that reports directly to the provincial government and acts as the administrative arm of the provincial government for planning, budgeting, and financing of the transport sector in the province. However, the PDOT also have to conform to the professional, technical, and general transport policy guidance issued by the MOT.

2.17 The division of responsibilities between the MOT and the provincial departments is clear. The ministry is responsible for all capital investment works on national roads system, from construction and rehabilitation to operations. However, routine maintenance is done by provincial departments for sections of national roads that fall in their provincial boundaries. The ministry is responsible for developing technical standards, approving the country's overall transport plans, and implementing them through state-owned enterprises and private sector contractors. The ministry also has a small rural road unit responsible mainly for distributing rural road development budgets to the provinces.

2.18 Division of responsibilities between provincial and district offices regarding maintenance of roads is not clearly defined and varies from one province to another. In most of the provinces, the PDOT are responsible for part of the national network, all of the provincial network and some of the district roads in their jurisdictions. Most district roads and all of the communal roads are the responsibility of district offices through their transport divisions, usually consisting of one to three engineers and technicians.

D. Rural Road Maintenance

2.19 The funding available for road maintenance in rural areas is insufficient to meet growing demand. The MOT allocated an equivalent of US$5 million in 1994 for rural roads construction and maintenance. However, very little of this money went to maintenance; almost all of it went to new road construction. Rehabilitation and routine maintenance of big structures, such as bridges, are done by provincial departments, mostly through their own enterprises. On the other hand, maintenance of small structures as well as surface work on district roads is coordinated by district offices. Maintenance parties are organized in teams (on an ad hoc basis) consisting of three to five people responsible for a road segment, corresponding to about 1 kilometer per person. Because of funding shortages, most maintenance work is focused on areas where local materials and unskilled labor are easily available and ignores those works that require skilled labor and imported material. This explains why resurfacing work is usually washed away because of the lack of drainage system structures, and also explains why large numbers of bridges are missing.

2.20 There are no standards or specifications for periodic and routine maintenance of rural roads. In addition, there is no annual plan for maintenance, nor does coordination exist among the different government agencies to undertake the work. The lack of a rural roads inventory indicates the scope of the problem, and adds to the problems of maintenance management. The shortage of funds is aggravated by the lack of an effective system for routine maintenance. As a result rural roads continue to be of low quality and short-lived, and inaccessible during the rainy season because the excess rain washes away the new earth layer. The project will provide assistance in strengthening the standard practice of routine maintenance in the project provinces (paras. 3.16-3.17).

2.21 In Vietnam, men between 18 and 50 years of age and women between 18 and 45 are required to provide ten workdays per year of unpaid service to the Government. These days are used most commonly to undertake new construction and routine maintenance of public facilities, including roads. Because resurfacing work requires limited skills, the government uses the ten days for new construction and maintenance of roads by providing material and some technical assistance. If the work requires more than ten working days, the government may keep the workers beyond this period and pay them an equivalent of 3.0 to 3.5 kilograms of rice for each extra day of work.

3. THE PROJECT

A. PROJECT ORIGIN AND FORMULATION

3.1 Rural roads rehabilitation and maintenance needs were first identified during the December 1994 programming mission held in Hanoi between IDA and the Government of Vietnam. During the mission a first project to develop an effective rural transport network in rural and less privileged areas was agreed upon. The Government has made the project a priority because rural transport development was identified in a poverty assessment study as a key element to speed up the poverty alleviation program in rural areas.

3.2 The MOT was assigned as the counterpart agency responsible for preparing the project jointly with IDA. During the one-year period for project preparation, the ministry assigned five full-time staff to set up a Project Preparation Team in its Project Management Unit 18 to work with IDA and consultants hired under grant funding.

3.3 The Government also selected 15 provinces to benefit from the project. The selection was based on poverty criteria developed with IDA. Three of the five provinces selected in the northern upland, two of the three in north central, and two in the central highland are among the poorest provinces in the country. Two of the four provinces in the flood-prone area of the Mekong Delta and one coastal province are among the country's very poor provinces. The provinces selected represent the country's three distinctive terrains. Their combined population of 20 million people, 131,000 square kilometers of land, and 37,000 kilometers of the rural transport network represent 27 percent of the country's population, 39 percent of land area, and 30 percent of the rural road network.

3.4 Transfers from the central government have been essential to the economies of these provinces. The proportion of the budget transfer to total revenue of the provinces varies from 31 percent for Minh Hai, a moderately poor province, to more than 80 percent for Ha Giang, one of the country's poorest provinces. However, the share of investment in transport to total provincial expenditures has been minimal in the selected provinces — between 2 and 5 percent. Most transport investment has gone for capital improvements and maintenance of provincial roads. The maintenance budget is insignificant (less than 1 percent) in many cases (Annex 1). The proposed project will, for the first time, enable the selected provinces to tackle their rural infrastructure needs in a more systematic manner.

B. PROJECT OBJECTIVES AND DESCRIPTION

Project Objectives and Monitoring Indicators

3.5 **Project Objectives**. In line with IDA's Country Assistance Strategy (paras. 1.5-1.7) and the concern voiced by local governments during the joint Ministry of Planning and Investment/UNDP/IDA poverty workshop in September 1995, the overall objectives of the project are to:

(a) improve and upgrade access to rural communities and link them to the district and provincial road networks;

(b) develop local capacity to improve the level of service of low-volume roads and to maintain them on a sustainable basis; and

(c) encourage the development of local contractors.

3.6 **Key Monitoring Indicators**. The project's achievement will be measured against the following key indicators agreed to by the Government and IDA (see para. 4.14) and summarized in Annex 2:

(a) Input indicators, upon which project implementation progress will heavily depend, include the recruitment of an international-level technical adviser; the number of workshops and amount of training organized for the Project Implementation Division (PID), Provincial Project Management Units (PPMUs), and contractors; and the speed in procuring necessary maintenance equipment for the project.

(b) Output and outcome indicators, which are related to physical targets, include the length of rehabilitated roads, the length of maintained roads, and the improvement in road accessibility during the rainy season.

(c) Development impact indicators, which indicate the social and development benefit derived from road rehabilitation, include the increase in household income from off-farm work, the increase in number of trips to economic and social infrastructures, and the increase in the size of contracts undertaken by small contractors.

Project Description

3.7 To achieve the above objectives, the proposed project will help finance the following main components:

(a) rural access road rehabilitation and maintenance using the spot improvement technique;

(b) institutional strengthening and training; and

(c) the study of issues relating to rural transport development.

3.8 **Rural Access Roads Rehabilitation and Maintenance**. The specific features included in this component are:

(a) rehabilitation and improvement of about 5, 000 kilometers of roads and bridges in the 15 selected provinces, of which 3,500 kilometers (70 percent) will be district roads and 1,500 kilometers (30 percent) will be communal roads;

(b) development of an effective road maintenance procedure and practice by assisting in setting up a maintenance management program; and

(c) resettlement and rehabilitation of people affected by the project.

3.9 During project preparation the Project Preparation Team and PDOT, with assistance from consultants, prepared the detailed rural core network maps, which demonstrates that, on average, 40 percent of rural road networks transverse areas where average population density per square kilometer is more than 300, and that about 70 percent of the population in the road service area will benefit directly or indirectly from these roads. Although improvement of all the core rural network identified on the map is well beyond the resources available under the project, the maps provide a good basis for selection of roads to be included in the first-year program. Preliminary road inventories and engineering of 1,200 kilometers of roads carried out during project preparation in four provinces indicate that the per kilometer costs will vary between US$4,000 and US$20,000, with an average of US$7,000 - US$10,000. This estimate includes the cost of preparing project engineering designs through the application of simplified methods and procedures prepared for this purpose and included in the Technical Guidelines annexed to the Operational Manual. The engineering work will be contracted to local survey and design companies at the provincial level, with price limits of US$100 per kilometer of road, including field and office works.

3.10 **Level of Service Aims Under the Project**. The level and type of improved access will be tailored to the specific needs of people in different areas. Two levels of access are aimed for under the project: (a) reliable access, which provides relatively consistent and safe access with some short-term closures permissible; and (b) minimum access, which provides basic and essential access to local populations although with some difficulty and sometimes with longer closures than with reliable access. The technical standards and design features will be kept simple and low cost, although they will be completely adequate for the required performance from an engineering perspective.

3.11 Communal roads will be improved to a stage where they can provide minimum access (para. 3.10). For these roads, which serve the immediate day-to-day travel and transport needs of villages and communes, the approach to be adopted will be a participatory one, starting from the initial planning and decisions on the selection of roads to be improved, the type of improvements to be carried out and their simple engineering features, and the methods and resources to be used for the work. These approaches will be worked out during the first year of the project on a pilot basis, and will be implemented in future years. The continued participation of beneficiary communities in future maintenance of these roads will be addressed during the first-year program (see para. 4.9).

3.12 **Spot Improvement Method**. Based on the levels of access aimed for under the project, such access can be economically achieved using a spot improvement method to bring the roads to a maintainable condition and to maintain them routinely. Spot improvements will be carried out without any significant changes to vertical and horizontal alignment. Spot improvement includes reshaping of running surfaces to improve surface drainage and traffic running conditions; drainage works such as lateral, cross, and longitudinal drains; erosion control and elimination of landslides; and limited graveling, mostly with natural gravel or some macadam and irregular stone paving on steep grades. Although the works will be limited to improvements at critical spots, they will be of good quality, appropriate for present and short-term projected traffic, and consistent with current Vietnamese standards (TCN 4054-85 for district roads and 22-TCN-210-92 for commune roads Class A and B). The current geometric standards are in line with international standards. However, structural design and techniques are usually overdesigned considering the existing light traffic volume on rural roads (see paras. 2.5-2.6).

3.13 The Government, with assistance from IDA and consultants, has prepared an Operational Manual (OM) to be used under the project. The manual includes selection criteria for roads and bridges to be included under the project, a sample bid document, an illustrative flow of funds, and technical guidelines. Prior to negotiations, the draft OM was reviewed and found satisfactory to IDA. At negotiations, agreement was reached that MOT will adopt and implement the OM, that the OM will be reviewed in light of implementation experience, and that any revision of the OM will be furnished to IDA for approval (see also para. 4.6)

3.14 **The Selection Criteria.** The roads and bridges to be included in the project will be selected based on the following population, economic, and social criteria:

(a) ***Population Criteria***. The selection of roads for rehabilitation aims to maximize the number of beneficiaries while maintaining network continuity and consistency as well as paying attention to logistical constraints and pragmatic work scheduling. The selection criteria, therefore, include screening of candidate road sections based on the number of people served. The selection criteria will be fine-tuned in later years after gaining experience in the first year. Also, in the later years, the selection criterion based on population density will be made more stringent to ensure that the maximum number of people is served for each kilometer of road improved. At this stage the tentative criteria set is that each kilometer of road will serve a minimum of 300 people. Roads in provincial capitals and towns will not be eligible for improvement under this project.

(b) ***Economic Criteria***. An economic analysis (Chapter 5) shows that with an average yield per hectare of 3.5 tons for paddy, a majority of farm production in Vietnam, at a price of VND 2,000 per kilogram, it will generate sufficient value-added benefit to support a road improvement cost of US$15,000 per kilometer. The economic criteria, therefore, include a set of parameters in that: on the cost side the average investment cost

should not exceed US$15,000 per kilometer; on the benefit side, that at least one-third of the road services area is productive land. However, if the investment cost increases to US$20,000 per kilometer, the investment will be justified only if the road services an area in which a higher-value crop is produced on a commercial scale. Cost-benefit analysis will be required to justify the investment in such cases (para. 5.6).

(c) ***Social Criteria***. Although poverty alleviation is one of the project's main objectives, the above population and economic criteria may leave some of the poorest segments of the rural society outside the project's reach. To target less-privileged mountain and ethnic populations in areas where population density is low and economic potential dim, 20 percent of the road rehabilitation fund will be earmarked for rural access in those areas not justified under the population and economic criteria. The social criterion to be used in these areas is that more than 30 percent of the road-influenced area is populated by an ethnic minority.

3.15 **Selection of Bridges.** The bridges to be rehabilitated under the project will be selected based on the priority assigned to roads, and on the condition of existing bridges. Bridges would be built to accommodate current and future international loading standards for the existing category roads (see para. 2.7). In the flood-prone areas of the Mekong Delta, the project will emphasize the construction and rehabilitation of bridges and the protection of waterway embankments when they coincide with road embankments or when water erosion may endanger the structure of road embankments. When connections exist between roads and waterways, making the two transport modes complementary, the project will include the provision or improvement of simple low-cost landings and piers for the interchange of traffic. An estimated cost for bridge engineering is about 2 percent of the estimated value of its civil works. The project will finance bridges with a maximum construction cost of US$50,000 for each bridge.

3.16 **Maintenance.** A critical aspect of the road improvement component will be to support the development of a maintenance management program and to introduce effective routine road maintenance. Two important factors that lead to insufficient routine maintenance on rural roads were identified as weak organization and lack of funds. The project will assist the PPMUs in setting up routine maintenance, emphasizing prompt maintenance on critical sections. The system of lengthman and an organized maintenance team to be in charge of certain sections of the road will be emphasized where appropriate. A standard routine maintenance practice will be developed with the 15 provinces under the project. The credit will provide maintenance funds for one year after the rehabilitation work is completed on each road link under the project. During the one-year period the PPMUs, district engineer offices, and local communities will be provided with maintenance tools and appropriate training to undertake the maintenance work on a more regular basis. After a one-year training period and with the appropriate tools, district engineer offices should be able to plan, organize, and manage routine maintenance more effectively. Further incentives for promoting effective routine maintenance will be developed during the first year of the project.

3.17 Maintenance will be done by low-cost and simplified techniques using labor-based approaches supplemented with small-scale equipment such as tractors, tractor-drawn graders, trailers, and compactors. Annual maintenance and repair of critical spots could be contracted out to private contractors for district roads and to communes for communal and intercommunal roads. Community participation approaches will be encouraged for maintenance of communal roads, to be worked out as mentioned in paragraphs 3.11 and 4.9. Routine maintenance will be carried out following the procedure described in the OM.

3.18 **Technical Advisory and Supervision.** An international consultant and a group of national consultants will be hired under the project to provide technical support to the PID and PPMUs in the overall supervision of the project (para. 4.4).

3.19 **Institutional Strengthening and Training**. The project will provide support for project management, implementation, and institutional strengthening of implementing agencies at the central and provincial levels, including accounting and auditing of project account. The component will also support the development of local contractors.

(a) At the central level, the project will assist in strengthening the capacity in the MOT to provide support and guidance to the PDOT during project implementation and to monitor and evaluate their work afterward; in developing a computerized rural roads information system that can aid in road maintenance planning and programming procedures, and in reporting, monitoring, and evaluation; and in developing technical performance criteria and standards for lower category roads.

(b) At the provincial level, the component aims to assist local authorities with simple revenue and expenditure review to ensure that proper planning, budgeting, and management funding is provided for needed rural infrastructure; to implement the OM developed during project preparation; and to conduct on-the-job training in planning and programming and construction supervision, and to organize training for contractors and local government officials.

(c) In keeping with the national policy, which is to fund the rural road construction and maintenance effort from the national budget and execute the effort with local capability, project roads will be built by local contractors who will receive training under the project. The project would provide funds for classroom and on-the-job training to prospective contractors in bid preparation, cost accounting, and contract management, using standard procurement procedures to introduce them to the concept of operating and managing small contract works in a competitive bidding environment. The contractors can then use this knowledge when competing for works under the project.

3.20 Contractor training services will be provided by a consultant to be engaged under the project. The training program for the first year will include contractors from the first

four provinces, and expand to cover the rest of the project provinces in the following two years. Upon completing their training, the contractors will be provisionally registered by the PDOT as eligible to be awarded contracts. This will distribute the work to many contractors, and encourage competition and labor-based and light equipment approaches. A limited amount of contractor training will be provided prior to project effectiveness under existing grant funding.

3.21 As part of the training exercise on modern bidding standards for registered contractors, a bracketing system will be allowed for the first five NCB contracts in each of the 15 provinces. Therefore, bidding documents will include schedules of quantities and standard unit prices from engineer's estimates. The trained and registered contractors will be required to submit quotations of their own unit rates or, alternatively, to quote a unit price as a percentage of the given prices. Brackets of 25 percent discount or premium on individual items and within a 10 percent of the total contract will be allowed. Starting from the sixth contract in each province, bidding documents will not include cost, and bracketing will be eliminated.

3.22 A Rural Road Information System based on a Geographic Information System - Transportation will be established in the PID to enhance data collection, manipulation, and analysis of the rural road network system. This will be a simplified version of a similar system currently being developed by the MOT for the national network. The system will aid in road maintenance planning and programming procedures, and in the long term will support other road administration functions such as reporting, monitoring, and evaluation. Funds from the project will be used to purchase hardware and software, as well as database design, training, and data conversion. The PID will initiate the process to set up the proposed system in the second year of the project. At negotiations agreement was reached that a service contract to implement the system be finalized by June 30, 1999. Draft Terms of Reference for the task are shown in Annex 3.

3.23 Long-term training as well as short courses, study tours, and workshops will be supported under the project. During negotiations agreement was reached that the Government will submit to IDA for approval by March 31 of each year, beginning in 1997, a proposed training program for the central Government and provincial staff involved in the project, and that the Government will implement the approved program.

3.24 **Study**. A *Rural Transport Investment Strategy Study* will be included in the project to identify issues related to demand and investment in the rural transport sector and to establish guidelines for future investment. The study will assess the existing practice of rural transport infrastructure investment decisions, rationalize rural infrastructure investment expenditures, address the main constraints to resource mobilization, and estimate the resources necessary to effectively improve the core rural network. Draft Terms of Reference for the task are shown in Annex 4.

C. PROJECT COST AND FINANCING

Project Cost

3.25 Estimates of project costs are VND 816.5 billion, or US$60.89 million equivalent, including physical and price contingencies (US$9.4 million). The foreign exchange component is estimated to be US$15.13 million, or 25 percent of the total project cost. A summary of costs by project component is given in Table 3.1, and further details are in Annex 5.

Table 3.1. Project Cost Summary

	Dong (billions)			US$ (millions)		
Component	Local	Foreign	Total	Local	Foreign	Total
Roads Rehabilitation and Maintenance	420.30	129.40	549.70	38.21	11.76	49.97
Institutional strengthening	3.80	7.40	11.20	0.34	0.68	1.02
Study	1.40	4.10	5.50	0.13	0.37	0.50
Total Base Cost	425.50	140.90	566.40	38.68	12.81	51.49
Physical contingencies	42.55	14.09	56.64	3.87	1.28	5.15
Price contingencies	145.80	47.70	193.50	3.21	1.04	4.25
Total Project Cost	613.85	202.69	816.54	45.76	15.13	60.89

3.26 The cost of civil works and construction material is based on recent tender prices, experience with other IDA projects, and estimates by consulting engineers. Costs for vehicles and equipment are based on recent procurement during the project preparation period. All-inclusive costs per staff-month for foreign specialist services are estimated based on regional and international consultants rates. Costs for local specialist services are estimated based on local experience. A total of 210 staff-months of local specialists and 70 staff-months of foreign specialists will be required.

3.27 All base costs are estimated in January 1996 prices. Physical contingencies of 10 percent of the base cost estimate have been applied to all components. Price contingencies have been calculated for foreign and local costs. When expressed in US dollars, the escalation for foreign and local costs is based on expected international annual price increases of 2.0 percent in 1996, 1.62 percent from 1997 to 1999, and 2.23 percent after 2000. When expressed in Vietnamese Dong, the increase is based on expected domestic

price increases of 10 percent in 1996, 6 percent between 1997 and 1999, and 5 percent after 2000.

Project Financing

3.28 IDA will finance 91 percent of road rehabilitation and maintenance and 100 percent of institutional strengthening components, or 90.3 percent of total project cost. The Government will finance 9 percent of roads works and 100 percent of the study, or 9.7 percent of total project cost.

Table 3.2. Project Financing by Components (millions of US dollars)

	US$ million		
	GOV	IDA	Total
Roads rehabilitation and maintenance	5.4 (9)	53.8 (91)	59.2
Institutional strengthening	0 (0)	1.2 (100)	1.2
Study	0.5 (100)	0 (0)	0.5
Total Project Cost	5.9 (9.7)	55.0 (90.3)	60.9 (100.0)

Note: Numbers in parentheses are percentages.

4. ORGANIZATION AND MANAGEMENT

A. PROJECT MANAGEMENT

4.1 The project will be implemented by the MOT and fifteen selected PDOT. At the central level, a Project Implementation Division (PID) will be set up under the ministry's Project Management Unit 18 (PMU18) and headed by a full-time division manager. The Director General of PMU18 will also serve as Project Director of this project. The PID will be responsible for monitoring and guiding project implementation. The unit's role will be limited to coordination and support functions and implementation of subcomponents procured under international competitive bidding (ICB). Project implementation will be decentralized to each project province. A PPMU will be established in each PDOT. Each provincial unit will prepare annual workplans, procure engineering and civil works, evaluate bids, and submit evaluation reports to the selection committee that awards contracts. In addition, the provincial units will coordinate contract maintenance activities for lengthman and small-scale contractors as well as community labor organized through district offices. A detailed description of the functions of the PID and PPMUs, as well as other units involved in project implementation, is included in the OM. During negotiations an agreement was reached that as a condition of effectiveness, PID and PPMUs of the first four provinces be established and heads of the five units appointed. Documentation of the organizational arrangements and the staffing plan was presented to IDA for review and comments prior to negotiations.

4.2 Briefly, the PID will be responsible for monitoring and guiding such activities as annual budget allocation, physical targets and training plans, review and approval of eligibility criteria, and financial and physical commitments. The unit will also supervise and manage ICB-procured components such as technical assistance, studies, training and any bulk purchase of goods; prepare an aggregate disbursement plan, statement of expenditures, and data sheets to be sent to IDA; provide technical guidance and training to PPMUs' staff; and organize and develop interprovincial technical exchanges among unit managers.

4.3 The PPMU will undertake the day-to-day implementation activities and be responsible for: (i) preparing annual workplans including civil works, maintenance activities, and training needs; (ii) organizing and managing financial, accounting, and payment activities for road works and maintenance; (iii) arranging for bidding, bid evaluation, recommendations for contract awards, contracting, and supervision of engineering design and construction; (iv) organizing community-based labor through district offices; (v) preparing annual disbursement plans; (vi) preparing appropriate documentation to support statement of expenditures; (vii) collecting data on physical, financial, and other progress indicators that support project monitoring and evaluation; and (viii) analyzing data and recommending improvement of policies, guidelines, and procedures.

4.4 The national staff of the PID will be complemented by an international expert whose draft Terms of Reference are in Annex 6. These experts will provide technical expertise and training to the national staff and serve as resource persons to address project-related policy and technical issues. Technical assistance to the PPMUs will be provided mainly by the trained staff of the national support unit, supported by international experts.

B. Implementation Arrangements

4.5 Because much of the responsibility for implementation will be given to local authorities, who have diverse capabilities, implementation methods need to be flexible, realistic, and practical. Implementation arrangements should fit well with the project design and be open to such diverse implementation methods as community-organized labor, direct contracting, and national competitive bidding.

4.6 Project implementation procedures and guidelines for technical and administrative matters will follow the Operational Manual. A draft version of this manual was prepared and submitted to IDA for review and comments prior to negotiations. During negotiations, the draft OM was further discussed and finalized. Agreement was reached during negotiations that the adoption of OM satisfactory to IDA will be a condition of effectiveness.

4.7 **Selection of Roads to be Financed under the Project**. Roads will be selected according to a set of eligibility conditions as defined in the Operational Manual and summarized in paragraphs 3.14 - 3.15. Annual work programs for other components such as rural road maintenance, assistance to small-scale contractors, and other institutional strengthening will be reviewed annually. During negotiations agreement was reached that MOT will prepare and submit to IDA for approval on August 31 of each year, beginning in 1997, a proposed annual work program and budget for project activities in the following calendar year, including a list of road links to be improved, and thereafter implement the annual work program as approved by IDA. The first-year program was discussed and agreed to at negotiations. However, action plans will be prepared separately in certain cases. An ethnic minorities development plan (para. 5.14) will be prepared for road links in areas inhabited by ethnic minorities. Environmental Impact Assessments (para. 5.11) will be prepared for roads in environmentally sensitive areas. Similarly, Resettlement Action Plans or inventories (para. 5.13) will be prepared for road links that involve resettlement.

4.8 A set of social criteria stipulated in the OM will be used to target roads that serve areas inhabited by the very poor and minorities, which do not usually meet the general population and economic criteria. The OM would provide that no more than 20 percent of project funds can be allocated for road works based on social criteria alone.

4.9 **Community Participation**. When communes are the direct beneficiaries of the road segment and the work does not require substantial construction skills, the commune or communities within the commune will be contracted to undertake the work using the Government price list to determine the contract value. A typical bill of quantities for spot improvement works is shown in Annex 7. Supervision of work will be done by the district offices. As indicated in paragraph 3.11, a pilot scheme will be implemented during the first year. PID, PPMUs, and external technical experts will help make necessary adjustments to incorporate lessons gained from the first-year operation.

4.10 **Implementation Schedule**. Because of the large number of provinces covered under the project and the need to test the procedures developed during the preparation stage, a sequential approach will be adopted for project implementation. The first-year program will serve as a pilot and demonstration project to test and modify, as warranted, all technical and administrative guidelines stipulated in the OM. Government staff and contractors will also be trained. Therefore the first-year program will include a representative sample of road works, including surfacing, bridges, and drainage structure improvement or rehabilitation. Thus a variety of technical problems and solutions, administrative procedures, and contracting, training, and institutional development needs will be addressed. The first-year program will ensure that demonstration sites are easily accessible.

4.11 Project implementation activities will start in four of the fifteen provinces covered under the project once the credit is effective; the remaining eleven provinces will enter the program after the first project year. The order and timing of provincial entry will depend on how well prepared the province is and on the ability of the management units in each province. The Government has expressed its intention to start the second group within six months of the start-up of the first group. To ensure smooth start-up, the eleven remaining provinces will begin their pre-implementation activities about six months prior to the actual start of implementation. Pre-implementation activities include briefing and training for administrative, technical, and financial management staff of the project in each province. The Government's goal is to implement the rehabilitation work in all fifteen provinces in three years. The first-year review will examine the feasibility of this goal and modify it, if necessary, taking into consideration the achievements of the first-year program.

4.12 Agreement was reached that MOT will prepare and furnish to IDA a first-year project review report no later than January 31, 1998, and a joint MOT/IDA review mission will be carried out by March 31, 1998 (para. 4.32). The first-year review will include:

(a) the need for revising the Operational Manual (para. 4. 6);

(b) procurement and other issues relating to community-organized civil works (paras. 3.11 and 4.9); and

(c) implementation timetable (para. 4.11).

C. Monitoring, Evaluation, and Reporting Arrangements

4.13 The PID will monitor, evaluate, and report on the project's activities and expenditures, based on information provided by the provincial offices. Progress will be measured against the key indicators agreed on by the Government and IDA (Annex 2).

4.14 On the basis of these key indicators, the MOT will develop and implement a computerized monitoring, evaluation, and reporting system. Data will be collected at the provincial level and processed by the PMU 18. A short-term specialist with experience in computerized project management will assist in the establishment of the project monitoring and evaluation system, train staff and periodically follow up on system implementation. During negotiations agreement was reached that MOT will, by December 31, 1997, establish and maintain operational procedure satisfactory to IDA for project monitoring and evaluation based on performance indicators satisfactory to IDA (para. 3.6).

4.15 The PID will be responsible for preparing semi-annual reports using the key performance indicators as the basis for assessing implementation progress. The report will also identify possible problems or impediments and make specific recommendations for remedial action. During negotiations assurance was sought that the PID will prepare and submit to IDA semi-annual progress reports by March 31 and September 30 of each year commencing September 30, 1997.

D. Procurement

4.16 Procurement under the project will be in line with IDA procurement guidelines and procedures (Guidelines for Procurement under IBRD Loans and IDA Credits of January 1995 and revised in 1996, and Guidelines for the Use of Consultants by World Bank Borrowers and by the World Bank as Executing Agency of August 1981). A summary of procurement arrangements is shown in Table 4 .1.

Table 4.1. Summary of Proposed Procurement Arrangements (millions of US dollars)

Components	ICB	NCB	Other1/	Total
1. Civil works for Road rehabilitation and maintenance		34.5 (31.4)	19.3 (18.0)	53.8 (49.4)
2. Goods				
- Equipment	0.6 (0.6)	-	0.4 (0.4)	1.0 (1.0)
- Vehicles and motorbikes		-	0.9 (0.9)	0.9 (0.9)
- Furniture	-		0.3 (-)	0.3 (-)
- Office supplies	-	-	0.3 (-)	0.3 (-)
3. Services contracts				
- Rural roads information systems	-	-	0.3 (0.3)	0.3 (0.3)
4. Consultant services				
- TA & overseas training	-	-	1.6 (1.6)	1.6 (1.6)
- Technical advisory and supervision		-	1.8 (1.8)	1.8 (1.8)
- Studies	-	-	0.5 (-)	0.5 (.-)
5. Miscellaneous				
- Local training	-	-	0.4 (-)	0.4 (-)
Total	0.6 (0.6)	34.5 (31.4)	25.8 (23.0)	60.9 (55.0)

Note: Figures in parentheses are amounts financed by IDA.
1/ Includes shopping, direct contracting, community-organized labor, and consultant services.

4.17 As discussed in paragraph 4.2, the PID will be responsible for procurement of such items as technical assistance, studies, rural roads information system, and purchase of office equipment and furniture to be used at headquarters and in the provinces. The PPMUs will be responsible for procuring all road works executed under the project in their provinces, as well as some equipment, supplies, and furniture to be purchased locally. Because the operational capacity of PID and PPMUs are currently weak, support to strengthen their institutional capacity has been included in the project (paras. 3.19-3.23).

4.18 **Civil Works.** Civil works (US$53.8 million) will mainly include upgrading the level of service of selected district feeder roads and commune access roads by constructing missing bridges, improving road drainage systems, and providing regraveling. Works will also include the protection of waterway banks when these coincide with road embankments or when they

endanger the safety of the road. Some direct contracting will be used for packages of up to US$10,000 for small-scale labor-based contractors and community-organized labor. The total value of procurement under direct contracting will not exceed US$8 million. Contracts up to US$50,000 (total about US$10 million) may be procured, using lump-sum fixed price or unit price contracts, according to simplified procurement procedures for works, similar to shopping among trained, qualified and registered domestic contractors in the appropriate category by soliciting quotations from at least three of them. Contracts above US$50,000 equivalent (about US$30 million) will be procured according to national competitive bidding procedures acceptable to IDA. There will be no ICB for civil works since works under the project are small, scattered across fifteen provinces, and not technically complex, and thus are unlikely to attract foreign competition. A summary of the typical bill of quantities for works under the first-year program to be financed under the project is shown in Annex 7. The project's OM includes some sample bidding documents developed in compliance with IDA's procedures on standard bidding documents for small works (paras. 3.13 and 4.6).

4.19 **Goods**. Goods to be procured under the project (US$2.5 million) will be suitably packaged and procured by the PID and PPMUs as appropriate. Because of the small-scale requirements, vehicles, motorbikes and laboratory equipment will be packaged into lots of less than US$150,000 and procured by international shopping with at least three price quotations from at least two countries in accordance with IDA guidelines, and with an aggregate value not exceeding US$1.5 million. The rest will be procured through ICB. All furniture required for the project, totaling about US$0.3 million, will be financed fully by the Government and procured according to Government guidelines. Domestic preferences of 15 percent of the CIF price or the actual customs duty, whichever is lower will apply to domestically manufactured goods under ICB procurement and the Bank's standard bidding documents will be used for ICB procurement.

4.20 **Consulting and Training.** Consulting services totaling 70 staff-months of international and 210 staff-months of national expertise, and foreign and local seminars and training and road information system (estimated to cost US$3.7 million), engineering contract (costing about US$0.52 million) and studies (costing US$0.5 million) will be procured on the basis of the Government's guidelines for the use of consultants and will use the Bank's Standard Form of Contract for Consultants' Services.

4.21 **Review of Procurement**. IDA will conduct a prior review of all documents concerning the tendering and award of: (i) all goods; (ii) all consultancy contracts financed by IDA that exceed US$100,000 for firms and US$50,000 for individuals; (iii) roads in forest buffer zones; (iv) all road works involving resettlement; (v) roads in ethnic minorities areas; and (vi) the first three civil works contracts of each PPMU and all contracts estimated to cost more than US$150,000 equivalent per contract. Contracts not covered under the categories mentioned above will be retained by the PID and PPMUs and reviewed by IDA on a random basis. For consultant services to be financed by IDA, the prior review will include terms of reference, short lists, letters of invitation, recommendations for award, and the final contract. In addition, all terms of reference, single source selection of consulting firms, regardless of the contract value, are also subject to prior Bank review. Even though normally about 80 percent

of the value of IDA-financed procurement would be subjected to prior review, the project justified a lower coverage since there is a large number of similar or repetitive contracts.

E. DISBURSEMENT

4.22 The project will be completed by June 30, 2001, five years after credit effectiveness. The credit closing date will be December 31, 2001, six months after the expected completion. The estimated disbursement schedule is given in Annex 8.

4.23 The proposed allocation of the credit and percentage of expenditure to be financed by IDA will be as follows:

(a) 95 percent of total cost of civil works;

(b) 100 percent of total expenditure on technical assistance, workshops, and training; and

(c) 100 percent of foreign expenditures (CIF) for directly imported equipment; 100 percent of local expenditures (ex-factory) for locally manufactured equipment and 65 percent of total expenditures for other locally procured items.

4.24 To facilitate disbursement, a Special Account will be opened with an authorized allocation of US$5.0 million representing the estimated average expenditures for a four-month period. However, an initial deposit to the Special Account shall be limited to US$3.5 million until disbursements and outstanding commitments against the credit shall be equal to or exceed the equivalent of SDR 10 million. The account will be opened in U.S. dollars in a bank acceptable to IDA. The Special Account will cover IDA's share of eligible expenses in both local and foreign currencies. Applications for replenishment of the special account, supported by appropriate documentation would be submitted regularly —preferably monthly, but not less than quarterly— or when the amounts withdrawn equal 20 percent of the initial deposit.

4.25 Under a centralized fiscal system but with decentralized physical execution, it is important to design a report flow and funds flow mechanism that can efficiently and speedily channel funds to subprojects without sacrificing centralized quality control. Based on budget approval of expenditure under the project (yearly or quarterly) and invoices certified by PPMUs and PID, the General Department for Development Investment (GDDI) will pay IDA's share out of the Special Account. The withdrawals from the Special Account will be made under the joint signature of the Project Director and the GDDI director; the counterpart fund will be paid by the GDDI through its provincial offices. The report flow and fund flow mechanism is shown in Annex 9.

4.26 For reasons of efficiency, the project will pay for output (itemized works) against measured progress and prorated lump-sum or unit price contracts. After the contractors have finished part of the work, the district engineer will check and certify that the work has been done according to the contract. A copy of the contracts and certified bills will be sent to the PPMU, which will approve and pass it on to the PID. After approving the certified bills, the PID will pass the bills on to GDDI for further review. After being satisfied with its review, GDDI will pay the counterpart funding portion to the contractors and authorize the Special Account service bank to pay IDA share directly to the contractor. The PID will prepare a replenishment application on a monthly basis and send it to the External Finance Department (EFD) under MOF to review the expenditures and prepare the withdrawal application. EFD will then have the application signed by State Bank of Vietnam and send it to IDA for Special Account replenishment. Any inconsistencies will be corrected by the EFD at this stage. During negotiations the funds flow mechanism (Annex 9) was discussed and confirmed. The project will also support an establishment of an accounting system in PID capable of monitoring the funds flow mechanism and recording all transactions under the project, in particular the SOE records.

4.27 Full documentation will be required for services obtained from consulting firms under contracts exceeding US$100,000 and, in the case of individual consultants, for contracts exceeding US$50,000, all goods, and for works procured under contracts exceeding US$150,000. All other disbursements will be made against statements of expenditure (SOE) prepared by the PID. Supporting documents will be made available to IDA's supervision missions and to the auditor.

4.28 Conditions for disbursement include:

(a) on resettlement issue: specific RAPs will be required if 150 or more people are affected in a road link. If fewer than 150 people are affected, a time-bound action plan for compensation and resettlement will be prepared in accordance with the agreed Policy Framework for Land Acquisition, Compensation, and Rehabilitation of Project Affected Persons (para. 5.12). The submission to and approval of a specific RAP or action plan by IDA and completion of resettlement activities will be a condition of disbursement for road links (para. 5.13);

(b) on environmental issue: the Government will prepare and submit to IDA an Environmental Impact Assessment for roads located within forest buffer zones including a time-bound action plan for undertaking the environmental mitigating measures before disbursement is made against civil works and goods for such roads (para. 5.11); and

(c) on ethnic minorities issue: for road links to be built in ethnic minorities areas, an ethnic minorities development plan will be prepared and submitted to IDA for approval prior to disbursements for works on such roads (para. 5.14).

F. ACCOUNTING AND AUDITING

4.29 During negotiations assurance was obtained from the Government that: (i) separate project accounts will be established for their respective components at the MOT and PDOT; (ii) provincial offices will be responsible for filing a monthly report on the project's account to the PID; (iii) Special Account and project accounts, including documentation for SOEs, will be audited annually by independent auditors acceptable to IDA, with the audit including a separate opinion on the use of the SOEs and the status of audit compliance; (iv) IDA funds can be used to finance expenditures incurred in arranging for the project annual audit report; and (v) the detailed audit report will be submitted to IDA within nine months of the closing of the government's fiscal year. The first-year audit report will cover the period from January to December 1997.

G. PROJECT MONITORING AND IDA SUPERVISION

4.30 Physical progress as well as other aspects of the project will be monitored by MOT following forms and indicators included in the OM and agreed to at negotiations. Any land and compensation matters, environmental effects, or questions about the quality of selection and implementation of works will be reviewed on a sampling basis by IDA.

4.31 IDA will conduct project supervision missions at six-month intervals during project implementation, with first-year and midterm reviews to evaluate progress made and determine necessary actions. The expected timing and expertise requirements for these missions are included in Annex 10. In preparation for IDA missions, the PID will compile and submit semiannual progress reports to IDA, including the key progress indicators from the previous six-month period (paras. 3.6 and 4.14).

4.32 There will be a joint MOT/IDA first-year review of the project (para. 4.12) to assess progress made during the pilot program and to modify the OM, if necessary. Prior to the review mission, the Government will prepare and submit to IDA an assessment of progress made in achieving project objectives, technical assistance performance, and the need to modify the OM. The Government will also prepare a program of action to address any deficiencies in project design or implementation identified in the assessment.

4.33 A midterm review will be done in the third year of the project. Project design, implementation procedures, and project objectives will be reviewed. During negotiations agreement was reached that the Government will prepare and submit the midterm review report to IDA by December 31, 1998 for a joint review mission in March 31, 1999.

5. JUSTIFICATION, BENEFITS, AND RISKS

A. OVERVIEW

5.1 The proposed project has been assigned a high priority in the Government and IDA's work program because it is a key element in tackling rural development and poverty alleviation. By directing funds to improve selected infrastructure in local governments and communities, the project will strengthen stakeholder ownership, which provides incentives for the communities to help maintain the rehabilitated assets after the project is completed.

5.2 Vietnam's new economic policies, particularly the emphasis on light industry and the economic responsibility system in agriculture, are creating a rapidly growing demand for transport. In rural areas agricultural production and the increasing production of households and rural enterprises must be transported, often rapidly, to nearby towns and neighboring areas. Thus substantial improvement of the rural transport infrastructure is required. Rural transport systems will create opportunities to exploit resources for which low-cost motorized transport is required, and will accrue benefits to the residents of the areas served. The detailed economic analysis for the project given below focuses on the rural road rehabilitation and maintenance component, which accounts for about 80 percent of the project cost.

B. ECONOMIC EVALUATION

5.3 **Road Influence Areas**. The project covers fifteen poor provinces where per capita GDP ranges from US$61 (32 percent of the country average) in Ha Giang to US$143 (74 percent of country average) in Minh Hai. The weighted average per capita GDP of the project provinces is US$106, or about 56 percent of the country average (Annex 11). The population of the fifteen project provinces totals about 20 million, with an area of about 40 percent of the country but with 30 percent of the road network. The detailed road network map prepared during project preparation shows that an average of 5 percent of the network in these provinces is classified as national road, 7 percent is provincial road, 14 percent is district road, and 74 percent is communal road. Assuming that 20 percent of the population in these provinces are urban residents and that the rest are distributed evenly on provincial, district, and communal roads with a normal distribution curve, one kilometer of district road has a direct influence on about 2.27 square kilometers and about 300 people (Annex 11).

5.4 **Project Benefits**. The project assumes that about one-third of the direct benefit areas are cultivable, and that the majority of the low-value crop in Vietnam is paddy. The national average yield per hectare of paddy land is 3.5 tons, and that the domestic market price of paddy is about US$0.2 per kilogram. Using a conservative approach, the project assumes that the benefit of better roads and lower transport costs will contribute to a gradual increase in commercialized paddy production of about 1 percent a year starting from the second year of road rehabilitation to the sixth year, with farm productivity stabilizing afterwards. The value of paddy production that is directly influenced by one kilometer of road is US$530 in the second year and US$2,648 in the sixth year. The project also assumes a 2 percent reduction in losses

from the transport of agricultural products on poor condition roads relative to the "without project scenario".

5.5 **Project Costs**. For the base case scenario, the cost of spot improvement on district and communal roads is US$7,200 a kilometer, which is the average cost estimated during the project preparation using simplified engineering methods (para. 3.9). Routine maintenance for this type of road in Vietnam using lengthman and simple road maintenance tools cost about US$137 a kilometer per year. Periodic maintenance will be required every ten years, so the cost-benefit stream is only calculated for the first ten years after the project is initiated.

5.6 **Economic Rates of Return**. Starting from the second year, benefits are about 20 percent of the investment cost. As shown in Annex 12, the estimated Net Present Value (NPV) at a 12 percent discount factor is US$7,791 per kilometer of rehabilitated roads and the Economic Rate of Return (ERR) is 32.5 percent. The sensitivity analysis shows that even if costs more than double, to US$15,000 a kilometer, the investment is still viable, with a NPV of US$827 per kilometer and an ERR of 13.3 percent. However, if the investment cost increases further to US$20,000 a kilometer or if it stays at US$15,000 a kilometer but benefits are reduced by 25 percent, then NPVs will become negative and ERRs are reduced to about 7 percent (Annex 12). From this analysis it is concluded that investment costs over US$15,000 a kilometer will be justified only if the investment is in areas where higher value crops are produced on a commercial scale, and that economic analysis for such investment would be required.

5.7 **Nonquantifiable Benefits**. Since labor costs account for more than 30 percent of the total cost for road rehabilitation, the project is estimated to generate about US$14 million of wage income to local labor. The employment and cash compensation of populations in poor provinces is an important feature of the project. Many villagers in the selected provinces maintain subsistence livelihoods, with minimum cash incomes. Therefore the cash income to be earned under the project will provide important additional resources to these underprivileged villagers.

5.8 Labor-based methods can be successful and competitive with equipment-based methods in countries, like Vietnam, where labor costs are very low. Where unskilled villagers are willing to work for the equivalent of US$1 a day, capital-intensive methods are not attractive. Further, since it is likely that local populations will be involved in maintaining road assets once rehabilitation works are completed, using them for rehabilitation works under the project will provide them with the on-the-job training and skills needed to perform proper maintenance afterward. As a result maintenance will be more sustainable and of a higher quality than in the past, when unskilled and unpaid labor were used for road maintenance.

5.9 Because institutional strengthening efforts are directed toward the provincial levels, it is expected that by the end of the project all fifteen selected PDOTs will gain technical and administrative knowledge that enables them to efficiently manage and maintain the rural road networks in their provinces. In addition, once the small-scale contractors in the provinces have gained project management and cost accounting experience, they will be able to compete in the

country's fast-growing competitive bidding environment. If this approach is successful it can be disseminated to the country's 38 other provinces.

B. Environmental Impact

5.10 The project has been classified in environmental Category B. The scope of the project works are limited to the rehabilitation and maintenance of selected district feeder roads and communal access roads. These activities are not expected to compromise environmental quality or destroy natural habitats. Road improvements will ensure proper drainage and enhance soil stability, as well as provide greater vehicular and pedestrian safety through improvements to road surfaces and embankments, and the construction of missing bridges. Overall, the project's environmental impact is expected to be small and mostly positive. Given the project's sequential approach and the small environmental impact expected, no Environmental Impact Assessment will be prepared up front. Progress reports will indicate any problems encountered and solutions adopted during implementation.

5.11 To ensure that contractors employ appropriate techniques to protect the environment during construction, instructions, prototype designs, and guidelines have been prepared and included in the OM. To protect forests and reserved land, road eligibility criteria will ensure that the roads selected under the project are limited to those roads that link villages to market centers, not to forest areas. During negotiations agreement was reached that no roads will be financed in reserved areas. In the forest buffer zones, an Environmental Impact Assessment will be prepared and submitted to IDA for approval prior to disbursement for any section of road in the buffer zones.

C. Land Acquisition and Involuntary Resettlement

5.12 Road rehabilitation using spot improvement methods normally does not require widening roads or acquiring land. To the contrary, it often limits the spreading of roads onto adjacent fields in several tracks. Therefore it is expected that most of the roads rehabilitated under the project will occupy the same or even less land when improved. However, since only the details of the first-year program have been planned which do not include works causing land acquisition, the future need for minor additional strips of land cannot be ruled out. During negotiations a Policy Framework for Land Acquisition, Compensation, and Rehabilitation satisfactory to IDA was agreed upon. This framework will contain the procedures to be followed for rehabilitation of roads requiring additional land, including the principles for land acquisition, resettlement, and rehabilitation; the institutional and legal framework, including entitlement policies; implementation arrangements; rules for local participation in implementation; grievance redressal mechanisms; and provisions for internal and external monitoring, all of which are satisfactory to IDA.

5.13 During negotiations agreement was reached that when 150 or more people are affected by a road link, specific Resettlement Action Plans will be required. These road-specific reports will include results of socioeconomic surveys and censuses of all parties affected by the project; detailed compensation and resettlement or rehabilitation plans for the various groups affected by the project; a timetable for implementation; organizational responsibilities for implementation; a detailed budget for funding the various compensation and rehabilitation measures; and internal and external monitoring arrangements. If fewer than 150 people are affected, a time-bound action plan for compensation and resettlement will be prepared in accordance with the framework (see para. 5.12). The submission to and approval of a specific RAP or action plan by IDA and completion of resettlement activities will be a condition of disbursement for those road links. At negotiations agreement was reached that by March 31, 1997 PID will retain an independent agency or agencies with qualified and experienced staff and terms of reference acceptable to IDA to periodically carry out external monitoring and evaluation of the action plans, and to prepare an annual report to submit to PID and IDA by August 31 of each year starting in 1997.

D. Indigenous Peoples and Ethnic Minorities

5.14 Population density in the road service area is one of the main eligibility criteria for road selection. While this approach spreads the benefits of the project to a large portion of the population, it tends to exclude sparsely populated and mountainous areas, where most ethnic minorities live. Even with the refined selection criteria of incorporating an accessibility rating — which gives higher priority to roads that are not presently accessible — this approach still favors the coastal plain and excludes most mountainous areas. These economic criteria may result in some of the poorest segments of society being left outside the project's reach. In order to target mountain and ethnic populations, an understanding was reached at negotiations that up to 20 percent of credit earmarked for rural access road rehabilitation may be used in those areas justified under the social criteria (para. 3.14(c)). To ensure that ethnic minorities are consulted during the planning stage and that they benefit from the road construction, guidelines for preparing a development plan for ethnic minorities will be included in the OM. During negotiations agreement was reached that an ethnic minorities' development plan is prepared and submitted to IDA for approval prior to disbursements for works on road links in areas inhabited by ethnic minorities.

E. Sustainability

5.15 Project sustainability will be enhanced by at least three actions. **First**, the project will support the development of institutional and human resource capacity that will continue to support road rehabilitation and maintenance once the project is completed. **Second**, the project supports the rural roads information system and the setting up of an effective system for rural maintenance management at the local level to ensure continued maintenance once the project is complete. Furthermore, a Rural Infrastructure Investment Study will be conducted to address the issues, problems, and needs relating to rural transport investment for Vietnam. **Third**, project preparation has involved a series of participatory and interactive workshops

with national, provincial, and district stakeholders with a view to fostering local ownership of the project.

5.16 **Participation of beneficiaries** during project preparation was achieved at two levels. **First**, the staffs of the MOT and PDOT were actively involved in project preparation, collecting data, consulting with other agencies, taking road inventories, mapping the entire rural roads network and prioritizing roads for the first-year program, and developing and refining various components of the project. **Second**, Government officials were provided with training during project preparation. Two workshops were organized to discuss the project concept and draft project design, drawing representatives of national and provincial agencies involved in rural roads construction and maintenance. In addition, during project implementation some works will be implemented by community-organized labor, which requires the active involvement of beneficiaries at both the planning and implementation stages.

F. Risks

5.17 Because the project's design is somewhat innovative for the Government of Vietnam, the project could be assumed to entail considerable risk. However, the risk of the "wrong" project being chosen in each selected district and commune is small given the participatory process involved (para. 5.16) and the immense interest of the central and local governments for the project. Still, the main risks relating to implementation include: (i) Vietnam's lack of experience with implementation of externally financed projects and competitive bidding, which might delay contracting for and execution of project works; (ii) private contractors' lack of experience with bidding procedures and works execution; (iii) failure to provide adequate routine maintenance, partly because of the absence of good standard maintenance procedures and mainly because of the lack of funds, which would result in early deterioration of the rehabilitated roads; and (iv) the tight implementation schedule expected by the Government — to complete the project in three years — might not be fulfilled.

5.18 Consulting services provided during project preparation and technical assistance to be provided during project implementation will minimize the technical risks. Training provided to private contractors will minimize the risks in contracting works to the private sector. The procedures for effective routine maintenance and management to be set up under the project will minimize the risks relating to substandard maintenance. For the risk in extending the implementation period, the project disbursement schedule assumes that roads will be rehabilitated in five years instead of three. This schedule will not constrain the Government from progressing more rapidly.

6. AGREEMENTS REACHED AND RECOMMENDATIONS

A. AGREEMENTS

6.1 The conditions of credit effectiveness and disbursement as well as agreements and understandings reached during project negotiations are as follows:

During Negotiations the Government Submitted

(a) A draft Operational Manual;

(b) A plan of the first-year program;

(c) A MOT approved Resettlement and Rehabilitation Policy Framework; and

(d) Draft arrangements for the flow of funds and related paper between the central and provincial governments and methods of payments.

Agreements Reached During Negotiations

(a) The Operational Manual will be adopted by MOT and applied to all implementation aspects of the project, and revisions will require prior IDA review (para. 4.6);

(b) The Government will submit a proposed training program for the central and provincial government staff and private contractors involved in the project to IDA for approval by March 31 of each year commencing in 1997 (para. 3.23);

(c) The Government will submit a proposed work program and budget for project activities in the following calendar year to IDA for review and comments by August 31 of each year (para. 4.7);

(d) The Government will initiate the establishment and implementation of a computerized monitoring and evaluation system using agreed monitoring indicators, by December 31, 1997 (para. 3.6), and qualified consultants will be employed by the same date (para. 4.14);

(e) The Government will submit semiannual progress reports on project implementation activities to IDA for review and comment by March 31 and September 30 of each year commencing September 30, 1997 (para. 4.15);

(f) The Government will prepare and furnish to IDA a first-year review report no later than January 31, 1998 (para. 4.12);

(g) The Government will submit a midterm review report to IDA for review and comment by December 31, 1998 (para. 4.33); and

(h) The Government will ensure annual auditing using an independent auditor acceptable to IDA. Detailed audit reports will be submitted to IDA within nine months of the closing of the government's fiscal year. The first-year audit report will cover January to December 1997 (para. 4.29).

Conditions of Effectiveness

(a) Issuance of the Operational Manual (para. 4.6);

(b) The PID and the PPMUs of four identified provinces will be established and heads appointed (para. 4.1); and

Conditions of Disbursement

(a) Specific RAPs will be required if 150 or more people are affected in each road link. If fewer than 150 people are affected, a time-bound action plan for compensation and resettlement will be prepared in accordance with the agreed policy framework. The submission to and approval of a specific RAP or action plan by IDA and completion of resettlement activities will be a condition of disbursement against civil works for concerned road links (para. 5.13);

(b) The Government will prepare and submit to IDA an Environmental Impact Assessment for roads located within forest buffer zones including a time-bound action plan for undertaking the environmental mitigating measures before disbursement is made against civil works for such roads (para. 5.11); and

(c) For road links to be built in ethnic minorities areas, an ethnic minorities development plan will be prepared and submitted to IDA for approval prior to disbursements for works on such roads (para. 5.14).

B. RECOMMENDATION

6.2 Subject to the above agreements and conditions, the project is suitable for a Credit to the Socialist Republic of Vietnam in the amount of SDR 37.8 million (US$55.0 million equivalent), on standard IDA terms with 40 years' maturity.

Viet Nam: Rural Transport Project
Provincial Revenue and Expenditure in selected provinces (1995)
Unit: Million VND

	1995 GDP per capita ('000VND)	Provincial Revenue			Provincial Expenditures				
		Total	Of which: Transfer fr cen Govt		Total	Of which: road investment		of which:Maintenance	
			VND	%		VND	%	VND	%
Ha Giang	793.00	263.79	216.62	82.12	258.30	37.42	14.49	25.66	9.93
Lai Chau	770.00	268.90	224.33	83.43	264.87			6.24	2.36
Vinh Phu	1,206.00	342.30	241.00	70.41	362.00	29.89	8.26	9.15	2.53
Bac Thai	3,003.00	288.62	100.00	34.65	288.62	15.00	5.20	5.20	1.80
Than Hoa	2,310.00	504.00			591.00	27.41	4.64	8.50	1.44
Nghe An	2,277.00	504.28			483.18	4.73	0.98	4.15	0.86
Ha Ting	1,650.00	270.00	171.50	63.52	285.80	6.58	2.30	1.80	0.63
BenTre	2,167.00	250.19	246.15	98.39	250.19	12.55	5.02	2.61	1.04
Tra Vinh	1,980.00	105.00	101.05	96.24	212.39	11.94	5.62	1.49	0.70
Minh Hai	2,313.00	820.96	257.56	31.37	463.90	10.49	2.26	1.66	0.36

Source: MOT/PMU18 and mission estimates

Vietnam: Rural Transport Project
Key Project Monitoring Indicators

	PY1	PY2	PY3	PY4	PY5	Total
Input Indicators						
1. Recruitment of International Technical Advisor (mm)	12	16	16	16	10	70
2. Organizing workshops & training for:						
@ PID	1	1	-	-	-	2
@ PPMUs	2	2	1	1	1	7
@ contractors	2	2	2	1	1	8
3. Procuring necessary maintenance equipment (% of required tools)	0	25	75	100	0	
Output Indicators						
4. Length of rehabilitated road (Km)	200	1000	1800	1400	600	5000
5. Cumulative length of mainted road (Km)	0	200	1200	3000	4400	5000
6. Accessibility of road during wet season* (see Accessibility Index below)	10	8	7	6	5	
Development Impact Indicators						
7. Increase in household income from off-farm work(% incr. fr. base-line stud	0%	5%	10%	15%	15%	
8. Increase in no. of trips to economic & social infrastructure	0%	5%	10%	15%	15%	
9. Increase in the size of contract undertaken by small contractors	< $50,000	< $60,000	< $75,000	> $75,000	>$75,000	

Notes: Accessibility Index:

5 = Excellent	- 2WD car in all weather
6 = Good	- 2WD car in dry season only
7 = Fair	- 4WD Cong Nong in all weather
8 = Poor	- 4WD Cong Nong in dry season only
10 = Failed	- Not passable by 4WD
Suffix A:	- Not passable due to missing structure

Viet Nam - Rural Transport Project

Rural Roads Information System

1. MOT and its representatives in the provinces, PDOTs, are involved among other things, in the collection and management of several layers of transportation related information. These information is used by MOT and PDOTs in planning, design, implementation and management of Transportation projects, as well as by other government agencies, each for their own use. MOT has recognized the need for Modern Information Technology to support these functions. Therefore, MOT should be empowered to face these challenges by developing a system capable of storing, maintaining and manipulating roads related information. The system would be based on the Geographic Information System (GIS) technology which links digital maps to tabular database and would be built at the top of advances already made in the Ministry of Transport in this area. During project preparation, rural roads inventories were prepared and entered in computerized tabular database (in Microsoft Excel format), and linked to hard copy maps using a well defined spatial reference. The proposed work would include preparing Rural Roads Information System Implementation Plan, build the first phase of the implementation plan (a simple GIS system that can be used for data storage and maintenance), and develop a simple application for Rural Roads Prioritization.

2. The slow learning curve of absorbing the Information Technology is recognized and should be taken into consideration throughout the program in order to ensure the achievements of the project's physical targets. Therefore, implementation of Rural Roads Information System will first be developed using a simple system that supports data collection, storage and maintenance and the development of one application for Rural Roads Prioritization's. The database would be designed so that in the future the system would support applications such as planning, roads maintenance, and monitoring and evaluation.

System Components

3. The scope of work for the project includes:

(a) developing Rural Roads Information System Implementation Plan;

(b) Implementing the first phase of the plan, including a simple application using GIS to collect, store and manipulate Rural Roads Spatial Data;

(c) development of a simple application for Rural Roads Prioritization; and

(d) Training and Technology Transfer.

Implementation Plan

4. The Consultant will review progress and performance of existing roads information systems already in use in MOT and Other related agencies, document Hardware,

Software, and existing data models. Then, the Consultant would prepare Rural Roads Implementation Plan to be used for rural roads building on the advances already made in MOT in this area. This would include definition of Hardware, Software, data model and developing strategies for System Architecture and implementation strategy. Furthermore, the study would identify the business needs and applications that would be supported by the system.

Implementing Phase I of the Proposed Plan

5. The consultant would implement Phase I of the proposed plan. This would include purchase and installation of Hardware and Software, conversion of GIS related data for Rural Roads Network and also National and Provincial Network for the 15 provinces. It is preferably that data conversion, specially digitizing, be done by PMU18 staff under direct supervision from the consultants. However, Quality Control and the linkage between Spatial and Tabular data would be the responsibility of the consultant.

6. Spatial data that would be entered in the system include, administrative boundaries, National, Provincial, District, and Communal boundaries if applicable. Roads Spatial data would include National, Provincial, District and Communal Roads. Some of these spatial data might already exist in Digital format, therefore the consultants might be required to import these data into the system instead of digitizing it from hard copy maps.

Developing Simple Application for Rural Roads Prioritization

7. Since the demand is so high compared to the available funds, prioritization of roads to be included under the project is an important factor in the planning process. Therefore, the consultant would develop an application for roads prioritization using the methodology described in the Operational Manual. The methodology uses the No. of beneficiaries per Km, Network considerations and socio-economic factors. Relevant Chapters in the Operational Manual would be included in this TOR as an attachment.

Training and Technology Transfer

8. The consultant would provide one week seminar for PMU18 and other MOT in introduction of GIS Technology. Topics included are spatial data, spatial analysis, map projection, database design, and applications of GIS in Transportation Management. The consultant would also provide on the job training from PMU18 staff to use the system. He will also train PMU18 staff digitizing, Quality Control, Map Production, and system customization.

9. PMU18 would provide a full time information systems specialist to work with the International Consultants. This person would be responsible for managing the system, including data conversion for the rest of the Network after consultants departure. PMU18 would also provide low skilled staff for data entry including digitizing.

VIET NAM - RURAL TRANSPORT PROJECT

RURAL INFRASTRUCTURE STRATEGY

STUDY TERMS OF REFERENCE

Background

1. The activities of the Rural Transport Project include three components:

   (a) rural roads rehabilitation and maintenance using sport improvement techniques;

   (b) institutional strengthening and training of local contractors; and

   (c) a study to address the issues of rural transport development.

The project concept and design was based on preparation and planning work carried out by a Government Project Preparation Team and consultants retained under a grant from PHRD, Japan. Annex 1 presents a brief outline of the project objectives and components.

2. This project is the first phase of a projected longer term program to improve the rural access transport network in Viet Nam and its focus will be to promote economic and social development and to alleviate poverty in rural areas by facilitating rural access and enhancing opportunities for market agriculture surplus and integrating local populations into regional and national economies. However, there is a paucity of detailed data and information relating to Viet Nam economic, social, institutional and physical development and about the inter-linkages between these different aspects of its development, particularly in relation to the vast majority of its population that live and work in the rural areas. The proposed study will provide an improved basis for policy formulation, strategy development, investment planning and programming and institutional structures and systems for future investments in and attention to improvement, operation and maintenance of rural infrastructure. It will also apply these improved approaches to formulate a strategy and plan of action that will guide projected follow on investments in the rural infrastructure sector.

Study Objectives

3. The study's sphere of interest will be the various elements of rural infrastructure that impinge on the economic, social and welfare development of rural populations, in particular, transport infrastructure both land and water based, but also, to the extent that accessibility to economic, social and welfare facilities is directly related to the location of these facilities, the study will consider issues related to location decisions for such facilities. Accordingly, the study objectives are:

(a) To review the Government's ongoing policies, strategies and programs for rural infrastructure development, operation and maintenance and for the establishment and development of related institutional capacity;

(b) To review the role of rural infrastructure and its use in facilitating agricultural growth and rural development in Viet Nam and its role in alleviating poverty and addressing the effects of poverty on rural people including different social and minority groups and of each gender;

(c) To assess current rural infrastructure constraints and needs, institutions and policies, financing mechanisms, local capacity for construction and maintenance and technology choices, particularly for using labor-based approaches and natural materials for road and track improvements and pavements and for travel and transport means that are simple, adequate and affordable for the needs of rural populations;

(d) In the light of the above reviews and assessments, to recommend any changes required in existing policies, strategies, programs and institutions and to elaborate a national strategy for the sub-sector consistent with Viet Nam□
modernization and industrialization and transition to a market economy as well as its ongoing process of decentralization and its objectives to improve rural access and service quality to the rural poor and thus enhance rural and regional development.

4. An important part of the study will be the development of a data bank on accessibility and the needs of the rural infrastructure networks, their development, operation and maintenance.

Scope of Work

5. The first task will be to assemble and summarize the data on supply and demand for rural infrastructure, the impacts of rural infrastructure (where available) in Viet Nam and data on allocations, releases and expenditures for rural infrastructure. Figures should be assembled to include latest expenditure information and would build upon the report Viet Nam - Transport Sector- Serving an Economy in Transition□1994). The study will analyze these data to illustrate the overall patterns in supply and demand for rural infrastructure. The statements prepared with this data will serve as the basis for analyzing the service delivery and resource requirements for rural infrastructure.

6. Aggregate levels of funding and infrastructure stocks will be compared to common indicators such as GDP, income and employment; provincial and regional indicators will also be contrasted and compared. The supply of rural infrastructure, in terms of resource allocation, will be analyzed over time and space. Expenditure will be analyzed in terms of their composition - e.g. rehabilitation, maintenance, new construction - and the level for

each item compared to estimates of global requirements (i.e. maintenance and rehabilitation).

7. Budgeting preparation and execution practices for rural infrastructure at the national, provincial and project specific level will be assessed from a review of current practice in MOT and PDOTs as well as District and commune levels. This review could be conducted with the assistance of local consultants who will assess the current arrangements for implementing public expenditure decisions in the infrastructure sector.

8. The quality of service delivery will be analyzed in relation to the standards of rural infrastructure and service characteristics. This aspect of the study will be limited by the relative paucity of information on detailed condition surveys of the existing rural infrastructure stock and the difficulties associated with measuring quality of service (e.g. rural transport). Local consultants may be engaged to collect additional data as necessary. Also the study should recommend future strategies for addressing the paucity of information and data and should consider the need for a more detailed travel and transport survey and study, perhaps in the form of a research project for a post graduate candidate sponsored through a fellowship or scholarship program.

9. Once the analyses of resource allocation and financial resource mobilization are completed a global estimate of resource requirements, by activity, can be prepared for different scenarios. The scenarios would be prepared based on findings of the review of the rural development strategy. Based on the global estimates of resource requirements for each scenario considered, sub-sector specific recommendations would be prepared and a rural infrastructure strategy will be developed. The strategy will present a position on sectoral priorities and weigh the budgetary and institutional limitations identified. Existing levels of funding and current trends will be compared with the estimated needs to implement the rural infrastructure strategy.

10. Key considerations of the Study in relation to the elements of the rural infrastructure system will be:

(a) The information base - including accurate base and inventory maps, inventories of the stock and operational condition of a range of physical facilities, including but not limited to transport infrastructure, and traffic data;

(b) Accessibility Planning - responding to such questions as who needs access to what, for what reason or purpose, by what (likely) means of transport, with what relative priority and with what prospective return or effect?;

(c) Infrastructure Development and Maintenance - based on the results of accessibility planning and taking into account such issues as appropriate design and technology, construction standards, quality and longevity of outputs, the modality and management of delivering those outputs and maintenance standards; and

(d) Complementary Interventions - including a potentially wide range of transport and non-transport activities geared to accelerating the response to infrastructure development and to minimizing the travel and transport burden among the target group as a whole.

11. With sustained access, mobility and minimization of the travel and transport burden as a major objective of the proposed strategy, it will be necessary to monitor the rural transport system as a whole and to apply a management system to rural infrastructure including maintenance management.

Risks

12. The most significant risk faced by the proposed study is the fact that some cross-sectoral issues- across various types of rural infrastructure would be only superficially analyzed given the type of data presently available and expected to be collected by the study. Efforts will be needed to focus on the themes across sub-sectors. A further risk will arise from the inertia expected within existing institutions and agencies associated with rural infrastructure as well as from existing professional staff, including engineers, who may resist cooperation and collaboration if they feel their professional reputations under threat when their past works and decisions are put under scrutiny as candidates for modernization.

Output and Audience

13. The study is expected to assist the Government and donors in planning for rural infrastructure investments, operation and maintenance. Since the study is expected to improve allocation of resources in rural infrastructure, provide the framework for future rural infrastructure lending and identify a resource envelope, it will assist Government□ current efforts to improve service delivery and address poverty issues in rural areas. Specific outputs of the study will include a rural infrastructure strategy with specific priorities, policy, institutional and financial reform recommendations. A draft Table of Contents is attached.

RURAL INFRASTRUCTURE STRATEGY STUDY

REPORT - PROPOSED TABLE OF CONTENTS

VIII RESOURCE REQUIREMENTS FOR MAINTENANCE AND IMPROVEMENT OF RURAL INFRASTRUCTURE

A: Unit Costs

B: Resource Requirements

IX RURAL INFRASTRUCTURE STRATEGY AND ACTION PLAN

ANNEXES AND ATTACHMENTS

SOCIALIST REPUBLIC OF VIET NAM - RURAL TRANSPORT PROJECT

Project Cost Estimates
(January 1996 prices)

Items	1996 Loc	1996 Fore	1996 Tot	1997 Loca	1997 Forei	1997 Tota (US$: '000)	1998 Loc	1998 Forei	1998 Tota	1999 Loca	1999 Fore	1999 Tota
Rural Roads Rehabilitation/Maintenance												
a. Engineering design	9.4	1.0	10.4	46.8	5.2	52.0	93.6	10.4	104.0	140.4	15.6	156.0
b. Civil Works	676.2	169.1	845.3	3381.0	845.3	4226.3	6762.0	1690.5	8452.5	10143.0	2535.8	12678.8
c. Maintenance cost incl	28.3	15.3	43.6	141.6	76.3	217.9	283.2	152.5	435.8	424.9	228.8	653.6
d. Supervision cost, of which:												
- Technical Advisory &	0.0	35.7	35.7	0.0	178.5	178.5	0.0	357.0	357.0	0.0	535.5	535.5
- PID's office, transport & Admin.												
@ Local staff salar	1.5	0.0	1.5	7.5	0.0	7.5	15.0	0.0	15.0	22.5	0.0	22.5
@ Office & other eq	0.6	0.6	1.1	8.3	8.3	16.6	8.3	8.3	16.6	5.5	5.5	11.0
@ Local travel & ad	1.5	0.4	1.9	7.7	1.9	9.6	15.4	3.8	19.2	23.0	5.8	28.8
- PPMUs' office, Transport & Admin.												
@ Local staff salar	17.1	0.0	17.1	85.5	0.0	85.5	171.0	0.0	171.0	256.5	0.0	256.5
@ Office & transpor	10.6	10.6	21.2	159.1	159.1	318.2	159.1	159.1	318.2	106.1	106.1	212.1
@ Local travel & ad	10.8	2.7	13.5	54.0	13.5	67.5	108.0	27.0	135.0	162.0	40.5	202.5
e. Land acquisition cost	5.3	0.0	5.3	26.3	0.0	26.3	52.7	0.0	52.7	79.0	0.0	79.0
f. Resettlement and minor	0.0	0.0	0.0	15.0	0.0	15.0	37.5	0.0	37.5	52.5	0.0	52.5
Subtotal	761.3	235.3	996.6	3917.8	1288.0	5205.8	7668.3	2408.6	10076.9	11362.9	3473.4	14836.3
Instituional Strengthening												
a. Workshop & training:												
to PMU18 and PPMUs	5.2	7.8	13.0	26.0	39.1	65.1	52.1	78.1	130.2	78.1	117.2	195.3
to contracting industr	0.4	0.9	1.3	2.0	4.6	6.6	4.0	9.2	13.2	5.9	13.9	19.8
b. Rural road information	0.0	0.0	0.0	24.0	96.0	120.0	36.0	144.0	180.0	0.0	0.0	0.0
Subtotal	5.6	8.7	14.3	52.0	139.7	191.7	92.0	231.4	323.4	84.1	131.0	215.1
Study												
a. Inv.strategy for rural	0.0	0.0	0.0	26.0	74.0	100.0	65.0	185.0	250.0	39.0	111.0	150.0
Subtotal	0.0	0.0	0.0	26.0	74.0	100.0	65.0	185.0	250.0	39.0	111.0	150.0
Total base cost	766.9	244.0	1010.9	3995.8	1501.7	5497.5	7825.3	2825.0	10650.3	11485.9	3715.5	15201.4
Physical contingencies (10%	76.7	24.4	101.1	399.6	150.2	549.8	782.5	282.5	1065.0	1148.6	371.6	1520.1
Total	843.6	268.4	1112.0	4395.4	1651.8	6047.2	8607.8	3107.5	11715.3	12634.5	4087.0	16721.6
Price contingencies												
Annual (%)	2.00	2.00		1.6	1.6		1.6	1.6		1.6	1.6	
Compounded (%)	2.00	2.00		3.7	3.7		5.3	5.3		7.0	7.0	
Amount	16.9	5.4	22.2	160.4	60.3	220.7	458.8	165.6	624.4	889.5	287.7	1177.2
Project Total	860.4	273.8	1134.2	4555.8	1712.1	6267.9	9066.6	3273.1	12339.7	13524.0	4374.8	17898.8

Notes:

a. 1996 exchange rate: US$1.00 = Dong 11,000
b. All figures are rounded.

Items	2000 Loc	2000 Fore	2000 Tota	2001 Loc	2001 Fore	2001 Tota	TOTAL Loca	TOTAL Forei	TOTAL Tota
					(US$: '000)				
Rural Roads Rehabilitation/Maintenance									
a. Engineering design	93.6	10.4	104.0	84.2	9.4	93.6	468.0	52.0	520.0
b. Civil Works	6762.0	1690.5	8452.5	6085.8	1521.5	7607.3	33810.0	8452.5	42262.5
c. Maintenance cost incl tool	283.2	152.5	435.8	254.9	137.3	392.2	1416.2	762.6	2178.8
d. Supervision cost, of which:									
- Technical Advisory & Sup	0.0	357.0	357.0	0.0	321.3	321.3	0.0	1785.0	1785.0
- PID's office, transport & Admin.									
@ Local staff salary	15.0	0.0	15.0	13.5	0.0	13.5	75.0	0.0	75.0
@ Office & other equipm	3.3	3.3	6.6	1.7	1.7	3.3	27.6	27.6	55.2
@ Local travel & admin.	15.4	3.8	19.2	13.8	3.5	17.3	76.8	19.2	96.0
- PPMUs' office, Transport & Admin.									
@ Local staff salary	171.0	0.0	171.0	153.9	0.0	153.9	855.0	0.0	855.0
@ Office & transport eq	63.6	63.6	127.3	31.8	31.8	63.6	530.3	530.3	1060.5
@ Local travel & admin.	108.0	27.0	135.0	97.2	24.3	121.5	540.0	135.0	675.0
e. Land acquisition cost	52.7	0.0	52.7	47.4	0.0	47.4	263.3	0.0	263.3
f. Resettlement and minority	42.0	0.0	42.0	0.0	0.0	0.0	150.0	0.0	150.0
Subtotal	7567.8	2308.2	9876.0	6784.2	2050.6	8834.8	38212.1	11764.1	49976.3
Instituional Strengthening									
a. Workshop & training:									
to PMU18 and PPMUs	52.1	78.1	130.2	46.9	70.3	117.2	260.4	390.6	651.0
to contracting industry	4.0	9.2	13.2	3.6	8.3	11.9	19.8	46.2	66.0
b. Rural road information sys	0.0	0.0	0.0	0.0	0.0	0.0	60.0	240.0	300.0
Subtotal	56.0	87.4	143.4	50.4	78.6	129.1	340.2	676.8	1017.0
Study									
a. Inv.strategy for rural tra	0.0	0.0	0.0	0.0	0.0	0.0	130.0	370.0	500.0
Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	130.0	370.0	500.0
Total base cost	7623.9	2395.6	10019.4	6834.7	2129.2	8963.9	38682.3	12810.9	51493.3
Physical contingencies (10%)	762.4	239.6	1001.9	683.5	212.9	896.4	3868.2	1281.1	5149.3
Total	8386.3	2635.1	11021.4	7518.2	2342.1	9860.3	42550.6	14092.0	56642.6
Price contingencies									
Annual (%)	2.2	2.2		2.2	2.2				
Compounded (%)	9.4	9.4		11.9	11.9				
Amount	790.0	248.2	1038.2	892.4	278.0	1170.4	3208.0	1045.3	4253.2
Project Total	9176.3	2883.3	12059.6	8410.6	2620.2	11030.7	45758.5	15137.3	60895.8

SOCIALIST REPUBLIC OF VIET NAM - RURAL TRANSPORT PROJE T

Project Cost Estimates
(January 1996 prices)

Items	1996 Loc	1996 Fore	1996 Tot	1997 Loca	1997 Forei	1997 Tota	1998 Loc	1998 Forei	1998 Tota	1999 Loca	1999 Fore	1999 Tota
						(Vietnam Dong: billi						
Rural Roads Rehabilitation/Maintenance												
a. Engineering design	0.10	0.01	0.11	0.51	0.06	0.57	1.03	0.11	1.14	1.54	0.17	1.72
b. Civil Works	7.44	1.86	9.30	37.19	9.30	46.49	74.38	18.60	92.98	111.57	27.89	139.47
c. Maintenance cost incl	0.31	0.17	0.48	1.56	0.84	2.40	3.12	1.68	4.79	4.67	2.52	7.19
d. Supervision cost, of which:												
- Technical Advisory &	0.00	0.39	0.39	0.00	1.96	1.96	0.00	3.93	3.93	0.00	5.89	5.89
- PID's office, transport & Admin.												
@ Local staff salar	0.02	0.00	0.02	0.08	0.00	0.08	0.17	0.00	0.17	0.25	0.00	0.25
@ Office & other eq	0.01	0.01	0.01	0.09	0.09	0.18	0.09	0.09	0.18	0.06	0.06	0.12
@ Local travel & ad	0.02	0.00	0.02	0.08	0.02	0.11	0.17	0.04	0.21	0.25	0.06	0.32
- PPMUs' office, Transport & Admin.												
@ Local staff salar	0.19	0.00	0.19	0.94	0.00	0.94	1.88	0.00	1.88	2.82	0.00	2.82
@ Office & transpor	0.12	0.12	0.23	1.75	1.75	3.50	1.75	1.75	3.50	1.17	1.17	2.33
@ Local travel & ad	0.12	0.03	0.15	0.59	0.15	0.74	1.19	0.30	1.49	1.78	0.45	2.23
e. Land acquisition cost	0.06	0.00	0.06	0.29	0.00	0.29	0.58	0.00	0.58	0.87	0.00	0.87
f. Resettlement and minor	0.00	0.00	0.00	0.17	0.00	0.17	0.41	0.00	0.41	0.58	0.00	0.58
Subtotal	8.37	2.59	10.96	43.26	14.17	57.43	84.76	26.49	111.26	125.57	38.21	163.78
Instituional Strengthening												
a. Workshop & training:												
to PMU18 and PPMUs	0.06	0.09	0.14	0.29	0.43	0.72	0.57	0.86	1.43	0.86	1.29	2.15
to contracting industr	0.00	0.01	0.01	0.02	0.05	0.07	0.04	0.10	0.15	0.07	0.15	0.22
b. Rural road information	0.00	0.00	0.00	0.26	1.06	1.32	0.40	1.58	1.98	0.00	0.00	0.00
Subtotal	0.06	0.10	0.16	0.57	1.54	2.11	1.01	2.54	3.56	0.92	1.44	2.37
Study												
a. Inv.strategy for rural	0.00	0.00	0.00	0.29	0.81	1.10	0.72	2.04	2.75	0.43	1.22	1.65
Subtotal	0.00	0.00	0.00	0.29	0.81	1.10	0.72	2.04	2.75	0.43	1.22	1.65
Total base cost	8.44	2.68	11.12	43.95	16.52	60.47	86.08	31.07	117.15	126.35	40.87	167.22
Physical contingencies (10%	0.8	0.3	1.1	4.4	1.7	6.1	8.6	3.1	11.7	12.6	4.1	16.7
Total	9.3	3.0	12.2	48.4	18.2	66.5	94.7	34.2	128.9	139.0	45.0	183.9
Price contingencies												
Annual (%)	10.00	10.00		6.00	6.00		6.00	6.00		6.00	6.00	
Compounded (%)	10.00	10.00		16.60	16.60		23.60	23.60		31.01	31.01	
Amount	0.9	0.3	1.2	8.0	3.0	11.1	22.4	8.1	30.4	43.1	13.9	57.0
Project Total	10.2	3.3	13.5	56.4	21.2	77.6	117.0	42.3	159.3	182.1	58.9	241.0

Notes:
a. 1996 exchange rate: US$1.00 = Dong 11,000
b. All figures are rounded.

Items	2000 Loc	2000 Fore	2000 Tota	2001 Loc	2001 Fore	2001 Tota	TOTAL Loca	TOTAL Forei	TOTAL Tota
				(Vietnam Dong: billi					
Rural Roads Rehabilitation/Maintenance									
a. Engineering design	1.03	0.11	1.14	0.93	0.10	1.03	5.15	0.57	5.72
b. Civil Works	74.38	18.60	92.98	66.94	16.74	83.68	371.91	92.98	464.89
c. Maintenance cost incl tool	3.12	1.68	4.79	2.80	1.51	4.31	15.58	8.39	23.97
d. Supervision cost, of which:									
- Technical Advisory & Sup	0.00	3.93	3.93	0.00	3.53	3.53	0.00	19.64	19.64
- PID's office, transport & Admin.									
@ Local staff salary	0.17	0.00	0.17	0.15	0.00	0.15	0.83	0.00	0.83
@ Office & other equipm	0.04	0.04	0.07	0.02	0.02	0.04	0.30	0.30	0.61
@ Local travel & admin.	0.17	0.04	0.21	0.15	0.04	0.19	0.84	0.21	1.06
- PPMUs' office, Transport & Admin.									
@ Local staff salary	1.88	0.00	1.88	1.69	0.00	1.69	9.41	0.00	9.41
@ Office & transport eq	0.70	0.70	1.40	0.35	0.35	0.70	5.83	5.83	11.67
@ Local travel & admin.	1.19	0.30	1.49	1.07	0.27	1.34	5.94	1.49	7.43
e. Land acquisition cost	0.58	0.00	0.58	0.52	0.00	0.52	2.90	0.00	2.90
f. Resettlement and minority	0.46	0.00	0.46	0.00	0.00	0.00	1.62	0.00	1.62
Subtotal	83.71	25.39	109.10	74.63	22.56	97.18	420.30	129.41	549.71
Instituional Strengthening									
a. Workshop & training:									
to PMU18 and PPMUs	0.57	0.86	1.43	0.52	0.77	1.29	2.86	4.30	7.16
to contracting industry	0.04	0.10	0.15	0.04	0.09	0.13	0.22	0.51	0.73
b. Rural road information sys	0.00	0.00	0.00	0.00	0.00	0.00	0.66	2.64	3.30
Subtotal	0.62	0.96	1.58	0.55	0.86	1.42	3.74	7.44	11.19
Studies									
a. Inv.strategy for rural tra	0.00	0.00	0.00	0.00	0.00	0.00	1.43	4.07	5.50
Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	1.43	4.07	5.50
Total base cost	83.86	26.35	110.21	75.18	23.42	98.60	425.51	140.92	566.43
Physical contingencies (10%)	8.4	2.6	11.0	7.5	2.3	9.9	42.6	14.1	56.6
Total	92.3	29.0	121.2	82.7	25.8	108.5	468.1	155.0	623.1
Price contingencies									
Annual (%)	5.00	5.00		5.00	5.00				
Compounded (%)	37.56	37.56		44.44	44.44				
Amount	34.7	10.9	45.5	36.8	11.5	48.2	145.8	47.7	193.5
Project Total	126.9	39.9	166.8	119.5	37.2	156.7	613.9	202.7	816.5

Socialist Republic of Viet Nam
Rural Transport Project

Project Cost Estimates
(January 1996 prices)

Items	--(Dong:billion)--- Loc	Fore	Tot	-------(US$:'000)--- Loca	Foreig	Tota	% Foreig to tot	% of total
Rural Roads Rehabilitation/Maintenance								
a. Engineering design	5.1	0.6	5.7	468.0	52.0	520.0	10.0	0.85
b. Civil Works	371.9	93.0	464.9	33810.0	8452.5	42262.5	20.0	69.40
c. Maintenance cost incl	15.6	8.4	24.0	1416.2	762.6	2178.8	35.0	3.58
d. Supervision cost, of which:								
- Technical Advisory &	0.0	19.6	19.6	0.0	1785.0	1785.0	100.0	2.93
- PID's office, transport & Admin.								
@ Local staff salar	0.8	0.0	0.8	75.0	0.0	75.0	0.0	0.12
@ Office & other eq	0.3	0.3	0.6	27.6	27.6	55.2	50.0	0.09
@ Local travel & ad	0.8	0.2	1.1	76.8	19.2	96.0	20.0	0.16
- PPMUs' office, Transport & Admin.								
@ Local staff salar	9.4	0.0	9.4	855.0	0.0	855.0	0.0	1.40
@ Office & transpor	5.8	5.8	11.7	530.3	530.3	1060.5	50.0	1.74
@ Local travel & ad	5.9	1.5	7.4	540.0	135.0	675.0	20.0	1.11
e. Land acquisition cost	2.9	0.0	2.9	263.3	0.0	263.3	0.0	0.43
f. Resettlement and minor	1.6	0.0	1.6	150.0	0.0	150.0	0.0	0.25
Subtotal	420.3	129.4	549.7	38212.1	11764.1	49976.3	23.5	82.07
Instituional Strengthening								
a. Workshop & training:								
to PMU18 and PPMUs	2.9	4.3	7.2	260.4	390.6	651.0	60.0	1.07
to contracting industr	0.2	0.5	0.7	19.8	46.2	66.0	70.0	0.11
b. Rural road information	0.7	2.6	3.3	60.0	240.0	300.0	80.0	0.49
Subtotal	3.7	7.4	11.2	340.2	676.8	1017.0	66.5	1.67
Study								
a. Inv.strategy for rural	1.4	4.1	5.5	130.0	370.0	500.0	74.0	0.82
Subtotal	1.4	4.1	5.5	130.0	370.0	500.0	74.0	0.82
Total base cost	425.5	140.9	566.4	38682.3	12810.9	51493.3	24.9	84.56
Physical contingencies (10%	42.6	14.1	56.6	3868.2	1281.1	5149.3	24.9	8.46
Total	468.1	155.0	623.1	42550.6	14092.0	56642.6	24.9	93.02
Price contingencies								
Annual (%)								
Compounded (%)								
Amount	145.8	47.7	193.5	3208.0	1045.3	4253.2	24.6	6.98
Project Total	613.9	202.7	816.5	45758.5	15137.3	60895.8	24.9	100.00

Notes:

a. 1996 exchange rate: US$1.00 = Dong 11,000
b. All figures are rounded.

The Socialist Republic of Vietnam

Rural Roads Project

Outline Terms of Reference for Implementation Advisor

Background

1. The Government of Vietnam expects to receive a Credit from the International Development Association (IDA) to implement the Rural Roads Project in 15 provinces in the country over a period estimated to be from three to five years. The project has three components: (i) implementation of spot improvement program of about 5000 km of district roads and corresponding routine maintenance; (ii) institutional strengthening for implementing agencies at the central and provincial government and providing training to local contractors; and (iii) a study of issues related to rural transport.

2. The project would be managed at two levels: (i) central level in Hanoi under Project Implementation Division (PID) within PMU18, Ministry of Transport and Communication; and (ii) provincial level in provinces under the Provincial Project Management Unit (PPMU) under Provincial Department of Transportation (PDOTs). At the central level, PID which would compromise of about 10 high level staff, would be responsible for the overall management and coordination of project activities. At the provincial level, PPMUs would be responsible for the day-to-day operational activities for project implementation. Organization and staffing of PPMUs would be designed to adopt implementation needs and would vary from 5 to 10 high level staff.

Objectives

3. The objective of this Technical Assistance is to provide administrative and technical support to the implementing agencies at the central and provincial levels. Another objective is to transfer technology and know-how skills to local staff in order to build the capacity of MOT and PDOTs to efficiently manage and maintain the National Rural Roads Network.

Scope of Works

4. A project advisor would be stationed in PMU18 initially for three years, and would be extended to a maximum of five years if necessary. The advisor should have a civil engineering or transportation degree with at least 10 years experience of administrative and managerial responsibilities of roads, and preferably rural roads, institutions. It is preferable that the advisor has cultural experience in South East Asia. Scope of work of this advisor includes:

(a) provide support to the Project Manager in:

(i) general coordination including planning and budgeting activities;

(ii) engineering and technical aspects related project implementation;

(iii) project management including monitoring, evaluation and reporting;

(iv) financial management including preparation of disbursement plans and arranging annual audits;

(v) institutional strengthening focusing on training and interprovincial activities;

(vi) evaluation and revision of the Operational Manual; and

(vii) procuring Goods and Services.

5. General coordination including planning and budgeting activities. The advisor would provide direct support to the project manager in the overall management and coordination of project activities. The advisor would also advise the Project Manager in the improvement of planning methodology, economic analysis, traffic engineering, and poverty evaluation. More specifically, the advisor would:

(a) evaluate the distribution of funds criteria used during the preparation stage and recommend improvements;

(b) evaluate the eligibility criteria for roads selection in light of the data collected in the 11 provinces and the information collected during the first year program and recommend modifications;

(c) evaluate the ranking methodology used for roads selection during the first year program and recommend improvements.

6. Provide advise on engineering and technical aspects related to project implementation. The advisor would provide support to the project manager on the newly introduced technical approaches such as spot improvement and contracting procedures including pre-qualification, bidding, evaluation and awarding contracts. In addition, the Advisor would provide support to PPMUs to implement the project according the Operational Manual. In particular the advisor would:

(a) assist PPMUs to carry out the simplified engineering design for roads to be rehabilitated under the project according to the Technical Guidelines Manual; and

(b) advise the project manager on the need to change the Vietnamese bridge loading standards on rural roads to match current and future needs.

7. Assist Project Manager in Monitoring, Evaluation and Reporting. The advisor would provide direct support to the Project Manager in monitoring and evaluating project activities, and would support PID in the development and installation of the monitoring, evaluation and reporting system.

(a) draft TOR for Information Systems Specialist to develop a conceptual design for the computerized monitoring and evaluation system;

(b) draft TOR for local consultants selection to implement the monitoring and evaluation system and train PMU18 to operate the system;

(c) assist the Project Manager in project evaluation;

(d) assist the Project Manager in preparing the semi-annual progress reports to be submitted to IDA every six months;

(e) assist the project manager in preparing the Mid-Term review Report.

8. Financial management including preparation of disbursement plans, disbursement, and arranging annual audits. The advisor would assist the project manager in testing the financial and accounting procedures and the compliance with the World Bank documentation and disbursement requirements.

(a) assist PID to process, aggregate and update annual disbursement plans to be submitted to GDDI;

(b) assist PID in setting up procedures for payment processing;

(c) assist PID in preparing Statement of Expenditures for Special Account replenishment; and

(d) assist Project Manager to arrange for Annual audits.

9. Institutional Strengthening Focusing On Training And Interprovincial Activities. The project advisor would help to organize and manage training activities in project preparation, management, and monitoring and evaluation.

(a) assist the Project Manager to organize workshops, and seminars;

(b) draft TOR to recruit training specialists to conduct the seminars and workshops; and

(c) assist the Project Manager to organize study tours.

10. Evaluation And Revision Of The Operational Manual. In light of implementation lessons, the advisor would present recommendations to revise the Operational Manual. In particular, the advisor would:

(a) help PID to implement routine maintenance strategy, and to complete the missing part of the manual; and

(b) assist PID to update/complete both the Operational Procedure and the Technical Guidelines Manuals.

11. Procuring Goods and Services. Assist the Project Manager in procurement issues according to IDA guidelines and Government procedures as specified in the Credit Agreement.

(a) prepare TOR and bidding documents, seek prior approval of IDA for ICB contracts as specified in the Credit Agreement.

(b) assist project manager in procuring other items, in particular purchase of goods, and contracting routine maintenance.

(c) assist the project manager in seeking IDA's prior approval for the first three Civil Works contracts in each province.

12. In addition to the Project Advisor, the Consultant would supply on demand several qualified specialist of an estimated amount in total of 10 man-months. Training and Information Systems Specialists have been identified during project preparation. Other expertise would be identified during implementation. For each specialist, the Consultant would present TOR, Action Plan, and the corresponding CV to be approved by PMU18 and IDA. The advisor would also hire an equivalent of 80 man-months of local consultants in relevant areas as well as support staff and translators to assist him to undertake this assignment.

Annex 7

VIETNAM
Rural transportation Project

Typical Costs

I. Spot Improvement - Typical Bill of Quantities -

	Unit	Typical Volumes	Typical unit cost	Total US$	%
Earthworks					20
embankment	m3	800	2	1,600	
Drainage					25
pipe culvert	m	15	115	1,725	
concrete	m3	2	120	240	
Structure					17
bridge	m2	2.7	500	1,350	
Pavement					34
gravelling	m3	300	9	2,700	
Day works				385	5
Total US$/Km				8,000	100

II. Routine Maintenance Typical Cost

LENGTHMAN WORK:	Unit	Typical Volumes	Typical unit cost	Total US$	%
fees lengthman	month	6	40	240	66
hand tools	set	1	60	60	17
supervision	month	0.15	100	15	4
motorcycle	Km	600	0.08	48	13
output 2Km/year			total:	363	100
(cost Km/year)				182	
GANG WORK					
labour	month	33	30	990	33
Hand tools	set	10	39	390	13
supervision	month	0.75	100	75	2
motor cycle	Km	200	0.08	16	1
Hand compactor	H	120	1	120	4
gravel hauling	m3Km	6000	0.2	1200	40
truck	h	48	5	240	8
output 20 Km/year			total:	3031	100
Gang cost US$/Km/Year				152	
Lengthman cost plus gang cost : US$/Km/Year				333	
contingencies 20 %				67	
Routine Maintenance cost US$/Km/Year				400	

Annex 8

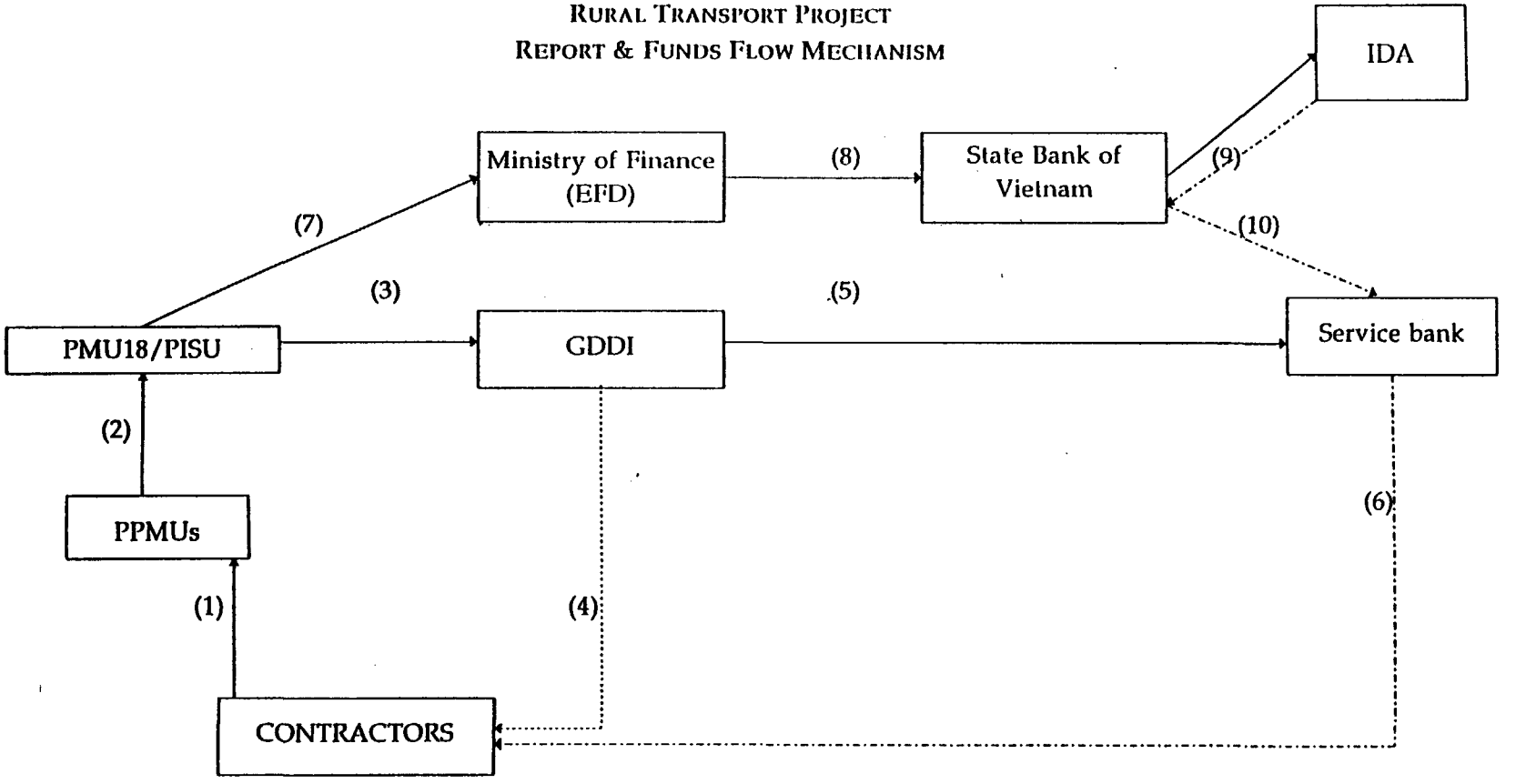
Socialist Republic of Vietnam
Rural Transport Project

Estimate Disbursement Schedule

IDA fiscal year and semester ending	Disbursement in semester	Cumulative		Disbursement Profiles %	
	US$ Million	US$ Million	%	Regional transport	Regional agriculture
1997					
December 31, 1996	3.5	3.5	6.4	3.0	3.0
June 30, 1997	0.5	4.0	7.3	10.0	6.0
1998					
December 31, 1997	2.5	6.5	11.8	14.0	14.0
June 30, 1998	3.5	10.0	18.2	26.0	22.0
1999					
December 31, 1998	6.0	16.0	29.1	38.0	30.0
June 30, 1999	8.0	24.0	43.6	46.0	42.0
2000					
December 31, 1999	9.0	33.0	60.0	58.0	50.0
June 30, 2000	7.0	40.0	72.7	70.0	58.0
2001					
December 31, 2000	5.5	45.5	82.7	78.0	66.0
June 30, 2001	5.5	51.0	92.7	86.0	74.0
2002					
December 31, 2001	4.0	55.0	100.0	94.0	82.0
June 30, 2002				98.0	90.0
2003					
December 31, 2002				100.0	96.0
June 30, 2003					100.0

Credit Closing: December 31, 2001

RURAL TRANSPORT PROJECT
REPORT & FUNDS FLOW MECHANISM



Report Flow ——————
Counterpart Fund Flow .....
IDA Fund Flow -.-.-.-.-.-.-

Drafted by: MOF
Dated: 23 August, 1996

VIETNAM- RURAL TRANSPORT PROJECT

SUPERVISION PLAN (BASED ON JULY, 1996 BOARD DATA)

Approximate Date	Activity	Duration (Weeks)	Skill Requirements	Staff Weeks
January, 1997	PLW	2	TM, RE, PS, EC	8
October, 1997	SPN	2	TM, RE, RR, IS	8
March, 1998	FYR	2	TM, RE, EC, IS	8
October, 1998	SPN	2	TM, RE	4
March, 1999	MTR	2	TM, RE, IS, EC	8
October, 1999	SPN	2	TM, RE	4
April, 2000	SPN	2	TM, RE	4
October, 2000	SPN	2	TM, RE	4
April, 2001	SPN	2	TM, RE	4
October, 2001	SPN	2	TM, RE	4
April, 2002	PCM	2	TM, RE, EC	6

Required Skills

TM	Task Manager
RE	Roads Engineer
PS	Procurement Specialist
RR	Resettlement Specialist
EC	Economist
IS	Implementation Specialist

Activity

PLW	Project Launch Workshop
SPN	Supervision
FYR	First Year Review
MTR	Mid-Term Review
PCM	Project Completion Mission

VN-Netwk.xls

SOCIALIST REPUBLIC OF VIET NAM
Rural Transport Project
Road Network Analysis
Road Network of the 15 Project Provinces

Region Province	(1993) GDP/capi ($)	Population (1993) million	Area Km2	Nation. Roads Km	Prov. Roads Km	Mapped** DR Km	Mapped** CR Km		TOTAL NETWORK Km	No.of Commune	No.of District
Hagiang	61.4	0.535	7,831	365	346	379	2524		3614	172	10
Lao Cai	64.2	0.552	8,049	475	186	240	2444		3345	172	10
Lai Chau	108.8	0.521	17,140	414	422	258	35	*	1129	151	9
Bac Thai	134.2	1.168	6,503	290	287	824	2347		3748	242	13
Vin Phu	113.8	2.249	4,836	243	412	1241	10770	*	12666	395	14
Thanh Hoa	107.7	3.382	11,168	395	828	2127	12004	*	15354	624	23
Nghe An	113.3	2.743	16,381	438	434	1598	9760	*	12230	383	18
Ha Tinh	92.5	1.309	6,054	300	281	833	4904	*	6318	262	10
Binh Thuan	93.6	0.882	7,992	175	282	461	2279		3197	142	6
Kon Tum	124.6	0.226	9,934	150	187	496	2702		3535	90	7
Dac Lac	112.4	1.211	19,800	467	648	793	1495	*	3403	197	17
Ben Tre	126.7	1.331	2,247	12	291	442	953		1698	154	8
Soc Trang	111.2	1.197	3,107	95	221	455	1905	*	2676	94	7
Tra Vinh	87.3	0.958	2,369	40	120	312	763		1235	75	8
Minh Hai	142.9	1.757	7,689	146	186	620	2801		3753	119	14
Proj.Tot	106.31	20.021	131,100	4,005	5,131	11,079	57,686		77,901	3,272	174
Country Tot	191.1	72.509	330,991	11,484	16,142	31,264	91,210		150,100	9,970	535
Proj/country (%)	55.63	27.61	39.61	34.87	31.79	35.44				32.82	32.52

Notes: 1. DR = District Roads, CR = Communal Roads
* Communal road data in these provinces are not reliable.
** mapped during preparation and quoted passable to home made (Cong Nong) truck.
Source: General Statistical Office, MOT/PMU18, and mission estimate

SOCIALIST REPUBLIC OF VIET NAM
Rural Transport Project
Road Network Analysis
Network Distribution and Population Density in the 15 Project Province

Region Province	------distribution of network %------- NR	PR	DR	CR	Urban popul 20 % ('000)	Rural popul ('000)	---Popul located on network---- NR	PR	DR	CR	Total popul
Hagiang	10.10	9.57	10.49	69.84	107.0	428.0	107	46	50	332	535
Lao Cai	14.20	5.56	7.17	73.06	110.4	441.6	110.4	29	37	376	552
Lai Chau	36.67	37.38	22.85	3.10	104.2	416.8	104.2	246	150	20	521
Bac Thai	7.74	7.66	21.99	62.62	233.6	934.4	233.6	78	223	634	1,168
Vin Phu	1.92	3.25	9.80	85.03	449.8	1,799.2	449.8	60	180	1,560	2,249
Thanh Hoa	2.57	5.39	13.85	78.18	676.4	2,705.6	676.4	150	385	2,171	3,382
Nghe An	3.58	3.55	13.07	79.80	548.6	2,194.4	548.6	81	297	1,816	2,743
Ha Tinh	4.75	4.45	13.18	77.62	261.8	1,047.2	261.8	49	145	853	1,309
Binh Thuan	5.47	8.82	14.42	71.29	176.4	705.6	176.4	66	108	532	882
Kon Tum	4.24	5.29	14.03	76.44	45.2	180.8	45.2	10	26	144	226
Dac Lac	13.72	19.04	23.30	43.93	242.2	968.8	242.2	214	262	493	1,211
Ben Tre	0.71	17.14	26.03	56.12	266.2	1,064.8	266.2	184	279	602	1,331
Soc Trang	3.55	8.26	17.00	71.19	239.4	957.6	239.4	82	169	707	1,197
Tra Vinh	3.24	9.72	25.26	61.78	191.6	766.4	191.6	77	200	489	958
Minh Hai	3.89	4.96	16.52	74.63	351.4	1,405.6	351.4	72	242	1,092	1,757
Proj.Tot	5.14	6.59	14.22	74.05	4,004.2	16,016.8	4004.2	1,112	2,401	12,503	20,021

SOCIALIST REPUBLIC OF VIET NAM
Rural Transport Project
Road Network Analysis
Characteristic of 1 Km of District Road

	Area of Influence per 1 Km											
	area of influence (km2)				Total Area	Areas (Km2)				population		
	NR	PR	DR	CR	Km2	Direct Km2	Indirect Km2	Total Km2	Comunal road	Direct #	Indirect #	Total #
Hagiang	0	834	913	6,084	7,831	2.41	16.05	18.46	0.32	132	877	1009
Lao Cai	0	522	673	6,854	8,049	2.80	28.56	31.36	0.30	154	1,567	1721
Lai Chau	0	10,116	6,185	839	17,140	23.97	3.25	27.22	not reli	583	79	662
Bac Thai	0	540	1,550	4,414	6,503	1.88	5.36	7.24	0.36	270	770	1040
Vin Phu	0	160	483	4,193	4,836	0.39	3.38	3.77	not reli	145	1,257	1402
Thanh Hoa	0	618	1,588	8,962	11,168	0.75	4.21	4.96	not reli	181	1,021	1202
Nghe An	0	603	2,220	13,558	16,381	1.39	8.48	9.87	not reli	186	1,137	1323
Ha Tinh	0	283	838	4,933	6,054	1.01	5.92	6.93	not reli	174	1,024	1198
Binh Thuan	0	746	1,219	6,027	7,992	2.64	13.07	15.72	0.29	233	1,154	1388
Kon Tum	0	549	1,456	7,930	9,934	2.93	15.99	18.92	0.27	53	291	344
Dac Lac	0	4,370	5,348	10,082	19,800	6.74	12.71	19.46	not reli	330	622	952
Ben Tre	0	388	589	1,270	2,247	1.33	2.87	4.21	0.42	632	1,362	1993
Soc Trang	0	266	548	2,293	3,107	1.20	5.04	6.24	not reli	371	1,553	1924
Tra Vinh	0	238	619	1,513	2,369	1.98	4.85	6.83	0.32	641	1,568	2210
Minh Hai	0	396	1,322	5,971	7,689	2.13	9.63	11.76	0.36	390	1,761	2150
tal Proj.	0	9,103	19,655	102,342	131,100	1.77	9.24	11.01	0.44	217	1,129	1345

SOCIALIST REPUBLIC OF VIET NAM
Rural Transport Project
Road Network Analysis
Characteristic of 1 Km of District Road (adjust for reliable date)

	-Area of Influence (Km2)-			-------population--------		
	Direct Km2	Indirect Km2	Total Km2	Direct Number	Indirect	Total
Hagiang	2.41	16.05	18.46	128	853	981
Lao Cai	2.80	28.56	31.36	149	1,519	1668
Lai Chau						
Bac Thai	1.88	5.36	7.24	258	735	993
Vin Phu						
Thanh Hoa						
Nghe An						
Ha Tinh						
Binh Thuan	2.64	13.07	15.72	227	1,124	1352
Kon Tum	2.93	15.99	18.92	59	322	381
Dac Lac						
Ben Tre	1.33	2.87	4.21	621	1,339	1960
Soc Trang						
Tra Vinh	1.98	4.85	6.83	629	1,537	2166
Minh Hai	2.13	9.63	11.76	381	1,722	2104
Average	2.27	12.05	14.31	307	1144	1450
Minimum	1.33	2.87	4.21	59	322	381
Maximum	2.93	28.56	31.36	629	1722	2166
Stand Dev	0.50	7.84	8.26	205	447	595
Average	Minh Hai	Binh Thuan	Binh Thuan	Minh Hai	Binh Thuan	Binh Thuan

SOCIALIST REPUBLIC OF VIET NAM
Rural Transport Project
Economic Cost Benefit Analysis

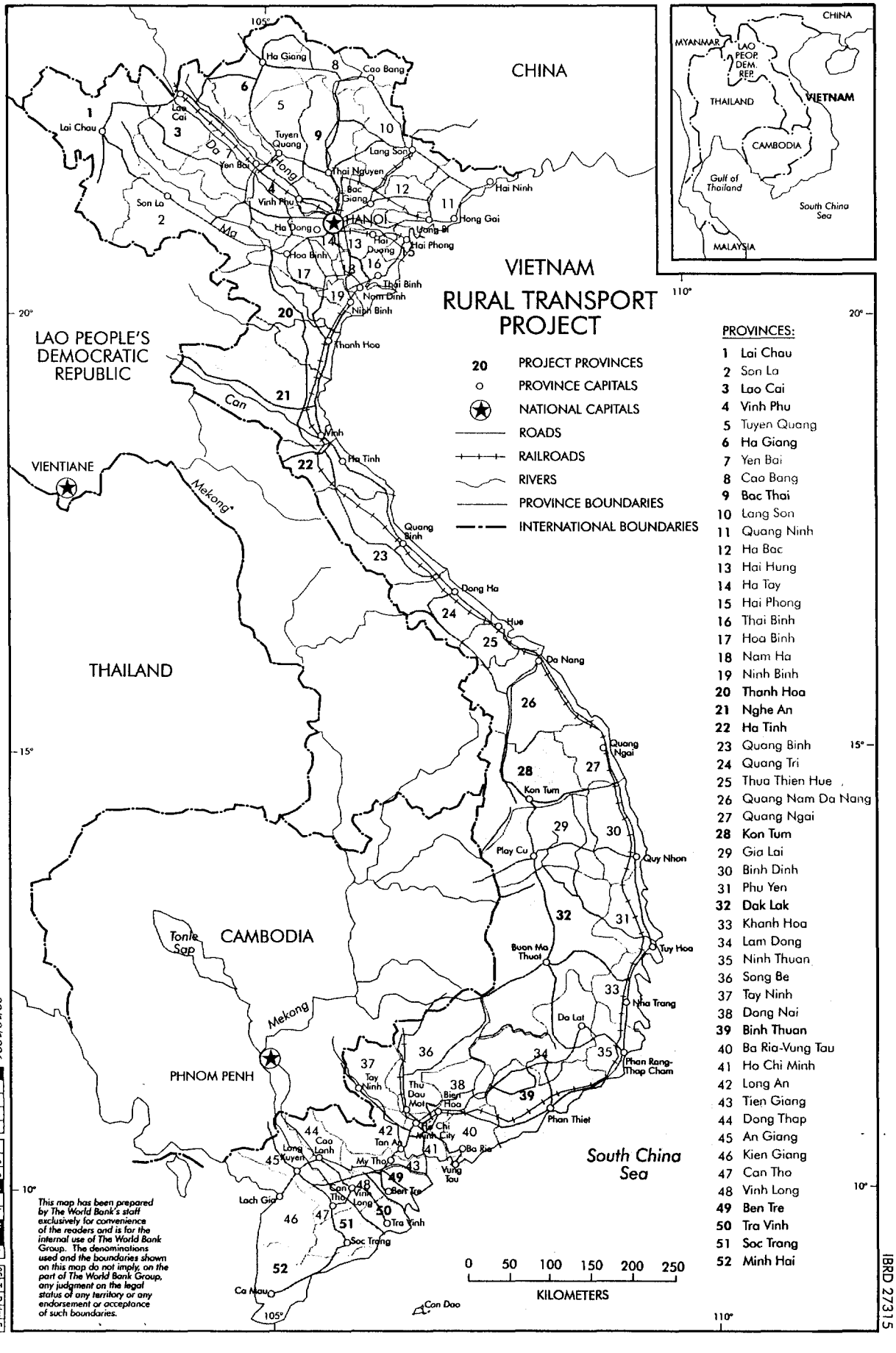
Base Case Senario for Spot Improvement of District Road

ssumption:		
Area of direct Influ	227	ha
proportion cultivabl	0.333	
Cultivated area	76	ha
yield	3.5	ton/ha
selling cost	0.2	US$/kg
Value of production	52967	US$
population	307	
production/capita	173	US$
Invest cost for spot	-7200	US$/km
routine maintenance	-137	US$/km

Benefits	Production increase (%)	US$/year
production increase		
year 1	0	0
year 2	0.01	530
year 3	0.02	1059
year 4	0.03	1589
year 5	0.04	2119
year6 t0 11	0.05	2648
reduction of loses	0.02	1059

Year	Base Case			cost increase to $15000/km			cost increase:$15000/km benefit reduce by 25%			cost increase: $20000/km		
	Cost	Benefits	Flow	Cost	Benefits	flow	Cost	Benefits	Flow	Cost	Benefits	flow
1	-7200	0	-7200	-15000	0	-15000	-15000	0	-15000	-20000	0	-20000
2	-137	1589	1452	-137	1589	1452	-137	1191.8	1,055	-137	1589	1452
3	-137	2119	1982	-137	2119	1982	-137	1589.0	1,452	-137	2119	1982
4	-137	2648	2511	-137	2648	2511	-137	1986.3	1,849	-137	2648	2511
5	-137	3178	3041	-137	3178	3041	-137	2383.5	2,247	-137	3178	3041
6	-137	3708	3571	-137	3708	3571	-137	2780.8	2,644	-137	3708	3571
7	-137	3708	3571	-137	3708	3571	-137	2780.8	2,644	-137	3708	3571
8	-137	3708	3571	-137	3708	3571	-137	2780.8	2,644	-137	3708	3571
9	-137	3708	3571	-137	3708	3571	-137	2780.8	2,644	-137	3708	3571
10	-137	3708	3571	-137	3708	3571	-137	2780.8	2,644	-137	3708	3571
11	-137	3708	3571	-137	3708	3571	-137	2780.8	2,644	-137	3708	3571
NPV (12 %)			7791			827			-2901			-3637
IRR			32.485			13.282			7.115			7.417

MAP SECTION


VIETNAM
RURAL TRANSPORT PROJECT
CHINA
LAO PEOPLE'S DEMOCRATIC REPUBLIC
THAILAND
CAMBODIA
VIENTIANE
PHNOM PENH
HANOI
Mekong
Da
Ma
Can
Tonle Sap
South China Sea
Gulf of Thailand
MYANMAR
LAO PEOP. DEM. REP.
THAILAND
VIETNAM
CAMBODIA
MALAYSIA
SOUTH CHINA SEA
20 PROJECT PROVINCES
PROVINCE CAPITALS
NATIONAL CAPITALS
ROADS
RAILROADS
RIVERS
PROVINCE BOUNDARIES
INTERNATIONAL BOUNDARIES
PROVINCES:
1 Lai Chau
2 Son La
3 Lao Cai
4 Vinh Phu
5 Tuyen Quang
6 Ha Giang
7 Yen Bai
8 Cao Bang
9 Bac Thai
10 Lang Son
11 Quang Ninh
12 Ha Bac
13 Hai Hung
14 Ha Tay
15 Hai Phong
16 Thai Binh
17 Hoa Binh
18 Nam Ha
19 Ninh Binh
20 Thanh Hoa
21 Nghe An
22 Ha Tinh
23 Quang Binh
24 Quang Tri
25 Thua Thien Hue
26 Quang Nam Da Nang
27 Quang Ngai
28 Kon Tum
29 Gia Lai
30 Binh Dinh
31 Phu Yen
32 Dak Lak
33 Khanh Hoa
34 Lam Dong
35 Ninh Thuan
36 Song Be
37 Tay Ninh
38 Dong Nai
39 Binh Thuan
40 Ba Ria-Vung Tau
41 Ho Chi Minh
42 Long An
43 Tien Giang
44 Dong Thap
45 An Giang
46 Kien Giang
47 Can Tho
48 Vinh Long
49 Ben Tre
50 Tra Vinh
51 Soc Trang
52 Minh Hai
0 50 100 150 200 250
KILOMETERS
105°
110°
20°
15°
10°
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