

Romania

Ex-Post Evaluation of Japanese ODA Loan Project
Railway Rehabilitation Project of Bucharest-Constanta Line

External Evaluator: Yasuhiro Kawabata, Sanshu Engineering Consultant

0. Summary

The objectives of the project were to expand the transporting capacity and improve the transporting efficiency by ensuring stability and safety of the railway operation through upgrading the existing railway tracks (86km) and related facilities including signals, telecommunication systems, electrical facilities, and station facilities between Bucharest and Constanta (225km), which is a segment of the European Fourth Corridor. The project has been highly relevant to the development plans and needs of Romania, as well as Japan's ODA policies. With respect to the expansion of transporting capacity and improvement of transport efficiency, which are the project objectives, the project has largely achieved its objectives, and thus the effectiveness and impact are high. Outputs of main project components are almost as planned. However, both project cost and project period significantly exceeded the plan. Therefore, efficiency of the project is considered low. No major problems have been observed in the operation and maintenance system, therefore sustainability of the project effect is considered high.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Projection Location



Fetesti-Constanta section
Ending Point of the Project (Constanta)

1.1 Background

The railway in Romania, which had exclusively served for the medium and long distance transport by 1980s, had been required to undertake the fundamental reform since the political

system changed in 1989. Referring to the demand to the transport sector in 1990s, on the freight transport, the demand to roads and inland waterways was expected to be relatively increased and the railway to be lowered. On the other hand, on the passenger transport demand, the railway was still the major mode, and it had still served the important role in Romania.

Former Romanian National Railway Company (CFR), which became independent from Ministry of Transport in 1991, had continuously deficit in 1990s. Thus, since rehabilitation and maintenance had not been properly undertaken, and the existing tracks had been deteriorated, decrease of operating speed due to weaker base foundation had grown increasingly apparent. Under these circumstances, the World Bank provided the technical assistance with a target to improve the management system and strengthen the technical capacity of CFR during 1992 – 1994. Moreover, the structural reform plan in the railway sector was prepared in collaboration with European Bank for Reconstruction and Development (EBRD) and EU. Under the reform planning process, the Romanian government started the fundamental reform in the railway sector including division of the former CFR into several entities/enterprises.

While the expansion strategy to the east¹ by EU had been promoted from mid 1990, the main railway and highway network in the central and eastern Europe was planned to be intensively developed as the “European Corridors” and was to be unified to the western Europe standards. After collapse of the cold war system, the relationship between central/eastern European countries and the former Soviet Union was weakened, and instead, that with western countries was strengthened. Consequently, the transport demand along the east and west corridor connecting between central/eastern European countries and western countries was increasing. In the Pan-European Transport Minister’s Conference held in 1994, “Central-Eastern Europe Transport Corridor Concept” targeting the international transport network in the eastern Europe was developed, and Romania was obliged to rehabilitate and develop the sections passing through the nation along Corridor 4 (Berlin – Istanbul), Corridor 7 (Danube waterways), and Corridor 9 (Helsinki – Plovdiv). Among three corridors, Corridor 4, which links between western Europe and Asia, is the most important corridor for Romania. Corridor 4 connecting with the western Europe via Hungary branches off in capital city, Bucharest with one route connecting with Turkey and another connecting with Constanta, which is the largest commercial port, faced to the Black Sea. The Bucharest – Constanta section is the most important trunk corridor for Romania, and the freight (container) transport demand is particularly anticipated in a long run. It was expected that the transport route originating at Constanta port (the Japanese ODA loan for the project was signed in 1998) would be more expanded after rehabilitation was made,

¹ It was recognized that it was essential to expand EU member countries including countries in the Balkan Peninsula in order to achieve peace, stability and prosperity in Europe by settling the conflict in the Balkan Peninsula.

1.2 Project Outline

The objectives of the project were to expand the transporting capacity and improve the transporting efficiency by ensuring stability and safety of the railway operation through upgrading the existing railway tracks (86km) and related facilities including signals, telecommunication systems, electrical facilities, and station facilities between Bucharest and Constanta (225km), which is a segment of the European Fourth Corridor. The location of the project site is shown in Figure 1.



Note: The section shown in green (Baneasa - Fetesti) was financed by EU.

Figure 1: Location of Project Site

Loan Approved Amount/ Disbursed Amount	25,635 million yen/24,988 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2001/March 2001
Terms and Conditions	For civil work and procurement: Interest Rate: 2.20%, Repayment Period: 30 years (Grace Period: 10 years) Conditions for Procurement: General untied For Consulting services: Interest Rate: 0.75% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: General untied
Borrower / Executing Agency(ies)	Government of the Republic of Romania / Railway Infrastructure Company (CFR)
Final Disbursement Date	November 2008

Main Contractor (Over 1 billion yen)	Leonhard Weiss Bauunternehmung(Germany)/E. Heitkamp Gmbh (Germany)/Taisei Construction Co., Taisei Construction Co., Swietelsky Baugesellschaft M.B.H. (Germany)/H. F. Weebe Gmbh & Co Kg (Germany)/Takenaka, Balfour Beatty Rail Gmbh (Germany), Thales Rail Signaling Solutions Gmbh (Germany)/Thales Rail Signaling Solutions S.R.L. (Romania)
Main Consultant (Over 100 million yen)	Obermeyer Planen / Beraten (Germany)/JARTS/Pacific Consultants International/Japan Transportation Consultants, Pacific Consultants International/Padeco/Seneca(USA)
Feasibility Studies, etc.	Romanian Ministry of Transport prepared the feasibility study report with the financial assistance of EU (1999)
Related Projects (if any)	Constanta South Port Development Project (Japanese ODA loan was signed in1998)

2. Outline of the Evaluation Study

2.1 External Evaluator

Yasuhiro Kawabata, Sanshu Engineering Consultant

2.2 Duration of Evaluation Study

Duration of the Study: September 2012 – August 2013

Duration of the Field Study: November 24 – December 9, 2012, March 3 – March 22, 2013

3. Results of the Evaluation (Overall Rating: B²)

3.1 Relevance (Rating: ③³)

3.1.1 Relevance with the Development Plan of Romania

In October 1999, the Romanian government developed “National Development Preliminary Plan 2000-2002”. Later, “National Development Plan 2002-2005⁴”, which was expanded based on the preliminary plan, was adopted as the mid-term national development plan. National Development Plan 2002-2005 covered all the agenda discussed in the previous preliminary development plan, and the key strategic agenda were strengthening of industrial development and competitiveness, development of the private sector, development of infrastructure, promotion of agriculture and rural development and others. More specific strategies for the infrastructure development were development of transport and urban infrastructure, and investment to the information technology related infrastructure, and thus, the proposed project

² A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

³ ③: High, ②: Fair, ①: Low

⁴ Since the document introducing the content of National Development Preliminary Plan 2000-2002 is not available, the Development Plan 2002-2005, which covers the Preliminary Plan 2000-2002 was used as the base material at the appraisal stage.

was one of key strategic agenda.

National Development Plan 2007-2013, developed in 2007 defines six priorities including the followings: 1) increasing economic competitiveness and developing the knowledge-based economy; 2) development and modernization of transport infrastructure; 3) environment protection and improvement; 4) development of human resources, promotion of employment and social inclusion, strengthening of the administrative capacity; 5) development of the rural economy and increase of agricultural productivity and 6) reducing regional development gaps. Regarding development and modernization of transport infrastructure, since Romania joined European Union (EU) in January 2007, rehabilitation and development of infrastructure based on the EU standards was particularly the agenda to be urgently tackled.

At appraisal (2001) and at ex-post evaluation, development and modernization of transport infrastructure in the transport sector was/is considered to be a priority agenda and one of key strategies for Romania.

3.1.2 Relevance with the Development Needs of Romania

In 1990s, since former Romania National Railway Company (Căile Ferate Române - CFR) had kept low tariffs, and its institutional setup was ineffective, CFR have had continuously deficit. Since rehabilitation had not been properly undertaken and thus, tracks had been deteriorated, lowering of the operational speed was considered to be an issue.

In the Pan-European Transport Minister's Conference held in 1994, "Central-Eastern Europe Transport Corridor Concept" was developed, and Romania was obliged to rehabilitate and develop the sections passing through the nation along three corridors including the Corridor 4 (Berlin - Istanbul), in which the part of the section is the project section. Accordingly, Romania needed to upgrade and high-standardize the current tracks and related facilities conforming to the EU standards.

The Corridor 4 branches off in Bucharest, Romania. One route connects with Turkey and another connects with Constanta, which is the largest commercial port, faced to the Black Sea, and is the most important corridor for Romania. Although the section under the project occupies 2% of the total length of the railway network in the country, the section covers about 17% of total transported amount. Thus, the transport demand, particularly on the freight (container) had been anticipated in a long run.

Regarding the railway transport infrastructure, rehabilitation and modernization of the sections comprising the part of Trans-European Transport Network (TEN-T), in which the Bucharest-Constanta section under the project is part of TEN-T, was needed to be urgently tackled. Rehabilitation of Corridor 4 commenced in 1996, and the non-project Baneasa – Fetesti section within the Bucharest – Constanta section was completed with EU funds in 2011.

Advantages of railway transport in comparison to other transport modes are: energy

efficiency (the energy consumption for a conventional ton-km is about 1/6 of road vehicles) and lower pollution (the air pollution per ton of freight represents only 1/10 of other modes). Thus, the proposed project is in line with the EU strategy, in which the amount of air pollution would be reduced by 2030.

3.1.3 Relevance with Japan's ODA Policy

In the JICA's Country Assistance Strategy for Romania (issued in March 2001), the Japanese government committed to assist in the development of transport network in the Balkan region taking into account the return of new Yugoslavia to the international community. In this regard, the Japanese government intended to give a priority to the transport infrastructure, which could provide benefits not only to the regional development, but also to the economic development of Romania. Thus, the project matched with the Japan's ODA policies.

Accordingly, the project has been highly relevant with the Romanian development plan and needs, as well as Japan's ODA policies. Its relevance is therefore considered high.

3.2 Effectiveness⁵ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

Since the outcome of the project was to expand the transporting capacity and improve transport efficiency by ensuring the stability and safety of the railway operation, the following quantitative effects were examined. Results of the analysis are shown below.

(1) Major indicators on railway operations

Major indicators on railway operations are shown in Table 1.

Originally, civil works and procurement of equipment were scheduled to be completed in December 2006 and in June 2004, respectively. The target figures for each indicator were set for those in 2008.

⁵ Sub-rating for Effectiveness is to be put with consideration of Impact.

Table 1: Major Operational Indicators for the Fourth Corridor

	Base Line	Actual				
	2000	2008	2009	2010	2011	2012
1) Freight transport (million ton-km/year) (Fetesti – Constanta)						
Projected		1,216				
Actual	887		961	768	987	1,015
2) Passenger transport (million passenger km/year) (Fetesti – Constanta)						
Projected		608				
Actual	526		825	884	961	987
3) Average track capacity (trains/day) (Bucharest – Constanta)						
Actual	105	48	48	48	144	144
4) Average delay time (minutes/train) (Bucharest – Constanta : Direct Train)						
Actual			29	24	06	60
5) Average travel time (minutes) (Bucharest – Constanta : Direct Train)						
On Timetable	165	298	265	234	170	158
6) Maximum operating speed (km/hour) (Bucharest – Constanta)						
Freight: Projected		120				
Actual	80		80	80	80	80
Passenger: Projected		160				
Actual	120		120	120	140	140

Source: Responses to the Questionnaire

Note 1: The project volume of freight and passenger transport after 2009 is not available.

Note 2: The average travel time is the average time by direct trains between Bucharest and Constanta shown in the timetable.

Note 3: During the winter time in 2012, Europe was attacked by heavy snow storms and delay of the travel time occurred resulting in the longer travel time in 2012.

Note 4: Maximum operating speed for freight and passenger trains will be raised to 120 km/hr and 160 km/hr, respectively starting in 2014.

Note 5: Track capacity: number of trains operational during the certain unit hour (generally per day) in certain section

Note 6: The reason for substantial increase of travel time for three years from 2008 through 2010 is that the Baneasa – Fetesti section was under construction with the EU fund.

- 1) After completion of the project, the volume of freight transported was slightly increased (by 3%) from 2011 to 2012. However, it was lower than the projected volume for 2008 (83%). Reasons why the actual volume in 2012 was only slightly higher than that in the previous year are likely: i) the train operations were partly suspended due to heavy snow in winter; and ii) the economic condition of Europe has been severely affected by the economical crisis in Greece.

Impacts to the transported volume by competition with the road transport are considered minimal as follows. According to the Romanian National Highway Authority, the annual average daily traffic in 2010 for the section between Fetesti and Cernavoda was 10,900 vehicles per day. However, since no traffic counting was undertaken in 2011 and 2012, the recent data on the average daily traffic was not available. The daily traffic based on the simple traffic counting, which was made in the same section when the field inspection was undertaken (on December 4, 2012) is estimated at about 15,000 vehicles per day.

Regarding the impacts on the freight transport by the parallel expressway, it was observed that trucks were mostly transporting groceries and daily commodities in a container and that the competitiveness with railways, which can transport a bulk of cargo at once was low. Thus, the mode share depending on the type of freight transported has been established. (source: discussions with the cargo transport agent, state-owned CFR Marfa)

- 2) The amount of passenger transport for the past four years has been increasing. Comparing the actual passenger transport in 2012 with the projected volume for 2008, the passenger transport was increased by 1.9 times.
- 3) The average track capacity was increased by 40% against the baseline figure, since the rehabilitation/improvement of the EU-funded Baneasa - Fetesti was completed in 2011 and thus, the whole alignment of Bucharest - Constanta became fully operational.
- 4) The average travel time between Bucharest and Constanta was reduced from 165 minutes before the project to 158 minutes after the project.
- 5) The maximum operating speed was 80 km/hour for freight trains and 120 km /hour for passenger trains before the project. After completion of the project, the maximum speed for passenger trains was raised to 140 km/hour. Starting in 2014, the maximum speed for freight and passenger trains is to be raised to 120 km/hour and 160 km/hour, respectively.

(2) Railway Accidents (Bucharest - Constanta section)

Data for the past four years indicates that in 2011 there were 2 train/car collisions and one was killed in one of the accidents. The train/car accidents took place at the at-grade crossing, which had a simple crossing bar for an approaching car for each direction, and after the accident, a set of crossing bars, which covers completely both directions was installed at all the at-grade crossings with the European funds.

3.2.2 Qualitative Effects

Under the ex-post evaluation exercise, beneficial surveys were undertaken⁶. The summary of survey results are discussed below.

⁶ Beneficiary surveys were conducted in the following manner. Date of surveys undertaken: December 17-20, 2012. Locations: around Bucharest and Constanta stations. Number of samples collected: 92 males and 63 females with a total of 155 (139 passengers and 16 non-passengers).

• Improvement of safety after project

Unit: %

Fully disagree	Disagree	Not clear	Agree	Fully agree	No idea
2	2	16	32	44	4

• Reduction of travel time after project

Unit: %

Fully disagree	Disagree	Not clear	Agree	Fully agree	No idea
4	8	25	34	27	2

• Reduction of waiting time at station after project

Unit: %

Fully disagree	Disagree	Not clear	Agree	Fully agree	No idea
3	7	26	34	24	6

• Improvement of delay of train operation after project

Unit: %

Fully disagree	Disagree	Not clear	Agree	Fully agree	No idea
5	8	23	32	30	2

About 80% of respondents recognize that the safety has been improved after completion of the project, and about 60% noted that the travel time has been shortened. The results likely confirm that the project has contributed to qualitative improvement for the transport demand. Moreover, about 60% of respondents conceive that the project has contributed to the reduction of waiting time at stations and to the improvement for delay of train operation. Thus, the project in some degree contributes to addressing the transport demand.

3.3 Impact

3.3.1 Intended Impacts

(1) Contribution to Promotion of Economic Development

As a result of the global financial crisis, Romania's GDP fell more than 7% in 2009, prompting Romania to seek a \$26 billion emergency assistance package from IMF, EU, and other international lenders. Drastic austerity measures led to a 1.6% GDP (\$260.7 billion) contraction in 2010. In 2011, the export has increased with GDP of \$267.1 billion, and the growth rate has turned to be plus (Source: CIA - The World Facebook). The freight amount handled at Constanta Port is as shown in Table 2. Since the data on the ratio of freight amount brought into/out of Constanta Port by mode (vehicles or railway) was not available, the degree of contribution by the project to the economic development and export is uncertain.

Table 2: Freight Amount handled by Containers at Constanta Port

Unit: TEU

Year	Export	Import	Transit	Total
2009	154,102	155,590	277,206	586,898
2010	190,109	196,447	162,640	549,196
2011	235,147	238,860	182,688	656,695
2012	299,069	297,139	253,191	849,399

Source: Constanta Port Authority

Note 1: TEU = Twenty-foot Equivalent Unit

Note 2: Figures for 2012 were estimated by prorating the 9-month data from January through September.

Note 3: The freight amount handled by containers at Constanta Port occupies about 13% of the total freight amount in ton basis.

Summary of the beneficial survey results on the enhancement of economic activities along the railway corridor and promotion of business after project are shown below.

- Enhancement of Economic Activities along the Railway Corridor

Unit: %

Fully disagree	Disagree	Not clear	Agree	Fully agree	No idea
2	13	16	24	14	31

- Promotion of Business after Project

Unit: %

Fully disagree	Disagree	Not clear	Agree	Fully agree
8	8	38	31	15

Note: responses of non-users (salesperson at stations, bus and taxi drivers who transport passengers between stations and towns)

According to the beneficial surveys, the ratio of respondents who conceived contribution of the project after completion of the project is about 40% regarding enhancement of economic activities along the corridor, and 50% on business promotion, respectively. The reason for the lower recognition of the project's contribution is mainly economic recession which affects the whole European countries.

3.3.2 Other Impacts

(1) Impacts on the natural environment

Ministry of Environment cleared the Environmental Impact Assessment (EIA) in March 2001, and it was valid until the project completion regarding the external agency-funded projects. According to National Railway Company (CFR), the railway alignment mostly passes through non-residential areas, and the impact to the living environment was very limited. During the project implementation, appropriate countermeasures were undertaken, including the slope protection work undertaken at

sites where topography or geological conditions were poor in order to prevent washout of soils from the project site. An environmental monitoring was undertaken during implementation, and it is reported that no major issue occurred.

(2) Land Acquisition and Resettlement

Since the project was rehabilitation work within the existing right-of-way, no additional land acquisition and no resettlement occurred. However, procedures for transfer of the ownership of national land with a total area of 30,255 m² were made.

(3) Other Positive and Negative Impacts

None.

Since the economic condition in Europe has been deteriorated because of the Lehman Shock occurred in September 2008, followed by breakout of Greek economic crisis in January 2010, the trade and logistics with neighboring countries have stayed stagnant. Thus, the growth of the amount of freight and passenger transported for the past two years (from 2011 to 2012) is minimal. However, the amount of passengers transported has been substantially increased compared the actual volume in 2012 with the projected volume for 2008. With respect to the expansion of transporting capacity and improvement of transport efficiency, which are the project objectives, increase of tracks capacity, and reduction of travel time have been achieved. The increase of operating speed is also planned. The project has largely achieved its objectives and thus the effectiveness is high.

3.4 Efficiency (Rating: ①)

3.4.1 Project Outputs

The original and actual output of the project is shown in Table 3.

The original scope of work at appraisal was planned based on the scope/bill of quantities defined and estimated in the feasibility study, completed in 1999. However, during the project implementation, the detailed designs and bidding documents were completed and the scope of work was partly revised.

Table 3: Output (original and actual)

Item	Original Plan	After revisions made (main items)	Actual
Civil Work	<ul style="list-style-type: none"> embankment consolidation (1.9 millionm³, drainage : 87km) rehabilitation of structures (11 bridges with 646m, 25 culvert boxes) construction of stations (platform 32,800m², 9 buildings) rehabilitation of tracks (rail 57km, ballast 370,000m³) contact lines (260km) 	<ul style="list-style-type: none"> embankment consolidation (2.4 million m³, drainage : 87km) rehabilitation of structures (16 bridges with 706m, 51 culvert boxes) construction of stations (platform 27,250m², 10 new buildings) rehabilitation of tracks (rail 298km, ballast 600,000m³) contact lines (262km) 	<p>Almost as planned</p> <ul style="list-style-type: none"> embankment consolidation (2.2 million m³, drainage : 100km) rehabilitation of structures (16 bridges with 711m, 51 culvert boxes) construction of stations (platform 22,500m², 10 new buildings/rehabilitation) rehabilitation of tracks (rail 305km, ballast 500,000m³) contact lines (280km)
Procurement/ installation of equipment	<ul style="list-style-type: none"> signals (112 units), telecommunication (85km), Electric (substations), Operating system (85kmABS) equipment 	<ul style="list-style-type: none"> signals (340 units), telecommunication (85km), Electric (substations), Operating system (85kmABS) equipment 	<p>as planned</p> <ul style="list-style-type: none"> signals (340 units), telecommunication (85km), Electric (substations), Operating system (85km ABS) equipment (4 items with 18 sets)
Consulting services	<ul style="list-style-type: none"> detailed designs assistance in tendering (preparation of bidding documents, assistance in bid evaluation) construction supervision advice on clauses on environmental issues in the bidding documents advice on management and financial issues technical advice on environmental protection <p>Foreign 360 M/M Local consultant: 720 M/M Local staff: 420 M/M</p>		<p>As planned</p> <ul style="list-style-type: none"> detailed designs assistance in tendering (preparation of bidding documents, assistance in bid evaluation) construction supervision advice on clauses on environmental issues in the bidding documents advice on management and financial issues technical advice on environmental protection <p>Foreign: 439 M/M Local consultant: 1,234 M/M Local staff: 860 M/M</p>

Source: JICA appraisal documents, Project Completion Report, Responses to the Questionnaire

Note: Project length: Bucharest North – Baneasa (5.3 km) and Fetesti – Constanta (76.6km) with a total length of 82km.

Main revisions made on the scope of work during the detailed engineering stage are as follows:

- 1) At the feasibility study stage, no major rehabilitation on stations and main tracks was planned. However, in order to conform to the EU standards, major rehabilitation works were added at the detailed design stage.

- 2) Originally, double tracking work was planned for the section between Bucharest North and Baneasa. Later, this plan was canceled.
- 3) The number of bridges to be rehabilitated at the feasibility stage was 11, and this was later increased to 15.
- 4) The number of culverts planned to be rehabilitated was originally 25, however, this was increased to 51.

The revisions made are based on the results of detailed designs, and they are considered appropriate. It seems that the impacts to the project (particularly on operational indicators) by progress of the EU-funded rehabilitation and improvement work for the Baneasa - Fetesti section (completed in 2011) were not fully taken into consideration at appraisal stage.

Comparing the planned scope of work defined after completion of detailed designs with actually accomplished scope of work, there are no major changes except that the higher standards than those proposed at the planning stage were applied to the design standards.



Beginning point of Bucharest -
Baneasa section (Bucharest Station)



Ending point of Bucharest North -
Baneasa section (Baneasa Station)

3.4.2 Project Inputs

3.4.2.1 Project Cost

The estimated project cost at appraisal was 34.180 billion yen, of which the total Japanese ODA loan of 25.635 billion yen was to be used for foreign currency and part of local currency portions, and the remaining 8.545 million yen was to be own funded. The actual cost project was 78.862 billion yen, and substantially increased, which is equivalent to 231% of the planned cost. Comparing the project cost in Euro, the planned project cost at appraisal was 342 million Euro, and the actual cost was 536 million Euro, which is equivalent to 156% of the planned cost. The actual project cost excluding increase due to price escalation is 438 million Euro, which is equivalent to 128% of the planned cost.

Table 4: Comparison of Project Cost (Planned and Actual)

Unit: million yen

Item	Planned					Actual				
	Foreign Yen loan	Local		Total		Foreign Yen loan	Local		Total	
		Own fund	Yen loan	Total	Yen loan		Own fund	Yen loan	Total	Yen loan
Civil Work, Procurement of Equipment/ Installation	14,781	1,059	6,955	22,795	21,736	22,487	41,319	0	63,806	22,487
Consulting services	1,705	0	715	2,420	2,420	2,501	672	0	3,173	2,501
Contingency	1,479	802	0	2,281	1,479	-	-	-	-	-
Land acquisition	0	42	0	42	0	0	0	0	0	0
Tax	0	6,642	0	6,642	0	0	11,883	0	11,883	0
Total	17,965	8,545	7,670	34,180	25,635	24,988	53,874	0	78,862	24,988

Source: JICA appraisal documents, Project Completion Report, Responses to the Questionnaire

Exchange rate: 1 EUR =100.87 yen (at planning stage in June 2000), Average exchange rate during the project implementation: 1 EUR = 147 yen for civil work

Main reasons for substantial project cost increase are as follows:

- 1) Design changes were made and variation orders were issued during implementation (including construction of turnouts, embankment consolidation, change of interlocking system, protection of cables, long hauling distance of wastes, construction of a substation and others). Since the connecting Baneasa-Fetesti section was also under rehabilitation with the EU funds, various design changes were made to conform to the design standards applied to the Baneasa-Fetesti section. As rehabilitation and development of infrastructure conforming to the EU standards was also the agenda to be urgently addressed, all the design changes made are considered appropriate.
- 2) Contracts with contractors were made in Euro. During the project implementation after appraisal, the Japanese yen became weaker (from 1 EUR =100.87 yen to 1 EUR = 147 yen), and this resulted in 50% cost increase in Japanese yen.
- 3) The price escalation for materials, labor, transporting costs and equipment was estimated at 9.46 million Euro at the appraisal stage. However, the actual cost of price escalation was 88.54 million Euro, which is about 10 times of the estimated cost.

3.4.2.2 Project Period

The original project period planned at appraisal was from March 2001 (signing of the Loan Agreement) to December 2006 with a total period of 70 months. The actual project period was from March 2001 to October 2010 (commencement of operation of the project section) with a total period of 116 months, or equivalent to 166% of the plan. Although the loan was closed in November 2008, the remaining work was continued with own funds, and the whole project

including acceptance by the employer was completed in May 2012. However, since the project section became operational in October 2010, the project completion date was defined to be October 2010.

Table 5: Comparison of Project Period (Planned and Actual)

	Planned (at L/A signing)	Actual
Selection of a consultant	2001.07-2001.12	2001.03-2002.09
Detailed designs	2002.01-2002.12	2003.02-2004.08
Bidding for civil work	2002.07-2004.06	2004.05-2005.11
Civil work	2004.01-2006.12	2005.12-2010.10
Procurement of equipment	2002.07-2004.06	2004.10-2006.06
Consulting services	2002.01-2006.12	2003.02-2012.05

Source : JICA appraisal documents, Project Completion Report, Responses to the Questionnaire

Main reasons for delay of the project implementation are as follows:

- 1) At the selection process for consultants, the implementation was delayed by 9 months against the original schedule.
- 2) Preparation of detail designs was delayed, resulting in 20 months delay at the completion of detailed designs.
- 3) Due to delay of completion of detail designs, the tendering process for selection of contractors was delayed, resulting in 17 months delay at the tendering process stage.
- 4) Originally, construction was planned to commence in December 2005 and complete by December 2008. However, since the train operation had been continued according to the normal time table until October 2008, construction did not progress as planned. On the other hand, by November 2008 the loan was almost 100% withdrawn, and the remaining work needed to be completed with own funds. Due to the economic crisis, the government could not allocate the budget as needed, and payment to contractors was delayed, resulting in much slower progress of the work. Consequently, the project period was substantially extended.

3.4.3 Results of Calculations of Internal Rates of Return (IRR)

Financial Internal Rate of Return (FIRR) and Economic Internal Rate of Return (EIRR) calculated at appraisal were 7.27% and 16.71%, respectively. It is not possible to recalculate FIRR and EIRR at the ex-post evaluation stage, since it is extremely difficult to collect accurate relevant information and data needed for recalculation, which includes construction and operation/maintenance costs for the EU-funded Baneasa – Fetesti section with respect to costs, and tariff/charge revenue from relevant enterprises and entities (refer to 3.5.1 the operation and maintenance organization under the Sustainability) regarding benefits.

Outputs of main project components are almost as planned. However, both project cost and

project period significantly exceeded the plan. Therefore, efficiency of the project is considered low.

3.5 Sustainability (Rating: ③)

3.5.1 Structural Aspects of Operation and Maintenance

National Railway Company (Căile Ferate Române - CFR) is responsible for operation and maintenance of the completed railway lines including maintenance of infrastructure and operational control of railway lines after completion of the project. The total number of employees as of 2011 is about 24,000. However, maintenance of contact lines, electrical traction substations and supply sources installed under the project is entrusted to the 100% CFR-owned “Electrificare”, which has about 2,800 employees as of 2011. While, maintenance of telecommunication networks is performed by the 100% CFR-owned “Telecomunicatii”, which has about 1,000 employees as of 2011 on an annual contract basis.

Regarding the operation and maintenance of the project sections, the Bucharest Regional Center for Operation, Maintenance and Repair is responsible for the section between Bucharest North and Baneasa, while the Constanta Regional Center is responsible for the section between Fetesti and Constanta. The total number of technical employees in charge of maintenance of the project section is about 300, which includes some staffs, who are responsible for other sections as well.



Operation system at Cernavoda Pod



Freight transported by railway

3.5.2 Technical Aspects of Operation and Maintenance

All the staffs in charge of operation and maintenance of the project section at CFR Regional Centers for Operation, Maintenance and Repair, Electrificare and Telecomunicatii have taken the on-the-job training on operation and handling in case of failure from suppliers/contractors after the facilities were completed or equipment was installed, and operation and maintenance manuals are well prepared. Most of equipment installed are still within the warranty period, and thus, it is possible to call suppliers/contractors and handle the issue together when any

problem occurred, which could be part of on-the-job training as well.

Regarding the maintenance work for infrastructure, internal regulations and manuals are prepared for each facility and equipment by CFR, and staffs have taken relevant training courses regularly.

3.5.3 Financial Aspects of Operation and Maintenance

The Income and Expenditure Statement of CFR for the past three years is shown in Table 6.

Table 6: Income and Expenditure Statement of CFR

Unit: thousand lei

	2009	2010	2011
Fare revenue	983,280,925	2,166,850,975	3,089,763,226
Financial income	156,362,647	923,853,382	981,811,524
Revenue total	1,139,643,572	3,090,704,357	4,071,574,750
Operation and maintenance costs	2,263,682,114	4,384,982,499	4,780,029,762
Financial expenses	160,567,830	927,714,090	718,652,813
Income tax	28,667	32,250	0
Balance	△1,124,038,542	△1,294,278,142	△708,455,012

Source: Project Completion Report, Responses to the Questionnaire

CFR has had adverse balance for the past three years, but deficit has been subsidized by the national budget in the following year. In 2011, rehabilitation of the EU-funded section was completed, and since then, the transport volume has been increasing. Although it also depends on how soon the European economy would recover, it is expected that the balance would improve with increase of the fare/charge revenue, since the Bucharest – Constanta section became fully operational.

The actual maintenance expenses spent for the Fetesti – Constanta section and the budget allocated for fiscal year 2013 are shown in Table 7.

Table 7: Actual Maintenance Expenses spent for the Fetesti – Constanta section and Budget allocated for Fiscal Year 2013

Unit: lei

Item	2011 (Actual)	2012 (Actual from January to June)	2013 (Budget)
Tracks, Superstructure, Signals	4,064,557	2,505,113	4,500,000
Buildings	952,308	35,289	3,000,000
Telecommunications	121,324	62,286	-
Contact lines/ Power source	7,658,780	3,785,473	4,630,000
Total	12,796,969	6,388,161	12,130,000

Source: Project Completion Report, Responses to the Questionnaire

Since the Bucharest North – Banease section under the project is only 5km, the actual maintenance expenses spent for the Fetesti – Constanta section and the budget allocated are shown. Since facilities and equipment rehabilitated or installed under the JICA- and EU-funded projects are still partly within the warranty period, the maintenance budget has not been fully allocated to some items. The implementing agency commented that the budget allocated for maintenance for the past two years and this year is appropriate.

3.5.4 Current Status of Operation and Maintenance

Regarding facilities and equipment rehabilitated or installed under the project, the routine maintenance (e.g. ocular inspection) and periodic maintenance (e.g. replacement of worn out rails, crushed stone compaction) have been undertaken according to the CFR's maintenance manuals. No major problems are reported.

During the field inspection, it was noted that a railway control technician was walking along the railway tracks while checking the condition of rails and sleepers. This ocular inspection has been undertaken every day. Regarding procurement and management of spare parts, since the equipment and facilities are still within or right after expiration of the warranty period, no particular problems have been reported.

No major problems have been observed in the operation and maintenance system, therefore sustainability of the project effect is considered high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objectives of the project were to expand the transporting capacity and improve the transporting efficiency by ensuring stability and safety of the railway operation through upgrading the existing railway tracks (86km) and related facilities including signals, telecommunication systems, electrical facilities, and station facilities between Bucharest and Constanta (225km), which is a segment of the European Fourth Corridor. The project has been highly relevant to the development plans and needs of Romania, as well as Japan's ODA policies. With respect to the expansion of transporting capacity and improvement of transport efficiency, which are the project objectives, the project has largely achieved its objectives, and thus the effectiveness and impact are high. Outputs of main project components are almost as planned. However, both project cost and project period significantly exceeded the plan. Therefore, efficiency of the project is considered low. No major problems have been observed in the operation and maintenance system, therefore sustainability of the project effect is considered high.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

As discussed under the Efficiency, during the project implementation, changes of project scope were made in order to conform to the EU standards, and this is the main reason for substantial difference in output. Since the EU-funded project was already planned at the appraisal stage, the project should have taken into consideration the impacts by the EU-funded project. When other plans and programs such as country's future plans and relevant infrastructure projects, affecting the scope of the proposed project, were already foreseen, verification and analysis on these plans and programs needs to be undertaken at the preparation stage for the similar type of future projects. Then, the appropriate project scope, which takes into account the relevant other plans and program needs to be defined.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Output 1) Civil Work	<ul style="list-style-type: none"> • embankment consolidation (1.9 million m³, drainage: 87km) • rehabilitation of structures (11 bridges with 646m, 25 culvert boxes) • construction of stations (platform 32,800m², 9 buildings) • rehabilitation of tracks (rail 57km, ballast 370,000m³) • contact lines (260km) 	<p>Almost as planned</p> <ul style="list-style-type: none"> • embankment consolidation (2.2 million m³, drainage: 100km) • rehabilitation of structures (16 bridges with 711m, 51 culvert boxes) • construction of stations (platform 22,500m², 10 new buildings/rehabilitation) • rehabilitation of tracks (rail 305km, ballast 500,000m³) • contact lines (280km)
2) Procurement /installation of equipment	<ul style="list-style-type: none"> • signals (112 units), telecommunication (85km), Electric (substations), Operating system (85kmABS) • equipment 	<ul style="list-style-type: none"> • signals (340 units), telecommunication (85km), Electric (substations), Operating system (85km ABS) • equipment (4 items with 18 sets)
3) Consulting Services	<ul style="list-style-type: none"> • detailed designs • assistance in tendering (preparation of bidding documents, assistance in bid evaluation) • construction supervision • advice on clauses on environmental issues in the bidding documents • advice on management and financial issues • technical advice on environmental protection <p>Foreign experts 360 M/M Local experts 720 M/M Local staff 420 M/M</p>	<p>As planned</p> <ul style="list-style-type: none"> • detailed designs • assistance in tendering (preparation of bidding documents, assistance in bid evaluation) • construction supervision • advice on clauses on environmental issues in the bidding documents • advice on management and financial issues • technical advice on environmental protection <p>Foreign experts 439 M/M Local experts 1,234 M/M Local staff 860 M/M</p>
2. Project Period	March 2001 -December 2006 (70 months)	March 2001 -October 2010 (116 months)
3. Project Cost		
Amount paid in Foreign currency	17,965 million yen	24,988 million yen
Amount paid in Local currency	16,215 million yen	53,874 million yen
Total	34,180 million yen	78,862 million yen
Japanese ODA loan portion	25,635 million yen	24,988 million yen
Exchange rate	1EUR = 100.87 yen (as of June 2000)	1EUR = 147 yen (average between December 2005 and October 2010)