The Republic of the Philippines

Improvement and Modernization of Commuter Line South Project

Report Date: March 2001
Field Survey: September 2000

1. Project Profile and Japan's ODA Loan

Site Map: Manila Metropolitan Area, Republic of the Philippines

Commuter Line South

(1) Background

The Philippine National Railway (PNR) Commuter Line runs north – south through the CBD (central business district) of Metro Manila. As such, there was a high potential demand for the line, but the low frequency of service did not enable the line to meet the peak demand. Also, because trains did not run on the schedule, the number of passengers declined from its peak of 22,000 persons/day in 1977 to approximately 3,000 persons/day in November 1989. Based on the its *METRO TREN* in December 1989, PNR had the rolling stock repaired at its own costs, and gradually increased the number of train service, and brought itself a considerable recovery of passengers to the level of 15,000 persons/day in May 1990.

It was pointed out that the factors impeding the operation of trains were:
[1] Lack of usable diesel cars.
[2] Superannuation of tracks, rail bridges and other facilities.
[3] Squatter issues.

PNR estimated a vitalization of the Commuter Line South, with the aforementioned issues solved, would arise an increased demand of around 70,000 persons/day in 1992. . Among the above three issues, PNR planned to solve the first one, the lack of rolling stock, by using the inspection and repair center that had been completed in February 1990 with Japan's ODA loan assistance to refurbish 55 cars and engines. There was, however, an urgent need to relocate the squatters (that corresponded to the issue [3] above) and rehabilitate the track (the issue [2]), in order to raise the transportation capacity to 65,000 persons/day that would meet the potential demand, with the rehabilitated rolling stock in a maximal effectiveness of assistance.

(2) Objectives

The objective of this project was to enhance the convenience of transportation of the Metro Manila

residents who suffered from chronic road congestion, by refurbishment of the track and bridges of the PNR Commuter Line South (total length: 56.6km) with a increased daily passenger traffic of 66,500 persons/day by 1994.

(3) Project Scope

The ODA loan covered the entire foreign currency portion and a part of the local currency portion of the following:

[1] Track improvement (rail replacement, tie replacement, ballast addition, track bed improvement).
[2] Bridge improvement.
[3] Installation of fences to prevent squatters.
[4] Consulting services.

(4) Borrower/Executing Agency

Republic of the Philippines / Philippine National Railways (PNR)

(5) Outline of Loan Agreement

Loan Amount/Loan Disbursed Amount	¥2,005 million / ¥1,855 million
Exchange of Notes/Loan Agreement	March 1991 / July 1991
Terms and Conditions	Interest rate: 2.7% p.a., Repayment period: 30 years (grace period: 10 years), General Untied
Final Disbursement Date	October 1998

2. Evaluation

(1) Relevance

The plan was modified during the implementation of the project. On the one hand the budget was increased for civil engineering works in urgent need such as the rehabilitation of superannuated track and bridges, on the other hand rehabilitation of signal and communication facilities and of stations was excluded from the original project scope, while the track improvement between Tayuman (Tutuban) and Espana was also excluded due to some squatters remaining on the PNR properties. With all the above changes made on the project scope, this project remains to be relevant, considering that the Philippine government aims to offer a mass transit railway system for alleviating road congestion and reducing air pollution .

However, as noted in the “Effectiveness” section below, inadequate procurement of maintenance equipment has prevented of some operational and maintenance activities after completion, including the rehabilitated sections.

(2) Efficiency

(i) Implementation Schedule

The plan called for the start of construction in February 1993 and completion in February 1995 (a construction period of approximately two years), but construction did not start until February 1995 and it was not completed until August 1998 (a construction period of three years and seven months). The start of construction was delayed by two years, and the duration overran by 19 months, which in aggregate ended up in a delay of approximately three years and seven months. The reasons for the delay were the changes in the project scope to prioritize urgent civil works, and the time required to settle the squatter issue.

(ii) Project Cost

While the cost of high-urgency civil works for the rehabilitation including track and bridges increased, the total cost did not exceed the initial plan, since the procurement of communications and some other equipment was removed from the project scope. . Assessment is impossible on the technical impact of omitting components such as improvements to communications. It is considered relevant that priorities of funds allocation were given to the more important, from the viewpoint of economic efficiency.

(3) Effectiveness

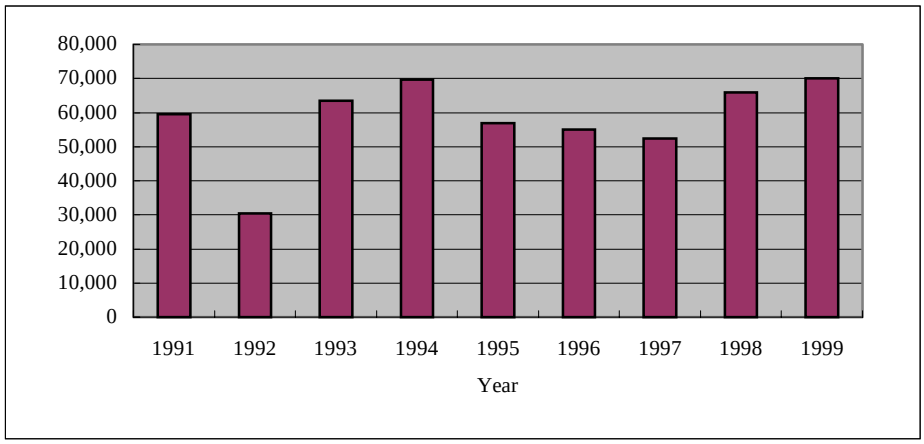
(i) Movements in passenger transport volumes and passenger numbers

Figure 1 shows movements in annual passenger transport volumes on the Commuter Line South between 1991 and 1999. PNR purchased ten new diesel locomotives in May 1992, and recorded a remarkable progress in 1993 .

A temporary drop between February 1995 and August 1998 was due to the civil and installation works for the implementation of this project. A train accident on the Main Line South in September 1997 reduced passengers in that year. In 1999, after completion of this project, the passenger volume recovered to the 1994 level.

Figure 1: Annual passenger transport volume on the Commuter Line South

(Units: Thousands of person-km)



Source: PNR

Table 1 below shows the relationship between the numbers of passengers and trains in 1998-99. Daily number of passengers recorded a 3.2% increase in 1999 on the preceding year, but it is still only 21% of the initially planned value. In the period of January-October 2000 a shortage of locomotives cut the number of services to 50-70% of the average for the preceding year, cutting daily number of passengers at one stage to as low as 70% of the average. Countermeasures have been devised, including the addition of a long-distance locomotive[1], bringing the number of services back to an average of 27.5 per day.

Table 1: Statistics for number of passengers and frequency of services on the Commuter Line South

	Planned at the appraisal	1998 (actual)	1999 (actual)
Number of passengers (persons/day)	66,500	13,320	13,740
Frequency of services (trains/ day)	N.A.	25	26

Source: PNR

The following reasons can be given for the major shortfall in number of passengers, relative to the initial forecast made at the time of the appraisal.

(a) Impact of sections which have not been rehabilitated

The 4.5km stretch between Tayuman (Tutuban) and Espana was removed from the scope of the ODA loan because of safety reasons of squatters. The un-rehabilitated track on that section has caused many derailments, and the use of that section is worsening continually.

(b) Track bed deterioration due to illegal activities by squatters

Even on the sections which were rehabilitated, the conditions are deteriorating rapidly due to squatters living their everyday lives[2] on both sides of the track. The occurrence of subsidence one year after completion and the theft of ballast are degrading the stability of the track bed.

(c) Lack of locomotives

As Table 2 shows, the number of available locomotives of PNR is very small. The primary cause of this problem is that the PNR fell short of the funds for purchase of spare parts due to the deteriorated financial results. The situation was aggravated when PNR could not hold the Prequalification Bidding Award Committee for procurement matters for two years[3] due to PNR's internal reasons.

1 Compared to locomotives for commuter lines, long-distance locomotives have more horsepower and cost more to run, but the decision was taken to put one on the line due as an emergency measure.

2 Problems include discharge of squatters' waste water along the tracks.

3 This internal PNR problem was in the process of being solved at the time of the field study.

Table 2: Conditions of locomotives and cars (as of August 3, 2000)

Units: number of cars/locomotives

	In service	Under repair	Awaiting repair	Total
Locomotives				
900-type	9	4	3	16
2500-type	4	1	7	12
5000-type	3	3	4	10
Total of Locomotives	16 (42.1%)	8 (21.1%)	14 (36.8%)	38 (100.0%)
Commuter train cars				
DRC Live Motor	4	2	1	7
DRC MCBP	1	0	2	3
DRC Loco Haul	19	7	19	45
Total of DRC	24 (43.6%)	9 (16.4%)	22 (40.0%)	55 (100.0%)

Source: PNR

Note DRC is an abbreviation for diesel rail car. DRC live motor is a car for inspection work, and DRC MCBP is an abbreviation for DRC motor car baggage power. Both are motor engines. DRC loco haul is a hauled car. DRC and 5000-type locomotives are used on the Commuter Line South.

(d) Lack of maintenance equipment

There is a shortage of maintenance equipment, such as automatic tamping machines[4] and ballast regulators[5]. Few are currently available for maintenance works.

(e) Lack of operating budget

As indicated in the later section on “Sustainability”, the PNR financial results are worsening, and its shortage of operating budget makes it difficult to pay costs for spare parts and fuel.

(ii) Speed and safety

Table 3 compares train speeds between Tayuman (Tutuban) and Espana, and between Espana and Carmona in 1990 and 1998. The field study did not include any technical examination of the track conditions , which influences on train speed and safety, but the Espana – Carmona section, which was rehabilitated, was clearly differentiated from other sections.

4 Track maintenance equipment that packs down the ballast to repair track misalignment etc.

5 Track maintenance equipment used for arranging the ballast layer.

Table 3: Maximum Speed on Each Section

Year	1990	1998
Between Tayuman (Tutuban) and Espana (Not rehabilitated)	20-25km/h	25-30km/h
Between Espana and Carmona (rehabilitated)	30-35km/h	50-70km/h

Source: PNR

According to PNR documents, the maximum speed for the section of track between Espana and San Pedro (the station next to Carmona), which was the subject of the rehabilitation project, is set at 60km/h. For the section between Tayuman and Espana, which was not rehabilitated, it is set at 15-30km/h.

Table 4 compares the numbers of derailment in the rehabilitated sections and un-rehabilitated sections of the Commuter Line South. Other than the state of the track, the frequent derailments can also be blamed on the superannuation of locomotives and cars. The section excluded from rehabilitation scope of this project was between Tayuman (Tutuban) and Espana. Judging from the data for the last three years, rehabilitation work makes a contribution to improving the safety of operation.

Table 4: Number of Derailments

	1998	1999	2001 (First half)	Total
Rehabilitated section	6	2	2	10
Section excluded from rehabilitation	15	31	5	51

Source: PNR

(4) Impacts

(i) Quantitative Impacts

(a) Operating income

The operating income of the Commuter Line have been increasing over the last three years. Its share in the PNR's total operating income amounts to nearly 20% in 1999 (see Table 5).

Table 5: Commuter Line operating income and its share in the PNR's total operating income

Units: 1,000 Pesos

	1992	1993	1994	1995	1996	1997	1998	1999
Commuter Line operating income (a)	7,248	14,472	16,151	13,754	10,998	15,794	21,761	22,698
PNR total operating income (b)	59,540	59,106	64,369	85,487	38,052	105,553	117,713	116,978
(a)/(b) (%)	12.2%	24.5%	25.1%	16.1%	28.9%	15.0%	18.5%	19.4%

Source: PNR

Note: The drop in operating income in 1996 was due to typhoon damage.

(b) Fares and travel times

Table 6 compares the travel time and the fare during peak commuting hours on the Commuter Line South and other means of transport between Espana and Carmosa in February 2001. The Commuter Line South was a quick and cheap means of mass transit, particularly in the commuting hour.

Table 6: Comparison of fares and travel times for modes of transport between Espana and Carmona

Mode of transport	Travel time		Fare	
	Commuting hours	Ordinary times	Air conditioned	Ordinary
PNR	80 minutes	80 minutes	16 pesos	12 pesos
Taxi	105 minutes	60 minutes	300 pesos	NA
Bus	175 minutes	80 minutes	59 pesos	49 pesos
Jeepneys	195 minutes	130 minutes	NA	43 pesos

Source: Field study findings, February 2001.

Note: 1) Commuting hour periods are 07:00~09:00 and 16:00~21:00. Ordinary times are 09:00~16:00.
2) Buses require three changes, and jeepneys require five changes. In addition to the above travel times, jeepneys require waits of at least 10 minutes for each change.

(c) Financial Internal Rate of Return (FIRR)

At the time of the appraisal, the FIRR for this project was estimated at 9.4%, assuming fare revenue as the benefit of the project. However, while it is presumed that the project section ran a deficit every year to date and the FIRR is negative, we could not recalculate on the actual results since we have not been able to acquire sufficient data from the executing agency.

(d) Economic Internal Rate of Return (EIRR)

At the time of the appraisal, the EIRR for this project was estimated at 28.3%, assuming fare revenue and time saved by passengers as the major benefits of the project. We could not recalculate on the actual results since we have not been able to acquire sufficient data from the executing agency.

(ii) Qualitative Impacts

As mentioned above in the “Efficiency” section, the squatter issue remains unresolved. At the time of the appraisal, there were 9,000 squatter households within five metres from the track in July 1990. By September 1996, that figure had exceeded 10,000 households. The PRN used a special task force (comprising Manila City, PNR, the Housing and Urban Development Coordinating Council (HUDCC) and the National Housing Authority (NHA)) to tackle the problem of squatters by relocating them to empty properties of PNR and then clearing the vacated dwellings. These activities have merely limited effects, compared with the plan[6]. The reasons for the delay in relocation include PNR’s financial problems, difficulty in finding resettlement destinations, the squatters’ opposition to relocation, and refusal by local

[6] , Of the planned 4,334 households which were to be resettled to an area farther from the tracks, approximately 450 had been moved by October 1996. Of the 580 households scheduled for relocation to Pandakan, 17 have been relocated (relocations began in 1997). According to PNR, the number of squatters at the planning stage was less than at the implementation stage, so the plan was believed to be feasible.

governments to accept the squatters. The presence of squatters inside railway tracks is one of the socio-economic problems that PNR has most concerned about. It will be difficult for PNR for itself to solve this issue because of the scale of the relocation, the socio-economic environment surrounding the targeted people of relocation, the size of funding required, and the necessity of coordination with the other relevant institutions and the residents of destination communities of resettlement .

(5) Sustainability

The operation and maintenance of this project after completion have been carried out by PNR, as planned. The organizational structure of PNR has considerable problems, as seen in the following, on the operation and maintenance and the financial sustainability.

(i) Operation and Maintenance

The engineering department of PNR handles track maintenance. As of January 2001 the department had 517 staff members against the regular number of 1,023. Within the department, the Manila Division is responsible for the maintenance of the Commuter Line South. As of November 2000, the division had 251 staff members against the regular number of 319. On the manuals, maintenance works should be conducted by teams of five, with each responsible for the daily care of 2.0-2.5km of track[7]. However, the lack of staff and maintenance equipment makes adequate maintenance impossible.

The PNR is considering of automation of track maintenance system (with automatic tamping machines, etc.), which would yield little effect while the squatter issue remains unsolved.

(ii) Financial Status

PNR remains in a weak financial position, with problems including continuous losses (before it received its government subsidies, PNR made a net loss of 817 million pesos in FY 1999, and a 670 million pesos of loss remained after subsidies). Payroll, the largest cause of the loss, accounted for 85.5% of operating costs in 1999, 2.75 times operating income for the year: operating income does not even cover payroll. In a bid to reduce subsidy payments to PNR, the Philippine government is demanding PNR for reshaping of management, including personnel cost reduction, to cut the losses.

3. Lessons Learned

When a project involves relocation of squatters, it will take a lot of time to settle the issue due to the social and political complexity of nature. It is necessary to examine the feasibility of the executing agency's relocation methodology and the responsibilities of each related agency must be checked, and to draw a relocation plan that allows an adequate period of time for implementation.

[7] The teams' duties consist of garbage disposal, grass cutting, adding ballast, repairing areas where the track bed is weakened due to the lack of drainage equipment, replacing ties, collecting and aligning rails, etc.

Comparison of original and actual scope

Item	Plan	Actual
①Project Scope		
-Track rehabilitation		
Rail replacement	14km (37kg/m)	0.8km (32kg/m) 1.5km (37kg/m)
Tie replacement	PC ties (excluding car sheds and curves of 800-metre radius or less)	Same as planned
Ballast addition	$0.5m^3/m$	$1.0m^3/m$
Track bed improvement	18km	Same as planned
-Bridge rehabilitation	4 bridges between Tayuman (Tutuban) and Carmona	10 bridges between Espana and Carmona.
-Signal rehabilitation		Not implemented
Electric-type automatic signal system	12 sets	
Mechanical rock point	39	
Automatic level crossing signal	10	
-rehabilitation of communications facilities	2	Not implemented
-Station rehabilitation	16 stations	Not implemented
-Installation of fences	Kalookan~Tutuban~Paco (partially excluded)	Between Vito Cruz and Buendia Between Bicutan and Muntinlupa *Out of the section between Tayuman (Tutuban) and Carmona, Tayuman (Tutuban) - Espana was not rehabilitated.
-Consulting Service		
Foreign	72M/M	82 M/M
Local	56M/M	72 M/M
②Implementation Schedule	Feb. 1993 ~ Feb. 1995	Feb. 1995 ~ Aug. 1998
③Project Cost		
Foreign currency	¥1,710 million	¥1,855 million
Local currency	¥963 million	¥754 million
Total	¥2,673 million	¥2,609 million
ODA Loan portion	¥2,005 million	¥1,855 million
Exchange rate	1 peso = ¥6.8	1 peso = ¥5.17