

Philippines

Disaster Prevention and Rehabilitation Project (Philippine-Japan Friendship Highway and Naguilian Road)

Report Date: March 2001

Field Survey: September 2000

1. Project Profile and Japan's ODA Loan



Site Map: Luzon Island,
the Republic of the Philippines



Philippine-Japan Friendship Highway

(1) Background

Road transport in the Philippines has been developed and expanded as the country's core transport network. While progress has been made on the quantity of roads, deterioration of roads and bridges is advancing due to low rates of paving and an overall lack of maintenance, and the qualitative improvement and refurbishment of roads is inadequate.

One of the road sections covered by this project was the Philippine-Japan Friendship Highway (the section between Calauag and Labo), which is a national trunk road. It is part of the main arterial road linking Southern Luzon, which is mainly agricultural and has a low regional domestic product, with the capital Manila. The road is intended to support the development of the region. The other section is the Naguilian Road, a grade two national route, which links the resort area of Baguio with Manila, and serves as a route to transport agricultural produce, mined materials and other produce of the surrounding area.

Despite their importance, both roads have become dilapidated in the 20 years since they were built. Many areas suffered surface damage and hazardous embankments, and a JICA feasibility study indicated 55 locations in urgent need of repair or improvement. Repair was urgently required to improve safety on the roads.

(2) Objectives

The project was to implement rehabilitation and disaster prevention measures on hazardous locations on the Philippine-Japan Friendship Highway and the Naguilian Road, such as areas strewn with fallen stones and areas with collapsing embankments. These measures were intended to make trunk road transport on these roads safe and efficient.

(3) Project Scope

The project scope covered the Philippine-Japan Friendship Highway (the section between Calauag and Labo) and the Naguilian Road, which were to receive the following improvements:

- [1] Road paving repair and improvement.
- [2] Embankment disaster prevention measures.
- [3] Bridge rehabilitation.
- [4] Consulting services (detailed designs and construction supervision).

Within the above, the ODA loan covered 75% of the cost required for civil works and services, and the agreement was concluded in 1990.

(4) Borrower/Executing Agency

Republic of the Philippines / Department of Public Works and Highways (DPWH)

(5) Outline of Loan Agreement

Loan Amount/Loan Disbursed Amount	¥5,708 million / ¥5,378 million
Exchange of Notes/Loan Agreement	October 1989 / February 1990
Terms and Conditions	Interest rate: 2.7%, Repayment period: 30 years (10 years for grace period), General Untied (However, consulting services are partial untied.)
Final Disbursement Date	May 1997

2. Results and Evaluation

(1) Relevance

Overall this project was in line with the Philippines' strategy for the infrastructure sector, as stated in its medium-term development plan (1987~1992), which called for efforts to concentrate on the repair and improvement of existing facilities. Also, for the Philippine-Japan Friendship Highway, this project was preceded by another ODA loan to rehabilitate the road in Northern Luzon, making this project part of an ongoing effort to rehabilitate the road. In the current situation the portion of the Philippines' limited road related budget which is allocated to repair and rehabilitation has a higher priority than road improvements and new construction. The plan for work on the Philippine-Japan Friendship Highway was subjected to extensive changes, such as reduction of the road length for paving repairs and an increase in the number of locations for embankment disaster prevention works. Nevertheless, the changes were based on the subsequent detailed design, natural conditions and other factors, and appear to have been appropriate. Thus the relevance of the project appears to have been maintained.

(2) Efficiency

The detailed design was completed five months behind the planned schedule, and the construction supervision, disaster prevention works and rehabilitation works were delayed by 20 months. The main reasons for the delay were changes in the paving design, inevitable accidents, namely typhoon damage, and public security problems. The total project cost was ¥778 million less than planned for reasons including

the bidding results and the fall in the value of the Peso¹.

(3) Effectiveness

(i) Effects of reductions in travel time and cost

The DPWH calculated unit travel costs and time costs per kilometer for each model and year of automobile (private cars, jeepneys, buses, trucks, motorcycles and motor tricycles) on each type of road condition (good, normal, poor, very poor). Using the travel costs and costs associated with travel time for 1997, when the project was completed, an average weighted to account for traffic volume (estimated traffic volume in the case of road conditions was calculated according to the DPWH figures. Table 1 shows costs calculated using the average for the case where the project was implemented and where the project was not, to show the saving yielded by the project. Clearly the project yielded a substantial saving.

Table 1: Project Effects in Saving Travel and Time Costs

Units: Pesos/km (per vehicle)		
Travel cost	Naguilian Road	Philippine-Japan Friendship Highway
Case where the project was not implemented (A)	9.3	9.1
Case where the project was implemented (B)	5.1	5.1
Saving effects in travel cost (A)-(B)	4.2	4.0

Units: Pesos/km (per vehicle)		
Time cost	Naguilian Road	Philippine-Japan Friendship Highway
Case where the project was not implemented (A)	3.5	3.1
Case where the project was implemented (B)	1.5	1.3
Reduction effects in travel time (A)-(B)	2.0	1.8

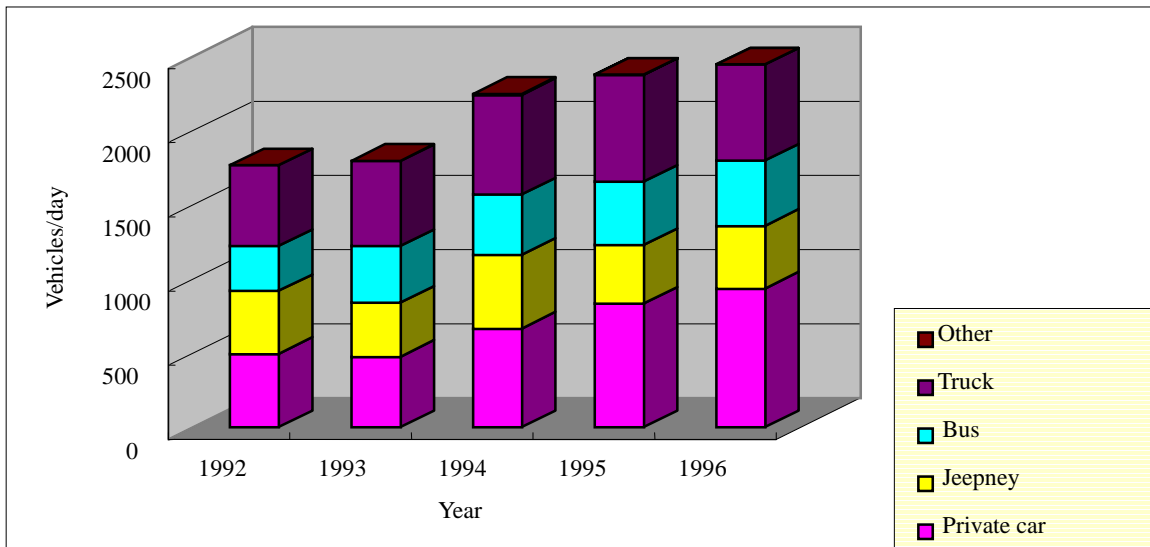
Source: Calculated based on DPWH material.
 Note: The above costs per km do not include tax.

(ii) Traffic volume

The Naguilian Road runs from Buang on the road north of Manila to Baguio, which is a resort, tourism and cultural city. The DPWH has conducted a survey of traffic volume between Burgos and Sabilan on the Naguilian Road (the main route where traffic can be monitored on the inter-city sections beyond the suburbs of Baguio). The results are as shown in Figure 1 below.

¹ Compared to the Peso-Yen exchange at the time of the appraisal, the exchange rate when loan disbursement was requested during project implementation was more than 27% lower.

Figure 1: Average Annual Daily Traffic Volumes by Vehicle Type for the Naguilian Road (between Burgos and Sabilan) (AADT)



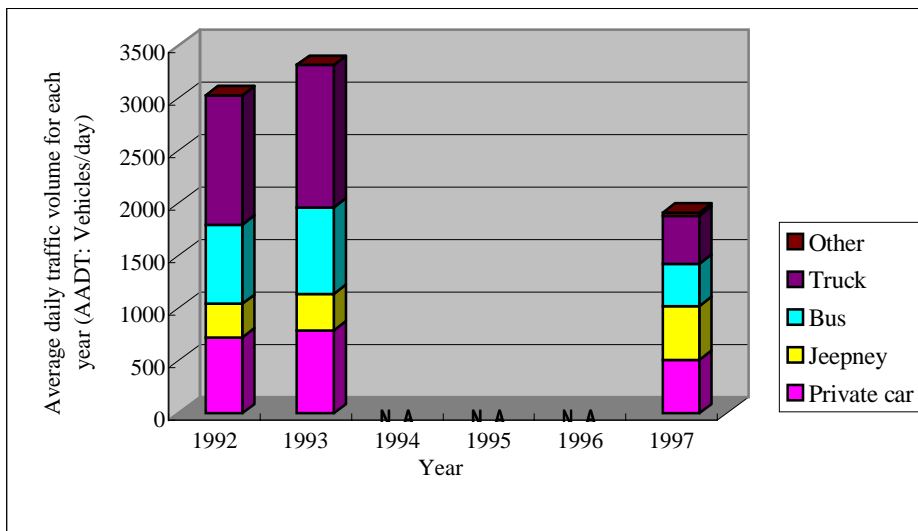
Source: DPWH material.

Notes: 1) Units: Vehicles/ day

2) Motorcycles and motor tricycles are included in "Other".

The traffic volume on the Naguilian Road grew every year during the implementation period of this project, and a forecast made by the DPWH in 1997 predicted annual growth rates over the 20 years to 2016 of 7% for automobiles, 6% for buses and jeepneys etc., 4~5% for trucks and 5% for motorcycles and motor tricycles.

Figure 2: Traffic Volume Survey Results for the Philippine-Japan Friendship Highway (between Calauag and the border of Camarines Norte)



Source: DPWH material.

Notes: 1) AADT = Average Annual Daily Traffic (units: vehicles/day).

2) Traffic volume surveys were not conducted between 1994 and 1996.

Recently recorded values (Figure 2, 1,913 vehicles/day in 1997) of average daily traffic for the Philippine-Japan Friendship Highway (between Calauag and the border of Camarines Norte) already exceed the traffic volume predicted for 2000 at the time of the appraisal². Furthermore it is estimated that the overall traffic volume³, including the portion redirected to the Kirino Highway (a bypass road which joins Calauag and Shipokoto in a shorter distance than the equivalent stretch of the Philippine-Japan Friendship Highway), which was then in temporary use, is substantially higher than the recorded values stated in Figure 2.

Traffic redirection via the Kirino Highway is thought to be the main reason why recorded traffic volume figures in Figure 2 for the Philippine-Japan Friendship Highway are lower for 1997 than for 1992~1993. Construction of the Kirino Highway began under the LISR (Luzon Island Strategic Island Network) Plan adopted by the DPWH in 1993, and at the time of the appraisal for this project (1990) it was not possible to predict the dispersion of traffic to that road.

(iii) Economic Internal Rate of Return (EIRR)

At the time of the appraisal the average EIRR for the Naguilian Road and the Philippine-Japan Friendship Highway (sections between Calauag and Matsunogu and between Allen and Calbayog) was calculated at 31.7%, based on benefits such as reduced detour road expenses, shorter travel times and reduced maintenance expenses. The increased work on embankment safety and bridge repair reduced the total length of road covered by the project to approximately one third of the planned distance, with a substantial reduction in expected benefits. However, when the recorded figures obtained in this survey for travel cost reductions, shorter travel times and maintenance cost reductions were used to recalculate EIRR, a value of 17.5% was obtained. This is a favorable result, considering the reduction in project benefits caused by the major alteration to the project scope.

(4) Impact

(i) Impact on regional economy

As Figure 1 above showed, traffic volume on the Naguilian Road (the main section) was growing continuously, with movements of passengers and freight intensifying in both directions. Thus it appears that the project made a contribution to expanded economic development and employment opportunities in the region.

For the Philippine-Japan Friendship Highway, there is no data for the usage of the road as a whole, for the benefits to the region as a whole, and for any inter-relation between benefits and road usage. Therefore it is impossible to gauge the impact of this portion of the project.

(ii) Impact on environment

This project is not believed to have had any notable negative impact, and it obtained a Certificate of Non-coverage from the Ministry of Environment and Natural Resources indicating that no initial

² The prediction for average daily traffic in 2000 made at the time of the appraisal was that in the section between Saint Helena and Labo (between kilometer posts 270 and 320.2). The volumes at the 290km and 320km posts would be 1,778 vehicles/day and 1,198 vehicles/day, respectively.

³ The entire route was formally opened to traffic in November 1998.

environmental survey is required.

(5) Sustainability

(i) Organization and staff

Maintenance for this project on the Philippine-Japan Friendship Highway (between Calauag and Labo) is handled by the Camarines Norte District Office maintenance section, while the La Union District Office maintenance section is responsible for the Naguilian Road. For example, Camarines Norte District Office, which was visited by the field survey, divides the area for which it is responsible into two zones, each of which is allocated one engineer and one assistant engineer. Each zone has three maintenance crews, each consisting of one site foreman and seven maintenance workers, and maintenance work is conducted according to plans. Table 2 compares the planned and actual numbers of DPWH workers and the worker-days expended on maintenance for each of the zones with jurisdiction over the road sections covered by this project⁴.

Table 2: Comparison of Planned and Actual Workers and Work-days Provided for Maintenance

		1996		1997		1998		1999		Up to the third quarter of 2000	
		No. of workers	Worker days x1,000	No. of workers	Worker days x1,000	No. of workers	Worker days x1,000	No. of workers	Worker days x1,000	No. of workers	Worker days x1,000
Cordillera Administrative Region	Plan	517	116	446	103	451	99	574	153	484	87
	Actual	554	141	442	35	501	146	444	137	471	90
Region I	Plan	365	84	397	91	295	70	277	71	249	41
	Actual	274	341	397	27	350	146	276	74	316	62
Region IV-A	Plan	578	133	552	127	528	120	632	157	544	93
	Actual	383	97	411	52	444	122	505	132	494	86
Region V	Plan	534	128	493	113	449	96	537	142	539	103
	Actual	567	86	493	113	517	162	551	158	625	126
Total	Plan	1,994	461	1,888	433	1,723	386	2,020	522	1,816	324
	Actual	1,778	665	1,743	227	1,812	577	1,776	501	1,906	365

Source: DPWH

In some years the number of worker days expended exceeds the initial plan, and in other years it falls short. In many cases the maintenance workers are short-term laborers⁵, and we can infer that the district offices make worker allocations flexibly according to the spare budget and the necessary maintenance work.

(ii) Maintenance costs

The cost of ordinary repair and maintenance of national roads and bridges is calculated as the product of Equivalent Maintenance Kilometrage (EMK) and price per unit EMK. The Naguilian Road⁶ which was covered by this project is under the jurisdiction of the Cordillera Administrative Region and Region I. The

⁴ The DPWH has been increasing the proportion of maintenance work it contracts out, from 50% in 1996-1998 to 70% after 1999.

⁵ The recorded input of maintenance workers in Region 4-A for 2000 (up to the third quarter) was 86,400 worker-days, of which 64,800 worker-days was temporary employment.

⁶ This project covered the 47km between Bauan and Baguio.

Philippine-Japan Friendship Highway between Calauag and Labo⁷ is under the jurisdiction of Regions IV-A and V. The EMK values and budget allocations based on those values in the past 4 years are as shown in Table 3.

Table 3 Maintenance Costs

Amount: Unit 1,000 peso

	1997		1998		1999		2000	
	EMK	Amount	EMK	Amount	EMK	Amount	EMK	Amount
Naguilian Road	72.91	4,873	73.45	5,179	73.91	5,211	74.18	5,597
Philippine-Japan Friendship Highway (Calauag ~ Labo)	192.60	12,872	192.95	13,605	193.02	13,610	193.06	14,566
EMK unit price (Peso)	66,835		70,511		70,511		75,447	

Source: DPWH

- Notes: 1) The maintenance budget is calculated as the product of the EMK and the estimate price per unit EMK.
 2) The maintenance cost for the Naguilian Road includes portions which were not covered by the ODA loan.

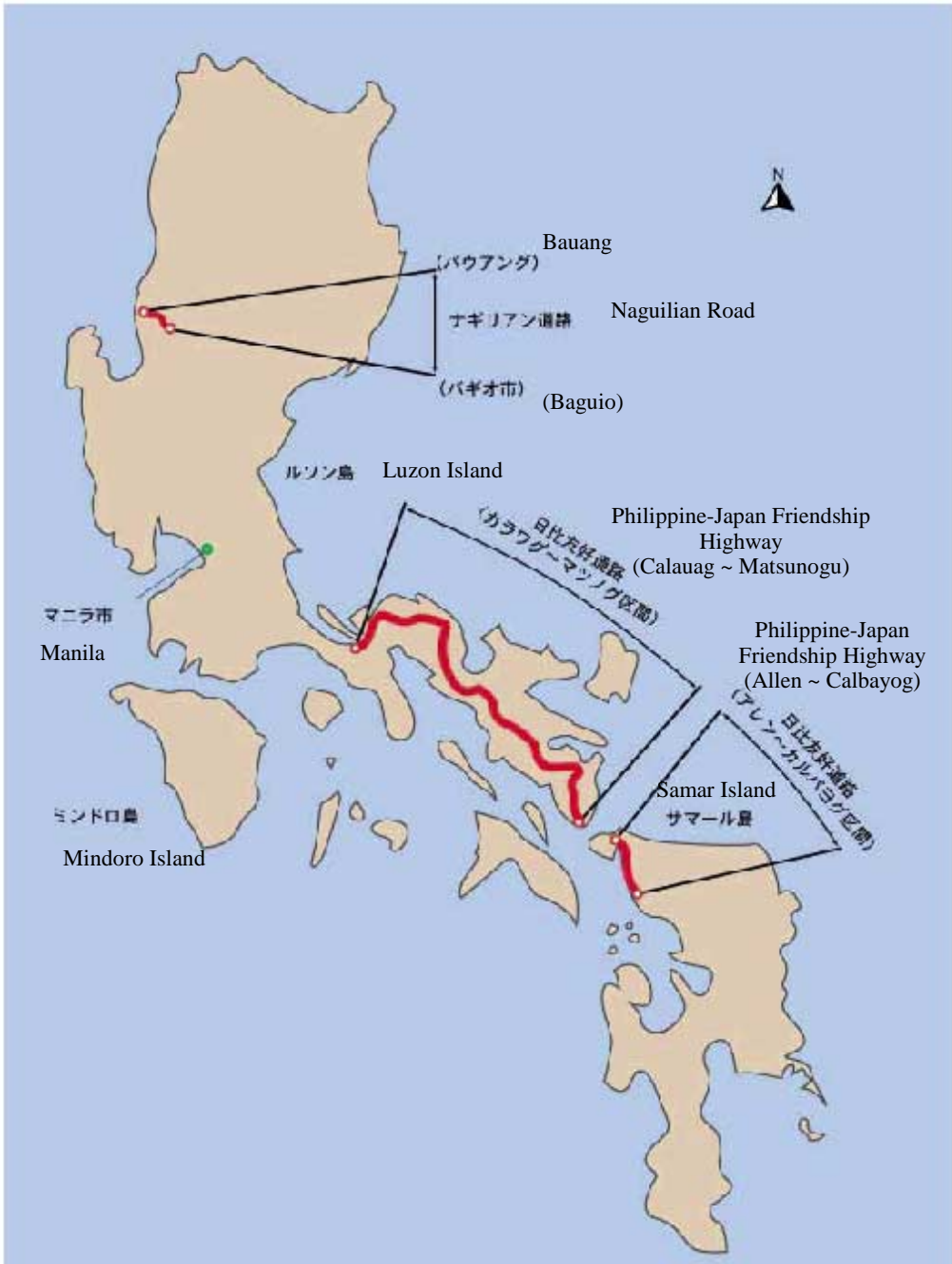
The EMK for 2000 at the Camarines Norte District Office, which was visited for the study, was 320.7EMK for roads and 45.9EMK for bridges, totaling 366.6EMK, for which the maintenance budget is 27.7 million Pesos. The budget is to cover labor, materials, equipment and other costs. Actual budget allocations are made on a quarterly basis. Equipment required for maintenance work is borrowed from Area Equipment Services (AES), which is adjacent to the district office. AES lends out one dump truck, one road grader, one road roller and four cars, but most of its equipment, including that for loan, is extremely old. A 15% share of EMK is set aside for the maintenance of equipment (spare parts, tires, oil etc.). Where road facilities take major damage from typhoons or other natural disasters, the repairs cannot be covered by the ordinary maintenance budget, and funds must be allocated from the construction budget, but the construction budget also has limited funds.

In 2000 a fund was established for the maintenance of national routes, as a countermeasure against the shortage of funding for road maintenance. The fund draws on a newly introduced car ownership tax (the Road Maintenance Tax, levied on all motor vehicle owners). This step is expected to yield an improvement in the road maintenance situation through earlier detection of problems and implementation of repairs.

⁷ This project covered the 88km between Calauag and Labo.

Comparison of Original and Actual Scope

Item	Plan	Actual
Project Scope		
1.Road paving repair and improvement		
-Naguilian Road	47km	47.0km
-Calauag ~ Matsunogu	313km	88.0km
-Allen ~ Calbayog	40km	0.0km
2.Embankment disaster prevention measures		
-Naguilian Road	Zero	3 bridges
-Calauag ~ Matsunogu	13 bridges	13 bridges
-Allen ~ Calbayog	2 bridges	Zero
3.Bridge rehabilitation		
-Naguilian Road	15 points	84 points
-Calauag ~ Matsunogu	19 points	43 points
-Allen ~ Calbayog	14 points	Zero
4.Consulting Service		
-Detailed design	Foreign: 41M/M Local: 595M/M	Foreign: 52M/M Local: 740M/M
-Construction supervision	Foreign: 110M/M Local: 1191M/M	Foreign: 117.5M/M Local: 1279.5M/M
		The rehabilitation actually implemented on the Philippine-Japan Friendship Highway under this project was on the Calauag ~ Labo section (87.944km, packages 3 and 4). The section between Labo and Matsunogu received rehabilitation and disaster prevention works under a different ODA loan project (PH-P145 and PH-P164).
Implementation Schedule	1989 ~ 1995	1990 ~ 1997
Project Cost		
Foreign currency	¥3,971 million	¥5,378 million
Local currency	587 million peso	323 million peso
Total	¥7,610 million	¥6,832 million
ODA Loan portion	¥5,708 million	¥5,378 million
Exchange rate	1 peso = ¥6.2	1 peso = ¥4.5



Project Site Map