

ASIAN DEVELOPMENT BANK

IES:PHI 97039

Impact Evaluation Study Series (Number 50)

IMPACT EVALUATION STUDY

OF

BANK OPERATIONS IN THE ROAD SECTOR

IN THE

PHILIPPINES

December 1997

ABBREVIATIONS

AADT	-	Annual Average Daily Traffic
AC	-	Asphalt Concrete
ADT	-	Average Daily Traffic
AR	-	Appraisal Report
BOT	-	Build-Operate-and-Transfer
DBST	-	Double Bituminous Surface Treatment
DPWH	-	Department of Public Works and Highways
EIRR	-	Economic Internal Rate of Return
EMK	-	Equivalent Maintenance Kilometer
HDM-III	-	Highway Design and Maintenance Standards Model III
HDM-IV	-	Highway Design and Maintenance Standards Model IV
IES	-	Impact Evaluation Study
NTCP	-	Nationwide Traffic Counting Program
OD	-	Origin-Destination
OECF	-	Overseas Economic Cooperation Fund
PCC	-	Portland Cement Concrete
PCR	-	Project Completion Report
PMO	-	Project Management Office
PPAR	-	Project Performance Audit Report
PTSS	-	Philippine Transport Strategy Study
RES	-	Reevaluation Study
SAPS	-	Special Assistance for Project Sustainability
TA	-	Technical Assistance

NOTES

- (i) The fiscal year (FY) of the Government ends on 31 December.
- (ii) In this Report, "\$" refers to US dollars.

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EXECUTIVE SUMMARY

The road network is the most indispensable part of the Philippines' transportation system, accounting for over half of freight and nearly 90 percent of passenger traffic. It plays an important role in the Government's national goals and strategies for development. The Bank has provided assistance to the road sector since 1970. As of June 1997, 11 road projects (including one program) had been financed by 14 Bank loans totaling \$726.5 million. Six of these projects (including one program) have been postevaluated. The Impact Evaluation Study (IES) focuses on these five postevaluated projects (excluding the program loan) and a completed project that was self-evaluated by the operational department, but was not independently postevaluated by the Post-Evaluation Office. The six projects covered in the IES are Cotabato-General Santos Road, Iligan-Cagayan de Oro-Butuan Road, Tarlac-Santa Rosa and Feeder Roads, Mindanao Secondary and Feeder Roads, and the First and Second Road Improvement.

The IES road projects, which were designed to support the Philippines' National Development Plans during 1970-1980 and completed during 1978-1989, are in Luzon, Visayas, and Mindanao, reflecting the Bank's policy to spread its assistance evenly among the major regions of the country. The common objectives of these projects were to construct, rehabilitate, and upgrade existing national and feeder roads to facilitate commodity flows and accelerate the socioeconomic development of the respective regions.

The major objective of the IES is to review and assess the broader issues concerning the effectiveness, efficiency, relevance, and impact of Bank operations in the road sector in the Philippines, with reference to the six completed/postevaluated projects. The Study examines the physical conditions and traffic growth of the roads constructed or rehabilitated under Bank-financed projects, and determines their economic benefits and sustainability. In addition, the IES seeks to obtain insights into the institutional setting and policy environment as well as the factors affecting the effectiveness of Bank assistance with a view to drawing lessons of experience to improve the quality of future projects and strengthen the strategic content of Bank lending in the sector. Field surveys covering the six selected projects were carried out under a Bank-financed small-scale technical assistance to provide a database for the IES.

The IES found that the physical conditions of the roads under review vary widely. The project roads that were completed earlier during 1978-1982 (Cotabato-

General Santos Road, Iligan-Cagayan de Oro-Butuan Road, and Tarlac-Santa Rosa and Feeder Roads) were in fair to good conditions mainly because they were soundly constructed with rigid concrete pavements. With the exception of certain sections, the roads under the remaining three projects, which were completed during 1985-1989 (Mindanao Secondary and Feeder Roads, and the First and Second Road Improvement), were mostly in unsatisfactory conditions as a result of poor design and construction coupled with lack of maintenance. For the Mindanao Secondary and Feeder Roads Project, most of the roads deteriorated rapidly to their preproject conditions, requiring complete rehabilitation only a few years after their completion.

The traffic volumes were found to be generally less than the levels projected at appraisal for most of the roads studied. Only the sections of roads catering to tourists had traffic volumes exceeding appraisal projections. Analysis of the composition of traffic indicates that the shift from low- to high-capacity trucks had not taken place as expected. Neither was there evidence to suggest that the increase in traffic was directly related to increase in agricultural outputs. Because of slower-than-expected traffic growth and rapid pavement deterioration as a

result of poor construction and inadequate maintenance, the economic benefits of most IES roads measured in terms of vehicle operating cost savings would be lower than the appraisal projections. Consequently, most roads, with the exception of certain sections, are expected to yield economic internal rates of return (EIRRs) lower than the levels estimated at appraisal, completion, and postevaluation, and only three projects (Cotabato-General Santos Road, Iligan-Cagayan de Oro-Butuan Road, and Tarlac-Santa Rosa and Feeder Roads) would have EIRRs at the acceptable level of 10 percent or higher. Although the Bank road projects have not had considerable impact on agricultural development as expected, they have generated social benefits to the people in the road influence areas in terms of improved access to health facilities, educational opportunities, and convenience of traveling.

Not until the early 1990s did the Bank assistance accord importance to strengthening the institutional capacity in the road sector in the Philippines. The projects covered by the IES did not include any specific objectives or components to strengthen the Department of Public Works and Highways (DPWH), the core executive institution of the road sector, which was responsible for the implementation of these projects. The indirect benefits received from DPWH staff were in the form of improved technical and managerial capabilities obtained through the transfer of knowledge from the international consultants/contractors engaged to assist DPWH in project implementation.

The IES confirmed the generally successful rating for three of six projects: Cotabato-General Santos Road, Iligan-Cagayan de Oro-Butuan Road, and Tarlac-Santa Rosa and Feeder Roads. For the Mindanao Secondary and Feeder Roads Project, no improvements were found on the conditions of the feeder roads and the levels of traffic since postevaluation. This project remains unsuccessful. For the First and Second Road Improvement Projects, certain sections have generated reasonably high EIRRs while

some sections are expected to yield negative EIRRs. In view of their performance, these two projects are rated as partly successful. Overall, the effectiveness of Bank road projects in the Philippines could have been further improved.

The IES examined a number of important issues relevant to the road sector in the Philippines. First, road design standards should be selected on the basis of minimum road life cycle costs, taking into account the construction, maintenance, and road user costs. The high pavement costs could be avoided if the problems in controlling axle loads to reduce road maintenance requirements could be resolved. Second, the effect of inadequate road maintenance and its associated costs on the returns on investment projects needs to be addressed. Maintenance of provincial roads requires greater attention in light of the recent decentralization policies implemented by the Government. Third, the IES highlights the importance of prioritization and planning of road expenditures, including institutional reforms to ensure that road sector fiscal revenues are used to cover more adequately the Government's total capital and recurrent expenditures on roads. The funding community can play a key role in encouraging and assisting the Government in implementing the necessary institutional and financial reforms for the road sector.

From its findings, the IES made recommendations for consideration by the Government and the Bank. It is important that the Government combine a major institutional reform with a reform of road financing based on a fair allocation of funds to the sector and that management of roads be subjected to commercial disciplines. In addition, the current system

of road maintenance, the equivalent maintenance kilometer system, should be replaced because it places excessive emphasis on regional equity considerations. The Government should adopt and institutionalize a totally new maintenance, planning, and budgeting system based on economic considerations. For its part, the Bank should collaborate with other major funding agencies to place high priority on the development and maintenance of a rigorous road information and maintenance system capable of prioritizing road investment and maintenance expenditures on the basis of engineering and life cycle analysis. DPWH's proven capability in implementing a road maintenance program should be a condition for the Bank's future lending for road improvement projects.

I. INTRODUCTION

1. The Philippines is an archipelagic country of about 300,000 square kilometers with a population of 70.3 million (1996). Within this land space, a few major islands account for most of the country's population centers and economic activity. Transport in this geographic setting is mainly intransland land transport complemented by interisland shipping and air links. The Philippine roads and highways form a relatively dense network of approximately 161,000 kilometers (km) of which about 26,600 km form national roads, 29,200 km provincial roads, 16,800 km city and municipal roads, and 88,400 km barangay (village) roads.
2. The Bank's involvement in the road sector in the Philippines was initiated in 1970. As of June 1997, the Bank had approved 14 loans amounting to \$726.5 million for 11 projects (including one program loan) and one study. This was supplemented by a total of \$8.3 million for 17 technical assistance (TA) projects (Appendix 1). Eight of the Bank-assisted projects have been completed and six of them postevaluated.¹ Of the six postevaluated projects (including one program loan), four were generally successful, one partly successful, and one unsuccessful (details in para. 19).

II. BACKGROUND

A. Impact Evaluation Study Objectives, Approach, and Methodology

3. The Impact Evaluation Study (IES) aims to (i) take stock of the Bank operations in the road sector and their role in promoting modernization of land transport in the Philippines; and (ii) examine the institutional setting and policy environment, and enquire into the factors that have affected the effectiveness of Bank lending at the project and institutional levels. The results IES will provide guidance for future design of road projects and programs and strengthen the strategic content of Bank lending in the Philippines.
4. To generate for the IES a database that could be compared with the data provided in Bank appraisal and postevaluation documents, field surveys funded by small-scale TA2 were conducted for six projects where roadworks had been

1 Of the six, one was reevaluated in February 1991 (IE-14:A *Reevaluation Study of the Road Improvement Project in the Philippines*).

2 TA No. 2317-PHI: *Impact Evaluation Study of Bank Assistance in the Roads Sector*, for \$100,000, approved on 3 April 1995.

completed for a sufficient length of time. These road projects are located in the islands of Mindanao, Luzon, Palawan, Panay, Marinduque, and Masbate. The surveys included inspection for surface condition, roadside traffic counts measured in terms of annual average daily traffic (AADT) on 14 road sections by volume and vehicle type with origin-destination surveys, reestimates of vehicle operating costs, vehicle time, and cost savings. The models used for reestimating the vehicle operating cost in the IES generally followed those adopted by the Bank for the appraisal of road projects. These reestimates formed the basis for the revision of project benefits (road users' consumer surplus), and recomputation of economic internal rate of return (EIRR).

5. In addition to the results of the surveys, a more broad-based assessment of achievements and impacts was obtained through a review of appraisal reports (ARs), project completion reports (PCRs), project performance audit reports (PPARs), sector reviews and studies of the Bank and the World Bank, and a number of Philippine publications. An Impact Evaluation Mission undertaken by Bank staff with the support of a transport economist/consultant in October 1995 gained important insights into the main issues, particularly the existing institutional framework and implementing policies affecting the Philippine road sector. The IES synthesizes the outcome of consultations and discussions with a number of government agencies, bilateral and multilateral aid organizations, private sector construction companies, and concerned Bank staff.

B. Overview of the Road Sector in the Philippines

1. General

6. Road transport is the dominant mode for the movement of both people and goods, accounting for just over half of freight and nearly 90 percent of passenger traffic. Road transport is particularly dominant in intransland movements. The second most important transport mode is interisland shipping services, accounting for about 47 percent of freight traffic and 9 percent of total passenger volume. Air transport's main importance is in moving longer distance interisland passenger traffic. Rail transport is confined to a single corridor in Luzon and carries even less passenger and goods traffic than air transport.
7. Being the primary mode of transportation, roads play a significant role in the attainment of the national goals and strategies for development. Government road programs have been used as a major vehicle to promote development since the early 1970s. This is reflected in the statements of development objectives included in all the development plans prepared (usually over a three-to-five year horizon) since 1972. Altogether the Bank-financed projects (including one program loan) in the road

sector were designed in support of the development of the road network in several national plans (Appendix 2).

8. Because of their economic importance, road infrastructure programs represent the largest item of capital expenditure in the national budget. In the 1993-1998 Medium-Term Philippine Development Plan, road infrastructure is expected to absorb 22 percent of planned Government spending on all infrastructure and 72 percent of its planned expenditure on transport infrastructure.

2. The Road Network

9. The Philippine public road network has grown from 61,000 km in 1970 to 161,000 km, of which 16 percent is paved and just under 60 percent is considered to be of all-weather standard. The percentage of paved roads has remained practically constant since 1970 although the network has grown by more than 100 percent. The network is classified into national, provincial, city and municipal, and barangay roads for administrative and budget purposes as well as, since 1989, into arterial and other roads; the latter comprise some 12,700 km of "strategic" roads. Road condition is not reliably documented. For arterial roads, a partial survey has shown 7 percent to be in good condition, 46 percent in fair, and 9 percent in bad condition while 38 percent were described as "trails." Unique to the Philippines, a major part of paved roads has a concrete cover although evidence from other Southeast Asian countries suggests that alternative pavements can be physically competitive and much less costly. Reflecting resource and capacity constraints, the network has expanded by more than 100 percent since 1970. In overall terms, this is adequate to accommodate the present densities of population and operating vehicles (except in the Manila conurbation where road space is inadequate) and shows that the problem of interurban road infrastructure in the Philippines is one of quality rather than quantity because a large percentage of the roads are unpaved (Appendix 3).

10. The road network caters to about 2.3 million motor vehicles in the country, including 0.6 million motorcycles and tricycles. It also supports the road transport industry comprising about 1,800 registered trucking companies, about 900 bus companies, and a large number of jeepney companies, cooperatives, and owner operators owning a fleet of more than 130,000 vehicles.

3. Road Administration

11. Core executive institutions of the road sector are the Department of Public Works and Highways (DPWH) for infrastructure, and Department of

Transportation and Communications for transport and its regulation.³ DPWH has elaborate formal systems and procedures for organization, planning, design and construction, and maintenance of roads. DPWH's formal programs originate in proposals by its field organization and local development councils, which are processed by the National Economic and Development Authority into regional and national plans and subjected to detailed scrutiny by the legislature. Presently, DPWH's medium-term programs cover a six-year period subject to annual review based on reprioritized projects and budget allocations. A major deficiency in the planning process of DPWH, however, is that it is not based on a rigorous analysis of overall network needs, and priorities are not always determined purely by technical assessments and economic analysis. In reality, the planning process is also influenced by politics, which has a significant impact on funding allocation and selection of projects. This is a broad issue that needs to be addressed through promotion of good governance at all levels.

4. Expenditure and Revenue

12. Funding of road expenditure presents massive and complex problems. Levels of public spending are inadequate by the standard of Philippine per capita income and system requirements. Fiscal allocations are based on socioeconomic, demographic, and political factors rather than economic considerations of system building. Overall funding of road expenditure is also heavily incongruous, with only a fraction of expenditure covered by tax revenue, leaving road expenditure funding essentially to the various foreign assistance programs. The share of foreign-assisted funding, largely through borrowings, has increased over time and accounted for 84-89 percent of total expenditure over the period 1992-1994 (Appendix 4). This contrasts with the road sector fiscal revenue, which is consistently in excess of total spending. Since 1983, the share of the revenues from road transport, which is spent in the road sector, has declined gradually to 11-16 percent during the period 1992-1994 (Appendix 4). This implies that (i) a large part of revenues from road transport is being applied to interbudgetary transfers of the national Government; and (ii) foreign assistance provides a major and indirect current budget support in the road sector, thus discouraging the work to promote the growth of a domestic revenue base commensurate with greater domestic self-reliance in the road subsector and accountability to the public.

3 Both are large, well-established line agencies with cabinet representation. DPWH planning and implementing functions are decentralized with a nationwide network of regional and district offices, while the Department of Transport and Communications as a regulating agency operates essentially from the center through a host of affiliated agencies. DPWH's mandate gives the agency near-autonomy subject to the need to share policy-making functions with the Department of Finance, the Department of Budget Management, National Economic and Development Authority, and the Office of the President under the Government committee system. Since 1991, DPWH has turned over responsibilities for certain provincial and barangay roads to local government units under the supervision of the Department of Interior and Local Government. The major influence over all aspects of operations (fund use) and programming is exercised by both Houses of Congress.

5. Road Maintenance

13. Under the present institutional setup, national roads are maintained by the district engineer's offices of the DPWH under the supervision of regional offices; province-funded roads and bridges by the provincial engineer's office, municipal roads by the respective engineering services of the municipalities, and the barangay roads by the local barangays.⁴ Routine maintenance funds are allocated by DPWH to its regional offices based on equivalent maintenance kilometer (EMK) system, which places excessive emphasis on regional equity consideration. For preventive or periodic maintenance, an annual lumpsum is provided, but the amount is inadequate to preserve road infrastructure.
14. The maintenance management system currently in use is ineffective. The EMK system does not take actual road conditions into account in determining funding allocations. Proper maintenance has not been undertaken in a timely manner. Little attention is being given to periodic maintenance of the roads still in good condition since most of the available funds are utilized to meet the most urgent repair needs of badly deteriorated roads. The deferment of periodic maintenance on these relatively good roads has led to pavement deterioration beyond the capacity of routine maintenance.

C. External Assistance

15. The funding community contributed significantly in the development of the road sector. The contributions are in the form of assistance for specific road construction, reconstruction and rehabilitation projects, project-related TA, and nonproject-specific TA addressing road policy issues, planning, training, institutional, and other relevant concerns. Major sources of assistance to the road sector in the Philippines are Japan's Overseas Economic Cooperation Fund (OECF), World Bank, the Bank, United States, and Australia. Details of foreign assistance to total National Government expenditure on road infrastructure since 1984 are in Appendix 5.
16. The map (page vi) gives a regional overview of the externally assisted road projects and shows the concentration level of external assistance of each funding agency. The main focus of external assistance has been on the national road network, although there have also been significant initiatives directed at minor provincial and barangay roads. The Bank's assistance for national roads has concentrated mostly in Mindanao and the Visayas, while that of the World Bank has been nationwide. The assistance from OECF has centered on the strategic north-south axis linking Luzon, Samar, Leyte, and Mindanao as well as road improvements and traffic management in Metro Manila. The United States Agency for International

4 Prior to 1991 maintenance of barangay roads is under the jurisdiction of DPWH.

Development on the other hand, has devoted a greater proportion of its efforts to rural and farm-to-market roads. The details of foreign assistance by each funding agency are in Appendix 5.

17. A review of the documentation of the experiences of the main sources in making loans to the Philippine road sector indicates a number of shared objectives. All funding sources assumed that their investment in road improvement and rehabilitation would result in the reduction of road transport costs and thereby contribute to economic efficiency and growth. Increasing the road project and network management capacity of the National Government and, to a lesser extent, local government institutions responsible for highway administration was also an important shared objective. An underlying assumption was that this would lead over time to a reduced dependence on foreign loans and TA by DPWH in particular. Complementary policy objectives advocated notably by the Bank and the World Bank included (i) reducing the excessive pavement damage costs caused by overloaded heavy vehicles by encouraging an increase in maximum permitted axle loading and improved enforcement of the legal axle load limits; (ii) encouraging deregulation of the road transport industry to make it more responsive to market demands; and (iii) increasing the potential resources available for road improvement and maintenance by encouraging rationalization of the structure of road user charges to reflect the real road use costs for which different categories of vehicles and road users are responsible.

III. OBJECTIVES AND IMPLEMENTATION PERFORMANCE OF THE PROJECTS COVERED BY THE STUDY

18. Since 1970 the Bank has provided 13 loans for 10 projects amounting to \$626.5 million for improvement of about 4,000 km of national roads and about 1,500 km of rural roads, as well as 1 program loan amounting to \$100 million for improving the policy environment in the sector. The Bank-assisted projects represent about 15 percent of the total national roads and less than 2 percent of total rural roads. Eight Bank-assisted projects (including one program loan) have been completed and three are under implementation. In addition to the improvement or rehabilitation of existing roads, the Bank also made a contribution in the policy environment and in financing about five TA studies designed to assist in road transport policy formation and more efficient management of the road network.
19. Of the eight completed Bank-financed road projects (including one program), six are covered in the Study. These are the road projects that have been

completed and operating for a sufficient length of time to show discernible impact. The projects are the following:⁵

- (i) Loan No. 56-PHI: Cotabato-General Santos Road (approved in 1970, completed in 1978, postevaluated in 1980, rated as generally successful);
 - (ii) Loan No. 106-PHI: Iligan-Cagayan de Oro-Butuan Road (approved in 1972, completed in 1982, postevaluated in 1984, rated as generally successful);
 - (iii) Loan No. 136-PHI: Tarlac-La Paz-Santa Rosa and Feeder Roads (approved in 1973, completed in 1979, postevaluated in 1982, rated as generally successful);
 - (iv) Loan No. 379-PHI: Mindanao Secondary and Feeder Roads⁶ (approved in 1978, completed in 1988, postevaluated in 1992, rated as unsuccessful);
 - (v) Loan No. 308-PHI: First Road Improvement Project (Tagaytay-Palico-Batangas Road); (Olongapo-Subic-Infanta-Bugallon Road) (approved in 1977, completed in 1987, postevaluated in 1987, reevaluated in 1991, rated as generally successful at postevaluation and reevaluation); and
 - (vi) Loan No. 477-PHI: Second Road Improvement Project (Iloilo-San Jose Road); (Kalibo-Nabas Road); (Puerto Princesa-Narra-Brooke's Point Road) (approved in 1980, completed in 1989, not selected for postevaluation, PCR was prepared in 1990, no rating was given).
20. Twelve Bank projects contain various kinds of roadworks for an estimated length of 3,000 km costing \$133 million.⁷ None of the road components in these projects are covered in the IES.

A. Project Selection and Objectives

21. With the exception of the Mindanao Secondary and Feeder Roads, all IES projects had originally been identified and prioritized through major (non-Bank)

⁵ The IES does not cover the Road and Road Transport Sector Program (Loan Nos. 1046-PHI[Sf]/1047-PHI), which was postevaluated in 1995 and rated as partly successful. However, the status of reforms implemented under the Program was reviewed in the context of the discussion on institutional aspects covered in the IES.

⁶ Preceded by a loan, Loan No. 227-PHI: *Mindanao Secondary and Feeder Roads*, for \$500,000, approved on 14 August 1975, for conducting a feasibility study.

⁷ Loan Nos. 126-PHI, 134-PHI, 529-PHI(SF), 802-PHI(SF), 915-PHI(SF), 946-PHI(SF), 999-PHI(SF), 1033-PHI(SF), 1053-PHI(SF), 1136-PHI(SF), 1163-PHI(SF), and 1332-PHI(SF).

sector studies.⁸ All IES projects had been included for implementation under the Philippine's National Development Plans during 1970-1980 (Appendix 2). Except for the Cotabato-General Santos Road, all IES projects benefited from Bank project preparatory TA studies.

22. The main objectives of all road projects covered by the IES were to accelerate the socioeconomic development of the respective regions through provision of an all-weather road network and establish an efficient road transport system to reduce transport costs and facilitate interregional commodity flows. These could be achieved through reconstruction, improvement, and rehabilitation of national roads and feeder roads of about 2,208 km in Luzon (1,151 km) and Mindanao (1,057 km), and provision of consulting services for construction supervision. With the exception of the Mindanao Secondary and Feeder Roads, all the IES projects were completed with no major changes in scope. The details of the objectives and the major components of the six IES projects are in Appendix 6.

B. Implementation Performance

23. Implementation of practically all IES projects involved massive delays and cost overruns reflecting the generic problems of Philippine road subsector institutions and contractors. Deviations from the appraisal estimates occurred (Table 1).

Table 1: Time and Cost Overruns of Road Projects

Project	Time Overrun (%)	Cost Overrun (%) ^a
Cotabato-General Santos Road	125	130 (158)
Iligan-Cagayan-Butuan Road	96	187 (171)
Tarlac-Santa Rosa and Feeder Roads	92	148 (143)
Mindanao Secondary and Feeder Roads	173	5 (na)
First Road Improvement	99	17 (43)
Second Road Improvement	122	10 (187)

na = not available.

^a \$ basis; P basis in parentheses.

24. An internal review of Philippine road projects in 1995 traced the engineering and operational causes of implementation delays including early deterioration of completed projects.⁹ For the IES group of projects, this review

8 Cotabato-General Santos Road by the United Nations Development Programme-sponsored National Transportation Planning Project and the others by the World Bank-supported Philippine Transport Survey of 1968/1969 were subsequently updated.

9 Transport and Communications Division, East (IETC) "Review of Bank-Financed Road Projects in the Philippines," ADB, Manila, 1995. The IETC Review presents an agenda for Bank consideration to improve

reaffirmed the findings of Bank PCR/PPAR that the leading causes of implementation delays were (i) the poor performance of local contractors and the frequent need for retendering after forfeiture of contracts (in five IES projects, civil works contracts were abandoned),¹⁰ (ii) delayed recruitment of consultants, (iii) variation orders due to revisions in design, and (iv) delays in acquisition of right-of-way. Construction delays, in turn, together with unrealistic appraisal estimates caused cost escalation. Although these appear as distinct factors, the common key denominator is the stagnation of DPWH project management capabilities at a low level due to failure by the Government and foreign sources to set in motion a process of reform of DPWH systems and procedures. A more detailed description of the implementation performance, and time and cost overruns experienced by these projects is in Appendix 6. Large time and cost overruns of practically all Bank road projects retarded the flow of project benefits by over four years on average. These have displaced impacts by as much as a full development plan period and caused implicitly secondary costs as a result of delays in other investments that were expected to complement the roads.

IV. IMPACTS OF THE BANK'S OPERATIONS

A. State of Projects in the Impact Evaluation Study

25. Field inspections showed that the physical conditions of IES projects vary widely. The Cotabato-General Santos, Iligan-Cagayan de Oro-Butuan, Tarlac-Santa Rosa roads that at IES had been in operation for 17-18 years were generally in good to fair condition due to sound construction. They had rigid concrete pavements although the shoulders and drainage are not maintained. Unless remedied, however, lack of maintenance will shorten the remaining life of the roads or call for early rehabilitation. The condition of the various roads in Luzon built and improved to an asphalt concrete standard under the First Road Improvement Project (in operation for 11-13 years) was also generally good to fair. On the Olongapo-Bugallon section of the Zambales coastal road, conditions were described as fair since much damage was inflicted by lahar flows after the Pinatubo eruption and maintenance has been poor. The Tagaytay-Batangas portion was in good to fair condition, except for the Palico-Batangas section (fair-poor), where regular overloading of trucks caused pavement failure. The 196-km minor roads, linking with the two main roads and improved under the project (including six access roads for satellite cities in the Metro Manila region), are in varying conditions ranging from poor to good.

the quality of its future road projects. It focuses on design standards, procurement, tendering, construction supervision, and procedures as these are links in the chain of causation over which Bank policy dialogue at the project level can exert influence. The Review sheds new light on factors that directly caused time and cost escalation and quality lags in civil works from the perspective of the road engineer and administrator.

10 The IES consultants have traced contract failures to the then existing DPWH system of prequalification.

26. Roads included in the Mindanao Secondary and Feeder Roads package (secondary link between General Santos and Malisbong, 450 km of feeder roads in various areas of northern and southern Mindanao) were constructed to a gravel standard, and most have returned to preproject condition not long after completion. The General Santos-Malisbong road has since been rehabilitated by the United States Agency for International Development. The failure of this road was caused primarily by the lack of capability of the provincial government concerned in road maintenance.
27. The Second Road Improvement Project upgraded national roads in Palawan and Panay as well as in Masbate, Marinduque, and Romblon to asphalt concrete standard. Only the first two were inspected for the IES and are reported to be in highly variable condition. The Panay road (now between 6 and 11 years old) has deteriorated in the mountainous sections on the Iloilo-San Jose portion while the Kalibo-Nabas section has deteriorated more widely and pavement failure is widespread. The Palawan road from Puerto Princesa to Brooke's Point (after six years of operation) is generally in poor condition, with significant portions of the asphalt cover gone; many stretches have been badly repaired. Base failures due to poor construction and lack of drainage appear to be major causes; in one area, the road has been completely destroyed by heavy trucks from a nearby quarry.
28. Overall, the IES has assessed 39 percent of surveyed road sections to be in good to fair condition, 30 percent in fair (satisfactory) condition, and 30 in poor or failed condition. Poor design and construction coupled with lack of maintenance have shortened both the service life of and benefit streams from IES roads compared with appraisal assumptions. The detailed description of the physical state of IES projects is in Appendix 7. The IES findings confirm those of the 1995 IETC Review, which concluded that

"... assessments of the performance of Bank-assisted roads... and their condition ... show that the first four loan projects, including the First Road Improvement Project, produced well engineered, durable roads. The subsequent loan projects, Second, Third, and Fourth Road Improvement Projects, have produced roads which have performed poorly to very badly, some of them failing before the end of the maintenance period. The unsatisfactory performance appears to be due to bad workmanship and substandard materials, in particular base course, condoned by poor or, in some cases, dishonest supervision. A secondary cause is inadequate drainage or embankment height, due either to poor design or not following the design and compounded by an almost total lack of routine maintenance ..."

B. Traffic Growth

29. Road utilization is the main determinant of benefits that is used for assessing the economic viability of investments in road construction and rehabilitation. To provide database for the IES, traffic surveys were carried out on 14 sections of 6 of the roads that had been improved with Bank assistance since the

early 1970s (details of the survey methodology are in Appendix 8). Both traffic volume counts and roadside origin-destination surveys were undertaken. The survey locations were similar to those on which the original traffic estimates of the appraisal were based. The IES traffic surveys were undertaken in September 1995 over a period of three days, 12 hours per day, at each survey location. The data gathered were converted to AADT basis using DPWH hourly, daily, and seasonal variation factors. The results of the IES traffic reestimations on surveyed roads indicated that of the 14 test sections, AADT was much below the appraisal prediction in 9 sections, exceeded the projected level in 3 sections, and approximated projections in the remaining 2 sections (Appendix 8, Table 2). The peace and order situation and the economic downturn of the country during the second half of 1980s and the early 1990s contributed to slower-than-expected traffic growth.

30. On the Cotabato-General Santos Road, traffic counts fell short of appraisal estimates; only between Marbel (Kalawag) and General Santos was traffic anywhere near the projections. Similarly, for the Iligan-Cagayan-Butuan Road, only a fraction of appraisal estimates was achieved: actual traffic was 38 percent of projections between Iligan and Cagayan and 10-22 percent on the remaining section. On the Tarlac-Santa Rosa Road generally, less than half of the expected traffic volume materialized. There are indications that the base year estimates at appraisal may have been overstated. For the Mindanao Secondary and Feeder Roads, no reestimates could be made, but due to the condition of the roads, incremental traffic would be negligible. Projections have been dramatically exceeded by the rapid growth of tourist traffic on the Tagaytay-Palico section of the First Road Improvement Project, which was not foreseen at appraisal. For two other test sections on this road, actual traffic fell short (Palico-Calaca) or approximated (Calaca-Batangas) the original appraisal estimates. No census was taken for the Palawan Road, but road utilization is known to be disappointing. For the two census sections of the Second Road Improvement Project, the original estimates were actually approximated (Iloilo-San Jose) or substantially exceeded (Kalibo-Nabas) due to Boracay tourism.
31. Traffic counts by type of vehicles show that the AR's future heavy vehicle traffic (trucks and buses) were severely overestimated at the time of appraisal. Only on 3 of 12 test sections were projections realized or exceeded: these are the Marbel-General Santos, Tagaytay-Palico, and Calaca-Batangas. Gross overloading of vehicles was found to be common.
32. The general findings of the traffic surveys are as follows: (i) appraisal forecasts for vehicular traffic were consistently higher than actual traffic; (ii) it was expected that on completion of the roads, there would be a shift from low- to high-capacity trucks; this did not occur; (iii) appraisal traffic projections were calculated by relating traffic growth to future real income, population, and the travel demand elasticity factor; this formula was not applicable to the road projects; (iv) the increase in vehicular traffic is not directly related to the increase in agricultural output because increased accessibility is more evident in a rise in per person trips than in goods or

commodity trips; this is contrary to the assumption that roads would have a considerable impact on the development and improvement in the agricultural zones of influence; (v) in the majority of surveyed roads, cars comprised the major portion of total traffic as well as incremental traffic; (vi) there was no significant change in truck traffic; and (vii) roads with the most consistent traffic growth were those catering to tourist traffic.

C. Economic Benefits and Reestimation of Rates of Return

33. The main economic benefits that are generally expected to result from the road improvement and rehabilitation projects (most of the Bank-financed projects fall into this category) are direct benefits to road users in the form of savings in road user costs.

34. The analyses of economic benefits in the ARs of the road projects covered by this IES were based on the use of vehicle operating cost models now generally considered out of date. These models assumed that vehicle operating cost reduction on roads with modest traffic levels can account for 60-90 percent of total road benefits over a road's functional life. The main deficiency of these older models is that they do not take sufficient account of road condition and pavement deterioration aspects because they had been originally developed to analyze road capacity rather than pavement deterioration problems. These models simply assumed that the pavement conditions under the with- and without-project situations would remain constant over the life of a road. This could overstate the benefits in cases where improved roads have suffered significant subsequent deterioration.

35. More modern models in use in developing countries such as the vehicle operating cost submodel of the World Bank's Highway Design and Maintenance Standards Model (HDM-III)¹¹ incorporate a much more formalized relationship between road geometry and surface roughness on one hand and vehicle operating speed and costs on the other. However, these models only came into general use after the mid-1980s, and after the road projects covered by this IES were appraised using the World Bank's HDM-III models.

36. The benefits considered in this IES were quantified in the form of vehicle operating cost savings in line with the procedures applied in the ARs, PCRs, and PPARs. However, some modifications in vehicle cost analysis were made by taking into account the effect of premature deterioration due to poor implementation and inadequate maintenance. Where conditions were unfavorable, vehicle operating cost remained high and consequent savings marginal. The estimations of vehicle

11 The Bank is now actively involved in assisting in the development of HDM-IV, the successor to HDM-III.

operating cost for the different types of vehicles and road conditions are in Table 1, Appendix 9.

37. The economic analyses for the IES took account of the following factors: (i) real cost increases during implementation, which were reliably assessed in the PPARs; (ii) different traffic growth experience compared with the initial forecasts; and (iii) the effects of premature deterioration of certain road projects. The savings associated with reduced travel time were not taken into account as the opportunity cost of such time is not considered significant in the social context of rural Philippines. The results (Table 2) indicate that with the exception of the Tagaytay-Batangas section of the First Road Improvement Project, the EIRRs for the IES projects are expected to decline from the levels estimated in the ARs and reestimated in the PCRs and PPARs. This is because the volumes of traffic on these roads have not subsequently risen to levels earlier projected. In addition, the deteriorating conditions of these roads as a result of inadequate maintenance have also reduced vehicle operating cost savings from the original levels. Of the Bank projects surveyed under the IES, the Mindanao Secondary and Feeder Roads Project, and the First and Second Road Improvement Projects have not fully met Bank standards for satisfactory economic performance. Investments in these projects have either been premature or have failed notwithstanding the fact that individual sections (Tagaytay-Batangas [First Road Improvement Project], Iloilo-San Jose [Second Road Improvement Project]) may show acceptable or superior results. The outcomes reflect rather unfavorably on the Bank's lending to the Philippines' road subsector as a whole, as only three of six projects (Cotabato-General Santos, Iligan-Cagayan de Oro-Butuan, and Tarlac-Santa Rosa) yield adequate EIRRs on capital. The details of the methodology and the assumptions used in the recalculation of the EIRRs are in Appendix 9.

Table 2: EIRR for Selected Projects

Project	AR	PPAR/RES	IES
Cotabato-General Santos Road	21.7	27.4	13.7
Iligan-Cagayan de Oro-Butuan Road	23.6	15.9	10.0
Tarlac-Santa Rosa Road	15.9	20.6	9.9
Mindanao Secondary and Feeder Roads ^a	18.0	nc	negative
First Road Improvement	18.3	14.2	nc
Tagaytay-Batangas	20.0	17.4/9.9	24.5
Olongapo-Subic-Infanta-Bugallon	17.5	12.9	negative
Second Road Improvement	23.4	10.8 ^b	nc
Iloilo-San Jose	nc	nc	13.1
Kalibo-Nabas	15.3	5.7 ^b	3.1
Puerto Princesa-Narra-Brooke's Point	18.3	14-16 ^b	negative

RES = Reevaluation Study, nc = not calculated.

^a Economic reevaluation was not carried out as most of the project roads deteriorated rapidly or were no longer passable within one year from project completion.

^b PCR estimate.

D. Socioeconomic Development Impact

38. The IES project roads contributed to the creation of an environment that supports and facilitates socioeconomic activities in the project areas. However, there was no evidence that the improvement of the roads had considerable impact on the development and improvement of the agriculture sector. The results of the survey show that increased accessibility is more in the context of an increase in people's trips than in transport of goods or commodities. Cars comprised a major portion of total traffic in the road projects surveyed, and the increase in traffic was attributable to the high increase in car traffic. There was no significant change in truck traffic and the expected shift from low- to high-capacity vehicles for commodities did not materialize. Nevertheless, most of the IES project roads have generated social benefits to the people in the road influence areas in terms of enhanced educational opportunities, access to health facilities, and convenience in traveling from one place to another. In addition, the improvement of the Tagaytay-Batangas section under the First Road Improvement Project has contributed to the growth of tourism in this region.

39. The reductions in road user costs are expected to be passed on to road users through reductions in transport rates. However, the extent to which savings from vehicle operating cost from road improvements are passed on to transport users depends on whether (i) fares and freight charges are based on cost calculations; (ii) the road transport sector charges are free from regulatory intervention; and (iii) the vehicle fleet is growing to assure competition. For these Bank-financed roads, which are expected to generate vehicle operating cost savings to achieve an acceptably high EIRR (Table 2), users would have benefited from lower transport rates considering the fact that reforms have been implemented by the Government to promote free entry into the road transport industry and to allow for flexible fare measure for provincial passenger transport.

E. Institutional Development

40. The DPWH¹² was the Executing Agency for the six projects studied. For the specific implementation of Bank-financed road projects, a Project Management Office (PMO) for Bank projects was established in Manila and was headed by a Deputy Project Director with the Bureau of Public Highways Commissioner as Project Director. PMO was responsible for all administrative matters relating to the project, including procurement.

12 DPWH was formed in February 1987 from the Ministry of Public Works and Highways. In turn, the Ministry of Public Works and Highways was formed in July 1981 from the amalgamation of the Ministry of Public Highways and Ministry of Public Works.

41. The six projects had no direct institutional component. Most of them were implemented by foreign and local contractors and were supervised by PMO through the supervising consultant supported usually by domestic consultants. However, the experience gained in implementing the six projects appeared to have improved technical and managerial capabilities in DPWH to some extent. In addition, under the Bank's first road program loan, institutional support was provided to DPWH in the fields of road maintenance, liberalization of provincial passenger transport, road safety, and environmental monitoring and improvement. A Bank TA was also provided to assist DPWH in carrying out contract maintenance.

F. Sustainability

42. The Cotabato-General Santos, Iligan-Cagayan de Oro-Butuan, and Tarlac-Santa Rosa Roads were soundly constructed and are likely to reach their projected design life. However, the majority of roads covered under the three other projects are deteriorating ahead of their normal rate of obsolescence because of these reasons: (i) the roads suffer from general lack of maintenance that besets all projects to some degree; and (ii) most projects include poorly constructed or implemented sections, sometimes major portions or entire roads (e.g., Puerto Princesa-Brooke's Point). These projects or sections have broken down and require rehabilitation or even reconstruction, only a few years after their completion. The feeder road components have largely reverted to their preproject state. Rehabilitation using non-Bank funds has already been selectively undertaken by the Government on some inoperative sections of Bank roads that posed obstacles to increasing tourism traffic, e.g., General Santos-Malisbong or Tagaytay-Palico. The factors having a direct bearing on sustainability of road pavements need to be considered during the design stage.

V. KEY ISSUES

A. Appropriate Design Standards¹³

43. The standards to which road improvements are designed should reflect a realistic assessment of the future utilization of the roads, taking into account the various physical, environmental, and cost aspects of the problem. The most appropriate design for a given situation will be the one that contributes to the minimization of total road life cycle costs¹⁴ and takes full account of potential budgetary constraints.

13 The issue of design standards is discussed in this IES in a more elaborate manner than it was in the 1995 IETC Review. However, the issues of roads construction standards, and project implementation and management, which were discussed in detail in the 1995 IETC Review are not discussed here, but are included as Appendix 10.

14 Include construction, maintenance, and road user costs.

44. The argument is sometimes advanced in the Philippines that it is better to have concrete paved roads because in the absence of subsequent maintenance they will survive better than other types of pavement. This view requires further consideration as it assumes inadequate road maintenance as given instead of confronting it for what it is—a key deficiency in the management of the country's road networks (Appendix 10).

45. A further argument sometimes put forward is that pavement design standards must be raised to take account of the widespread overloading of trucks. There is a certain realism in this argument, given the present pavement performance and inadequate policing of vehicle loading practices in the Philippines. However, in a road sector where the claim is that local budgetary resources for undertaking adequate road maintenance have been insufficient, it seems strange that higher than necessary road rehabilitation and improvement costs have to be incurred (and foreign loans repaid) to solve the problem of controlling axle loads which, other things being equal, should cost only a fraction of the higher pavement costs. Traditionally, the failure of axle load enforcement can be attributed to the fact that the enforcers, usually the police, are not given the resources or training to do the job properly. Equally important, their wages, which are usually tied to civil service pay scales, are nearly always too low to motivate them to be honest enforcers in the face of considerable temptation.

46. Road design standards are sometimes related to a road's functional classification. This is acceptable as long as the functional classification reflects reasonably and accurately the road's existing and potential levels of utilization. Relating road design standards to administrative road classifications is potentially wasteful because in many cases such classifications do not reflect potential utilization.

47. The Bank's TAs to DPWH have included a comprehensive road classification study that presented detailed recommendations for a functional and administrative classification of the nation's total road network in 1992. These recommendations are still being discussed within the Government and the administrative classification used for budget allocation purposes remains as the only road classification system.

B. Road Maintenance

48. Inadequate road maintenance, particularly the periodic or preventive maintenance, has been a continuous source of concern to all foreign funding agencies involved with the road sector in the Philippines. Experience from the IES road projects has indicated that the economic costs resulting from a failure to maintain what are probably the nation's most valuable infrastructure assets have been high and go far to explaining why the overall quality of the road network has not improved much from what it was two decades ago.
49. Inadequate maintenance and the reasons for it are not unique in the Philippines, but its results have been more severe than in other countries because of the variable standards of implementing roadworks. Part of the problem has been attributed to constrained budgets reflecting the poor performance of the economy. The other significant part of the problem has, however, been the absence of a "maintenance culture" within the institutions administering the nation's road networks. Political pressures for allocating scarce resources to politically more attractive new road initiatives have also contributed to the low priority accorded to maintenance. During the period 1990-1994, the budgetary allocations for road maintenance represented only about 12-16 percent of those for road construction (Appendix 4).
50. There are now signs of a change in official attitudes towards road maintenance, but this has not extended to reforming the basis on which maintenance funds are allocated. The present EMK system takes too little account of actual road and bridge conditions and places excessive emphasis on so-called regional equity considerations. The system does not ensure that maintenance budgets are allocated on the basis of needs and actual repair costs. Even though total maintenance allocations have risen substantially in nominal terms in recent years, there is not much evidence that this money has been spent where it is most needed. Given the actual decline in EMK-based spending in real (constant 1985 price) terms, the failure to allocate in relation to needs is even more serious.
51. The Bank has recognized the need to reform the road maintenance system in the Philippines. Under the Bank's Sixth Road Project,¹⁵ the measures to be taken to strengthen and upgrade periodic and routine road maintenance includes (i) review of the present system for planning and managing routine, emergency, and periodic maintenance to identify all critical administrative processes and procedures that have to be preserved under any new system; (ii) development of a new routine management system; and (iii) pilot demonstration of the new system in two regions. The work is still at the preparatory stage and an early assessment could not be made. During the development of the new system, however, consideration should be given to replace the EMK system by a totally new maintenance, planning and budgeting system based on reliable information on road and bridge conditions and maintenance costs. In addition, the new system should take into account the

15 Loan No. 1473-(PHI):*Sixth Road Project*, for \$167 million, approved on 30 September 1996.

maintenance of nonnational roads which appears to have disappeared as a subject for discussion since recent decentralization policies came into effect. These roads make up more than 80 percent of the road network and the problem of maintaining them cannot be ignored.

C. Prioritization and Planning of Roadworks Expenditure

52. DPWH does not have an adequate system for ensuring that investments in road maintenance, rehabilitation, and improvement are allocated according to priorities based on an analysis of needs. The road information collection and storage system reflects this to the extent that there appears to be no readily available up-to-date summary of information on national road conditions by pavement type. It also reflects the absence of a central highway database storing the sort of information that is required for modern highway expenditure prioritization and planning.

53. In 1993, Bank TA to DPWH contributed to the provision of a pavement management system and associated highway database covering part of the national road network. OECF consultants have made a start with a similar initiative covering the (different) parts of the network with which OECF is concerned. There is, however, no unified pavement management system or pavement information system of adequate rigor covering the whole national road network. The World Bank-sponsored Road Management System (now Road Information Management System), which was supposed to have provided this and which should have been under development for the past five years, has not even started yet. This reflects a lack of urgency in institutional response to a highly necessary reform of the management of the main road network.

D. Institutional Reform and Financing of Road Expenditures

54. In the Philippines, as in many other countries, the main road network is administered by a traditional Government department and financed out of the general government budget. Many of the shortcomings in the present management and financing of the road network can be attributed to this traditional institutional and budgetary framework. Roads are administered more like a social service rather than managed like a quasi commercial enterprise. A common feature of this traditional bureaucratic approach to highway administration is that there is too little hard information on how much it actually costs to run a road network. As a result, real maintenance requirements are frequently underestimated and underfunded. In the absence of rigorously analyzed expenditure priorities, the highway institution is disadvantageously placed to justify realistic budget allocations in the face of intense political lobbying for alternative ways of using scarce budgetary resources.

55. The financial resources for expenditure on roads come from general taxation, domestic borrowing, and foreign assistance. The locally financed component suffers from the vagaries of the highly politicized annual budget process. There is no necessary connection between tax revenue raised from road users and the expenditure requirements of the road network. Road users, the only consumers, are completely uninvolved in what does or should happen to the roads they use and in the absence of information on the real cost of travel. The traditional institutional framework compounds the financing problem. The historical evidence suggests that this is characterized by ineffective management structures, lack of clearly defined responsibilities, inadequate management systems, lack of managerial accountability, and, by comparison with the private sector, unattractive terms and conditions of employment that fail to attract or retain the type of staff most needed.
56. These problems are not unique to the Philippines, and there has been debate within the Government about necessary changes in the funding and provision of road services especially in Metro Manila. It is the Government's intention that necessary additions to highway capacity in the form of major expressways will be provided by means of build-operate-and-transfer (BOT) initiatives involving the private sector. Part of the underlying rationale for this is that the necessary investments have no chance of being financed out of the general Government budget and, in this respect, countries much richer than the Philippines have come to the same conclusion. However, for most of the highway network, this BOT type of option is not viable because traffic levels are not high enough to be realistically considered for commercial toll-related operation. The budgetary argument used in support of BOT-type initiatives might also be considered to apply to the problem of financing backlog maintenance and rehabilitation and subsequent, adequate maintenance on a continuing basis.
57. In a number of developing countries, radical new initiatives for the reform of the financing and management of highway networks have been considered under encouragement from the World Bank.¹⁶ The most successful efforts combine a major institutional reform with a reform of highway financing based on benign earmarking of funds for the highway sector. The key concept underlying both is commercialization. In short, roads should be subjected to the disciplines of the marketplace, they should be operated on a fee-for-service basis, and they should be managed like a business enterprise. This does not mean privatization; roads are to remain a public monopoly with ownership in government hands. It does, however, mean removing their operation out of the traditional bureaucratic framework into one or more highway agencies of a parastatal nature, which will be responsible for their management and subject to commercial disciplines. Four basic building blocks are considered to represent the core of the required reforms.
- (i) The involvement of road users in the management of roads to win public support for adequate road funding, to control potential monopoly power, and to constrain road spending to what is affordable.

16 Heggie, Ian. *Management and Financing of Roads: An Agenda for Reform*, Sub-Saharan Transport Policy Program, The World Bank, and Economic Commission for Africa.

- (ii) Securing an adequate and stable source of funding based on an appropriate system of road user charges and ensuring that there are sound arrangements for channeling funds to the road agency or agencies.
 - (iii) Establishing a clear organizational structure for the management of the highway system and defining who is responsible for what, both for roads and road traffic.
 - (iv) Strengthening the management of roads by providing effective systems and procedures, strengthening managerial accountability, and attracting the most competent available staff by increasing performance-related incentives and delinking staff remuneration from civil service pay scales.
58. This type of reform appears to have been most successful where most of these elements have been put in place. Many countries, including a number of the former Soviet republics, have partially tackled the financing problem by establishing road funds, but these have not necessarily been based on appropriately structured systems of road user charges, which is a key requirement. The latter implies a form of benign earmarking. However, this differs from the more traditional forms of earmarking, which have been criticized as imposing undesirable rigidity on government spending decisions. The Philippines had a road fund in the 1970s, but this was discontinued in response to the criticism mentioned above.
59. It may be argued that incremental improvements of the existing highway administration system will make more fundamental reform unnecessary. The history of the past quarter of a century, which is amply documented in reports of the Bank and other funding agencies, does not lend much support to this viewpoint. There is not much sign that the debate about what to do to improve the financing and management of most of the Philippine road system, which is not amenable to BOT-type solutions, has even started in Government circles and this reflects the general lack of urgency within both the bureaucracy and the political system in facing up to the need for fundamental reforms in the road transport sector.

E. The Role of the Community of Aid Agencies

60. The community of aid agencies has assisted in financing a high proportion of Government expenditure on the Philippine road network during the past 25 years, and it continues to do so. The bulk of this assistance has gone into road rehabilitation and reconstruction often made necessary by inadequate Government commitment to road maintenance. There is a danger that continuing with past forms of assistance will merely reinforce the cycle of rehabilitation, inadequate maintenance, and further requests for assistance for rehabilitation. While the Government now shows signs of being more seriously committed to funding adequate maintenance, it may underestimate the potential costs of backlog rehabilitation and maintenance because DPWH does not have the information or

planning basis for estimating those costs realistically. The lack of urgency in implementing the rather modest policy reforms so far proposed by foreign aid agencies and their lack of response to this inertia casts some doubt on how seriously such agencies would support a radical policy for reforming the financing and management of roads. Nevertheless, the history of the past 25 years does not lend much support to the idea that incremental improvements will obviate the need for more fundamental reform.

61. The funding community has potentially a key role to play in encouraging and assisting necessary institutional and financial reforms for the road sector, and ensuring their success, but only if aid agencies agree on objectives and the means of attaining them. They can support the reform process by providing well-targeted assistance and support, particularly technical assistance, and avoiding adoption of conflicting policies and contradictory forms of assistance based solely on their individual preferences. A first step in the commitment to meaningful reform would be to make future assistance conditional on strong evidence of improved DPWH performance in maintaining the national road network and on Government success in implementing the policy reforms proposed so far.

F. Issues for the Bank in Project Appraisal and Monitoring

62. The results of this Study suggest that the Bank's past road project appraisal and postcompletion reporting and monitoring procedures have not been entirely successful in warning of the potential effects of indifferent project implementation standards. This is possibly because the economic appraisal models in use within DPWH in the 1970s and 1980s took many crucial engineering aspects as given in the economic analysis of projects. More modern models such as the World Bank's HDM-III and its successor, HDM-IV, which is being developed with the Bank's assistance, have established much more rigorous relationships between road pavement properties, future pavement performance with alternative standards of maintenance, and the resulting effects in terms of road surface condition (roughness), and road user costs. The Bank and other foreign sources such as OECF have now introduced the HDM-III model into DPWH, and this will be superseded by the HDM-IV model when this becomes available.
63. The use of the HDM models for project appraisal permits a much more rigorous analysis of alternative project options. It also allows a much more meaningful assessment of project risks to be made by showing, for example, what the effects of premature pavement failure and inadequate maintenance will be on the project's potential EIRR. The intelligent use of the HDM models also permits much more rigorous monitoring of the engineering and economic performance of the Bank's road projects and has the potential to take the monitoring process beyond the somewhat simplistic benefit monitoring approaches used up to now. A final point on the use of the HDM models is that much more realistic assumptions can be made

about what would happen in the absence of the specific road improvement project being appraised. These more rigorous definitions of the without-project situation, which are crucial in the definition of project benefits, should be clearly described in the Bank's ARs.

64. In view of the importance of the assumption that reductions in road user charges are passed on to users of road transport services, much greater emphasis should be placed on monitoring real changes in road transport rates in response to road improvements.
65. Modern methods of appraising road improvement, rehabilitation, and maintenance projects focus attention on the concept of economic feasibility. Traditionally, a road project was deemed to be economically feasible if its EIRR exceeded a predefined cutoff discount rate, which was theoretically assumed to represent the opportunity cost of capital. In practice, where there is a backlog rehabilitation and maintenance situation, as there almost certainly is in the Philippines, most well-prepared projects are going to be economically feasible, and the real question is which projects are most feasible (of the highest economic priority) over the network as a whole. Given budget constraints, the real cutoff discount may be significantly higher than the 10-12 percent conventionally assumed, and a rehabilitation project with an EIRR of even 15 percent may not be of the highest priority in a network-wide context. The implication of this is that the Bank and other foreign sources will have to monitor more closely and be involved on a continuing basis in network-wide expenditure prioritization, planning, and programming within DPWH while road management systems are being developed and even beyond.
66. It is also important for the aid agencies to pay greater attention to the network as a whole. This requires a degree of involvement with areas of planning and programming which have not necessarily been part of the individual agencies' "project" concerns. All aid agencies need to be concerned with total network data quality, for example, and not just with the quality of data relating to specific road links in which they are interested.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. Overall Assessment

67. Almost from the start of its operation, the Bank became involved with the Philippine roads subsector, viewed as strategic to the initiation of rapid economic growth with equity. Bank project choices were guided by two major sector studies

that identified a longer term investment program. Technically, Bank lending began with a straightforward project approach that, after two attempts, was modified to comprise packages of diverse roadworks, with increasing participation of the implementing institutions. This has led to increased requirements for rehabilitation and maintenance of Bank road projects. As project experience proved, the shift toward wider scope of projects was not matched by the Bank's increased capacity for project supervision and did not take into account the availability of counterpart technical capabilities and the increasing politicization of public works. This opened a large gap between Bank project assumptions and actual outcomes: substandard quality of civil works and inadequate maintenance shortened the life of projects and curtailed the intended flow of benefits to road users; the economic worth of Bank projects diminished.

68. The IES confirms that the impact of Bank road projects has eroded steadily. All IES road projects are expected to yield lower EIRRs than those estimated during appraisal and postevaluation because the volumes of traffic have fallen short of projections and vehicle operating cost savings have been reduced due to rapid pavement deterioration caused by inadequate maintenance. Force majeure (insurgency and natural calamities) was also a factor limiting the benefits of road projects. Of the six road projects covered in the IES, three (Cotabato-General Santos, Iligan-Cagayan de Oro-Butuan, and Tarlac-Santa Rosa) are expected to yield acceptable EIRRs and can be rated generally successful. The First and Second Road Improvement Projects are considered partly successful; they combined certain sections that were relatively well built and proved economically viable. The Mindanao Secondary and Feeder Roads Project was rated unsuccessful because the lives of the roads constructed were substantially shortened by rapid deterioration, and many roads required complete rehabilitation only a few years after completion.
69. The present debate in Government circles regarding the provision for operation and maintenance of road infrastructure is dominated by the problems of inadequate road capacity in Metro Manila and the means of providing new capacity by some form of off-budget BOT initiatives. However, an overwhelming large proportion of the national road network carries too little traffic to be considered for this type of solution to the road funding problem. The devolution of responsibility for nonnational road administration to local governments appears to have removed the problem of the condition of nonnational roads from consideration at the Central level. The shortcomings of DPWH in administering the national road network are widely recognized, but there appears to be little fundamental debate about possible solutions. While the Government has finally acknowledged the importance of the road maintenance problem, it is still tied to the inappropriate EMK method of providing budgetary resources for it.
70. The core problem is that the national road network is administered like a social service by a traditional government department, the DPWH. The historical evidence suggests that this traditional institutional framework is characterized by

ineffective management structures, lack of clearly defined accountabilities, weak management systems, lack of managerial accountability and, by comparison with the private sector, poor terms and condition of employment that fail to attract and retain the calibre of staff most needed. The overall result is inertia, unnecessarily rigid, slow moving bureaucratic procedures, poor morale, and lack of management competence and financial probity.

71. Similar findings were concluded in the Philippine Transport Strategy Study (PTSS), which was carried out under a Bank-financed TA,¹⁷ to develop the Transport Agenda for the next Six Year Medium Term Philippine Development Plan, 1999 to 2004. The PTSS also identified institutional deficiency as a core problem: DPWH is not sufficiently proactive in maintaining and developing the national road network. This is evident in the current state of the road sector: (i) there is no clear strategy for the sector; (ii) there is a patchy picture of maintenance; (iii) planning is substantially ineffective; (iv) road design and construction are often poor and the performance of contractors is questionable resulting in lengthy construction times, which reduce estimates of economic viability; and (v) there are still large areas with network deficiencies. The PTSS has concluded that to solve the institutional problem, it is necessary to establish: (i) an autonomous national road and bridges agency responsible for maintaining and developing the national network; and (ii) a road maintenance fund from earmarked transport taxes. Another radical approach suggested by PTSS is to allow the private sector to manage parts of the national highway network.
72. The results of the PTSS have been fully accepted by the Government agencies and will form the core of transport policy of the next Six Year Medium Term Philippine Development Plan. Due to its importance the road sector figures prominently in the PTSS's recommendations (Appendix 11). Thus, the development of the road sector would depend on the seriousness of the Government to implement these recommendations.

B. Recommendations

73. From the findings of the IES, the following suggestions and recommendations are offered for consideration by the Government and the Bank:¹⁸

1. For the Government

17 TA No. 2487: *Preparation of a National Transport Strategy*, for \$1,000,000, approved on 19 December 1995. The Study was completed in March 1997.

18 These recommendations supplement those made in the 1995 IETC Review (Appendix 10).

74. The problems of the road sector in the Philippines are as much institutional and policy based as budget related. To address them, the Government should implement immediately the PTSS recommendations for the road sector, specifically the establishment of an autonomous agency and a road maintenance fund. The agency to be created should have clear objectives, substantial management autonomy, and be financially independent and transparent. This should be complemented with the creation of a road maintenance fund from earmarked transport taxes. This would reduce political interference, guarantee that the required maintenance expenditure is spent, and involve beneficiaries in allocating the funds among priorities.
75. The current system of road maintenance, the EMK system, places excessive emphasis on regional equity considerations but is unable to allocate maintenance budgets on the basis of need and actual repair costs. Consideration should be given to replacing the EMK system with a new maintenance, planning, and budgeting system based on reliable information on road and bridge conditions, and maintenance costs.
76. The Government should formally adopt the strategic priorities for the road sector recommended by PTSS. The first priority should be road maintenance (routine and periodic), followed by rehabilitation and then improvements. New roads should be the last priority.

2. For the Bank

77. The IES findings suggest that continuing the lending policies of the past two decades will not be sufficient to transform the condition of the nation's road networks and their management. It requires a more fundamental radical change. With the acceptance of the Government of the findings of PTSS, the Bank should exert further efforts for the implementation of the PTSS recommendations, specifically the creation of an autonomous road and bridges agency. Implementation of the PTSS recommendations should be a condition for the Bank's future assistance for road improvement projects.
78. In its future technical assistance, the Bank in collaboration with the other main international sources should place the highest priority on the development and maintenance within DPWH of a rigorous road information and management system. This system should at least be capable of prioritizing road investment and maintenance expenditures on the basis of engineering and life cycle analysis, and of developing a rolling medium-term program for such expenditures, taking into account potential budget constraints. With such a system in place, the Bank could have some

assurance that its assistance is directed at road projects of the highest economic priority rather than at projects that just meet the minimum EIRR criteria.

- 1 Of the six, one was reevaluated in February 1991 (IE-14:A *Reevaluation Study of the Road Improvement Project in the Philippines*).
- 1 TA No. 2317-PHI: *Impact Evaluation Study of Bank Assistance in the Roads Sector*, for \$100,000, approved on 3 April 1995.
- 1 Both are large, well-established line agencies with cabinet representation. DPWH planning and implementing functions are decentralized with a nationwide network of regional and district offices, while the Department of Transport and Communications as a regulating agency operates essentially from the center through a host of affiliated agencies. DPWH's mandate gives the agency near-autonomy subject to the need to share policy-making functions with the Department of Finance, the Department of Budget Management, National Economic and Development Authority, and the Office of the President under the Government committee system. Since 1991, DPWH has turned over responsibilities for certain provincial and barangay roads to local government units under the supervision of the Department of Interior and Local Government. The major influence over all aspects of operations (fund use) and programming is exercised by both Houses of Congress.
- 1 Prior to 1991 maintenance of barangay roads is under the jurisdiction of DPWH.
- 1 The IES does not cover the Road and Road Transport Sector Program (Loan Nos. 1046-PHI(SF)/1047-PHI), which was postevaluated in 1995 and rated as partly successful. However, the status of reforms implemented under the Program was reviewed in the context of the discussion on institutional aspects covered in the IES.
- 1 Preceded by a loan, Loan No. 227-PHI: *Mindanao Secondary and Feeder Roads*, for \$500,000, approved on 14 August 1975, for conducting a feasibility study.
- 1 Loan Nos. 126-PHI, 134-PHI, 529-PHI(SF), 802-PHI(SF), 915-PHI(SF), 946-PHI(SF), 999-PHI(SF), 1033-PHI(SF), 1053-PHI(SF), 1136-PHI(SF), 1163-PHI(SF), and 1332-PHI(SF).
- 1 Cotabato-General Santos Road by the United Nations Development Programme-sponsored National Transportation Planning Project and the others by the World Bank-supported Philippine Transport Survey of 1968/1969 were subsequently updated.
- 1 Transport and Communications Division, East (IETC) "Review of Bank-Financed Road Projects in the Philippines," ADB, Manila, 1995. The IETC Review presents an agenda for Bank consideration to improve the quality of its future road projects. It focuses on design standards, procurement, tendering, construction supervision, and procedures as these are links in the chain of causation over which Bank policy dialogue at the project level can exert influence. The Review sheds new light on factors that directly caused time and cost escalation and quality lags in civil works from the perspective of the road engineer and administrator.
- 1 The IES consultants have traced contract failures to the then existing DPWH system of prequalification.
- 1 The Bank is now actively involved in assisting in the development of HDM-IV, the successor to HDM-III.
- 1 DPWH was formed in February 1987 from the Ministry of Public Works and Highways. In turn, the Ministry of Public Works and Highways was formed in July 1981 from the amalgamation of the Ministry of Public Highways and Ministry of Public Works.
- 1 The issue of design standards is discussed in this IES in a more elaborate manner than it was in the 1995 IETC Review. However, the issues of roads construction standards, and project implementation and management, which were discussed in detail in the 1995 IETC Review are not discussed here, but are included as Appendix 10.
- 1 Include construction, maintenance, and road user costs.
- 1 Loan No. 1473-(PHI): *Sixth Road Project*, for \$167 million, approved on 30 September 1996.
- 1 Heggie, Ian. *Management and Financing of Roads: An Agenda for Reform*, Sub-Saharan Transport Policy Program, The World Bank, and Economic Commission for Africa.
- 1 TA No. 2487: *Preparation of a National Transport Strategy*, for \$1,000,000, approved on 19 December 1995. The Study was completed in March 1997.

1 These recommendations supplement those made in the 1995 IETC Review (Appendix 10).