

Indonesia

North Java Line Track Rehabilitation Project

Report Date : August, 2002

Field Survey : July, 2001

1. Project Profile and Japan's ODA Loan



Project Location Map



North Java Line (Cikampek - Cirebon)

1.1 Background

The two railway lines between Jakarta and Surabaya are the most important trunk lines in the Republic of Indonesia. Because of a lack of appropriate investment required for long-term operation and maintenance, the railway had deteriorated and lost importance among the inland transport modes. In 1968, the Government of Indonesia began rehabilitation work using its own funds. Since 1970, JBIC had supported the rehabilitation work of the North Java Line through a number of financial assistance projects. In the JBIC study of the Cikampek – Semarang section in October 1987, which aimed to find effective measures to maintain the effectiveness of these earlier JBIC projects, it was pointed out that (1) on-time train operation, as well as safe train movement, could not be secured owing to deficiencies in the railway facilities, and (2) some parts of tracks and bridges, which had been excluded from the preceding JBIC projects because they were within the scope of another government project, had deteriorated heavily.

1.2 Objectives

To enable train operation at an average speed of 55km/hr (maximum speed 80km/hr), to improve transport services, and to increase the number of railway passengers and the amount of freight, by replacing railway tracks on four sections of the Cikampek – Semarang rail segment on the North Java Line.

1.3 Project Scope

- 1) Procurement of track materials
 - (a) Rail and accessories

- (b) Turnout
 - (c) Thermit welding
 - (d) Geotextile
 - (e) Other material necessary for track rehabilitation
- 2) Installation works
 - 3) Engineering services

1.4 Borrower/Executing Agency

Republic of Indonesia / Directorate General of Land Communications (Former, Directorate General of Land Transport and Inland Waterways)

1.5 Outline of Loan Agreement

Loan Amount	8,229 million yen
Loan Disbursed Amount	5,754 million yen
Exchange of Note	December, 1989
Loan Agreement	December, 1989
Terms and Conditions	
Interest Rate	2.5 % p.a.
Repayment Period (Grace Period)	30 years (10 years)
Procurement	General Untied (Partially Untied for Consulting Services)
Final Disbursement Date	June, 1995

2. Results and Evaluation

2.1 Relevance

The project objective was the rehabilitation and improvement of the railway track in order to realize on-time train operation and safe train movement between Jakarta and Surabaya. At the time of project appraisal, the Government's national transport policy promoted the improvement of existing railway tracks and rolling stocks in order to make railway transport more efficient and give it an expanded role in the intercity transport system. The North Java Line is the most important and busiest line in the country, connecting its two largest cities. The JBIC study in 1987 found that there were some sections where the railway tracks, including rails, sleepers and roadbeds, were superannuated and deteriorated. To sum up, the project was consistent with national policy and the continuity of JBIC's policy at the time of appraisal.

The project still complies with the current national development policy and with the development plan of the Republic of Indonesia (PROPENAS (Program Pembangunan Nasional) (2000-2004)), since PROPENAS places a high priority on repair and maintenance of existing infrastructure in order to effectively utilize public facilities.

2.2 Efficiency

(2.2.1) Project Scope

There was no significant change in the project scope from the original decided at the time of project appraisal. The project was implemented on the sections originally chosen between Cikampek and Semarang, with minimal alteration. The actual total distance slated for rehabilitation/improvement was 132.6 km, whereas the original plan specified 131 km. Reductions in track materials procured were made possible by differences in site conditions and by differences in design standards between the original plan and actual implementation. These modifications were regarded as relevant for attaining the project objectives.

(2.2.2) Implementation Schedule

The installation work was originally scheduled for the period from August 1992 to October 1993, while the actual work period started in March 1993, eight months late, and lasted until December 1994. Reasons for the delay in the implementation schedule are as follows:

- a. The contractor (Joint Operation) selected in the LC (Local Currency) portion had a financial problem, which caused delays in the procurement of materials and which led to manpower insufficiencies.

As a result, the start of the installation work was delayed eight months.

- b. The installation work was interrupted by Perum KA (National Railway Public Corporation) in order to facilitate daily train operation.

Accordingly, implementation required up to six months more than was originally expected at the time of project appraisal.

(2.2.3) Project Cost

In the original plan appraised by the JBIC, the total project cost estimate was 9,682 million yen; it actually turned out to be 6,141 million yen. The cost under-run was largely due to the reduction in costs for procuring imported materials. The background for the reduction is as follows:

Prior to the commencement of physical site construction, a joint survey was conducted to confirm the quantities and location of the precise project site described in the original design.

The quantities of most work items were finally modified on the basis of the survey results, which clarified the site conditions where the facility/structure was to be built, including geographical features. In some cases, immediate action had to be taken by Perum KA with its own budget before JBIC's finance could be ready. For instance, section III (Kuripan – Krengseng) was in such critical condition that rehabilitation could not await finalization of design work for JBIC's assistance. Consequently, the quantity of the imported materials were reduced, because emergency repairs were made before the procurement recommendations of the surveys could be completed.

2.3 Effectiveness

At the time of project appraisal, it was expected that the project would contribute to improving

transport efficiency and to railway profitability by reducing travel time between the two largest cities. The effectiveness of the project is assessed on the five criteria discussed below.

(2.3.1) Operation Speed

In 1995, the first year after project completion, the actual operating speed - both average and maximum speeds – reached and, in some cases, even exceeded the original target at the time of project appraisal. The operating speed in the project section has, since 1996, been further increased by improvements in the operation system. Clearly, the project has achieved or exceeded its original objective, which was to attain train speeds of 55km/hr on average (80km/hr at maximum). According to the document from the executing agency, maximum speeds have increased to almost 100 km/hr, which means the travel time between Jakarta and Surabaya has been reduced from 14 hours to 9 hours.

Target operation speed has been maintained, even though bridge rehabilitation and track maintenance work which were not covered in this project began in 1998 on several sections between Cikampek and Semarang.

Table 1: Average Operation Speed

(Unit: km/hr)

Railway Sections	Cikampek - Cirebon		Cirebon - Weleri		Weleri – Semarang	
	Original	Actual	Original	Actual	Original	Actual
1995	55 (80)	70 (80)	55 (80)	70 (80)	55 (80)	70 (80)
1996	55 (80)	70 (90)	55 (80)	70 (90)	55 (80)	70 (90)
1997	55 (80)	80 (100)	55 (80)	80 (100)	55 (80)	80 (100)
1998	55 (80)	105 (110)	55 (80)	85 (100)	55 (80)	85 (95)
1999	55 (80)	105 (110)	55 (80)	85 (100)	55 (80)	85 (95)
2000	55 (80)	105 (110)	55 (80)	85 (100)	55 (80)	85 (95)

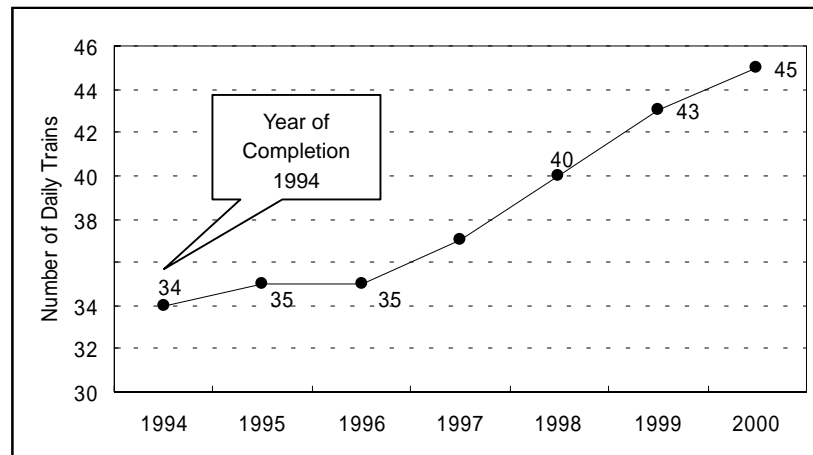
Source: PT.KAI

Note: Perum KA was transformed into PT. KAI.

(2.3.2) Number of Trains in Operation

The number of trains traversing the Cikampek – Semarang section daily increased after the completion of the project. This increase is regarded as an effect of the higher operational speed realized after project completion.

Figure1: Number of Train Operation for Cikampek - Semarang



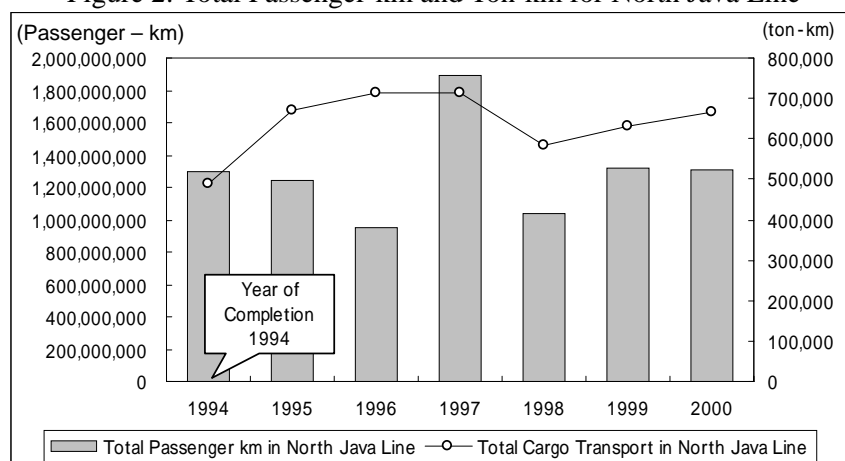
Source: PT.KAI

Note: Number indicates round trips

(2.3.3) Railway Passenger km and Freight ton-km

The passenger-km measurement declined from 1994 to 1996, owing to the modal shift to road transport from railway in accordance with the development of highways, including toll roads. The modal shift to road transport is considered to be still progressing, but further declines in train ridership have abated; the higher operational speed, attained in light of the higher quality of maintenance work which became the norm after privatization in 1999, has helped stabilize passenger use. In 1997, there appeared to be evidence of a statistical aberration. The passenger – km measurement was extremely high, but this high reading is believed to have been generated by a statistical error, based on a review of the statistical data for all of Indonesia.

Figure 2: Total Passenger-km and Ton-km for North Java Line



Source: PT.KAI

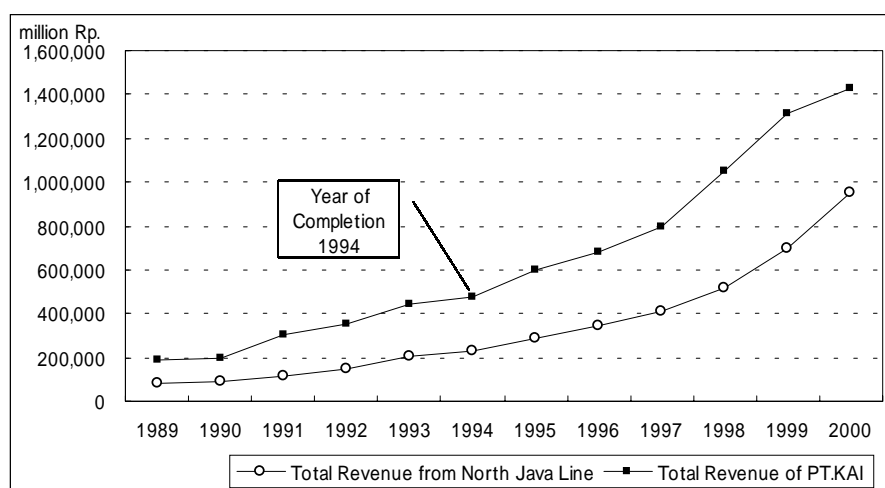
(2.3.4) Revenue

The total revenue from the North Java Line has increased since the completion of the project, with an average growth rate of 3.9 % per annum at real value, considering the inflation rates for the years

1994 to 2000. The line was operated by Perum KA under the DGLC (Directorate General of Land Communications) of the Ministry of Communication, which subsequently was transformed into PT.KAI (a limited liability company owned by the government) in 1999.

The growth rate of revenue after privatization has been 19% per annum in real terms, more than four times greater than that under Perum KA.

Figure 3: Total Revenue



Source: PT.KAI

(2.3.5) Economic Internal Rate of Return

The economic internal rate of return (EIRR) for the project was re-estimated using the actual project cost, as well as actual and expected benefits. The benefits of the project were estimated from (1) time-related cost savings and (2) transport-related cost savings, compared to similar road transport measurements at the time of appraisal. Although the EIRR estimation at the time of the appraisal included some controversial assumptions, they were employed without change for the re-estimation for the comparison purpose. The re-estimated EIRR is 10.2%, which is almost the same as the original EIRR (10.5%).

The similar figures, in spite of the cost under-run of the project, may be attributed to slower growth in passenger ridership than had been expected.

2.4 Impact

(2.4.1) Reduction of Railway Accidents

Railway accidents had been a serious problem for train operations. With this project, various measures were employed to improve the situation. The track has been continuously improved to reduce the incidence of derailment, and barriers and automatic alarms were installed to prevent pedestrians or vehicles from inadvertently crossing the tracks and causing accidents. These measures

might have contributed to the decrease in the number of accidents.

Table 2: Railway Accidents on the North Java Line

	Nature the Accident					Total
	A	B	C	D	E	
Year of Completion 1994	4	48	35	7	53	147
1995	1	63	44	9	65	182
1996	3	52	31	6	9	101
1997	2	44	22	6	5	79
1998	5	24	27	4	3	63
1999	3	26	33	7	18	87
2000	8	18	24	5	8	63

Source: PT.KAI

Notes: A= Train-Train collision; B= Train-Road vehicle collision; C= Derailment;
D= Natural Disaster (flood/landslide); E= Miscellaneous

(2.4.2) Environmental Impacts

According to the executing agency, there were no specific impacts on the environment, since the project primarily involved the rehabilitation of existing railway tracks.

(2.4.3) Impacts on Local Residents

There was no problem reported.

2.5 Sustainability

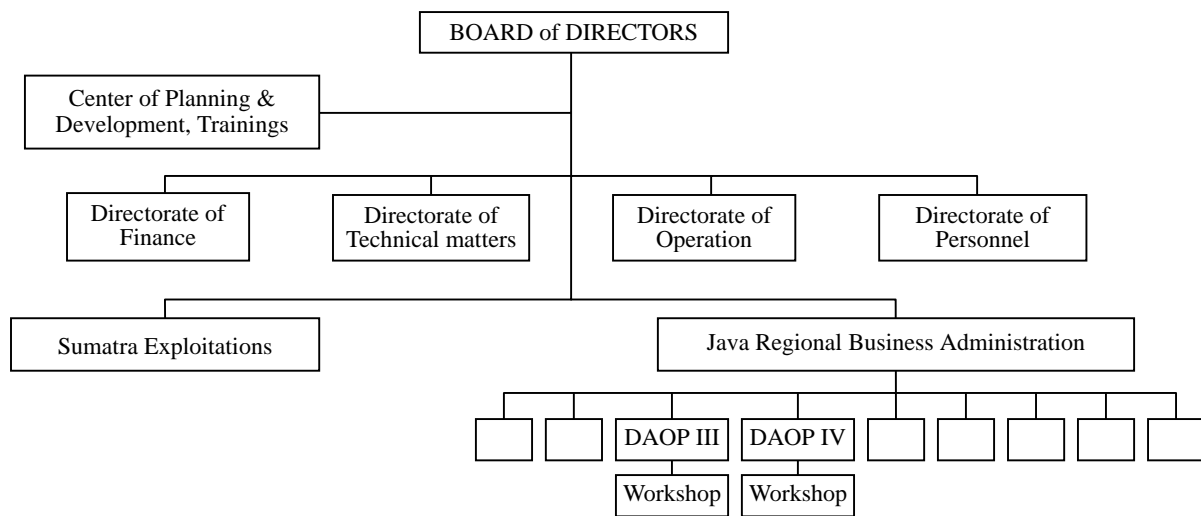
(2.5.1) Organization for Operation and Maintenance

The project sections between Cirebon and Semarang have been operated and maintained by Perum KA, which was converted into a limited liability company owned by the government named PT.KAI in 1999. DAOP III (Java Third District Office) of PT.KAI is responsible for the Cikampek-Cirebon section, and DAOP IV (Java Fourth District Office) of PT.KAI has jurisdiction over the Tegal-Semarang section. The total number of staff members at DAOP III is 1640, of which 603 people are working on track and bridge maintenance. The number of O/M staff, as well as their skill level, which the survey mission reviewed at the project site, seems to be adequate for fulfilling the project objectives at present. DAOP IV has basically the same organizational structure as DAOP III.

All the railway infrastructure and facilities still belong to the Central Government, so development costs for the railway are still being borne by the Government. PT.KAI is in charge of train operations and maintenance of railway tracks, locomotives/wagons and related equipment.

As a result, the PT.KAI pursues increases in profitability by upgrading railway services, while the Government plays a role in effectively developing the railway infrastructure in line with the national or regional development policy.

Figure 4: Organization Chart of PT.KAI



(2.5.2) Present Operation and Maintenance Conditions

a. Present Condition of the railway tracks

The survey mission visited the project site for the Cikampek-Cirebon section in June 2001. The railway track, including the basement, sleepers and rail, are well maintained as far as the project sections are concerned. However, for the connecting section between Jatibarang and Terisi, 13 km in length, the wooden sleepers are superannuated and rail bolts are missing, thereby restricting train speed to less than 60 km/hr. This section was not covered in this project, because it was considered in good condition at the time of project appraisal. The rehabilitation of this section is being reviewed by PT.KAI.

b. Railway Tariff

There are three classes of passenger tariff: economy, business and executive. The tariff for economy class is determined by the DGLC from the viewpoint of social welfare, while the other classes are determined by PT.KAI, from the viewpoint of profitability. Table 3 shows an example of the current tariff rate.

Table 3: Current Tariff Rate

	(Unit: Rp.)		
	Executive	Business	Economy
Jakarta - Semarang	72,000	32,000	24,000

Source: PT.KAI

c. Maintenance Work

There are five maintenance teams in charge of work for their respective sections. The work

consists of routine maintenance and periodic checking of the main facilities, including the railway tracks, by using inspection cars and testing equipment. Based on the inspections, serious problems, if any, are reported to the DGLC through the main office. Minor repairs are carried out by the maintenance teams themselves. According to PT.KAI, financial constraints have led to a general shortage of spare parts, particularly those related to the signal system.

(2.5.3) Financial Status

As stated above, since the operation and maintenance system is functioning adequately for the project sections, there is no serious threat to the sustainability of the project at present. Naturally, the 1999 privatization of the management body has caused a shift in priorities, making profitability and service quality measures of success. The financial condition and the service operations of PT.KAI are discussed below.

Table 4 shows the financial condition of PT.KAI before and after privatization. The main revenue sources are those from passengers, comprising 70% of total income.

The Central Government maintains a subsidy system for train operation and maintenance.

One subsidy applies to the O/M cost of infrastructure, depending on the railway length. The other one applies to public service operations for economy class passengers. In return for these subsidies, PT.KAI has to pay the Government a track cost-related fee for using the railway tracks, though it is difficult to assess whether it is sufficient to recover the capital cost. When the subsidy exceeds the track cost, PT.KAI receives a substantial boost to its balance sheet income.

The total revenue of PT.KAI decreased in 1999 and then increased sharply in 2000 after the privatization. But operating costs and overhead had exactly the same tendencies during that period, so net earnings before taxes remained the same for the period from 1997 to 2000. However the amount of the government subsidy has fallen in the recent years, turning negative in 2000. This comes as a result of privatization and implies that the railway management is becoming more sound, that is, revenue is expected to cover not only O/M cost but also some of the capital cost.

Table 4: Profitability of PT.KAI

(Unit: Million Rp.)

Description	Before the privatization		After the privatization	
	1997	1998	1999	2000
Train-Operating Revenues	726,359	937,976	725,189	1,390,520
Passenger Services	498,981	671,560	562,874	1,087,985
Freight Services	200,573	217,453	162,315	298,417
Train-Supporting Business Revenues	23,425	40,413	-	-
Other Operating Revenue	3,381	8,550	1,601	4,119
Government Compensation	31,500	31,500	18,375	-10,972
Total Revenues	757,859	969,476	745,165	1,379,548
Operation Cost	557,128	787,244	555,471	1,085,440
Gross Operation Earning	200,731	182,233	189,693	294,108
Overhead Cost	235,847	246,161	187,526	295,465
Net Operating Earning	-35,116	-63,928	2,168	-1,357
Related Businesses Revenue	65,486	101,777	28,497	40,695
Earning Before Contingencies	30,370	37,848	30,665	39,338
Contingency Profit / Loss	-1,869	-8,712	446	-15,481
Earning before Taxes	28,501	29,137	31,111	23,857
Taxes	0	8,732	3,532	0
Earning After Taxes	28,501	20,404	27,579	23,856

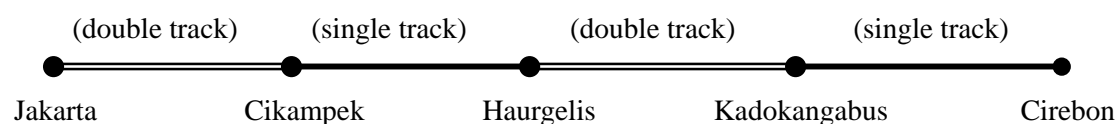
Source: PT.KAI

(2.5.4) Service quality

In terms of service quality, the number of accidents and operating speed can be considered the determinant indicators. As stated above, the number of accidents decreased by about half, compared to the number at the time of project appraisal. However, serious accidents still occur, particularly collisions between trains. The main causes are technical problems and human error, as shown in Table 2. For prevention, the training of operation staff remains highly important. The training realization ratio (actual number of trainees/planned number of trainees) increased from 1998 to 2000, particularly with regard to more effective operations. In view of the social and economic roles of the railway in the transport sector, it is important to foster the capability of personnel. Therefore, further efforts are necessary to procure skilled manpower and to provide further training so that the number of accidents can be reduced.

As for the average operating speed, the initial target has been attained with an achievement in excess of 80 km/hr. However, it may become difficult to maintain the high operating speed in accordance with the growth in the number of trains in operation. As passenger and freight levels increase, it is conceivable that current operational levels will, sooner or later, reach the capacity of the transport system.

Further increases in transport capacity will be necessary. The construction of a double track on the Cikampek – Haurgelis and Kadokangabus – Cirebon, which are the sections of single track between Jakarta and Cirebon, have already financed by ODA loan of JBIC.



3. Lessons Learned

The project was implemented based on the 1987 JBIC study, which aimed to find effective measures to maintain the effectiveness of these earlier JBIC projects. In this sense, it is learned that such JBIC study is effective for realizing a rehabilitation project, particularly in such a case that JBIC has continuously supported the development of certain infrastructure like North Java Line.

Comparison of Original and Actual Scope

Item	Plan	Actual
Project Scope		
Rehabilitation and improvement of the railway track between		
1) Cikampek & Cipunegara	(extension of 47.2km)	46.3km
2) Jatibarang & Cirebon	36.2km	39.0km
3) Kuripan & Weleri	13.9km	14.4km
4) Weleri & Semarang		32.9km
1. Procurement of track materials		
(a) Rail R54	156.5km	133.2km
(b) Turnout	64 sets	43 unit
(c) Thermit welding	16,500 nos.	8,134 unit
(d) Geotextile	583,000m	7,360m
(e) Tools for repair	1 set	-
(f) PC railroad tie	222,000 pcs	152,866
(g) Wood railroad tie	44,000 pcs	21,901
(h) Ballast	329,000m ³	300,886m ³
(i) Sand	164,000m ³	
2. Installation works		
(a). Renewal of rails		133.2 km
(b). Replacement of moisture proof sheet		7,360 m
3. Engineer services		
(a) Detail design	Pro(A) : 168 M/M	Exp. : 198.3 M/M
(b) Construction supervision	Pro(B) : 54 M/M	Local : 440.5 M/M
(c) Assistance of Indonesia follow up	Total : 222 M/M	Supporting Staff : 191.6 M/M
Implementation Schedule	July 1989 ~ Dec. 1993	Mar. 1990 ~ Mar. 1995
Project Cost		
Foreign currency	4,388 million yen	2,378 million yen
Local currency	5,294 million yen	3,763 million yen (75,265Rp)
Total	9,682 million yen	6,141 million yen
ODA Loan Portion	8,229 million yen	5,754 million yen
Exchange Rate	1 Rp. = 0.0731 yen (1989.4)	1 Rp. = 0.05 yen (1993)

Independent Evaluator's Opinion on North Java Line Track Rehabilitation

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The project activities included replacing railway tracks on four section of the Cikampek – Semarang segment of the North Java Line. Its main objective was to rehabilitate and improve the railway tracks so as to achieve on-time train operation and to improve safety of the railway transportation. Its other objectives were to increase the cruising speed of trains traveling on the segment under consideration; to increase transport service; and to increase the number of railway passengers and the amount of freight. These objectives were in accordance with Indonesia's economic policy and they remain relevant today. Java needs efficient means of transportation to move people and goods around. Over 100 million Indonesians live on Java where most of the manufacturing and other economic activities take place. In fact, the existing railway lines and roads rapidly become inadequate to meet the ever-increasing demand for efficient land transportation.

The project had three main activities, namely, procurement of track materials, installation works, and engineering services. These activities were in line with the overall goal and the attainment of the objectives and were consistent the intended impact and effects of the project under consideration.

We support the report's claim that the project might have contributed to the reduction in the number of overall accidents between 1994 and 2000. However, the presentation of the data used to support the claim is quite misleading. Table 2 of the report, shows the number of train-related accidents on the North Java Line during the period under consideration. The table shows that there had been a tendency for an increase in the number of train collisions during the period. Meanwhile, the number derailments fluctuated over the years but without a clear tendency of declining. It would be better if the number of accidents were presented in, say, per 1000 train trips on the Cikampek – Semarang Line. It is also important to provide information regarding the causes as well as the locations of those accidents.

In addition, it should be stated that there are other factors than improvement in the railway tracks that might have also contributed to the reduction in train accidents, such as, improvement in the signaling system, improvement in the management of traffic control, improvement in the operation and maintenance, etc. Presumably, there have been some improvements on these components of the railway transportation system during the period under consideration as well, and they should be taken into consideration accordingly.

Finally, we are of the opinion that the project should have some positive economic benefits to residents of towns along the railway line in question. Unfortunately, the survey did not investigate this issue.

* I have benefited from discussions with Ms Titik Anas who has been kind enough to provide some insightful comments about the report. The usual disclaimer applied.