EX-POST PROJECT EVALUATION 2012: PACKAGE IV-1 (THE PHILIPPINES)

NOVEMBER 2013

JAPAN INTERNATIONAL COOPERATION AGENCY

SANSHU ENGINEERING CONSULTANT

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Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2010, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2009. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

November 2013
Toshitsugu Uesawa
Vice President
Japan International Cooperation Agency (JICA)

Disclaimer

This volume of evaluations, the English translation of the original Japanese version, shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA. JICA is not responsible for the accuracy of English translation, and the Japanese version shall prevail in the event of any inconsistency with the English version.

Minor amendments may be made when the contents of this volume is posted on JICA's website.

JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project

Second Magsaysay Bridge and Butuan City Bypass Road Construction Project

External Evaluator: Masami Tomita, Sanshu Engineering Consultant

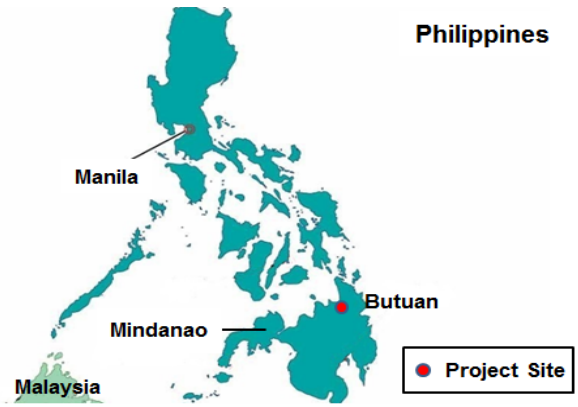
0. Summary

This project aimed at alleviating traffic congestions in the Butuan City and surrounding areas and facilitating smooth traffic and transportation between major cities in northeast of Mindanao, by constructing a new bridge and a bypass road at the crossing point of the Agusan River on the Butuan-Cagayan de Oro-Iligan Road in the Butuan City.

Relevance of this project is high, as the project is consistent with priority areas of Philippine's development plans and Japan's ODA policy, and moreover development needs for the project are high. Actual traffic volume on the project section 6 years after project completion is approximately 80% of the target, travelling time through the old bridge was largely reduced, traffic congestion in the Butuan City center was also reduced, and the volume of transportation around the project area and local economic activities seem to have increased. Thus, effectiveness and impact of the project are high. Efficiency of the project is fair, as both actual project cost and period slightly exceeded planned cost and period. Sustainability of the project is also fair, as the project section was converted to a national road at the time of ex-post evaluation (6 years after project completion), and budget for operation and maintenance (O&M) of the project section is supposed to be provided from next year and has not yet been provided currently.

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

1. Project Description



Project Location

Second Magsaysay Bridge

1.1 Background

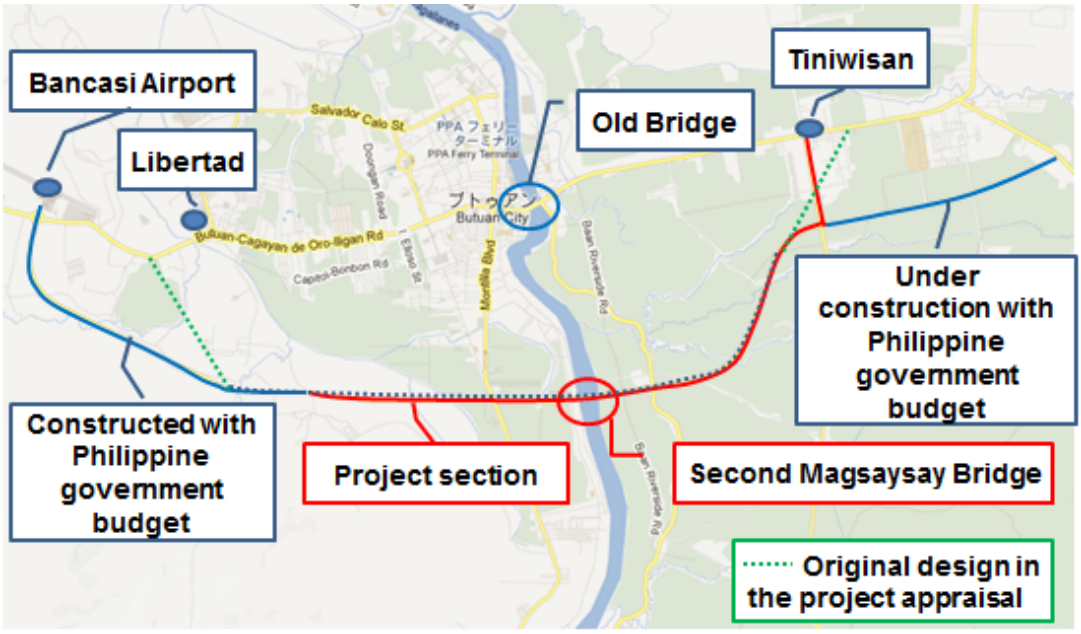
Road transportation is the most important transportation means in the Philippines, where the share of road transportation was approximately 90% of the total passenger transportation and approximately 50% of the total freight transportation at the time of project appraisal[1]. The island of Mindanao, where the project was implemented, lags behind economically in the country, which requires development from the perspective of poverty reduction, and has various issues related to development of road networks, as seen in its low paved road ratio compared with other regions. The Butuan-Cagayan de Oro-Iligan Road, which is the highway located at northeast of the island, serves a very important role for commodity distributions within the island and with neighbouring regions, and is the pillar for economic and social development of the island. The road overpasses the Agusan River, which is the largest river in the island, at the center of the Butuan City, the central city in northeast of the island. At the time of project appraisal, heavy traffic congestions were caused due to increasing traffic volumes around the existing bridge (the old Magsaysay Bridge), and the bridge was deteriorated, as it was built in 1957, and a fundamental repair was required. This project was implemented to tackle the problem.

1.2 Project Outline

The objective of this project is to alleviate traffic congestions in the Butuan City and surrounding areas and facilitate smooth traffic and transportation between major cities in northeast of Mindanao, by constructing a new bridge and a bypass road at the crossing point of the Agusan River on the Butuan-Cagayan de Oro-Iligan Road in the Butuan City, and thereby contributing to economic and social development of the northeast region of Mindanao.

Figure 1 below shows the project site map.

[1] Source: Japan International Cooperation Agency (JICA) appraisal documents



Source: edited based on Google map

Figure 1: Project Site Map

Loan Approved Amount/ Disbursed Amount	3,549 million yen / 3,506 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	August, 2000 / August, 2000
Terms and Conditions	Construction Works: Interest Rate: 0.95% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: Japan tied[2] Consulting Services: Interest Rate: 0.75% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: bilateral tied
Borrower / Executing Agency	Government of the Philippines / Department of Public Works and Highways (DPWH)
Final Disbursement Date	December, 2008
Main Contractor (Over 1 billion yen)	Nippon Steel Corporation (Japan) / TOA Corporation (Japan) (JV)

[2] This project was implemented utilizing the Special Yen Loan (SYL). SYL was introduced by the Government of Japan in 1998 as one of the financial relief measures for Asian countries suffered from the Asian economic crisis. SYL was to provide concessionary financial assistance for the development of infrastructures in the fields of transportation logistics, foundation for productive facilities and large-scale disaster prevention. The terms and conditions of SYL is set at greater concessionary level than standard terms and conditions of ODA loans, while the eligibility of the prime contractors under SYL is limited to Japanese nationals or judicial persons and procurement of goods and services under SYL is tied to Japanese goods and services (goods and services whose country of origin being other than Japan can be procured up to no more than 50% of the total loan amount), to promote participation of Japanese firms in projects.

Main Consultant (Over 100 million yen)	Katahira and Engineers International (Japan) / Sogo Engineering, Inc. (Japan) / Proconsult, Inc. (Philippines) / TCGI Engineers (Philippines) / DCCD Engineering (Philippines) (JV)
Feasibility Studies, etc.	Basic Ventures Consultants, 1992 Katahira and Engineers International / Proconsult, Inc. / TCGI Engineers / DCCD Engineering (JV), 1999
Related Projects	None

2. Outline of the Evaluation Study

2.1 External Evaluator

Masami Tomita, Sanshu Engineering Consultant

2.2 Duration of Evaluation Study

Duration of the Study: October, 2012 – September, 2013

Duration of the Field Study: January 24 – February 9, 2013, April 14 – April 27, 2013

3. Results of the Evaluation (Overall Rating: B[3])

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of the Philippines

At the time of project appraisal, in the Mid-Term Development Plan (1999-2004), to support economic and social development of the Philippines through provision of safe and reliable transportation services was stated as the development goal for the transport sector, and strategies to achieve the goal were; (1) reduction of the role of the government and promotion of involvement of the private sector in road construction and improvement; and (2) improvement of the quality of existing infrastructures through appropriate rehabilitation and maintenance, etc.[5] Particularly, priorities to achieve (2) above were; 1) upgrading of highways and decentralization of road networks development; and 2) introduction of an user charge policy in road construction and maintenance, and highways were being rehabilitated and introduction of new sources of funds was begun to be considered according to the user charge policy, under the Department of Public Works and Highways (DPWH)[6]. Moreover, regional development of the island of Mindanao, which was lagged behind in economic development, was one of the important issues of the Estrada administration, and the government of the Philippines was making a strong effort to develop the island through the formulation of the Mindanao 2000

[3] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[4] ③: High, ② Fair, ① Low

[5] Source: JICA appraisal documents

[6] Source: same as above

Development Plan[7].

On the other hand, at the time of ex-post evaluation, in the Philippine Development Plan (2011-2016) Chapter Five (Transport Sector), to ensure an integrated and coordinated transport network, to address the overlapping and conflicting functions of transport and other concerned agencies, and to promote development of conflict-affected and highly impoverished areas etc. are stated as goals for the transport sector, and strategies to achieve these goals are; (1) adopting a comprehensive long-term national transport policy; (2) developing strategic transport infrastructure and maintaining and managing transport infrastructure assets; (3) developing an integrated multimodal logistics and transport system; (4) separating the regulatory and operation functions of transport and other concerned agencies; and (5) improving transport networks in underdeveloped regions and conflict-affected areas to open up economic opportunities etc.[8] Particularly, priorities to achieve (2) above are prioritizing the upgrading of quality and capacity of existing transport infrastructure including roads, and applying the "user-pays" principle in infrastructure services including roads and expanding the road fund for securing funds for upgrading and maintaining infrastructure assets[9]. Moreover, the Caraga[10] Regional Development Plan (2011-2016) states that higher priority should be given to maintenance and rehabilitation of existing transport infrastructure network, and that in constructing new roads, roads of strategic importance to local development and for purposes of decongesting the urban areas should be prioritized, and Second Magsaysay Bridge and Butuan City Bypass Road Project Phase 2 (the section that connects the project section and the Pan Philippine Highway) is prioritized as a project to be implemented during the plan period[11].

Therefore, improvement of the quality of existing transport infrastructures is emphasized in Philippine's development plans both at the time of project appraisal and ex-post evaluation, and construction of the section that connects the project section and the Pan Philippine Highway is prioritized in the latest Caraga Regional Development Plan, and thus this project, which constructed a new bridge and bypass road to supplement the transportation function of the deteriorated old bridge in the island of Mindanao which is lagged behind in economic development, is consistent with development policies.

3.1.2 Relevance to the Development Needs of the Philippines

As explained above, at the time of project appraisal, the existing bridge (old bridge) required a major repair due to deterioration and the area around the existing bridge was heavily

[7] Source: same as above
[8] Source: http://devplan.neda.gov.ph/chapter5.php
[9] Source: same as above
[10] Caraga region: northeast region of Mindanao
[11] Source: documents provided by DPWH

congested due to increasing traffic volumes, and thus construction of a new bridge and a bypass road was required to supplement the existing bridge.

Table 1 shows the number of registered vehicles in Butuan City from the time of project appraisal to the time of ex-post evaluation.

Table 1: The Number of Registered Vehicles in Butuan City

(Unit: vehicles/year)

Year	2001	2002	2003	2004	2005	2006
Number of Registered Vehicles	10,213	10,550	10,621	11,481	7,748	8,316
Year	2007	2008	2009	2010	2011	-
Number of Registered Vehicles	9,085	13,767	16,109	19,872	21,720	-

Source: Land Transportation Office, Department of Transportation and Communications

As seen above, the number of registered vehicles in Butuan City at the time of ex-post evaluation is more than twice the number at the time of project appraisal, and the necessity for the new bridge constructed by the project is high to reduce traffic congestions in the city center (around the old bridge). Moreover, vehicles over 15 tons have not been allowed to pass the old bridge since 2008 to reduce traffic congestions around the old bridge[12], and the new bridge is necessary as an alternative route.

Therefore, the number of registered vehicles in Butuan City has been increasing since the time of project appraisal, and relevance of the project remains high at the time of ex-post evaluation for reduction of traffic congestions in the city center.

3.1.3 Relevance to Japan's ODA Policy

According to the Country Assistance Policy for the Philippines (2000), Japan emphasized the followings as prioritized areas for assistance based on the experience of Asian economic crisis; strengthening of industrial structures (particularly development of supporting industries) for medium to long term development and promotion of construction and management of economic infrastructures (transport and energy), lack of which becomes development constraint[13]. Moreover, Medium-Term Strategy for Overseas Economic Cooperation Operations of JICA (former JBIC) emphasizes development of transport networks (regional highways, major airports and ports) as prioritized areas for assistance in the Philippines, and this project was consistent with the policy[14].

This project has been highly relevant to Philippine's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

[12] Source: interviews with DPWH

[13] Source: The Country Assistance Policy for the Philippines, Ministry of Foreign Affairs

[14] Source: JICA appraisal documents

3.2 Effectiveness[15] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

3.2.1.1 Annual Average Daily Traffic (AADT)

Table 2 shows estimated and actual figures of AADT on both the old and new bridges. Compared with estimated figures of 6 years after project completion, the actual figure on the old bridge is approximately 90% of the estimated figure, and the actual figure on the new bridge is approximately 80% of the estimated figure. Moreover, in the project appraisal, approximately 20% of the total traffic volume (on both the old and new bridges) was expected to shift to the new bridge route, and approximately 20% of the total traffic volume actually shifted to the new bridge route. As indicated in Figure 1 above, a bypass road that connects the end point on the west side of the bypass road constructed by the project to the Bancasi airport was constructed by the Philippine government with their own funds, which was completed in 2012, and this seems to affect the shift of traffic to the new bridge route explained above to some extent.

Table 2: Estimated and Actual Figures of AADT on the Old and New Bridges

(Unit: vehicles/day)

Section	Baseline (2000)	Estimated (2006) (Project Completion)	Estimated (2012) (6 years after completion)	Actual* (2013) (6 years after completion)
Old Bridge	15,800	16,300	20,200	19,200
New Bridge	-	4,100	5,200	4,000
Total	15,800	20,400	25,400	23,200

Source: JICA appraisal documents, actual counting by the evaluator

Note*: The station where DPWH conducts traffic counting regularly is located before the junction leading to the old and new bridges, and data on actual traffic volume on each bridge route was not available. Thus, traffic counting was conducted on each bridge during the field survey (January 31, 2013, Thursday, 8:00am – 9:00am) with cooperation from DPWH. Actual traffic volume on the old bridge during peak 1 hour was 1,920 vehicles, and actual traffic volume on the new bridge during peak 1 hour was 403 vehicles. While traffic patterns differ according to countries, regions and other conditions, traffic volume of peak 1 hour is generally approximately 10% of daily traffic volume, and thus the actual figures above at the time of ex-post evaluation were calculated based on this principle.

3.2.1.2 Travelling Time/Average Velocity (Peak Hour)

Table 3 shows travelling time and average velocity during peak hour on the old and new bridge routes before and after project implementation. Baseline data for travelling time during peak hour on the old bridge route (between Libertad and Tiniwisan) was not available, but according to DPWH, it was approximately 30 minutes, and actual travelling time at the time of ex-post evaluation is approximately 16.5 minutes, and it was largely reduced. As explained later, according to the results of the beneficiary survey, while time reduced differs in different time of a day, majority of beneficiaries replied that travelling time through the old bridge route was

[15] Sub-rating for Effectiveness is to be put with consideration of Impact

reduced by 5 to 20 minutes on average, and thus, the actual figures below is consistent with the results of the beneficiary survey. As explained above, vehicles over 15 tons have not been allowed to pass the old bridge since 2008, and the fact that large vehicles now pass the new bridge is considered to largely contribute to reduction of travelling time and improvement of average velocity, and the fact that the old bridge was rehabilitated with Philippine government's budget in 2009 is also considered to contribute to the above improvement to some extent.

Table 3: Travelling Time and Average Velocity on the Old and New Bridge Routes (Peak Hour)

Section	Before Project*1		Ex-Post Evaluation*2	
	Travelling Time (minutes)	Average Velocity (km/hour)	Travelling Time (minutes)	Average Velocity (km/hour)
Old Bridge Route (Libertad-Tiniwisan)	Approximately 30	Approximately 20	Approximately 16.5	Approximately 35
New Bridge Route (Libertad-Tiniwisan)	-	-	Approximately 13.0	Approximately 60

Source: Interviews with DPWH, actual measurement by the evaluator

Note *1: Rough estimate based on interviews with DPWH, as the baseline data based on the actual measurement is not available.

Note *2: Travelling time was measured for both the old and new bridge routes on January 31, 2013, Thursday, 8:00am – 9:00am. The distance of the old bridge route is approximately 9 km and there are three traffic lights, and the distance of the new bridge route is approximately 13 km and there is no traffic light. While the western part of the road section that connects the old and new bypass roads was not constructed or rehabilitated under the project due to lack of budget, the new bridge route above includes the existing road section (approximately 3km) that connects the end of the new bypass road and the old bypass road.

3.2.1.3 Number of Traffic Accidents

Reliable data on the number of traffic accidents on and around the old and new bridges was not available, however, according to the results of the beneficiary survey[16], the percentage of the beneficiaries who replied that the number of traffic accidents around the old bridge was reduced after project implementation was 81%, the percentage who replied that the number increased was 3%, and the percentage who replied that they do not know was 16%, which suggests that the number of traffic accidents around the old bridge was generally reduced after project implementation.

3.2.2 Qualitative Effects

The beneficiary survey was conducted in the ex-post evaluation[17]. The overview of the results of the survey is shown below.

[16] For details of the results of the beneficiary survey, see "3.2.2 Qualitative Effects".

[17] The beneficiary survey was conducted in the following manner. Time: February 2013, the number of samples: 101 in total (male: 57, female: 44, residents and transport companies etc. near the old and new bridges), method: questionnaire survey

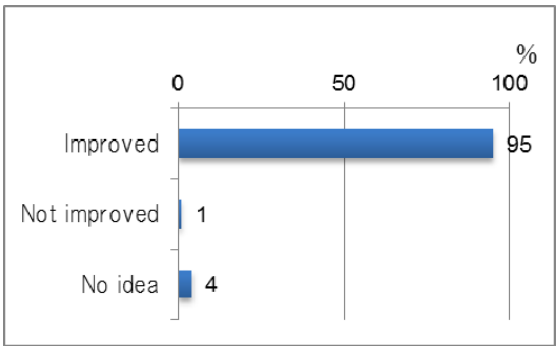


Figure 2: Traffic Congestion around the Old Bridge after Project Completion

Among 95% who replied that traffic congestion was improved, 50% replied that it was improved substantially, 34% replied that it was improved moderately, and 11% replied that it was improved a little.

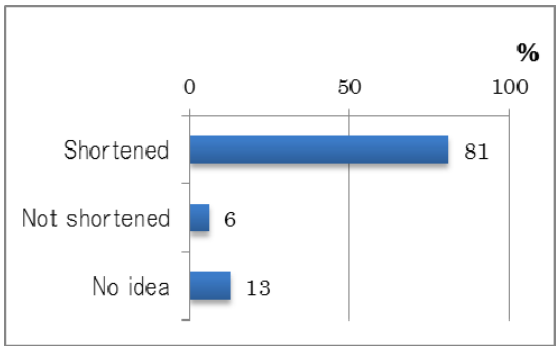


Figure 3: Travelling Time on the Old Bridge Route after Project Completion

Among 81% who replied that travelling time was shortened, 5% replied that reduced time was 5 minutes or less, 35% replied it was 5 to 10 minutes, 32% replied it was 10 to 20 minutes, 10% replied it was 20 to 30 minutes.

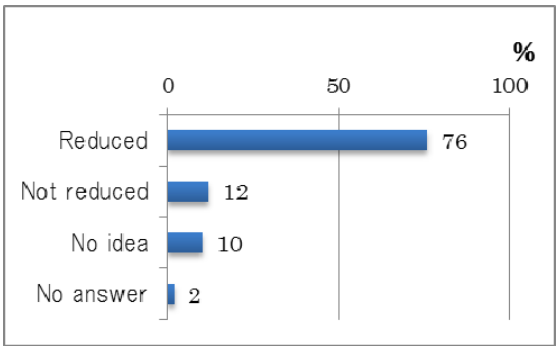


Figure 4: Travelling Cost after Project Completion

Among 101 beneficiaries, this question was asked to 42 beneficiaries who own their own vehicles and/or have responsibility to maintain public passenger utility vehicles. The cost reduced is mainly fuel cost and vehicle maintenance cost.

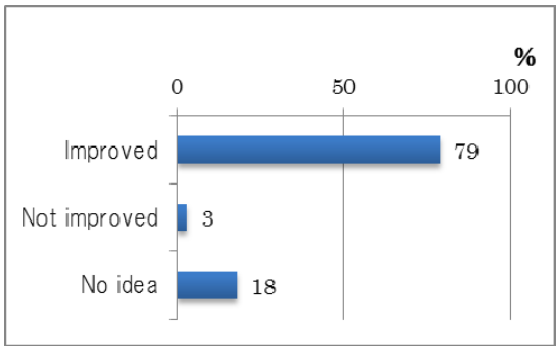


Figure 5: Accessibility to Key Places for Daily Life (shops, markets, schools, hospitals, and offices etc.) after Project Completion

More than 90% of beneficiaries replied that traffic congestion around the old bridge was reduced after project implementation. As explained above, vehicles over 15 tons have not been allowed to pass the old bridge since 2008, and the fact that large vehicles now pass the new bridge is considered to contribute to this result. Moreover, approximately 80% of beneficiaries replied that both travelling time and cost were reduced and accessibility to key places for daily life was improved after project implementation.

Therefore, the project objectives seem to have been achieved generally from the result of the beneficiary survey.

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Contribution to Local Economic and Social Development

(1) Result of the Beneficiary Survey

The results of the beneficiary survey on changes of the amount of commercial products transported and local economic activities in the region after project implementation are shown below.

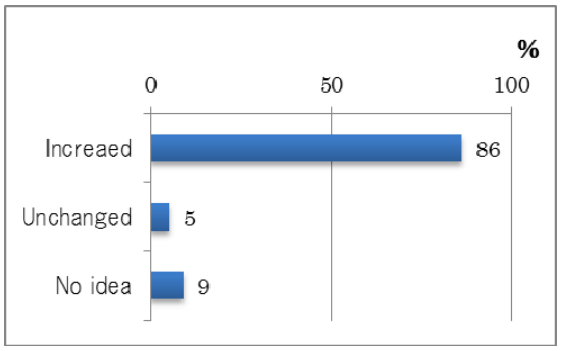


Figure 6: Changes on the Amount of Commercial Products Transported to Markets in the Region

The majority replied that transportation of agricultural products increased (87%: multiple answers)

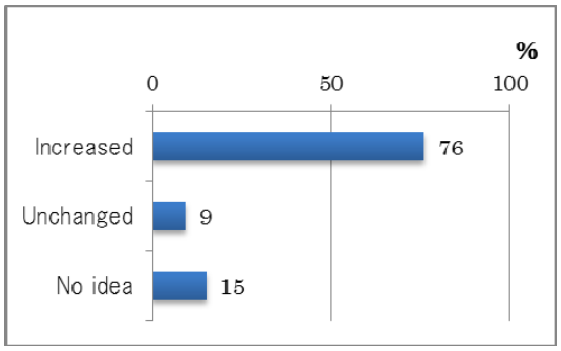


Figure 7: Changes on Local Economic Activities

Many replied that agricultural and commercial activities increased (agricultural: 60%, commercial: 61%: multiple answers)

Approximately 80% of beneficiaries replied that the amount of commercial products transported and local economic activities increased in the region after project implementation.

(2) Changes of Investment Amount and Gross Regional Domestic Product in the Caraga Region

Table 4 and 5 show the transitions of investment amount and gross regional domestic product (GRDP) in the Caraga region.

Table 4: Investment Amount in the Caraga Region

(Unit: million pesos)

Year	2008	2009	2010	2011	2012
Foreign Capital	118	168	0	64	297
Local Capital	1,880	282	2,553	49,585	11,489
Total	1,998	450	2,553	49,649	11,786

Source: Philippine Board of Investments

Table 5: GRDP of the Caraga Region

(Unit: million pesos)

Year	2002	2003	2004	2005	2006
GRDP	52,649	55,247	60,189	66,270	76,360
Year	2007	2008	2009	2010	2011
GRDP	96,553	99,806	87,220	99,037	109,765

Source: Philippine National Statistical Coordination Board

According to DPWH, transportation from one region to another became efficient due to project implementation, and thus many residential centers have been established around the project areas and the amount of investment in the region has increased, and as a result, employment has also increased. While the amount of investment in the Caraga region shown above rise and fall each year, it shows an increasing trend in recent years, and GRDP also shows an increasing trend. While various factors contribute to such increases, this project is considered to contribute to such increases to some extent through facilitation of efficient traffic and transportation in Butuan City.

3.3.2 Other Impacts

3.3.2.1 Impacts on the natural environment

At the time of project appraisal, an environmental impact assessment (EIA) was conducted for the project, and an environmental compliance certificate (ECC) was issued in February 2000 by the Department of Environment and Natural Resources (DENR)[18]. Consultants were required to monitor the consistency between requirements of ECC and actions taken during project implementation in order to minimize negative impacts on environment by construction works. At the time of ex-post evaluation, according to DPWH, environmental monitoring was properly conducted both during project implementation and at commencement of operation, and results were reported to JICA. Moreover, trees were planted along the new bypass road as erosion control of road shoulders and noise barrier. However, according to the results of the beneficiary survey, approximately 70% of beneficiaries replied that air pollution and noise increased along the new bridge and the new bypass road. As explained above, the new bridge and the new bypass road are mainly used by large vehicles, which seems to be the main reason. Some beneficiaries also pointed out that motorcycles racing along the new bridge and the new bypass road are dangerous and cause noise problems, which might be another reason, and speed control by police would be necessary for this problem.

3.3.2.2 Land Acquisition and Resettlement

At the time of project appraisal, acquisition of approximately 39 ha of land was planned

[18] Source: JICA appraisal documents

along the new bypass road[19], however, the actual area acquired was approximately 22 ha[20]. While the reason for the reduced size is not clear, the change of scope of the project seems to be part of the reason. The land acquired is mostly agricultural land and there was no resettlement.

This project has largely achieved its objectives, therefore its effectiveness and impact are high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

Outputs of the project (planned and actual) are shown in Table 6.

Table 6: Comparison of Outputs (Planned/ Actual)

Item		Planned	Actual
Civil Works	Steel cable-stayed bridge	Length 255m, 2 lanes	Length 360m, 2 lanes
	Approach bridge	Steel girder approach bridge 630m	Steel girder approach bridge 548m
	Bypass road	Length 13,115m, 2 lanes	Length 9,430m (construction of bypass road 8,100m + rehabilitation of Maguinda - Las Nieves Road 1,330m), 2 lanes
Consulting Service	Contents	・ Detailed design ・ Assistance for bidding ・ Supervision of civil works ・ Monitoring of compliance with ECC requirements ・ Assistance for land acquisition ・ Assistance for coordination between the executing agency and the city government concerned (Butuan City) etc.	Below was added to the original scope: ・ Additional geodetic survey, environmental impact assessment and geotechnical survey etc. due to design changes of the bypass road ・ Additional survey for drainage systems due to flood caused during project implementation ・ Supervision of civil works related to soft ground encountered near abutment etc.
	Mans-Month	International CS: 115M/M Local CS: 254M/M	International CS: 126.5M/M Local CS: 791.5M/M

Source: planned: JICA appraisal documents, actual: documents provided by DPWH and JICA internal documents

During the detailed engineering design, it was found out that the original alignment designed in the project appraisal is not appropriate, as an electric substation exists at the junction on the west side that connects the new bypass road and the Butuan-Cagayan de Oro-Iligan Road (the

[19] Source: same as above

[20] Source: documents provided by DPWH

existing bypass road), and a dense residential area exists at the junction on the east side that connects the new bypass road and the existing bypass road[21]. Requested by the Butuan City government, the design of the alignment was changed to avoid the substation and the residential area above and the congested areas within the city (this required extending the bypass road by approximately 5km on the west side and approximately 3km on the east side), however, this largely increases the project cost due to a sharp rise of prices for construction materials (mainly steel), and thus, the final alignment of the new bypass road on the west side was constructed up to the point that connects with the Bonbon access road and that on the east side was constructed up to the point that connects with the Maguinda-Las Nieves Road which was also rehabilitated under the project[22]. Consequently, the total length of the new bypass road was reduced from the planned length of 13,115m to 9,430m (construction of a bypass road 8,100m + rehabilitation of the Maguinda-Las Nieves Road 1,330m). However, additional bypass roads from the end point of the new bypass road on the west side to the Bancasi airport and from the end point of the new bypass road on the east side to the Pan Philippine Highway are being constructed by the Philippine government with their own funds, based on the reason that the final alignment adopted in this project is not sufficient to alleviate traffic congestions in the Butuan city (the additional bypass road on the west side was completed in 2012)[23].

The reason for the length of the steel cable-stayed bridge being increased (from 255m to 360m) seems to be to prevent falling debris from clashing the bridge piers in case of heavy rains, which resulted in the reduction of the length of the approach bridge (from 630m to 548m), however, the total length of the cable-stayed bridge and the approach bridge was increased (from 885m in total to 908m in total), which was because abutments needed to be built in a location away from the Agusan River to avoid the soft ground[24].

3.4.2 Project Inputs

3.4.2.1 Project Cost

The planned project cost at the time of project appraisal was 4,175 million yen (foreign currency: 3,068 million yen, local currency: 1,107 million yen), of which Japanese ODA loan portion was 3,549 million yen[25]. On the other hand, the actual project cost was 5,722 million yen (foreign currency: 3,683 million yen, local currency: 2,039 million yen)[26], of which

[21] Source: interviews with DPWH and JICA internal documents
[22] Source: same as above
[23] Source: interviews with DPWH
[24] Source: same as above
[25] Source: JICA appraisal documents
[26] Calculated by multiplying the actual cost by the average exchange rate of 1PHP=2.25JPY (the average exchange rate of the Japanese ODA loan disbursement period of August 31, 2000 –December 29, 2008), based on documents provided by DPWH.

Japanese ODA loan portion was 3,506 million yen, and it was higher than planned (137% against the plan). The reasons for the actual cost exceeding the planned cost were due to a sharp rise of prices for construction materials (mainly steel), extension of period for civil works, and the increase of land acquisition cost etc.[27] As explained above, this project was implemented utilizing the Special Yen Loan (SYL: the system under which procurement of contractors is tied to Japanese companies), and the customer satisfaction survey was conducted regarding SYL. DPWH replied that while the bid price seems to have been higher than usually, they are satisfied with contractor's schedule management, technical capacity, project management, quality of works, and technical transfer to local contractors etc.

3.4.2.2 Project Period

The planned project period at the time of project appraisal was 70 months in total from August 2000 (signing of the loan agreement) to May 2006 (completion of civil works)[28]. On the other hand, the actual project period was 82 months in total from August 2000 (signing of the loan agreement) to May 2007 (completion of civil works)[29], and it was slightly longer than planned (117% against the plan). The reasons for the actual project period slightly exceeding the planned period were the selection of the contractor being delayed due to a delay of administrative procedures, imported construction materials being stopped at the Port of Manila for two months (as the Bureau of Custom did not recognize that imported materials had a clearance from the government not to pay taxes), delayed payment of billings for the contractor, adverse weather conditions (flooding), soft ground encountered near the abutment, which required additional sub-surface investigations, and a delay in the land acquisition process etc.[30]

Table 7: Comparison of Planned and Actual Project Period

Content	Planned	Actual
Selection of Consultant	June 2000 – July 2001 (14 months)	N/A – August 2001
Detailed Design	August 2001 – October 2002 (15 months)	August 2001 – October 2002 (15 months)
Procurement of Civil Works	September 2002 – November 2003 (15 months)	November 2002 – April 2004 (18 months)
Civil Works	December 2003 – May 2006 (30 months)	May 2004 – May 2007 (37 months)

Source: planned: JICA appraisal documents, actual: documents provided by DPWH

[27] Source: interviews with DPWH and consultants involved in supervision of civil works
[28] Source: JICA appraisal documents
[29] Source: documents provided by DPWH
[30] Source: documents provided by and interviews with DPWH

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

3.4.3.1 Economic Internal Rate of Return

Due to the fact that data needed for quantitative analysis was not available, analysis for the internal rate of return was not possible.

Both project cost and project period exceeded the plan, therefore efficiency of the project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

At the time of project appraisal, the District Engineering Office in Butuan City under the Region XIII of DPWH was supposed to be in charge of operation and maintenance (O&M) of the project section, however, the responsibility for O&M was not delegated from DPWH Project Management Office - Philippine Japan Highway Loan (PMO-PJHL) to the Office for 6 years after project completion (the project section was not converted to a national road)[31]. Thus, while no entity had the formal responsibility for O&M of the project section, the Office voluntarily conducted O&M to the extent possible[32]. However, the project section was converted to a national road according to the Department Order No. 51 in May 2013 and responsibility for O&M of the section was formally delegated to the Office.

The number of permanent staff of DPWH as a whole is about 15,600 as of the end of October 2012, that of Region XIII is about 660 as of the end of October 2012[33], and that of the District Engineering Office is about 60 at the time ex-post evaluation[34]. The number of staff responsible for O&M of national roads in the Office is 12 permanent staff and 13 non-permanent staff (25 in total), and they maintain 100km in total of national roads and 21 bridges which are under responsibility of the Office[35].

No major problem is seen regarding the number of staff in the District Engineering Office.

3.5.2 Technical Aspects of Operation and Maintenance

The breakdown of 12 permanent staff responsible for O&M of national roads in the District Engineering Office is; 3 construction/maintenance foremen, 3 civil engineers, 3 heavy equipment operators, 1 maintenance engineer, and 2 service drivers, and 13 non-permanent staff are all labourers[36]. Civil engineers have approximately 20 years of work experience[37].

31 Source: interviews with DPWH
32 Source: same as above
33 Source: DPWH HP (http://www.dpwh.gov.ph)
34 Source: documents provided by DPWH
35 Source: documents provided by DPWH
36 Source: same as above

According to the Office, while there is no problem regarding technical capacity of road maintenance, trainings and manuals need to be provided for O&M of the steel cable-stayed bridge constructed by the project, as it is a new technology in the Philippines. Such trainings and manuals were not provided from consultants or contractors to the Office during the project implementation, however, JICA is currently preparing an O&M manual for steel cable-stayed bridges constructed in 3 regions including the Region XIII as part of the technical cooperation project, and training on O&M is also planned to be provided[38].

3.5.3 Financial Aspects of Operation and Maintenance

Table 8 shows the actual O&M cost of roads and bridges allocated to the District Engineering Office.

Table 8: O&M Cost of the District Engineering Office

(Unit: thousand pesos)

	2010	2011	2012
O&M Cost	8,029	14,950	23,008

Source: documents provided by DPWH

Note: reasons for the actual O&M cost being increased year by year are due to the increase of the road length which was converted from local roads to national roads (DPWH is responsible for national roads only) and the increase of labour cost etc.

According to the Office, O&M budget allocated from the DPWH headquarter is calculated based on the unit called Equivalent Maintenance Kilometrage (EMK) and the length of roads to be maintained. However, this calculation method does not take into account the actual situation in the field, and while proper O&M of roads and bridges that the Office is responsible for requires approximately 48,000 thousand pesos annually, about a half and/or one third of the amount only has been actually allocated[39]. In other words, as the responsibility for O&M of the project section has just been delegated to the Office in May 2013 and O&M budget for the project section has not yet been allocated, the Office voluntarily conducts O&M of the project section by squeezing out the O&M cost from already the tight budget (as the O&M cost for the project section is not included in the allocated cost shown in the above table)[40]. On the other hand, as explained in details below, apart from usual O&M, 5,000 thousand pesos has been released from the DPWH central budget every two to three years for asphalt overlay on approach bridges[41]. According to DPWH, O&M budget for the project section is supposed to be allocated to the Office from 2014, and situation of O&M of the project section is expected to be

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37 Source: interviews with DPWH

38 Source: interviews with DPWH and JICA

39 Source: interviews with DPWH

40 Source: interviews with DPWH

41 Source: documents provided by DPWH

improved from next year.

3.5.4 Current Status of Operation and Maintenance

Site inspection of the project section was conducted during the field survey for the ex-post evaluation, and several problems were observed as below, which seem to be problems related to supervision of construction works.

1) The soil under the approach bridges has been settled gradually due to soft ground, which requires regular asphalt overlays, or otherwise it will cause a split between the cable-stayed bridge and the approach bridge and will be very dangerous for vehicles to pass it through. The overlay has already been conducted twice since project completion in 2007.
2) There were several potholes on the carriageway of the new bridge, which was already repaired by the District Engineering Office by the time of site inspection.
3) The new bypass road overpasses a small river in the east side of the new bridge, and while reinforced concrete box culverts were made in the area during the project, a flooding is caused in case of heavy rains, and the Office regularly removes debris and siltation from box culverts. However, these culverts are not sufficient and construction of a small bridge is required.

As explained above, while O&M budget for the project section has not yet been allocated to the Office, the Office voluntarily conducts vegetation control along the new bypass road, reshaping of unpaved shoulders, cleaning of the carriageway of the new bridge, patching asphalt on potholes on the new bridge carriageway, asphalt overlays on the approach bridges, and removing debris and siltation from box culverts when flooding is caused due to heavy rains etc. Currently there is no major problem for passing through the project section and it is properly maintained, yet preventive maintenance cannot be conducted currently, and thus, to conduct preventive maintenance of the project section is desired from next year.

Some problems have been observed in terms of technical and financial aspects, therefore sustainability of the project effect is fair.

After the asphalt overlay on the approach bridge
(Soil was settled to the degree shown above)

Pothole on the bridge carriageway (repaired)

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed at alleviating traffic congestions in the Butuan City and surrounding areas and facilitating smooth traffic and transportation between major cities in northeast of Mindanao, by constructing a new bridge and a bypass road at the crossing point of the Agusan River on the Butuan-Cagayan de Oro-Iligan Road in the Butuan City.

Relevance of this project is high, as the project is consistent with priority areas of Philippine's development plans and Japan's ODA policy, and moreover development needs for the project are high. Actual traffic volume on the project section 6 years after project completion is approximately 80% of the target, travelling time through the old bridge was largely reduced, traffic congestion in the Butuan City center was also reduced, and the volume of transportation around the project area and local economic activities seem to have increased. Thus, effectiveness and impact of the project are high. Efficiency of the project is fair, as both actual project cost and period slightly exceeded planned cost and period. Sustainability of the project is also fair, as the project section was converted to a national road at the time of ex-post evaluation (6 years after project completion), and budget for operation and maintenance (O&M) of the project section is supposed to be provided from next year and has not yet been provided currently.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency (DPWH PMO-PJHL)

None

4.2.2 Recommendations to JICA

O&M manuals or trainings on the cable-stayed bridge were not provided to the District Engineering Office during project implementation, despite that the bridge constructed by the

project involved a new technology in the Philippines. Currently JICA is preparing such manual as part of the technical cooperation project and training is also planned to be provided. In order to ensure proper maintenance of the cable-stayed bridge, following up the provision of the manual and training is desired.

4.3 Lessons Learned

(1) During the detailed engineering design, it was found out that the original alignment of the new bypass road would have a significant impact on the existing substation and the residential area and it was not sufficient to alleviate traffic congestions in Butuan City. Then the design was changed, however, it was not materialized due to the limited project cost. Then additional routes are being constructed after project completion with Philippine government's budget. As the project appraisal is considered to be insufficient, a more detailed and accurate project appraisal regarding road alignment deploying experts would be necessary in future projects.

(2) There have been several problems along the project section such as soil being settled under the approach bridges, potholes on the bridge carriageway after a few years of project completion, and flooding along the new bypass road at the section overpassing a small river in case of heavy rains etc. All of these are considered to be inappropriate design and/or construction management, and thus quality control of consultants by an executing agency should be monitored, in order not to repeat the same problem in future.

(3) JICA needs to monitor and follow up from the implementation phase so that the responsibility for O&M is delegated smoothly after project completion in future projects.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	**Steel cable-stayed bridge:** Length 255m, 2 lanes **Approach bridge:** Steel girder bridge 630m **Bypass road:** Length 13,115m, 2 lanes	**Steel cable-stayed bridge:** Length 360m, 2 lanes **Approach bridge:** Steel girder bridge 548m **Bypass road:** Length 9,430m (construction of bypass road 8,100m + rehabilitation of Maguinda - Las Nieves Road 1,330m), 2 lanes
2. Project Period	August 2000 – May 2006 (70 months)	August 2000 – May 2007 (82 months)
3. Project Cost Amount paid in Foreign currency Amount paid in Local currency Total Japanese ODA loan portion Exchange rate	 3,068 million yen 1,107 million yen (395 million peso) 4,175 million yen 3,549 million yen 1 peso = 2.8 yen (As of January 2000)	 3,683 million yen 2,039 million yen (906 million peso) 5,722 million yen 3,506 million yen 1 peso = 2.25 yen (Average between August 2000 and December 2008)

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project

Metro Cebu Development Project (III)

(Cebu South Reclamation and Cebu South Coastal Road)

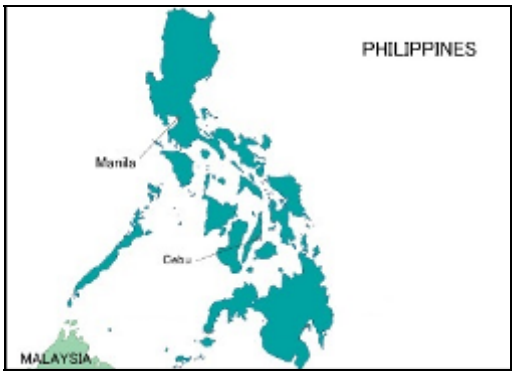
External Evaluator: Yasuhiro Kawabata, Sanshu Engineering Consultant

0. Summary

The objectives of the project were to attract enterprises and facilitate smooth traffic flow in the urban area by reclaiming and developing new land for an industrial zone, and constructing a coastal road, thereby contributing to promotion of the economic development in Metro Cebu. The project was not highly relevant with the Philippines' development plans and needs, and Japan's ODA policy. Therefore, its relevance is fair. Regarding construction of a coastal road, the project has contributed to smoothing the traffic flow in the urban area, since part of traffic diverts to the coastal road, which was constructed under the project. However, the original idea to attract foreign capital enterprises through establishing an industrial park in the reclaimed area was not materialized after the Asian Financial Crisis. Thus, it was changed to invite local enterprises and industry, and the development work including construction of building of University of the Philippines, a shopping mall, apartments, and light industry factories has been undertaken. However, as of today, only part of the area has been developed, and thus, achievement of project objectives made are at a extremely limited level compared with the original plans. Therefore, its effectiveness and impact is considered low. Although the project cost was within the plan, the project period was significantly longer than planned. Therefore, efficiency of the project is considered fair. Effects achieved by the project were made under the coastal road project. No major problems have been observed in terms of institutional management system, and technical and financial aspects for operation and maintenance, therefore sustainability of the project effect by the coastal road project is high.

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

1. Project Description



Project Location

Reclaimed land

Note: Buildings in the center are apartments.

1.1 Background

Metro Cebu[1] is the center of economy, trade and education in the central and southern Philippines and the economy has been growing in recent years. Geographically, it has flat plains expanding to the north and south along the shoreline with the rolling terrain behind it, and flat plains are relatively narrow. The northern districts including Mandaue, Cebu, and Lapu Lapu, which are close to an airport and ports, have been developed and spatially congested, while development in the southern districts including Talisay, which have poor accessibility has been behind. Thus, disparity between the northern and southern districts has been expanding.

The economy of Metro Cebu has been developing nucleating the 330 ha Mactan Export Processing Zone. However. since there was a limit to meet the demand from foreign investors, a new industrial park was needed in order to further the regional economic development. Creating a new development zone by reclaiming the Cebu south coast was considered to be an appropriate plan taking into the geographical condition such as accessibility to an airport and sea ports. It was also expected that it would help alleviate the disparity between the northern and southern districts, which has been a pending issue for a while. In addition, construction of an alternative road was considered essential, since more traffic congestion was foreseen without proper access to the developed area.

1.2 Project Outline

The objectives of the project were to attract enterprises and facilitate smooth traffic flow in the urban area by reclaiming and developing new land for an industrial zone, and constructing a coastal road, thereby contributing to promotion of the economic development in Metro Cebu.

[1] Metro Cebu consists of 7 cities and 6 towns including cities of Cebu, Mandaue, Talisay and Lapu Lapu.

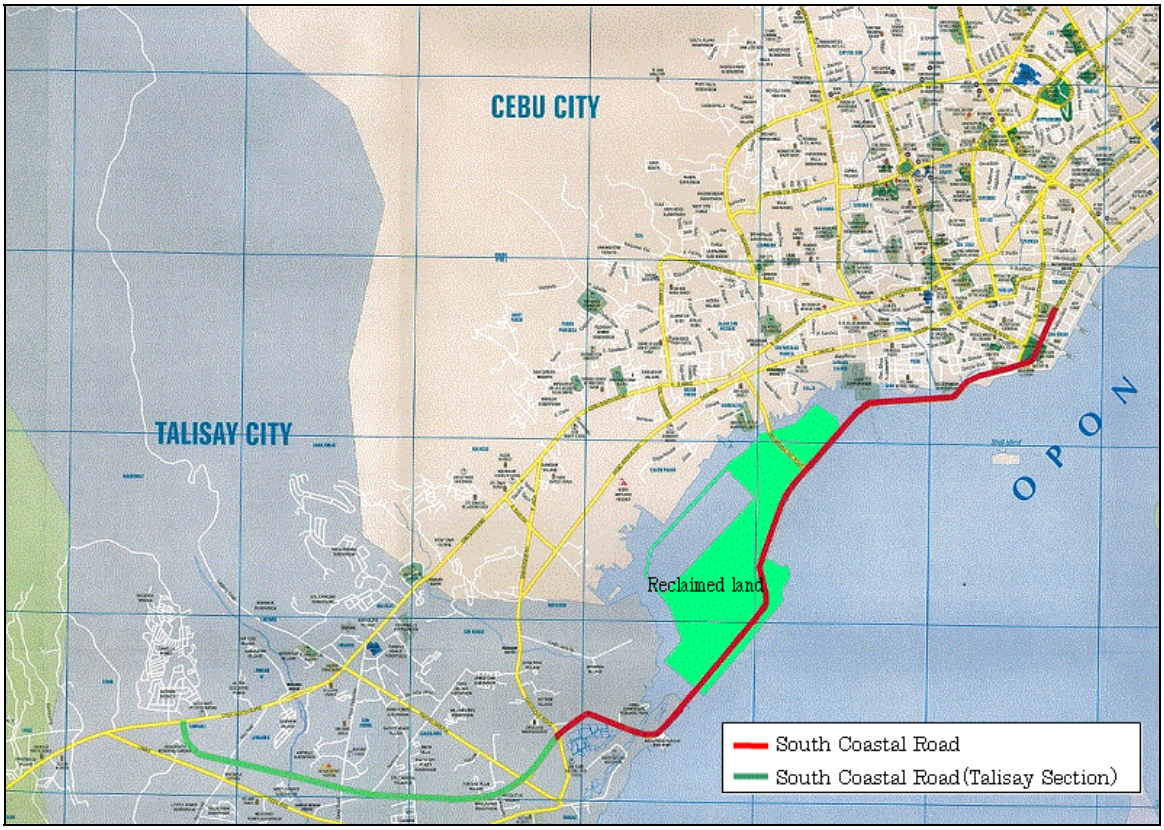


Figure 1: Location of the Project Site

Loan Approved Amount/ Disbursed Amount	Reclamation : 12,315 million yen /12,292 million yen Coastal Road : 18,391 million yen /18,377 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	Reclamation : July 1995 / August 1995 Coastal Road : July 1995 / August 1995
Terms and Conditions	(Both Projects) **Civil Work:** Interest Rate:2.70% Repayment Period: 30 years (Grace Period: 10 years) Conditions for Procurement: General untied **Consulting Services:** Interest Rate: 2.30% Repayment Period: 30 years (Grace Period: 10 years) Conditions for Procurement: General untied
Borrower/ Executing Agency(ies)	Reclamation : Land Bank of the Philippines Coastal Road : The Government of the Republic of the Philippines Reclamation : Cebu City Government Coastal Road : Department of Public Works and Highways (both projects were managed by Metro Cebu Development Office)
Final Disbursement Date	Reclamation : June 2004 Coastal Road : June 2006 (originally December 2002 / June 2003, respectively)

Main Contractor	Reclamation : Toyo Construction Coastal Road : Toa Corporation, Taisei Corporation ▪ Marubeni Corporation (JV), Kajima Corporation
Main Consultant	(Both projects) Nippon Koei ・ OPMAC ・ Katahira and Engineers Inc. ・ Toko Engineering Consultants Ltd. ・ CEDCO (Philippine) (JV)
Feasibility Studies, etc.	Feasibility Study by the World Bank (Central Visayas Urban Planning (December 1983), Feasibility Study for Metro Cebu Development Plan (III) by local funds (November 1989)
Related Projects	Japanese ODA Loan: Metro Cebu Development Project (I) (L/A signed in May 1989), Metro Cebu Development Project (II) (L/A signed in February 1990), Engineering Services for Metro Cebu Development Project (III) (L/A signed in June 1991), Second Mactan Bridge Construction Project (L/A signed in August 1993), Second Mactan Bridge (II) and Metro Cebu Road Development Project (L/A signed in March 1997) Grant: Supply of Materials and Construction of Bridges along Rural Roads (5 times since 1989)

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: October 2012 - September 2013

Duration of the Field Study: January 24 - February 13, 2013, April 14 - 27, 2013

3. Results of the Evaluation (Overall Rating: D[2])

3.1 Relevance (Rating: ②[3])

3.1.1 Relevance with the Development Plan of Philippine

Under the Mid-Term Development Plan 1993-1998, the following strategies were established: 1) attraction of foreign capital and investment through development of infrastructure and investment related system; 2) alleviation of poverty; 3) enhancement of people's quality of life; 4) promotion of decentralization based on the new Local Autonomy Act (1990); 5) strengthening of rural development by establishing President Office-run regional offices in Visayas, focusing on Cebu island and in Mindanao; and 6) reform of financial system.

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

[3] ③: High, ② Fair, ① Low

Objectives of the project matched with two strategies including 1) and 5) among above mentioned 6 strategies.

Under the current Philippine Mid-Term Development Plan 2011-2016, in order to achieve the inclusive growth, the government would address the following agendas: enhancement of governance, attraction of investment, infrastructure development by the PPP scheme, reforms of social security, strengthening of tax collection, and peace building/stable national security. With respect to the transport sector, improvement of quality of existing transport infrastructure, and development of transport networks and logistics are considered to be issues and challenges, and the following strategies are employed: provision of access to major tourism destinations and strategic production areas, identification and development of strategic logistics corridors, improvement of the road RORO[4] transport system, exploration of ASEAN connectivity through RORO and others.

3.1.2 Relevance with the Development Needs of Philippine

Since numerous foreign enterprises moved into the existing Mactan Export Processing Zones, the zones became too cramped and it became difficult to respond to the increasing demand for investment by foreign investors. Thus, it was noted that there was a need to develop a new industrial park in order to further the regional economic development. The Cebu south coastal district was considered to be an ideal location taking into account the geographical condition such as the accessibility to an airport and sea ports. However, it was considered that it was needed to construct a new alternative road in order to avoid more traffic congestion in Cebu city without improvement of accessibility in the district if an industrial park should be established by reclaiming.

Even now, the well balanced development and growth between the northern and southern districts is essential in order to promote the development of Cebu city. Since the project aims at developing the less developed southern district, it matches with the development needs for Cebu city. However, since the original development objective by reclaiming was to develop an industrial park and promote attracting foreign enterprises, the current land use plan (industries to be invited were changed to commercial sector, light industry, and other service business) is substantially different from the original plan. In the reclaimed land, buildings of University of the Philippines, residential complexes and light industry factories have been partly completed and a shopping mall is being constructed. The South Coastal Road under the project has contributed to alleviate the traffic congestion in the central Cebu city by diverting partly the traffic on the congested Cebu South Road to South Coastal Road. The project matches with the

[4] Roll-on/roll-off ships are vessels designed to carry wheeled cargo such as automobiles, and large trucks, that are driven on and off the ship on their own wheels.

development needs in Cebu city.

3.1.3 Relevance with Japan's ODA Policy

Under the Country Assistance Policy for the Philippines (established in December 1993), the assistance was to be given to sustainable economic development, poverty alleviation, environmental protection and improvement, rural development, reconstruction of damages caused by disaster/disaster prevention. Among these agendas, regarding the economic infrastructure, the following were considered to be priority assistance agendas: i) fundamental economic infrastructure for industry development (roads, rivers, ports); ii) reconstruction of economic infrastructure in the disaster-stricken areas; iii) development of disaster prevention system.

Among two projects, the Coastal Road Project matches with the Philippine development policies and the high priority agendas in the Japan's ODA Policy, and the development need is high. Regarding the Reclamation Project, since attraction of enterprises consisting of export processing producers was not materialized, the implementation of the project did not necessarily match with the Philippine development policies and needs, and the high priority agendas in the Japan's ODA Policy. The overall relevance of two projects is considered fair.

3.2 Effectiveness[5] (Rating: ①)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

This ex-post evaluation is related to two projects including both Metro Cebu Development Project (III) Reclamation and Coastal Road. Although an export processing zone was to be originally established in the completed reclaimed land, attraction of foreign capital enterprises was not achieved because of the Asian Financial Crisis in 1997. Thus, Cebu City changed the targeted industries to commercial business, light industry, service business and others, and submitted the concept plan to JICA in mid 2009. As of today, residential complexes and light industry factories have been partly completed and a shopping mall is being constructed. The remaining 1/3 of the land area has been for sale in lots. Thus, it is difficult to examine the development impact on the reclamation project at this moment. The quantitative impacts by Coastal Road Project are examined herein after.

(1) Average Daily Traffic (South Coastal Road)

The average daily traffic after completion of the project is shown in Table 1.

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

Table 1: Average Daily Traffic (South Coastal Road))

unit: vehicles/day

	2010	2011
Annual Average Daily Traffic	20,300 (29,000)	21,300 (30,900)

Source: DPWH
Note 1: Counting station: between Rafael Rabaya -Road San Roque Road along Talisay section
Note 2: Numbers in ( ) are traffic volume including motorcycles
Note 3: Data on the projected traffic volume not available

Considering that Talisay section and the connecting road, Sergio Osmena Blvd Road at the Cebu city are both at-grade 4-lane roads, traffic congestion likely occurs during peak hours in some sections. The traffic volume of the parallel Cebu South Road for the past three years are as shown below.

Table 2: Average Daily Traffic (Cebu South Road)

unit: vehicles/day

	2010	2011	2012
Annual Average Daily Traffic	38,552	38,340	40,412

Source: DPWH
Note 1: Counting station: around Lawaan I
Note 2: Traffic volume included motorcycles

Considering that Cebu South Road is also an at-grade 4-lane road, traffic congestion likely occurs during peak hours in some sections.

(2) Travel Time

The travel time required to pass the old road and South Coastal Road (the project road) between Lawaan I (intersection with the Talisay section) in the south along Cebu South Road and Cerreta Cemetery in Cebu city was measured. The result indicated that the travel time by South Coastal Road (the project road) is shortened by 14 minutes.

3.2.2 Qualitative Effects

Reclamation Project:

The original plan to attract foreign capital was not materialized, and the plan was changed to attracting local enterprises and industry. The development work in the reclaimed land commenced in 2010. However, at this moment only part of development plan (apartments and light industry factories) has been completed, and the development effects have not been achieved.

Coastal Road Project:

Upon completion of South Coastal Road, the route from the southern Cebu districts (Naga) to Mactan Island, where an Mactan International Airport, Mactan Economic Special Zones I and II, and resorts in the eastern shoreline are located, makes a detour around central Cebu city, and it reaches and crosses Mactan bridges. The travel time was shortened and it also contributes to alleviation of traffic congestion in the central Cebu city.

Since the reclaimed land has been being developed, it was considered difficult to examine the development effects at this moment. Thus, beneficial surveys to examine the effects were undertaken on the Coastal Road project (Talisay section)[6]. Beneficial survey results are shown below.

A) Was traffic congestion in the project area improved after the project? (%)

Yes	No
79	21

Among respondents, who answered "Yes", 48% answered that the improvement was substantial, and 45% answered that it was fairly improved. Only 7% responded that it was a little improved.

B) Was travel time shortened after the project? (%)

Yes	No
71	29

The degree of shortened travel time differs depending on the travel purpose and destinations. However, generally about 70% answered that the travel time was shortened.

C) Was accessibility to each facility improved after the project? (%)

Facility	%
Markets, shops, trade centers	61
Social services	45
Hospitals	21
Government/public agencies	10
Cebu Port	94
Mactan Airport	58

[6] Surveys undertaken: January 2013, Number of samples: 210 (residents along the project road and road users, Male 40%, Female 60%) , Survey method: interviews using a questionnaire.

As expected at the planning stage, many people admit that the accessibility to Cebu ports and Mactan International airports was improved. In addition, quite a number of respondents recognize the improvement of accessibility to markets, shops, and trade centers.

D) Was highway safety on national roads in the project area improved after the project? (%)

Very	Fairly	Improved	Not so much	Not improved
3	12	62	14	9

About 80% of respondents admit that the highway safety was also improved.

According to the results of beneficiary surveys, about 80% of respondents admit that the traffic congestion in the project area was improved after the project and that about 70% answered that the travel time was shortened. People conceive that the accessibility to each facility was improved, particularly to Cebu Port (94%) and Mactan Airport (58%) as expected at the planning stage.

3.3 Impact

3.3.1 Intended Impacts

The results of beneficiary surveys on impacts are shown below.

A) Do you think that the regional economic activities were promoted after the project? (%)

Yes	No
83	17

B) Do you think that the business chances were increased after the project? (%)

Yes	No
83	17

About 80% respondents gave the positive answers to promotion of regional economic activities and increase of business chances. The impact due to provision of an arterial road from the Talisay district to the coastal district appears.

C) Was the transported amount of commercial products to markets increased after the project? (%)

Increased	Decreased
80	20

About 56% conceive that the most increased commercial product is processed food, followed by agricultural products (44%), manufactured goods (41%) and electronics products (30%) among the increased products.

D) Was the household income increased after the project? (%)

Yes	No
45	55

Regarding the direct contribution of the project to the increase of household income, only 45% respondents conceive its direct benefits (increase of household income).

3.3.2 Other Impacts

Under the project, resettlement of directly affected 520 households and informal settlers of 400 households took place due to construction of an access road to the reclaimed land (Mambaling Road) and the coastal road. According to the executing agency, about 80% among resettled households moved to the designated land by the executing agency, and the rest (about 20%) resettled to other locations. Compensation was paid by Department of Welfare of the Urban Poor of the Cebu City Government.

On the other hand, the implementation of the project generated a series of complaints on impacts on the livelihood due to deterioration of the living environment by the project, and also demonstrations by the fisherfolks who live on the opposite shore facing the SRP and their allied NGOs and Community Based Organizations (CBO).

During preparation stage of the project, an Environmental Impact Assessment (EIA) was prepared and approved by the Philippines Government. However, regarding the impacts to the residents who live on the opposite shore facing the reclaimed land, issues are briefly discussed in the report stating that the marine resources along the shore has been deteriorated and that major impacts are not foreseen. There is no section in which impacts on the socioeconomic aspects of the residents on the opposite shore are well analyzed, and they are not listed as a risk item. Hearings with residents in the communities revealed that the disclosure of relevant project information was not made, nor public hearing was systematically made through posting in conspicuous public places and publication in newspaper. Lack of view points on impacts to residents who live on the opposite side is considered to be one of factors for less attention to socioeconopmic aspects. .

Cognizant of the above mentioned complaints and based on the discussion made between

JICA and the Philippine Government, in 2004 JICA conducted a study to clarify the alleged negative impacts of the project. Based on the study results, the study team recognized that the project had impacts on about 1,400 households including resettled households in 13 barangays in Cebu City facing the reclaimed land, and recommended a comprehensive social development plan covering livelihood, education, environment and others to urban poor communities in 13 barangays. Responding to the study conclusion, Cebu City has conducted the social compensation program to the identified communities since 2005. However, since it was considered difficult to identify the residents who were affected solely by the project, and Cebu City considered that it was more appropriate to provide assistance to the district as a whole, rather than solely to the identified residents. Cebu City identified 3,700 households, who lived in within 100 meters from the shorelines as the program beneficiaries. Cebu City originally planned a five-year Program ending in 2010. However, it decided to continue the Program even after 2011 and it has been still under implementation. The average budget allocated to the Program for the past 7 years was 3.5 million peso. (Although in addition to the budget for the Program, there is also general budget allocated to the programs to be implemented by relevant divisions of the City Government. However, the exact amount allocated to each program could not be clarified.) The Program, which still has been continued, is not funded solely by the City Government, but also by other sources of support including NGO, CBO and private sector as well. The Program includes: 1) assistance for livelihood projects (massage, rag sewing, meat processing and others); 2) education, health services and environmental programs including mangrove planting; and 3) sharing good practice, and showcasing of livelihood products.

The survey of 130 sample household-beneficiaries conducted by JICA, inviting a professor of Ateneo de Manila University in 2012 revealed that the quality/status of education and health has been improved. Residents were highly satisfied with efforts made on education and health services. On the other hand, regarding the assistance for livelihood projects, the share of residents who admitted they were either highly benefited (15%) or only slightly benefited (38%) was 53% and the remaining 47% said they did not enjoy the benefits. Reasons for not-benefited are that they could not yield a profit or that activities could not be maintained. Backgrounds for these negative outcome are: lack of funds; they used the funds for daily life activities; the interest rate for loans is high; and they could not collect sales proceeds. Although it is considered that the livelihood assistance to the urban poor is not easy and the outcome cannot be easily achieved, it is expected that the Cebu City Government would continue to improve the assistance program including livelihood assistance taking into account the current situation and problems.

The task team visited the project sites to inspect some of on-going social compensation programs. Among the livelihood assistance programs, under the crab raising business, about 1,000 baby crabs were initially put in the ponds and some grown up crabs were sent to the fish markets. However, since most of crabs later died, currently crabs were replaced by bangus fish

(popular fish in the Philippines) and they have been cultured. As one of successful programs, the massage therapy/finger pressure service at Wellness Center is listed. The Center has trained about 40 therapists, and 5 of them are now regularly working with the Center. About 20 therapists out of 40 have continued pursuing the livelihood as a physical therapist in other districts. Earnings at the Center collected from customers who have therapy services are 10,000 - 15,000 pesos per month, and they are used to operational expenses and labor costs. Regarding the sustainability of each program, the presence of a leader who has business operational/management skills is considered a key factor, together with enhancement and development of technical skills of individual employee, who participates in each program. As a health service assistance, health nutrition posts built in some of barangays could be good examples. Health nurses and nurses are regularly dispatched to the posts, and simple treatment/consultation is provided to the low income residents who cannot afford to go to a health center. According to a counselor of some barangay, expanding health posts and provision of sanitation facilities (e.g. waterless toilets) are still considered crucial.

At this moment, only part of the development plans (apartments and light industry factories) has been completed, and the development effects have not been achieved. The coastal road contributes to alleviation of traffic congestion in the central district of Cebu city. However, one of original objectives was to secure the accessibility under the plan in which the export processing zone was to be constructed in the reclaimed land. Judging the effectiveness made by both reclamation and coastal projects comprehensibly, the project has achieved its objectives at a limited level, and therefore its effectiveness and impact is low.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

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

Table 3: Output (original and actual)

	Major Scope of Work at appraisal	Major Scope of Work at completion
Reclamation		
Civil work:	1) Reclamation work for about 330 ha including revetment work of about 10.3km with a reclamation volume of 13.6 million m^3	1) Reclaimed area: about 296 ha (among which the area for a coastal road is about 24 ha. Since a 61 ha pond is included in the area, the actual reclaimed area is about 235 ha. The length of revetment work is about 9.2 km. The reclaimed soil volume was about 9 million m^3) 2) Additional work (a management office in the reclaimed area, roads/bridges, a sewage treatment plant, a desalination plant, major electric facilities and others)

Consulting services	1) Review of detail designs 2) Assistance in bidding activities 3) Construction supervision 4) Market research, management study and investment promotion study of the Cebu Export Processing Zone Foreign :201 M/M Local : 834 M/M	As planned Foreign :206 M/M Local : 839M/M
Coastal Road		
Civil work:	Construction of Cebu Coastal Road (totaling 7.75km) 1) Causeway Section(Segment 2): construction of a 6-lane 4.02 km highway with two bridges with a total length of 174m and a revetment work of 7.2km 2) Central Business District Section(Segment 3): construction of a 4-lane 3.73 km highway including the viaduct section with a total length of 2.8km 3) Development of resettlement sites	Construction of Cebu Coastal Road (totaling 7.75km) 1) Causeway Section(Segment 2): construction of a 6-lane 4.02km highway and a 4-lane 0.84 km highway with a total length of 4.86 km 2) Central Business District Section (Segment 3): construction of a 4-lane 2.89 km highway including the viaduct section with a total length of 1.62km Segment 3 was divided into 3A (viaduct section), 3B1 (approach section), and 3B2 (tunnel section), procurement of works was made by 3 packages. However, 3B2 (tunnel section) was completed with the own funds after the loan was expired. (commenced the work in June 2006 and completed in October 2010. 3) Development of resettlement sites
Consulting services	1) Review of detail designs 2) Assistance in bidding activities 3) Construction supervision Consulting services on the above services Foreign :292 M/M Local :1,260 M/M	1) Review of detail designs 2) Assistance in bidding activities 3) Construction supervision 4) Feasibility Study and the Detailed Design of structures for Segment 3B2. Foreign :470 M/M Local : 2,294.5 M/M

Source: JICA appraisal documents

Note: During the appraisal for the Coastal Road, the Talisay section (5.3 km) of the Coastal Road was included in the project. Since it was later judged that it was essential to give more time to handle the resettlement of squatters (illegal occupants), this component was dropped from the project. The component was added to the Second Mactan Bridge Project (II) as Metro Cebu Development Project. The Second Mactan Bridge Project (II) and the part of Metro Cebu Development Project (Talisay section) were combined as a project, and it was approved as Second Mandau - Mactan Bridge (Phase II) and Metro Cebu Road Project. The loan agreement was signed in March 1997.

Major changes made on the Scope of Work are as follows:

Reclamation Project:

1. Because of change of policy of the Cebu City Government, the original plan for

reclamation was changed to the one with a pond within the reclaimed land, resulting in reduction of reclaimed area by about 60 ha.

2. Originally, the filling materials were to be transported from off Maasin of southern Leyte. However, since a clearance was not secured from environmental viewpoints, materials were sourced out from quarries in Cebu Island.
3. Since savings were expected to accrue in the loan amount because of variation of foreign exchange rates, additional work was implemented. (the exchange rate at appraisal in January 1995 was 1 Peso = 4.13 yen. The rate at bidding for additional work in June 2002 was 1 Peso = 2.39 yen)

Coastal Road Project:

The project road length at the planning and completion stages is both 7.75 km. However, the number of contract packages for bidding was changed from original 2 to 4 packages. Particularly, the central business district section (Segment 3) was divided into 3A (viaduct section), 3B1 (approach section) and 3B2 (tunnel section) and bidding was made. Since 3B2 section was changed from the original flyover structure to a tunnel, a feasibility study and detailed designs were needed to be done, and thus the implementation period was substantially extended. At commencement of civil work (in 2006), about 1.7 billion yen (about 65% of the civil work cost) was disbursed. The project was completed with own funds spent for the remaining project cost. (The project commenced in June 2006 and was completed in October 2010). Since the 3B2 section was changed to a tunnel, undertaking of a feasibility study and detailed designs was added to the scope of work for consultants.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The originally estimated project cost of Metro Cebu Development Project (III) - Reclamation at appraisal was 16,420 million yen, of which the total Japanese ODA loan was 12,315 million yen. The actual project cost at completion was 12,860 million yen, which is equivalent to 78% of the planned cost, and the Japanese ODA loan disbursed was 12,292 million yen.

The originally estimated project cost of Metro Cebu Development Project (III) - Coastal Road at appraisal was 24,521 million yen, of which the total Japanese ODA loan was 18,391 million yen. The actual project cost at completion was 24,795 million yen, which is equivalent to 101% of the planned cost, and the Japanese ODA loan disbursed was 18,377 million yen.

The originally estimated total project cost of both projects at appraisal was 40,941 million yen, of which the total Japanese ODA loan was 30,706 million yen. The actual project cost at completion was 37,655 million yen, which is equivalent to 92% of the planned cost, and the

Japanese ODA loan disbursed was 30,669 million yen.

However, if the project cost was compared in peso, since the Japanese yen appreciated double compared with the exchange rate used at appraisal (1 peso = 4.13 yen), the actual project cost is likely much higher than the planned cost[7].

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

unit: million yen

Item	Planned					Actual				
	ODA loan	Local		Local		ODA loan	Local		Total	
	(foreign)	Own fund	ODA loan	Total	ODA loan	(foreign)	Own fund	ODA loan	Total	ODA loan
Reclamation										
1) Civil work	7,727			14,117	10,676				10,448	10,027
2) Consulting services	883			892	866				1,467	1,320
3) Physical contingency	773			1,412	30					
4) Interest during construction					743				945	945
Total	9,333			16,420	12,315				12,860	12,292
Coastal Road										
1) Civil work	9,997	2,904	5,885	18,286	15,382	12,481	5,303	3,571	21,355	16,052
2) Consulting Services	1,269	37	58	1,364	1,327	1,836	407	489	2,732	2,325
3) Development for resettlement areas	254	66	128	448	382					
4) Contingency	1,000	529	300	1,829	1,300					
5) Land acquisition/ Compensation	0	2,594	0	2,594	0		708		708	
Total	12,520 (3,031)	6,130 (1,484)	5,871 (1,422)	24,521 (5,937)	18,391 (4,453)	14,317	6,418	4,060	24,795	18,377
Total										
1) Civil work	17,724			29,329					31,803	26,079
2) Consulting services	2,152			2,185					4,199	3,645
3) Development of resettlement areas	254			448						
4) Contingency	1,773			3,241						
5) Land acquisition/ Compensation	0			2,594					708	
6) Interest during construction									945	945
Total	21,853			40,941	30,706				37,655	30,669

Source: JICA appraisal documents, PCR, Final Reports prepared by supervision consultants

Exchange rates:

Reclamation: At appraisal (January 1995), 1 US$ = 100 yen, 1 Peso = 4.13 yen; At contract signing (1997.10 - 2000.10), 1 Peso=4.64 yen by Oanda; Average during the project implementation (1997.4 - 2000.10), 1 Peso=2.24 yen by Oanda; Average during civil work implementation (2003.2 - 2004.5), 1 Peso=1.85 yen by Oanda.

Coastal Road: At appraisal (January 1995), 1 US$ = 100 yen, 1 Peso = 4.13 yen

Note 1: Numbers in ( ) are in million peso.

Note 2: The loan handling charge of 18 million yen is included in the cost for civil work (Coastal Road).

[7] Comparison between the planned and actual project costs should be made in Japanese yen. However, time has quite passed since the appraisal time (almost 18 years). During this period, the exchange rates have substantially floated. In addition, the exchange rates used for payment in Japanese yen under the contract made in peso, and the payment mode/conditions are not clear. Thus, project costs were converted into Japanese yen by using simple average exchange rates during the contract period.

Reclaimed land (Sea Channel)

Coastal Road Viaduct Section

3.4.2.2 Project Period

Reclamation Project:

The original project period planned at appraisal was from August 1995 (signing of the Loan Agreement) to June 2000 (civil work completion) with a total period of 59 months. The actual project period was from August 1995 (signing of the Loan Agreement) to December 2004 (civil work completion) with a total period of 113 months, or equivalent to 192% of the plan. The main reason for delay is: although the originally planned reclamation work was completed as planned, the additional work was implemented during March 2003 - December 2004, and thus, the overall work was completed with delay by 54 months (equivalent to 192% of the plan).

Coastal Road Project:

The original project period planned at appraisal was from August 1995 (signing of the Loan Agreement) to December 2000 (civil work completion) with a total period of 65 months. The actual project period was from August 1995 to October 2010 (completion of the tunnel section at the Cebu city side) with a total period of 183 months, or equivalent to 282% of the plan. The main reasons for delay are as shown below, and the implementation period was substantially delayed with combined reasons mentioned below.

1. Delay of effectiveness of the Loan Agreement (L/A was signed on August 30, 1995, and became effective on June 28, 1996)
2. The reclamation work was originally planned to be commenced in July 1997, ahead of road work, and to be completed in June 2000. The implementation plan, in which the road work (particularly causeway section) was to be commenced in July 1997 and completed in December 2000, is considered to be not pragmatic.

3. Delay of selection of contractors by half a year.
4. The ambush incident against engineers of a Japanese contractor occurred in February 2001, and construction was practically suspended until January 2002.
5. Due to problems on land acquisition occurred in the viaduct section in the central business district section (3A), the alignment needed to be changed and it took a long time to prepare detailed designs.
6. Similarly, at the connecting section from the coastal road to the existing city road in Cebu city (3B2), designs needed to be revised (from a viaduct structure in the city to a tunnel), and it took a long time to undertake a feasibility study and prepare new detailed designs.

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

(1) Financial Internal Rate of Return (FIRR)

FIRR for the reclamation project, calculated at the appraisal time was 14.8%. Since the objective of the reclaimed land was changed upon completion of reclamation work, recalculation of FIRR is not applicable.

(2) Economic Internal Rate of Return (EIRR)

EIRR for the coastal road project, calculated at the appraisal time was 19.1%. Since the scope of work was partially revised and the implementation period was substantially extended, recalculation of EIRR is difficult.

Regarding the reclamation project, although the project cost was within the plan, the project period significantly exceeded the plan. Therefore, efficiency of the project is considered fair. With respect to the coastal road project, although the project cost was almost as planned, the project period significantly exceeded the plan. Therefore, efficiency of the project is considered fair. The overall rating for efficiency combining two projects is considered fair.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

Since the reclamation project has not achieved its objectives, the sustainability on the coastal road project is hereinafter discussed.

Coastal Road Project:

Cebu City District Engineering Office under DPWH Regional Office VII (with about 230 regular staff) has been responsible for maintenance of the coastal road after the project was completed. Cebu City District Engineering Office has about 55 regular staffs,

and among those 8-9 staffs are responsible for maintenance work, with additional about 35 roadside maintenance workers. In addition, the Office employs about a few dozen temporary staffs. A maintenance worker is assigned every 3.5km for routine maintenance work of roads.

Regarding the coastal road, each office in charge of operation and maintenance of the project sections and districts is well staffed and no particular problem was observed.

3.5.2 Technical Aspects of Operation and Maintenance

Coastal Road Project:

DPWH has developed and possesses various manuals including those for road repair/maintenance, road maintenance activity, and road safety. For a newly employed staff, training is undertaken using DPWH's manuals and he is assigned to the field work. The routine maintenance work has been undertaken by force account, and technicians and workers have sufficient technical skills. The periodic maintenance work (such as replacement of expansion joints) and major rehabilitation (such as overlay), which require special equipment and skills are undertaken by contractors, who were selected through the competitive bidding process. The District Engineering Office, in charge of the project sections and district, has regularly undertaken training and prepared required manuals, and thus, there are no technical issue to sustain the effects of the project.

Coastal Road (Causeway section)

Coastal Road (Tunnel section)

3.5.3 Financial Aspects of Operation and Maintenance

Coastal Road Project:

The maintenance budget for routine maintenance of national roads including roads constructed under the project is provided directly to a District Engineering Office following the DPWH's standard norm and formula. Concerning the 2013 budget, 67,387 peso/km/year from the DPWH general budget, and additional 24,745 peso /km/year from the vehicle user charges, totaling about 92,000 peso/km/year is to be allocated to

the roadway section. Budget of 30,700 peso/km/year is allocated to the bridge/viaduct section (e.g. for old bridges). The maintenance cost spent by Cebu City District Engineering Office for the project section for the past five years is shown in Table 5.

Table 5: Operation and Maintenance Cost (Coastal Road)

unit : peso

Operation and Maintenance Cost	2008	2009	2010	2011	2012
	45,773	196,334	438,988	469,195	149,960,270

Source: DPWH Regional Office VII

Note: Except in 2012, the work undertaken is repair of pavement and marking. Rehabilitation and improvement of the causeway section was undertaken in 2012.

During ocular inspection in the field, no clacks on the pavement surface was observed, and the pavement condition looked fine.

3.5.4 Current Status of Operation and Maintenance

Coastal Road Project:

Maintenance work has been undertaken at the following frequency.

- Repair of potholes: as potholes were identified.
- Repainting of markings: when the marking became indistinct.
- Grass cutting, road surface cleaning, and clearing ditches: undertaken regularly

Routine and periodic maintenance for roads constructed under the project has been properly undertaken according to the maintenance manuals, and no issue was observed. As about ten years have passed since the pavement of the coastal road was completed, roughness and irregularity due to settlement became evident. In 2012, rehabilitation and improvement work was implemented.

As mentioned above, since the reclamation project has not achieved its objectives, the sustainability only on the coastal road project was discussed above. Regarding the coastal road project, no major problems have been observed in institutional, technical and financial aspects of the 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 attract enterprises and facilitate smooth traffic flow in the urban area by reclaiming and developing new land for an industrial zone, and constructing a coastal road, thereby contributing to promotion of the economic development in Metro Cebu. The project was not highly relevant with the Philippines' development plans and needs, and

Japan's ODA policy. Therefore, its relevance is fair. Regarding construction of a coastal road, the project has contributed to smoothing the traffic flow in the urban area, since part of traffic diverts to the coastal road, which was constructed under the project. However, the original idea to attract foreign capital enterprises through establishing an industrial park in the reclaimed area was not materialized after the Asian Financial Crisis. Thus, it was changed to invite local enterprises and industry, and the development work including construction of building of University of the Philippines, a shopping mall, apartments, and light industry factories has been undertaken. However, as of today, only part of the area has been developed, and thus, achievements of project objectives made are at a extremely limited level compared with the original plans. Therefore, its effectiveness and impact is considered low. Although the project cost was within the plan, the project period was significantly longer than planned. Therefore, efficiency of the project is considered fair. Effects achieved by the project were made under the coastal road project. No major problems have been observed in terms of institutional management system, and technical and financial aspects for operation and maintenance, therefore sustainability of the project effect by the coastal road project is high.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

In order to continue the social compensation program, it is essential to focus on the development of the operational management capacity including business operation and personnel management in addition to enhancement and development of technical capacity of individual participants in each program. Particularly, under the group type programs such as the livelihood assistance program, it is important to cultivate leaders who have business operational management capacity (management, financing, personnel management, technical skills, management vision and organizational skills).

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

1. Signing of loan agreements for two projects (reclamation and coastal road) was made in 1995. Thus, the ex-post evaluation is being done in 18 years after the loan signing date. Under the project with the long implementation period, filing and archiving the relevant project documents is quite often improperly managed by the implementing agency. JICA needs to keep all the project documents in order, and to supervise so that a well spelled

out project completion report is timely submitted upon loan expiration by the executing agency. Moreover, JICA should provide more advice on preparation of the project completion report and review more thoroughly so that the submitted report covers all the information and data required.

2. It is likely that the weakness on viewpoints from the residents who live on the other side facing the SRP affected quality of an EIA report, lack of consultation with residents and improper monitoring during the operational stage. Thus, in preparation of an EIA, the scope of analysis on potential impact items needs to be well studied. Moreover, even if the impacts are not foreseen with proper countermeasures, risks should be well defined and these risks needs to be monitored during the project implementation. JICA should pay attention to these risks and request the project executing agency to monitor potential risks which might take place during implementation.

3. At commencement of the project, the unreasonable/ unpragmatic changes and plans in designs and implementation schedule were made including the following: i) reduction of reclaimed area (due to construction of a pond) and change of borrow pits for sand for reclamation (from sea sand to the soils/sand in Cebu Island) under the reclamation project, and ii) the inappropriate/unpractical implementation schedule in which construction of the coastal road was to be undertaken while reclamation work was under implementation under the reclamation project. Moreover, during the project implementation, changes on routes and type of roadway structures at the connecting section with the existing city road were made under the coastal road project. Since these changes are fundamental problems in terms of the project scope, it would be questionable whether or not the technical review (including environmental aspects) at the appraisal stage was adequate. Thus, it is considered that more thorough technical appraisal should have been done at the appraisal stage inviting experts in each sector (expertise required for this project includes environment, road, dredging/reclamation, and construction management/planning).

Comparison of the Original and Actual Scope of the Project

Reclamation Project

Item	Original	Actual
1. Project Output	1) Reclamation work for about 330 ha including revetment work of about 10.3km with a reclamation volume of 13.6 million m^3	1) Reclaimed area: about 296ha (among which the area for a coastal road is about 24 ha. Since a 61 ha pond is included in the area, the actual reclaimed area is about 235 ha. The length of revetment work is about 9.2 km. The reclaimed soil volume was about 9 million m^3.) 2) Additional work (a management office in the reclaimed area. roads/bridges, a sewage treatment plant. a desalination plant, major electric facilities and others)
Consulting services	1) Review of detail designs 2) Assistance in bidding activities 3) Construction supervision 4) Market research, management study and investment promotion study of the Cebu Export Processing Zone Foreign : 201 M/M Local : 834 M/M	as planned Foreign : 206 M/M Local : 839 M/M
2. Project Period	August 1995 -June 2000 (59 Months)	August 1995 -December 2004 (113 Months)
3. Project Cost		
Amount paid in Foreign currency	9,333 million yen	Unknown
Amount paid in Local currency	7,087 million yen	Unknown
Total	16,420 million yen	12,860 million yen
Japanese ODA loan portion	12,315 million yen	12,292 million yen
Exchange rate	1 Peso = 4.13 yen (as of January 1995)	1 Peso=1.85-2.24yen (average between April 1997 and May 2004)

Coastal Road Project

Item	Original	Actual
1. Project Output	Construction of Cebu South Coastal Road (totaling 7.75km) 1) Causeway Section: construction of a 6-lane 4.02km highway with two bridges with a total length of 174m and a revetment work of 7.2km 2) Central Business District Section (segment 3): construction of a 4-lane highway with a total length of 3.73km including the viaduct section with a total length of 2.8km 3) Development of resettlement sites	Construction of Cebu South Coastal Road (totaling 7.75km) 1) Causeway Section(Segment 2): construction of a 6-lane 4.02km highway and a 4-lane 0.84 km highway with a total length of 4.86 km 2) Central Business District Section (Segment 3): construction of a 4-lane 2.89 km highway including the viaduct section with a total length of 1.62km Segment 3 was divided into 3A (viaduct section), 3B1 (approach section), and 3B2 (tunnel section), procurement of works was made by 3 packages. However, 3B2 (tunnel section) was completed with the own funds after the loan was closed. (commenced the work in June 2006 and completed in October 2010. 3) Development of resettlement sites
Consulting services	1) Review of detail designs 2) Assistance in bidding activities 3) Construction supervision Consulting services on the above services Foreign : 292 M/M Local : 1,260 M/M	1) Review of detail designs 2) Assistance in bidding activities 3) Construction supervision 4) Feasibility Study and the Detailed Design of structures for Segment 3B2. Foreign : 470 M/M Local :2,294.5 M/M
2. Project Period	August 1995-December 2000 (65 Months)	August 1995 -October 2010 (183 Months)
3. Project Cost Amount paid in Foreign currency Amount paid in Local currency Total Japanese ODA loan portion Exchange rate	 12,520 million yen 12,001 million yen 24,521 million yen 18,391 million yen 1 Peso = 4.13 yen (as of January 1995)	 14,317 million yen 10,478 million yen 24,795 million yen 18,377 million yen 1 Peso = approx.1.9 yen (average between January 1998-October 2010)

Total of 2 projects (Reclamation and Coastal Road)

Project Cost Total Japanese ODA loan portion	 40,941 million yen 30,706 million yen	 37,655 million yen 30,669 million yen

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project

Second Mandaue -Mactan Bridge (Phase II) and Metro Cebu Road Project

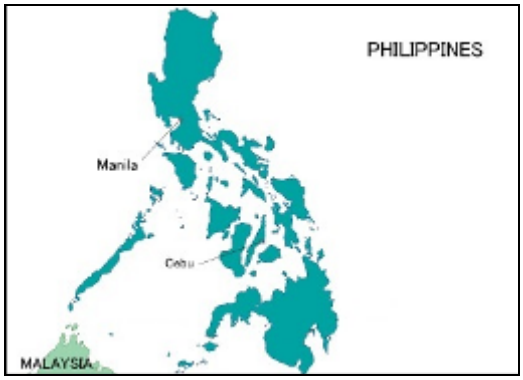
External Evaluator: Yasuhiro Kawabata, Sanshu Engineering Consultant

0. Summary

The objectives of the project were to improve the traffic safety and efficiency in the connecting section between Cebu and Mactan Island by constructing the Second Mactan Bridge connecting between Cebu and Mactan Island and rehabilitating the existing First Mactan Bridge, and to alleviate traffic congestion in central Metro Cebu by constructing the Talisay section of the coastal road, thereby contributing to promotion of the economic development in Metro Cebu. The project has been highly relevant to the development plans and needs of the Philippines, as well as Japan's ODA policies. Regarding improvement of the safety and efficiency of the transport between Cebu and Mactan Island, and alleviation of traffic congestion in the central Metro Cebu, which were both the development objectives, the project has somewhat achieved its objectives. Thus, the effectiveness is fair. Although the project cost was within the plan, the project period was significantly longer than planned. Therefore, efficiency of the project is considered fair. Some problems have been observed in terms of institutional and financial aspects for operation and maintenance, therefore sustainability of the project effect is fair.

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

1. Project Description



Project Location

Second Mactan Bridge

1.1 Background

Philippines's second largest economic city, Metro Cebu has been developing having Mactan Airport and Mactan Export Processing Zones as its nucleus, and leading country's economic growth. Before the project was commenced, the traffic volume of First Mactan Bridge, which

solely connected between Mactan Island and Cebu main island had been rapidly increasing (increased by 15% per annum). However, due to damage of piers caused by the vessel collision accident occurred in 1990 and increase of traffic volume, the durability had been lowered and it had not been able to cope with the traffic demand. Thus, construction of 4-lane Second Mactam Bridge and rehabilitation of First Mactan Bridge had been identified as the highest priority agenda. At the same time, since the traffic congestion in the Cebu city center was serious, construction of a detour road connecting between northern and southern Cebu was also imperative. In addition, there was a plan that an export processing zone was to be developed in the reclaimed land created in the south of Cebu city, and construction of an access road was also imperative. Therefore, expansion of the carriageway of Second Mactan Bridge to 4 lanes was needed in order to cope with the rapidly increasing traffic demand between Mactan Island and Cebu Island, and the safety of First Mactan Bridge needed to be enhanced through rehabilitation of the bridge.

1.2 Project Outline

The objectives of the project were to improve the traffic safety and efficiency in the connecting section between Cebu and Mactan Island by constructing the Second Mactan Bridge connecting between Cebu and Mactan Island and rehabilitating the existing First Mactan Bridge, and to alleviate traffic congestion in central Metro Cebu by constructing the Talisay section of the coastal road, thereby contributing to promotion of the economic development in Metro Cebu.

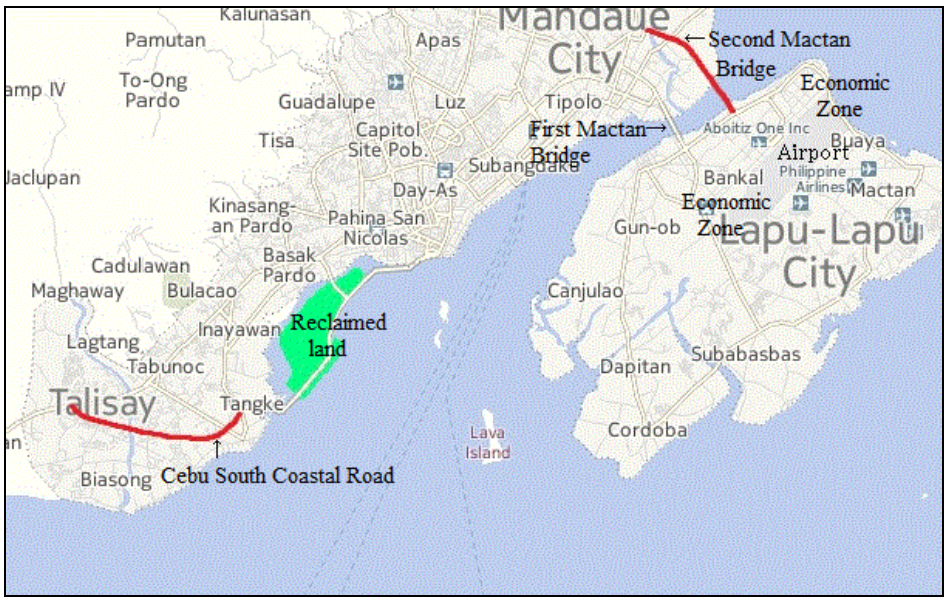


Figure 1: Location of Project Site

Loan Approved Amount/ Disbursed Amount	6,593 million yen/6,340 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 1997/March 1997
Terms and Conditions	Civil Work: Interest Rate: 2.70%, Repayment Period: 30 years (Grace Period: 10 years) Conditions for Procurement: General untied Consulting Services: Interest Rate: 2.30% Repayment Period: 30 years (Grace Period: 10 years) Conditions for Procurement: General untied
Borrower / Executing Agency(ies)	The Government of the Republic of the Philippines /Department of Public Works and Highways (DPWH)
Final Disbursement Date	June 2004
Main Contractor	Kajima Corporation/Sumitomo Const Co. J.V. Kajima Corporation
Main Consultant	Katahira and Engineers International, The Katahira & Engineers. Inc.
Feasibility Studies, etc.	Feasibility Study (for Second Mactan Bridge Construction Project), prepared by DPWH (December 1990), SAPROF (for Central Visayas Urban Development Plan) prepared by JICA (July 1988), Feasibility Study (for Metro Cebu Development (III)), prepared by DPWH (November 1989)
Related Projects	Japanese ODA Loan: Metro Cebu Development (I) (L/A signed in May 1989), Metro Cebu Development (II) (L/A signed in February 1990), Engineering Services for Metro Cebu Development (III) (L/A signed in June 1991), Second Mactan Bridge Construction Project (L/A signed in August 1993), Metro Cebu Development (III) Reclamation/Coastal Road (L/A signed in August 1995) Grant Aid: Supply of Materials and Construction of Rural Road Bridges (5 times since 1989)

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: October 2012 –September 2013

Duration of the Field Study: January 24 – February 13, 2013, April 14 – 27, 2013

3. Results of the Evaluation (Overall Rating: C[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance with the Development Plan of Philippines

Under the Mid-Term Development Plan 1993-1998, the following strategies were established: 1) attraction of foreign capital and investment through development of infrastructure and investment related system; 2) alleviation of poverty; 3) enhancement of people's quality of life; 4) promotion of decentralization based on the new Local Autonomy Act (1990); 5) strengthening of rural development by establishing President Office-run regional offices in Visayas, focusing on Cebu island and in Mindanao; and 6) reform of financial system. Objectives of the project matched with two strategies including 1) and 5) among above mentioned 6 strategies.

Under the current Philippine Mid-Term Development Plan 2011-2016, in order to achieve the inclusive growth, the government would address the following agendas: enhancement of governance, attraction of investment, infrastructure development by the PPP scheme, reforms of social security, strengthening of tax collection, and peace building/stable national security. With respect to the transport sector, improvement of quality of existing transport infrastructure, and development of transport networks and logistics are considered to be issues and challenges, and the following strategies are employed: provision of access to major tourism destinations and strategic production areas, identification and development of strategic logistics corridors, improvement of the road RORO[3] transport system, reinforcement of ASEAN connectivity through RORO and others.

3.1.2 Relevance with the Development Needs of Philippines

At the appraisal stage, increase of highway capacity (by construction of 4-lane Second Mactan Bridge)[4] connecting between Cebu main island and Mactan island, where an international airport and export processing zones are located, and enhancement of safety of First Mactan Bridge by rehabilitation were considered to most urgent issues to be tackled. In addition, construction of a detour road (Talisay section) connecting between the northern and southern Cebu regions was also urgent to alleviate traffic congestion in the central Cebu city.

Even now, First and Second Mactan Bridges, which both connect between Cebu main island and Mactan Island, where an international airport, export processing zones and resort areas in

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

2 ③: High, ② Fair, ① Low

3 Roll-on/roll-off ships are vessels designed to carry wheeled cargo such as automobiles, and large trucks, that are driven on and off the ship on their own wheels.

4 Under the original Second Mactan Bridge Construction Project (PH-P131), for which the loan agreement was signed in August 1993, the bridge was planned to be a 2-lane road. However, after the project commenced, the specification was changed to a 4-lane road.

the east coast are located, are key routes for the development of the Metro Cebu regional economy. Traffic passing the seriously damaged and deteriorated First Mactan Bridge (completed in 1973) is still limited to vehicles with less than 6 wheels. Although the bridge was to be rehabilitated under the project, the work was deleted from the project. The Second Mactan Bridge completed under the project is only the bridge which large vehicles can pass, and it is currently an extremely important link.

Construction of South Coastal Road (Talisay section) would contribute to alleviate traffic congestion in the central Cebu city through diverting some traffic on the seriously congested Cebu South Road to Cebu South Coastal Road constructed under the project. The project meets the development needs of Cebu City.

3.1.3 Relevance with Japan's ODA Policy

At the appraisal time, under the Country Assistance Policy for the Philippines for fiscal year 1997, the following agendas were listed as the priority agenda: 1) strengthening of economic infrastructure, 2) restructuring of industrial sector and agricultural development, 3) poverty alleviation and improvement of fundamental living environment, and 4) environmental protection. Among these agendas, regarding strengthening of the economic infrastructure, development of economic infrastructure including the transport sector was considered to be a high priority agenda.

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

3.2 Effectiveness[5] (Rating: ②)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

(1) Average Daily Traffic

1) Second and First Mactan Bridges

Average Daily Traffic on Second and First Mactan Bridges is shown in Table 1.

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

Table 1: Annual Average Daily Traffic on Second and First Mactan Bridges

Annual Average Daily Traffic (vehicles/day)	Actual Volume					
	2007	2008	2009	2010	2011	2012
Second Mactan Bridge						11,400 (16,000)
First Mactan Bridge	19,600 (25,900)	23,400 (33,200)	23,942 (33,700)	22,600 (32,000)	no counting data	no counting data

Source: Planning Division of DPWH Regional Office VII
Note 1: Opening date of Second Mactan Bridge is October 1999.
Note 2: Traffic volume is in absolute number (vehicles/day).
Note 3: Numbers in ( ) are traffic volume including motorcycles.
Note 4: Vehicles with less than 6 wheels are allowed to pass First Mactan Bridge.
Note 5: Daily traffic volume on the Second Mactan Bridge was estimated assuming that the actual day-time traffic volume counted from 6:00 to 7:00 on Wednesday, January 4, 2012 was 60% of the daily traffic.

The total traffic volume (all vehicles) in 2010 of First and Second Mactan Bridges was estimated at 71,200 vehicles per day, among which the traffic volume of the Second Mactan Bridge was estimated at about 40,000 vehicles/day under the lowest scenario case at the appraisal stage. Traffic counting has not been regularly undertaken for the Second Mactan Bridge since opening to traffic in October 1999. Before rehabilitation of expansion joints[6], traffic counting was undertaken during the day time (6:00 - 17:00) for one week in January 2012. According to the counting results, the traffic volume of the approach road at the Cebu city side was 11,400 vehicles/day (16,000 vehicles/day if motorcycles are included), which is about 40% of the projected volume. The reason for low actual traffic volume is that the approach section of First Mactan Bridge is closer to the city center at both the Cebu city side and Lapu Lapu city in Mactan Island. Even though the highway capacity of the bridge section (divided 4-lane) was expanded by the project, a bottleneck due to lack of highway capacity at the connecting road sections (particularly UN Avenue) is considered to be another reason.

The traffic volume of the First Mactan Bridge for the past three years during 2008 - 2010 was 23,000 - 24,000 vehicles/day (32,000 - 34,000 vehicles/day if motorcycles are included). Thus, it has likely reached the highway capacity for a two-lane highway and serious congestion has occurred during peak hours (106% of the projected volume).

2) Cebu South Coastal Road (Talisay section)

Annual Average Daily Traffic of South Coastal Road (Talisay section) is shown in Table 2.

[6] joints which prevents transferring force, separating structures with different natures.

Table 2: Annual Average Daily Traffic of South Coastal Road (Talisay section)

Unit: vehicles/day

	2010	2011
Annual Average Daily Traffic	20,300 (29,100)	21,300 (30,400)

Source: Planning Division of DPWH Regional Office VII
Note 1: A counting station is between Rafael Rabaya and Road San Roque Road along Talisay section
Note 2: Numbers in ( ) are traffic volume including motorcycles.

The traffic volume of the Talisay section in 2011 was 21,300 vehicles /day. Considering that it is a four-lane undivided highway, traffic congestion likely occurs during peak hours. The traffic volume of the parallel existing Cebu South Road for the past three years is shown in Table 3.

Table 3: Annual Average Daily Traffic of Cebu South Road

Unit: vehicles/day

	2010	2011	2012
Annual Average Daily Traffic	38,552	38,340	40,412

Source: DPWH
Note 1: A counting station is around Lawaan I
Note 2: Traffic volume includes motorcycles.

Considering that South Cebu Road is also a four-lane undivided highway, traffic congestion likely occurs during peak hours in some sections.

Table 2 shows that the traffic volume of South Coastal Road (Talisay section) reaches almost the highway capacity, and Table 3 shows that South Road (existing national road) has the traffic volume, which also reaches the highway capacity. From two tables, it is considered that all day South Road have been heavily congested if South Coastal Road (Talisay section) had not been constructed. It is clear that South Coastal Road (Talisay section) has contributed to alleviation of traffic congestion in the central Metro Cebu by diverging the traffic heading Cebu city center or coming out from the city center.

(2) Travel Time: Cebu South Coastal Road (Talisay Section)

The travel time by passing the old road, and by South Coastal Road (the project road) was compared in the section between Lawaan I (intersection with Talisay Road) in the south along Cebu South Road and Carreta Cemetery in Cebu city. The result indicates that the travel time of the route passing South Coastal Road (project road) is shorter by 14 minutes.

Table 4: Travel Time

Road	Distance	Operational Speed	Travel time (min)
South Cebu	11.3km	30km/hr	23
South Coastal	8.6km	60km/hr	9

Source: Responses to the Questionnaire
Note: Travel time between Lawaan I (intersection with Talisay Road) and Carreta Cemetery in Cebu

3.2.2 Qualitative Effects

As qualitative effects, the followings are recognized.

1) Since only the vehicles with less than 6 wheels are allowed to pass the First Mactan Bridge, large vehicles pass Second Mactan Bridge only. This results in segregation of passable route by type of vehicle, and it has contributed to enhancement of logistics efficiency between Cebu city and Mactan Island because of increase of efficiency (however, only during the period when the total traffic volume of both bridges is much less than the highway capacity).
2) Since the highway capacity was increased because of completion of Second Mactan Bridge and Cebu South Coastal Road, the project contributes to improvement of traffic condition in the central urban area of Cebu.
3) The access from the Cebu southern district (Naga) to Mactan Island (Mactan International Airport, Economic Zones I and II, and resort areas in the east coast are located) was improved by diverting the central Cebu city and passing First and Second Mactan bridges, the travel time was shortened (by about 15 minutes in average).

3.3 Impact

3.3.1 Intended Impacts

Since data on economic indicators by city in Metro Cebu including Mandaue, Cebu, Talisay, and Lapu Lapu in Mactan Island are not available, it is not possible to examine the impact on economic development and activation in quantitative terms. However, the executing agency testifies that the project has greatly contributed to the economic development and activation in the Metro Cebu region because of the following reasons. Since only the vehicles with less than 6 wheels are allowed to pass the First Mactan Bridge, upon completion of the project, merchandise produced in the Mactan Economic Zones to Cebu port, tourists arriving at Mactan Airport to Cebu city, air cargo to Cebu city, and foods/supplies to luxurious resort hotels in the Mactan east coast, which are fundamental to the economic development in the Metro Cebu region, are all transported by large vehicles (trucks and buses).

3.3.2 Other Impacts

(1) Impacts on the natural environment

According to the Project Completion Report, during the project implementation for the Second Mactan Bridge, watering, speed control, installation of traffic signs, provision of detour roads, and enforcement of traffic regulations were done in order to cope with issues regarding dust, noise, vibration and traffic management. With respect to South Coastal Road (Talisay section), planting was undertaken along the roadside and consideration has been given to the landscaping aspects. According to the implementing agency, no adverse impact to the natural environment by the project has been noted during the project implementation stage and after the project completion.

(2) Land Acquisition and Resettlement

Under the Second Mactan Bridge Project, land acquisition and resettlement have occurred. There were some cases in which land owners and residents could not reach an agreement about the amount for compensation, and some cases were left to the court for arbitration on the amount to be paid. However, since time has passed after the project implementation (14 - 15 years), details are unknown. Compensation for resettlement was paid to about 350 households in the Talisay section of the Coastal Road.

(3) Other Positive and Negative Impacts

Cebu City is a tourist city, which has beach resorts in Mactan Island off the coast of Cebu, and some remnants from the colony era in the city. The extradosed cable-stayed[7] bridge constructed under the project is a new landmark for tourism for the city.

Since rehabilitation of First Mactan Bridge was cancelled from the scope of the work under the project, the project has not contributed to enhancement of safety at First Mactan Bridge. The traffic volume of the Second Mactan Bridge, which was constructed under the project, and is only the bridge trucks can pass, was lower than the planned volume, and thus, the project somewhat achieved its objectives in terms of improvement of safety and efficiency of transport between Cebu Island and Mactan Island. Since Coastal Road (Talisay section) has been well used so that traffic congestion likely occurs during peak hours, the project has largely achieved its objectives. Combining two projects, the project has somewhat achieved its objectives, and therefore, the effectiveness is fair.

[7] Bridge structure, in which the main deck is supported by main tower and diagonal cables.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

The original and actual output of the project is shown in Table 5.

Table 5: Output (original and actual)

	Scope of Work at appraisal for Second Mactan Bridge Project	Scope of Work at appraisal for Second Mactan Bridge Project (II)	Scope of Work at project completion for Second Mactan Bridge Project (II)
Second Mandaue - Mactan Bridge			
Civil Work :	・ Second Mactan Bridge (bridge length: 998m, 2 lanes) ・ Approach Road (length: 1.2km viaduct, 2 lanes)	・ Second Mactan Bridge (main bridge length: 410m, 4 lanes) ・ Approach Road (total length: 2,948m: (viaduct 600m, approach road 2,348m) 4 lanes) ・ Rehabilitation of First Mactan Bridge (length: 860m)	・ Second Mactan Bridge (main bridge length: 410m, 4 lanes) : as planned ・ Approach Road (total length: 3,292m: viaduct 635m 、 approach road 2,657m) ・ Flyover for left turn traffic 192m: (additional work) ・ Rehabilitation of First Mactan Bridge (860 m) :cancelled
Consulting Services :	1) Geotechnical investigation /review of bridge type 2) Detail designs (No. of lanes for super-structures to be determined after completion) 3) Assistance in bidding activities 4) Construction supervision	1) Toll road study 2) Detail designs for First Mactan Bridge rehabilitation 3) Construction supervision Foreign : 31 + 83 = 114 M/M Local : 91 + 100 = 191 M/M Local Office Staff : 214 + 277 = 491 M/M	Scope of work was as planned.
Cebu South Coastal Road			
Civil Work :		・ Construction of Talisay section (length: 4.3km,4 lanes)	・ Construction of Talisay section (length: 4.5km,4 lanes)
Consulting Services :		1) Review of detail designs 2) Assistance in tendering activities 3) Construction supervision Foreign: 24 M/M Local: 123 M/M Local Staff: 197 M/M Total: 344M/M	Scope of work was as planned. Foreign: 41 M/M Local: 136 M/M Local Staff: 215 M/M Total: 392M/ M

Source: JICA appraisal documents, Project Completion Report, Final reports prepared by the consultants

Major changes made on the Scope of Work are as follows:

1. It was foreseen that the originally planned 2-lane bridge would reach the highway capacity in 3 to 5 years after commissioning the project based on the traffic volume analysis conducted in 1995. Thus, the carriageway was expanded to 4 lanes under the project.
2. The approach viaduct/roads were extended in order to apply gentler slope.

3. The left-turn flyover was constructed at the Mactan side in order to introduce the smoother traffic flow.
4. A connecting point with the existing road was moved to more city center side at the Mandaue side.
5. Rehabilitation of the First Mactan Bridge (860m) was cancelled from the project by request of the local government. (the estimated construction cost at appraisal was about 210 million Japanese yen.)
6. The originally planned toll collection facilities to be needed to operate as a toll road were cancelled from the project, since it was changed to a toll free road. (the estimated construction cost at appraisal was about 160 million Japanese yen.)

Left-turn Ramp at Mactan side
Second Mactan Bridge

Coastal Road (Talisay section)

3.4.2 Project Inputs

3.4.2.1 Project Cost

The originally estimated project cost including both phases (this project and the preceding project) at appraisal was 18,602 million yen, of which the total Japanese ODA loan was 13,465 million yen. The actual project cost at completion was 15,647 million yen, which is equivalent to 84% of the planned cost and the Japanese ODA loan disbursed was 13,060 million yen. However, if the exchange rates at appraisal (1 peso = 4.5 yen) and at implementation (1 peso = 3.31 yen) are taken into consideration, the actual project cost in local currency is equivalent to about 114% of the planned cost since Japanese yen appreciated by 25%.

Table 6: Comparison of Project Cost (Planned and Actual)

unit: million yen

Item	Planned					Actual				
	Foreign ODA loan	Local		Total		Foreign ODA loan	Local		Total	
		Own fund	ODA loan	Total	ODA loan		Own fund	ODA loan	Total	ODA loan
Second Mactan Bridge (Preceding project)										
1) Civil Work	4,336			5,751		3,469	256	2,254	5,979	5,723
2) Consulting Services	598			828		943	28		971	943
3) Price escalation	434			574		0	0		0	0
4) Physical contingency						0	0			
5) Land acquisition / compensation	0			615		0	720		720	0
6) Taxes	0					0	0		0	0
Total	5,368			7,768	6,872	4,412	1,004	2,254	7,670	6,666
Second Mactan Bridge (II) : (this project)										
1) Civil Work	2,490			5,623					3,981	3,838
2) Consulting services	634			692					400	360
3) Price escalation	511			1,003						
4) Physical contingency										
5) Land acquisition / compensation	0			1,125			1,312		1,312	
Total	3,635			8,443	5,286				5,693	4,198
Total of two phases	**9,003**			**16,211**	**12,158**				13,353	10,864
Cebu South Coastal Road: this project										
1) Civil work	689			1,145		1,903	138	27	2,068	1,930
2) Consulting services	61			169		130	4	82	216	212
3) Price escalation	40			68						
4) Physical escalation	73			121						
5) Land acquisition / Compensation	0			888			Included in PH-P158			
Total	863			2,391	1,307				2,284	2,142
Total of this project	4,498			10,834	6,593				7,977	6,340
Total of this project and the preceding project	9,866			18,602	13,465				15,647	13,006

Source: Appraisal documents, Ex-Post Evaluation Report for Second Mactan Bridge, Final Reports prepared by supervision consultants

Foreign exchange rates:

at appraisal for the original project 1 US$ = 124 yen, 1 Peso = 5 yen (July 1994); at appraisal for the subject project (PH-P175) 1 US$ = 106 yen, 1 Peso = 4 yen (March 1997): rate during the project implementation (1996.10 - 1999.10) 1 Peso = 2.62 yen; rate used by consultants for the Talisay Road section 1 Peso = 1.9 yen (information provided by the consultants.)

Note 1: The original scope of work included construction of a two-lane Second Mactan Bridge connecting between Cebu and Mactan Island, construction of a two-lane approach road, and consulting services.

Note 2: This project (Second Mactan Bridge (II)) includes expansion of roadway at the Second Mactan Bridge and its approach road sections from 2 lanes to 4 lanes, rehabilitation of the First Mactan Bridge (cancelled from the project) and consulting services.

Main reasons for increase and decrease of the project cost are as follows:

1. Rehabilitation of the First Mactan Bridge (860m) was cancelled. (the estimated construction cost at appraisal was about 210 million Japanese yen.)
2. The originally planned toll collection facilities to be needed to operate as a toll road was cancelled, since it was changed to a toll free road. (the estimated construction cost at appraisal was about 160 million Japanese yen.)
3. Change of foreign exchange rate (1 peso = 4.5 yen at appraisal and 1 peso = 3.31 yen at implementation). The actual project cost in Japanese yen is lower than the planned cost by about 16% due to yen appreciation.
4. Addition of a left-turn flyover (about 168 million peso or about 524 million yen)
5. Installation of vibration damper for stay cables and others (about 85 million peso or about 265 million yen)

3.4.2.2 Project Period

The original project period planned for Second Mactan Bridge at appraisal was from March 1997 (signing of the Loan Agreement) to August 1999 (planned opening date) with a total period of 30 months. The actual project period was also from March 1997 to August 1999 (official opening to traffic) with a total period of 30 months, which is exactly as planned. The original project period planned for South Coastal Road (Talisay section) was from March 1997 (signing of the Loan Agreement) to April 2000 (civil work completion) with a total period of 38 months. The actual project period was from March 1997 to May 2004 (civil work completion) with a total period of 87 months, which is equivalent to 228% of the plan. Thus, the project period significantly exceeded the planned period.

Second Mactan Bridge was open to traffic in August 1999 as planned. However, commencement of the work for South Coastal Road (Talisay section) was delayed since the subject section was included as a segment under the previous coastal road project (Metro Cebu Development (III)) and thus contractors were to be procured by contract package (segment). Conclusion of a contract with a consultant was delayed, and succeeding design reviews and selection of contractors were also delayed resulting in about three and half years delay at the stage of civil work commencement. Moreover, since some problems regarding land acquisition occurred during the project implementation, the project was further delayed by half a year resulting in four years delay in total.

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

(1) Financial Internal Rate of Return (FIRR)

Although the Second Mactan Bridge was planned to be a toll road at the appraisal stage,

FIRR was not calculated. During the project implementation, the bridge was changed to a toll-free road.

(2) Economic Internal Rate of Return (EIRR)

EIRR at ex-post evaluation, which was recalculated using the same condition and assumption made for calculation of the EIRR at the original appraisal time, is shown in Table 7. (Recalculation was made by the implementing agency.)

Table 7: EIRR (at planning/at post evaluation)

	at planning	at post evaluation
Second Mactan Bridge (II)	17.4%	Not possible
Cebu South Coastal Road	19.1%	17.4 (recalculated by DPWH)

Source: Numbers at the planning stage were from JICA appraisal documents.
Cost: construction cost, operation and maintenance costs
Benefits: Vehicle Operating Costs (VOC) saving and time saving

EIRR for the Second Mactan Bridge at the post evaluation stage was not recalculated since the data and information on each benefit item to calculate benefits was not available.

Regarding outputs, the scope of work was partly revised including cancellation of rehabilitation of the First Mactan Bridge. Although the project cost was within the plan, the project period significantly exceeded the plan. Therefore, efficiency of the project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

DPWH Regional Office VII was originally to be responsible for maintenance of the Second Mactan Bridge upon completion. However, the management of the road section including the bridge section was not transferred and thus, not classified as a national road until February 2013. (The bridge section was included in the national road network on February 14, 2013.) Thus, Cebu 6 District Engineering Office of Regional Office VII had been undertaking the minimum routine and periodic maintenance work. The District Engineering Office has about 40 regular staffs, and among those 8 staffs are responsible for maintenance work, with additional about 17 roadside maintenance workers. Cebu 2 District Engineering Office of DPWH Regional Office VII (with 230 regular staffs) has been responsible for maintenance of the Talisay section of the Coastal Road upon completion of the work. The District Engineering Office has about 55 regular staffs, and among those 9 staffs are responsible for maintenance work, with additional about 35 roadside maintenance workers. In addition, the Office employs about a few dozen

temporary staffs. A maintenance worker is assigned every 3.5km for routine maintenance work of roads.

3.5.2 Technical Aspects of Operation and Maintenance

DPWH has developed and posses various manuals including those for road repair/maintenance, road maintenance activity, and road safety. For a newly employed staff, training is undertaken using DPWH's manuals and he/she is assigned to the field work. The routine maintenance work has been undertaken by force account, and technicians and workers have sufficient technical skills. The periodic maintenance work (such as replacement of expansion joints) and major rehabilitation (such as overlay), which require special equipment and skills are undertaken by contractors, who were selected through the competitive bidding process.

Coastal Road (Talisay Section)

Second Mactan Bridge (Mandaue Side)

3.5.3 Financial Aspects of Operation and Maintenance

As mentioned above, since the Mactan Bridge section had not been officially classified as a national road, the normal maintenance budget has not been allocated to the section. In the original plan, the bridge section was designed as a toll road, and the collected revenue was to be used for maintenance. However, since the Cebu Provincial government has objected to the original proposal and toll collection has not been realized.

Since completion of the bridge in October 1999, Cebu 6 District Engineering Office has allocated budget to the maintenance work for the bridge section by diverting some from the maintenance budget allocated to roads under the District Engineering Office. However, it has received additional budget for major urgently needed rehabilitation and improvement work separately from DPWH Headquarters. From 2012 to 2013, replacement of expansion joints was made by spending 20 million peso, and currently (2013) overlay has been undertaken with the budget of 30 million peso. The budget for routine maintenance work for the Second Mactan Bridge section will be soon allocated.

The maintenance budget for routine maintenance of national roads including roads constructed under the project is provided directly to a District Engineering Office following the DPWH's standard norm and formula. Concerning the 2013 budget, 67,387 peso/km/year from the DPWH general budget, and additional 24,745 peso /km/year from the vehicle user charges, totaling about 92,000 peso/km/year is to be allocated to the roadway section. Budget of 30,700 peso/km/year is allocated to the bridge/viaduct section (e.g. for old bridges). The maintenance cost spent by Cebu 2 District Engineering Office for the Talisay section under the project for the past five years is shown in Table 8.

Table 8: Maintenance Costs (Cebu 2 District Engineering Office)

Unit: peso

	Maintenance costs	Maintenance work
2008	1,891,153	Reconstruction/improvement, marking, planting
2009	509,000	Installation of traffic signs, planting
2010	185,956,496	Road safety improvement, traffic signs, planting
2011	96,727,456	Road safety improvement, traffic signs
2012	57,088,259	Repaving, overlay, road markings

Source: Responses to the Questionnaire

3.5.4 Current Status of Operation and Maintenance

Since Second Mactan Bridge was open to traffic in October 1999, Cebu 6 District Engineering Office has been undertaking routine maintenance for the bridge section by diverting some from the maintenance budget allocated to roads under the District Engineering Office. Replacement of expansion joints conducted from last year has been completed and overlay is currently being implemented. From the ocular inspection during the field study, no particular major damage or distress was observed. However, although 13 years have passed since the bridge was open to traffic, major rehabilitation and improvement has not been undertaken. Thus, major rehabilitation and improvement work needs to be done in the near future. Before rehabilitation and improvement to be made, firstly thorough inspection of structures and members should be conducted. As mentioned above, on February 14, 2013 the Second Mactan Bridge section was officially included in the national road network, and Cebu 6 District Engineering Office can request for a budget for maintenance directly to DPWH Headquarters. Thus, it will be much easier to plan and make strategies not only for the routine maintenance work, but also periodic maintenance work and major rehabilitation/improvement work. Moreover, since the Second Mactan Bridge is the first extradozed bridge in the Philippines, the training program on maintenance methodology for special bridges is now being planned by JICA. A special bridge inspection vehicle will be also provided by JICA, and the inspection and review/planning of repair methods could be easily made.

During the field inspection of the Talisay section of Coastal Road, it was observed that

overlay has been partly implemented. However, rehabilitation of bridge joints has not been undertaken. Moreover, along the roadway, planting has been made, and consideration has been given to the aesthetic aspects. No major damages and distress were observed, and thus it seemed that maintenance has been properly undertaken.

The management of the Second Mactan Bridge was officially transferred to DPWH in February 2013, which is more than ten years after opening of the bridge in 1999. Until now, the minimum maintenance work has been undertaken. The maintenance for special bridges, which are new to the Philippines, has just commenced. Thus, it is difficult to judge at this moment whether or not a proper maintenance system (institutionally, technically, financially) would be established. Since provision of special equipment and training on the maintenance technology is planned by JICA, improvement on maintenance is expected. A thorough and detailed inspection, which has not be done yet, should be first conducted. At this moment, it is uncertain whether or not a proper maintenance work would be implemented, even taking into account possible effects of JICA technical assistance. Thus, some problems in terms of management, financial and technical aspects have been observed, therefore sustainability of the project effect is considered fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objectives of the project were to improve the traffic safety and efficiency in the connecting section between Cebu and Mactan Island by constructing the Second Mactan Bridge connecting between Cebu and Mactan Island and rehabilitating the existing First Mactan Bridge, and to alleviate traffic congestion in central Metro Cebu by constructing the Talisay section of the coastal road, thereby contributing to promotion of the economic development in Metro Cebu. The project has been highly relevant to the development plans and needs of the Philippines, as well as Japan’s ODA policies. Regarding improvement of the safety and efficiency of the transport between Cebu and Mactan Island, and alleviation of traffic congestion in the central Metro Cebu, which were both the development objectives, the project has somewhat achieved its objectives. Thus, the effectiveness is fair. Although the project cost was within the plan, the project period was significantly longer than planned. Therefore, efficiency of the project is considered fair. Some problems have been observed in terms of institutional and financial aspects for operation and maintenance, therefore sustainability of the project effect is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

It is recommended to regularly conduct traffic counting at the same location and same time of the year. The traffic volume is a fundamental data in planning and programming its yearly and future maintenance and management work, and for preparation of future road development plans. The Maintenance Division could be an appropriate unit responsible for collecting data on traffic count, and analyzing and storing the data.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

From the planning stage, consideration needs to be fully given to balance of highway capacity at the bridge section and of connecting/crossing roads (e.g. planning of a grade separation at the intersection where a connecting road and a crossing road intersect), and to the highway network in the city[8].

[8] The above mentioned “lessons learned” was introduced at the DPWH Regional Office during the second field visit. DPWH staff agreed with the proposal and informed that they were now planning to make the some section along UN Avenue an excavated structure (underpass) and to construct a left-turn ramp for traffic from Mactan Island to the Cebu city center at the intersection connecting with Plaridel Street.)

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Output		
Second Mandaue - Mactan Bridge: Civil Work	・ Second Mactan Bridge (main bridge length: 410m, 4 lanes)	・ Second Mactan Bridge (main bridge length: 410m, 4 lanes) : as planned
	・ Approach Road (total length: 2,348m: viaduct 600m, approach road 2,448m 4 lanes)	・ Approach Road (total length: 3,292m: viaduct 635m, approach road 2,657m)
		・ Flyover for left turn traffic 192m: (additional work)
	・ Rehabilitation of First Mactan Bridge (length: 860m)	・ Rehabilitation of First Mactan Bridge (860 m) :cancelled
Consulting services	1) Toll road study 2) Detail designs for First Mactan Bridge rehabilitation 3) Construction supervision	as planned
Cebu South Coastal Road: Civil Work	・ Construction of Talisay section (length: 4.3km,4 lanes)	almost as planned
Consulting services	1) Review of detail designs 2) Assistance in tendering activities 3) Construction supervision	as planned
	Foreign : 24 M/M Local : 123 M/M Local Staff : 197 M/M Total : 344M/M	Foreign : 41 M/M Local : 136 M/M Local Staff : 215 M/M Total : 392M/ M
2. Project Period	Second Mactan Bridge: March 1997 -August 1999 (30 months) Coastal Road: March 1997 - April 2000 (38 months)	Second Mactan Bridge : March 1997 -August 1999 (30 months: as planned) Coastal Road: March 1997 - May 2004 (87 months)
3. Project Cost		
Amount paid in Foreign currency	9,866 million yen	Unknown
Amount paid in Local currency	8,736 million yen	Unknown
Total	18,602 million yen	15,647 million yen
Japanese ODA loan portion	13,465 million yen	13,006 million yen
Exchange rate	1 Peso = 5 yen Second Mactan Bridge 1 Peso = 4 yen Second Mactan Bridge (II)	1 Peso = 2.62 yen (average between October 1996 and October 1999) 1 Peso = 1.9 Yen (consulting services for the Talisay section

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project

Subic-Clark-Tarlac Expressway Project

External Evaluator: Yasuhiro Kawabata, Sanshu Engineering Consultant

0. Summary

The objectives of the project were to promote human exchange and logistics system, improve transport efficiency, reduce transport costs and enhance highway safety by constructing an expressway with a total length of 90km connecting Subic with Tarlac via Clark, thereby contributing to promotion of the economic development in the Central Luzon Region. The project has been highly relevant to the development plans and needs of the Philippines, as well as Japan's ODA policies. Comparing the projected traffic volume with the actual figures (in 2011) in the Subic - Clark section and in the Clark – Tarlac section, the actual figure in each section is 70% and 77% of the projected traffic volume, respectively, which are lower than the planned. However, since the travel time was substantially shortened and the number of traffic accidents has been decreased year by year, the development of an efficient and safer expressway contributes to promotion of logistics. The project has somewhat achieved its objectives, and thus the effectiveness is fair. Since both project cost and project period exceeded the plan, efficiency of the project is considered fair. 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

Project Location

Conception Interchange

1.1 Background

The Central Luzon Region (with a total area of 16,500 km^2), which is located in the north of Metro Manila, is a key area for agricultural production in the Philippines, focusing on rice production. At the same time, it is the central industrial zone along with the Calabarzon region in the south of Metro Manila. The Central Luzon has been accommodating migrated people from the northern Luzon, and it is expected that it would help alleviate concentration into the Metro Manila. Particularly, it is expected that an alternative hub function for the logistics, which has been concentrating into the Metro Manila region would be promoted through developing infrastructure such as ports and airports around "Subic Bay Freeport Zone" and "Clark Freeport and Special Economic Zone", which were established in the former US bases after the US Navy and Air Force withdrew in 1992, and attracting private enterprises into both zones. In the JICA's Master Plan, the regional development plan covering three poles including Metro Manila, Subic and Clark is proposed. In the Luisita District of Tarlac City, which is located in the north of Clark and along the expressway, a large scale industrial park is being developed. Central Luzon is a key area for agricultural production, and also serves as a collection and distribution base for agricultural products from northern Luzon. Thus, development of agricultural sector is expected.

The project is divided into two expressway sections consisting of the Subic - Clark section and the Clark - Tarlac section. Since the road width of the existing national road between Subic and Clark is narrow, and some sections need to be largely bypassed due to eruption of Pinatubo volcano and succeeding mud flow damages, efficient logistics have been affected and substantial economic loss has accrued. Since the existing North Luzon Expressway ends around the suburb of Clark, the existing national route 3 (so called "Macarthur road"), which is parallel to the expressway, has been chronically congested by traffic in the Clark - Tarlac section. Since Tarlac has served as a collection and distribution base for agricultural products from northern Luzon, trucks loading full agricultural products have been constantly travelling with lower operating speed, and have created more congestion along the Macarthur road.

As mentioned above, early commencement of the project implementation has been anticipated so that efficient logistics in the Central Luzon Region would be promoted resulting in the integrated development of the regional economy, and correction of concentration into Metro Manila, which has been saturated, could be made.

1.2 Project Outline

The objectives of the project were to promote human exchange and logistics system, improve transport efficiency, reduce transport costs and enhance highway safety by constructing an expressway with a total length of 90km connecting Subic with Tarlac via Clark, thereby contributing to promotion of the economic development in the Central Luzon Region.

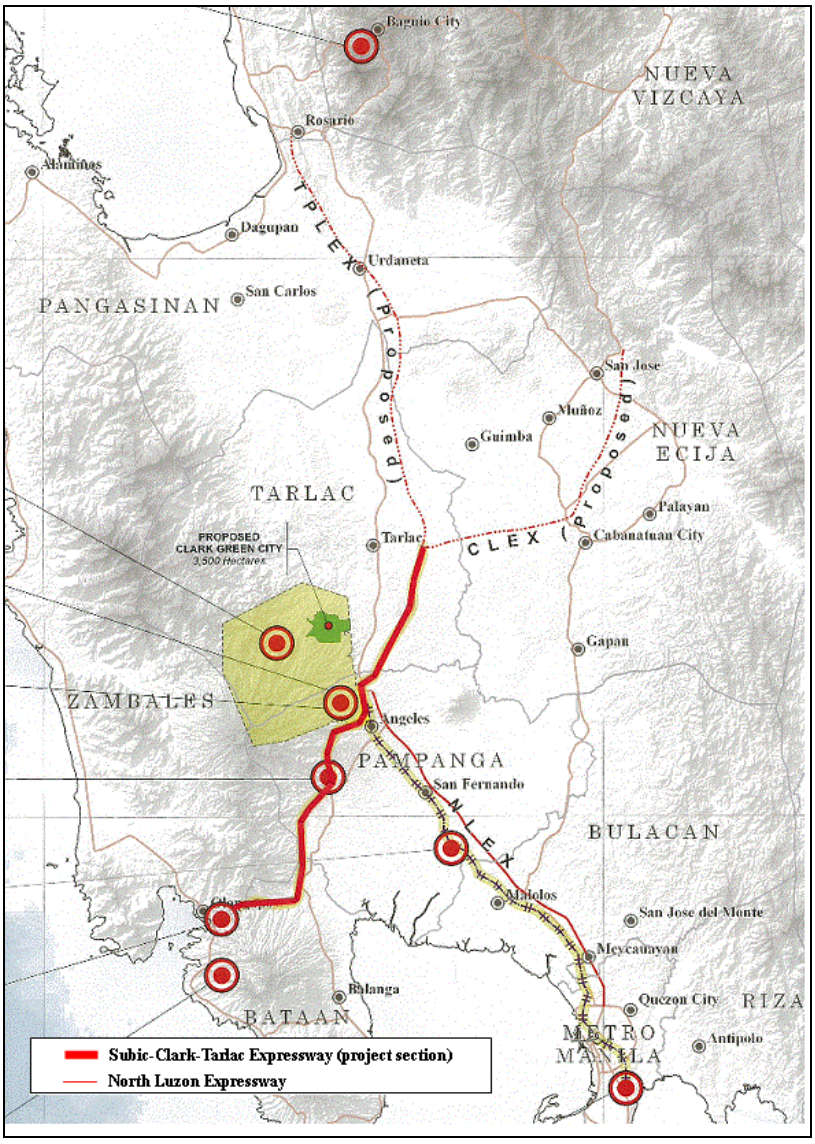


Figure 1: Location of Project Site

Loan Approved Amount/ Disbursed Amount	59,037 million yen (originally 41,931 million, but additional loan provided on March 31, 2008)/ 58,138 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	September 2001/September 2001
Terms and Conditions	Special Loan Civil Work: Interest Rate: 0.95%, Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: Multiple conditions Consulting services: Interest Rate: 0.75% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: Multiple conditions
Borrower / Executing Agency(ies)	Base Conversion Development Authority (BCDA) /BCDA
Final Disbursement Date	December 17, 2010 (originally December 17, 2009)
Main Contractor (Over 1 billion yen)	Obayashi Corporation・Kajima Corporation・Mitsubishi Heavy Industries, Ltd.・JFE Engineering Corporation (JV), Taisei Corporation・Hazama Corporation・Nippon Steel Corporation (JV)
Main Consultant (Over 100 million yen)	Nippon Koei・Katahira and Engineers International・Oriental Consultants Co. Ltd (JV)
Feasibility Studies, etc.	Mater Planning (for Central Luzon Development Plan) by JICA in September 1995, Feasibility Study (for Central Luzon Expressway Construction Project) by BCDA in 1999
Related Projects (if any)	Japanese ODA Loan: Subic Port Development Project (L/A signed in August 2000), Grant Aid: Construction of Rural Road Bridges and Supply of Materials (5 stages since 1989)

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: October 2012 – September 2013

Duration of the Field Study: January 24 – February 13, 2013, April 14 – April 27, 2013

3. Results of the Evaluation (Overall Rating: B[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance with the Development Plan of Philippines

The development objective of the transport sector in the Mid-Term Development Plan

[1] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[2] ③: High, ② Fair, ① Low

1999-2004 was to support the social-economic development in the Philippines by providing the safe and reliable transport services. In order to achieve the objective, the following strategies were established: 1) reduction of government's involvement in the transport infrastructure development and promotion of the private sector participation; 2) enhancement of quality of existing infrastructure by appropriate rehabilitation and maintenance management; 3) introduction of the appropriate legal framework and price policy to foster the competitive market, and others. Regarding the subject project, the government identified it as the transport network development project in the bases conversion and development program, which aimed to develop the socio-economic development in the central Luzon region. The maintenance and management services after completion of the project were planned to be entrusted to the private sector, and thus the project also met the government's policy, which aimed at promoting the private sector participation.

Under the current Mid-Term Development Plan 2011-2016, the following agendas are to be addressed in order to achieve the inclusive growth: good governance, promotion of investment, infrastructure development by the PPP scheme, social security reforms, enhancement of tax collection capacity, peace building/national security and others. With respect to the transport sector, the government is to strengthen the Philippines' productivity and competitiveness in the international community through development of the strategic logistics corridors around the Metro Manila region, and thus improving the logistics between the economical center and suburban cities. In the Development Plan, priority is given to development of the Subic-Clark-Manila-Batangas corridor, followed by the extension plan to both north and south directions as a strategic logistics corridor. Moreover, the government has a vision for "Clark and Subic to be the best international service and logistics center in the Southeast Asian Region".

3.1.2 Relevance with the Development Needs of the Philippines

It was expected that the traffic volume would drastically increase in the Subic-Clark section under the project as development of Subic Port and regional development around Clark has proceeded. Thus, in order to achieve the smooth traffic flow and secure traffic safety, development of an expressway connecting these two cities was anticipated. The northern section beyond Clark of the existing National Highway 3 (one lane for each direction) had been chronically congested and traffic accidents due to forced overtaking had often occurred. Thus, early construction of a safer expressway with higher capacity was seriously anticipated.

Under these circumstances, the earlier implementation of the project was anticipated in order to enhance efficiency of logistics in the central Luzon region, to undertake the comprehensive development of the regional economy, and to remedy concentration to the Metro Manila region, which has been already over-saturated.

The objective of the project matches with the concept and strategies of the current national

urban policy, and the project has contributed to strategic thrust for regional development plans for each of Clark Freeport/Special Economic Zone and Subic Freeport Zone. Key development regions in the Central Luzon including Clark Freeport/Special Economic Zone, Subic Freeport Zone and the Industrial Park in Tarlac were directly and effectively connected with the shortest length upon completion of the project. Furthermore, Tarlac-Pangasinan-La Union Expressway expanding to the north from Tarlac is expected to be open to traffic by the end of 2013, and construction of Central Luzon Expressway connecting between Tarlac and Philippine-Japan Friendship Highway is planned to be started with the JICA loan by the end of 2014. Thus, the highway network in the Central Luzon would be more expanded and it is expected to contribute to the regional economic development.

3.1.3 Relevance with Japan's ODA Policy

Under "the Medium-Term Strategy for Overseas Economic Cooperation Operations" (issued in December 1999), the assistance to the following agendas was listed as the priority agenda for the Philippines: strengthening of economic structure for the sustainable growth and overcoming factors, which constrain growth, poverty alleviation and correction of disparity among regions, assistance to environmental protection measures including disaster prevention, and development of human resources and institutional reforms.

As the JICA's policy at the appraisal stage, JICA planned to assist the development of the economic infrastructure including the transport sector in order to ensure the sustainable economic growth, and to resolve the bottleneck for economic development.

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

3.2 Effectiveness[3] (Rating: ②)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

As operation and effect indicators, three indicators including 1)annual average daily traffic, 2) travel time, and 3) number of traffic accidents were adopted.

(1) Annual Average Daily Traffic

The annual average daily traffic upon completion of the expressway is shown in Table 1.

[3] Sub-rating for Effectiveness is to be put with consideration of Impact.

Table 1: Annual Average Daily Traffic

Unit: vehicles/day

Annual Average Daily Traffic (veh./day)	Benchmark	Actual			
	2006	2009	2010	2011[4]	2012
Subic - Clark	3,900	6,100	8,100	7,800 (11,100)	8,400
Clark - Tarlac	5,700	13,600	16,400	15,700 (20,500)	16,700

Source: Toll Rate Adjustment to TRB(2009,2010,2011)and TMC data for 2012 unaudited yet
Note 1: Originally planned completion date: 2006
Note 2: Traffic volume in passenger car unit (PCU)
Note 3: Numbers in ( ) are projected volume (appraisal documents for the supplemental loan)

Since the whole sections of Subic - Clark - Tarlac Expressway (SCTEX) were open to traffic in July 2008, the traffic volume has been increasing during the period from 2009 to 2012. Comparing the actual traffic volume in 2011 with the projected on the both Subic – Clark and Clark – Tarlac sections, they are 70% and 77% of the projected, respectively.

(2) Travel Time

Changes of travel time in the project section before and after the project are shown in Table 2.

Table 2: Travel Time

Unit: minutes

	Baseline	Bench mark	Actual			
	2001	2006	2009	2010	2011	2012
Subic - Clark section	120	(60)	35	35	35 (60)	35
Clark - Tarlac section	90	(30)	22	22	22 (30)	22

Source: Responses to the Questionnaire
Note 1: Originally planned completion date: 2006
Note 2: The travel time at Baseline is the travel time traversing using the existing national road.
Note 3: Bench mark and actual figures are the travel time using the completed expressway.

The travel time required for the section between Subic and Clark, and between Clark and Tarlac using the existing national road before the project was 120 minutes and 90 minutes, respectively. After open to traffic, it was substantially shortened to 35 minutes and 22 minutes, respectively.

[4] At the appraisal time for the supplemental loan in November 2007, the expressway was planned to be open to traffic in April 2009 and thus the year of 2011 was assumed to be 2 years after opening.

(3) Number of Traffic Accidents

Changes in the number of traffic accidents after completion of the project are shown in Table 3.

Table 3: Number of Traffic Accidents

Numbers in traffic accidents

	Actual			
	2009	2010	2011	2012
Subic - Clark section	349	424	323	211

Source: Responses to the Questionnaire
Note 1: Originally planned completion date was 2006.
Note 2: Data on traffic accidents on the existing national road is not available.

Since the data on the traffic accidents on the parallel national road is not available, the impact due to completion of the expressway cannot be examined. The number of traffic accidents occurred on the expressway has been decreasing for the past three years as the expressway users has been getting used to drive on the expressway.

3.2.2 Qualitative Effects

Completion of the safer expressway with 2 interchanges for Clark, which enabled substantial shortening of the travel time has contributed to economic development in the Central Luzon Region, particularly in Pampanga. The invested amount to the Clark Freeport Zone has also been increasing.

Under the post evaluation assignment, beneficiary surveys were conducted[5]. Survey results are summarized below.

i) Has traffic congestion on the parallel national road (Subic - Clark - Tarlac) improved after completion the project? (%)

Yes	No
88	12

Among respondents who gave positive answers, 59% answered it was “substantial”, and 36% said it was “fairly”. Five percent answered it was “slightly”.

[5] Surveys conducted: January 2013. Number of samples: 403 (persons interviewed are road users, who are traveling on the expressway and residents along the expressway corridor. Male: 64%, Female: 36%). Survey method: interviews using a questionnaire.

ii) Was travel time shortened after completion of the project? (%)

Yes	No
90	10

iii) Has accessibility to following facilities been improved? (%)

Facility	%
Market, Shops, Trade Center	82
Social services	47
Hospitals	30
Government agencies/Public Services	35
Ports	34
Others	1

iv) Has the safety on the national road parallel to the expressway been improved after completion of the project? (%)

Substantially	Fairly	Improved	Not so much	Not Improved
5	7	47	25	16

About 60% of respondents conceive that the safety on the national road has been improved.

According to the beneficiary surveys, about 90% of respondents acknowledge that traffic congestion on the parallel national road has been improved, and that the travel time has been shortened after completion of the project. Moreover, they conceive that accessibility to each facility has been improved and the highway safety has been also improved.

3.3 Impact

3.3.1 Intended Impacts

(1) Transition of Population

Transition of population in three provinces where the project is located are shown in Table 4.

Table 4: Transition of Population

Unit: 1,000 persons

Province	2000	2010	Growthrate
Bataan	558	662	19%
Pampanga	1,484	1,911	29%
Tarlac	1,045	1,243	19%
Philippines	76,790	94,010	22%

Source: Responses to the Questionnaire

Note: Pampanga is the province where Clark Freeport Zone is located.

The growth rate of population in Pampanga, where Clark Freeport/Special Economic Zone is located for the past ten years was 29%, which exceeds the national average.

(2) Invested Amount

Transition of the invested amount to Clark Freeport/Special Economic Zone (CFZ) and Bataan Technology Park (BTP), which are located in the project area are shown in Table 5.

Table 5: Invested Amount to CFZ and BTP

	2008	2009	2010
CFZ: billion dollar	64.56	74.30	81.65
BTP: million peso	7.0	7.0	11.0

Source: Responses to the Questionnaire
Note: Invested amount is the accumulated amount.

The growth rate of the invested amount to Clark Freeport/Special Economic Zone for the past two years is 12% per annum.

(3) Increase of Floor Area of non-residential Buildings

The increase of the floor area of non-residential buildings in three provinces, where the project is located is shown in Table 6.

Table 6: Increase of Floor Area of non-residential Buildings

Unit: m^2

Province	2010	2011	Growth Rate
Bataan	64,000	75,000	17%
Pampanga	233,000	354,000	52%
Tarlac	44,000	109,000	148%

Source: Responses to the Questionnaire
Note: Pampanga is the province where Clark Freeport Zone is located.

The floor area of non-residential buildings has been increased by 52% in Pampanga and by 148% in Tarlac for the past two years (2010/2011).

By completion of the project, accessibility between Clark and international port city, Subic has been substantially improved. Furthermore, the Tarlac - Pangasinan - La Union Expressway expanding to the north from Tarlac is expected to be open to traffic by the end of 2013, and construction of Central Luzon Expressway connecting between Tarlac and Philippine-Japan Friendship Highway (linking with Aparri, northern tip of Luzon Island) is planned to be started at the end of 2014. Thus, the project has contributed as a priming for the regional economic development in Pampanga province, which is the center of Luzon in and around Clark.

Findings on the impact revealed through the beneficial surveys are summarized below.

i) Has the regional economic activities been promoted after the project? (%)

Yes	No
78	21

ii) Has the business chances been increased after the project? (%)

Yes	No
70	30

About 60% of the respondents, who answered “yes”, state that the increase was more than 30%.

iii) Has the transport amount of commercials goods to the markets increased after the project? (%)

Increased	Decreased
78	22

As the most increased commercial goods among increased goods, 64% answered that it was “agricultural products”, and 22% said that it was “industrial goods”. Twenty percent answered that it was “processed goods”.

iv) Has the household income increased after the project? (%)

Yes	No
53	46

Regarding the contribution of the project to the increase of household income, about half of the residents along the corridor conceive its positive contribution, while the remaining half do not its contribution.

According to the beneficiary surveys, about 80% of respondents acknowledge that the regional economic activities have been promoted, and 70% answered that the business chances have been increased. However, only half of the residents admit that they have received the benefit (increase of household income) from the project.

3.3.2 Other Impacts

(1) Impacts on the Natural Environment

Regarding the water pollution problem during the project implementation, the stockyard for construction materials (sand/soil, cement and others), which was considered to be the main source, was properly controlled and managed to contain the spill. According to the national law, tree planting has been done to replace the number of trees knocked down. During the operation stage, a multi-party monitoring team composed of representatives from Department of Environment and Natural Resources, BCDA, local governments and NGOs was created, and an environmental monitoring has been quarterly undertaken. No particular issue has been reported. BCDA has provided an environmental guarantee fund (EGF) to cover immediate rehabilitation and to compensate parties/communities affected by negative impacts of the project.

(2) Land Acquisition and Resettlement

Under the project, about 746 ha of land was acquired and compensation was paid to 1,358 land owners. Compensation was paid in cash and the total amount paid was about 810 million peso. It took much longer time than expected to acquire lands and pay compensation, since it needed to negotiate with each affected people about the amount to be paid, and time was also needed for application for tax clearance, application/approval for subdivision plans for revision, and other administrative procedures according to the domestic law.

(3) Other Positive and Negative Impacts

The implementation of the project has accelerated plans for construction of the Tarlac - Pangasinan - La Union Expressway, which heads north from Tarlac, and the Central Luzon Expressway, which connects Tarlac with Japan-Philippines Friendship Highway. It is expected that the highway network in the central Luzon region would be further strengthened and that they would contribute to promotion/activation of the regional economy, once two expressways were completed.

Comparing the actual traffic volume on the expressway in 2011 with the projected on the both Subic - Clark and Clark - Tarlac sections, they are 70% and 77% of the projected, respectively. However, the travel time has been substantially shortened and the number of traffic accidents on the expressway has been decreasing year by year. The development of efficient and safer infrastructure has contributed to promotion of logistics.

The project has somewhat achieved its objectives and thus the effectiveness is fair.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

The original and actual output of the project is shown in Table 7.

Table 7: Output (original and actual)

	Scope of Work at Appraisal (Appraisal documents)	Scope of Work at the Project Completion
Civil Work:	・ divided 4-lane expressway (about 56 km between Subic - Clark) (about 34 km between Clark - Tarlac) ・ 8 interchanges ・ 2 long bridges, 35 medium/ small bridges ・ 6 overbridges ・ 8 toll stations	・ divided 4-lane expressway (about 50 km between Subic - Clark) (about 40 km between Clark - Tarlac) ・ 12 interchanges ・ 4 long bridges, 33 medium/ small bridges ・ 12 overbridges ・ 14 toll stations
Consulting Services:	1) detail designs 2) assistance in tendering 3) construction supervision 4) assistance in management and maintenance 5) environmental protection related services (assistance in land acquisition and resettlement, environmental monitoring, advice to environmental protection undertaken by an Implementing Agency and contractors) Foreign: 481 M/M Local: 879 M/M	as planned Foreign: 619 M/M Local: 1,833 M/M

Source: JICA Appraisal documents, Wikipedia website, Project Completion Report, Responses to the Questionnaire

Main revisions made on the scope of work are as follows:

1. In the linking section connecting between the Subic-Clark section and Clark-Tarlac section, a segment of the existing North Luzon Expressway with a total length of about 3.2 km was originally planned to be used. However, since the agreement on the distribution of the collected toll revenue was not made with the management company in charge of North Luzon Expressway, an additional 4.5 km section was newly constructed parallel to the existing expressway. Accordingly, two interchanges were added.
2. Originally planned Portland cement concrete pavement was changed to the asphalt concrete pavement (surface course with a thickness of 10cm).
3. The bridge span for Sacobia-Bamban Bridge was widened by about 560 m taking into

account the wider river basin. As a result of detailed designs, the Pasig - Potreo River Bridge was planned to be located at the narrower crossing point so that the bridge length was shortened by about 1.9 km.

4. In order to improve the inconvenience due to separation of communities to be caused by the access controlled expressway, additional overbridges (6 units) were constructed. Furthermore, as a passage for farmers, 36 underpasses were additionally constructed.
5. Taking into account the hydrological system in the region, drainage culverts and irrigation channels were additionally constructed.
6. The grass was changed to trees in some slope sections.
7. Safety facilities (delineators, protection barrier, and others) were added.

Gumain River Bridge

Clark – Subic section

3.4.2 Project Inputs

3.4.2.1 Project Cost

The originally estimated project cost at appraisal was 49.33 billion yen, of which the total Japanese ODA loan was 41.931 billion yen. During the project implementation, the supplemental loan was provided, and the newly estimated cost became 82.166 billion yen, of which the Japanese ODA loan was 59.037 billion yen. The actual project cost was 71.734 billion yen and the Japanese ODA loan disbursed was 58.138 billion yen. The actual project cost was higher than the planned cost, which is equivalent to 145% of the planned cost. However, if the foreign exchange rate (1 peso is 2.4 yen) at the appraisal stage and the average rate (1 peso is 1.95 yen) during the implementation, which covers about 75% of the project cost, are taken into account, yen appreciated by about 20%. It is considered that the project cost was higher than the planned by about 100% in Philippine peso.

Table 8: Comparison of Project Cost

(Originally Planned, Planned after Supplemental Loan Provided and Actual)

Unit: million yen

Item	Originally planned					Planned after supplemental loan provided						Actual				
	Foreign	Local		Total		Foreign		Local		Total		Foreign	Local		Total	
	ODA loan	Own fund	ODA loan		ODA loan	Total	ODA loan	Own fund	ODA loan		ODA loan	ODA loan	Own fund	ODA loan		ODA loan
1) Civil Work	23,220	0	12,664	35,884	35,884	31,290	31,290	5,505	23,082	59,877	54,372	24,638	0	19,317	43,955	43,955
2) Contingency	2,322	0	1,249	3,571	3,571	60	60	0	0	60	60	-	-	-	-	-
3) Consulting Services	2,051	0	425	2,476	2,476	2,364	2,364	0	1,103	3,467	3,467	2,430	0	901	3,331	3,331
4) Interest during implementation						1,485	1,138	0	0	1,485	1,138	1,217	401	0	1,618	1,217
5) Land Acquisition/ compensation	0	2,604	0	2,604	0	0	0	2,367	0	2,367	0	0	1,579	0	1,579	0
6) Management expenses	0	341	0	341	0	0	0	2,591	0	2,591	0	0	1,554	0	1,554	0
7) Taxes	0	4,438	0	4,438	0	0	0	12,319	0	12,319	0	0	8,070	0	8,070	0
8) Price escalation												5,309	0	4,326	9,635	9,635
9) Interest/ Guarantee fees to BCDA												0	1,992	0	1,992	0
Total	27,593	7,383	14,338	49,330	41,931	35,199	34,852	22,782	24,185	82,166	59,037	33,594	13,596	24,544	71,734	58,138

Source: Origianl JICA appraisal documents, JICA appraisal documents for supplemental loan
Exchange Rates : At origianl appraisal 1 US$ = 108 yen, 1 Peso = 2.4 yen (January 2000)
At appraisl for supplemental loan 1 US$ = 122 yen,1 Peso = 2.63 yen (November 2007)
At post evaluation 1 Peso = 1.90 - 2.42 yen (for each item, average during implementatio period)

During the project implementation, the following revisions and additional work were undertaken, and they resulted in increase of the project cost:

1) Parallel to the expressway, a 4.5 km expressway was newly constructed together with additional two interchanges.
2) Six overbridges and 36 underpasses for farmers to pass were additionally constructed.
3) Culverts for drained water and irrigation channels were additionally constructed.

Reasons for the supplemental loan made after commencement of the project are as follows. The supplemental loan covered the additional costs increased by the above mentioned items as well.

1) The price of major construction materials substantially increased. (iron bars by 24%, asphalt by 68%, and steel by 25%)
2) Peso substantially appreciated. (1 peso = 1.93 yen at appraisal to 1 peso = 2.63 yen in

November 2007.)

3) Three interchanges and access roads were added to the project, and
4) It was considered essential that in order to reduce the share by BCDA, the ODA loan covered the cost increase due to designs changes and the interest during the project implementation, which were originally planned to be locally funded.

3.4.2.2 Project Period

The actual project period was longer than the planned. The original project period planned at appraisal was from September 2001 (signing of the original Loan Agreement) to December 2006 (planned opening date) with a total period of 64 months. The actual project period was from September 2001 to July 2008 (official opening to traffic) with a total period of 83 months, or equivalent to 130% of the plan.

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

1. Subic - Clark Section:
   1) additional work for 2 interchanges
   2) delay of acquisition of some part of land
   3) delay of installation work for traffic signs
   4) delay of procurement of contractors (Bid prices of bidders exceeded the government estimated price and rebidding was done)

2. Clark - Tarlac Section:
   1) additional work for Clark South Interchange and access roads (3.8 km)
   2) delay of acquisition of some parts of land for Mabalacat Interchange
   3) delay of final inspection and acceptance of Mabalacat Interchange and its connecting access road
   4) delay of procurement of contractors (Bid prices of bidders exceeded the government estimated price and rebidding was done)

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

(1) Financial Internal Rate of Return (FIRR)

FIRR at the appraisal time for the supplemental loan, which was recalculated using the same condition and assumption made for calculation of the FIRR at the original appraisal time, is shown in Table 9. (Recalculation was made by the implementing agency.)

Table 9: FIRR (at original planning stage and at the reappraisal stage for the supplemental loan)

	at original planning stage	at the reappraisal stage for the supplemental loan
FIRR (%)	5.7	7.78

Source: JICA appraisal documents for the supplemental loan
Cost: Construction cost, operation and maintenance costs
Benefits: toll revenues, other revenues from expressway service facilities

According to the recalculation made by the implementing agency, FIRR at the post evaluation stage is 8.00%, which is almost same as the FIRR calculated at the reappraisal stage.

(2) Economic Internal Rate of Return (EIRR)

EIRR at the appraisal time for the supplemental loan, which was recalculated using the same condition and assumption made for calculation of the FIRR at the original appraisal time, is shown in Table 10. (Recalculation was made by the implementing agency.)

Table 10: EIRR (at original planning stage and at the reappraisal stage for the supplemental loan)

	at original planning stage	at the reappraisal stage for the supplemental loan
EIRR (%)	20.4	15.49

Source: Responses to the Questionnaire
Cost: Construction cost, operation and maintenance costs
Benefits: VOC savings, time savings, income from promotion of tourism, savings of cargo transport charges at Subic Port

Since the basic date and information on each benefit item needed for calculation of benefits was not available, EIRR at the evaluation stage was not calculated.

Although the project cost was within the plan, the project period slightly exceeded the plan. Therefore, efficiency of the project is fair.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

Regarding the operation and maintenance services for the expressway completed under the project, the contract for the interim service provision was signed between Bases Conversion and Development Authority (BCDA), which is one of the government owned and controlled companies under the Office of the President and Tollways Management Corporation (TMC, subsidiary of Manila North Tollways Corporation) in December 2007, and TMC commenced

their services in March 2008. Although the operating right of the expressway was transferred to Manila North Tollways Corporation on July 20, 2011, the transfer of the operating right has not been approved by the government authority as of today. The total number of TMC staff, who are responsible for operation and maintenance of the expressway under the control of BCDA, is about 700 including about 230 toll attendants, about 250 traffic management staff, and about 150 workers in charge of maintenance work.

The Toll Operation Center, which is located in the Dolores Toll Station is responsible for operation and maintenance of the expressway.

Traffic Management in Toll Operation Center

Tarlac Interchange

3.5.2 Technical Aspects of Operation and Maintenance

According to Tollways Management Corporation (TMC), all the staffs in charge of operation and maintenance possess appropriate skills and technical qualification, and the number of staff assigned for operation and maintenance work is sufficient. All the staffs have regularly taken training courses in the relevant sectors and fields. Training subjects include: manual toll collection system (4 days), counterfeit detection (1 day), traffic management and incident response (20 days), and customer services (2 days). As the standard manuals, those for toll collection, traffic management, maintenance, and support services have been prepared.

No particular problem on implementation of trainings and preparation of manuals has been observed in the offices in charge of operation and maintenance of the expressway, and thus there is no technical issue, which might affect the sustainability of the project.

3.5.3 Financial Aspects of Operation and Maintenance

The revenues and expenditures of BCDA for the last three years are shown in Table 11.

Table 11: Revenue and Expenditure of BCDA

Unit: million peso

	2010	2011	2012
Revenues	2,435	3,674	3,047
Personal services	294	242	234
Maintenance and Other Operating Expenses	2,553	2,890	2,461
Total Expenses	2,848	3,132	2,694
Income from Operation	▵413	543	352
Other Income	▵2,405	548	▵21
Net Income	▵2,821	1,036	285

Source: Responses to the Questionnaire

The year 2010 ended in a deficit. However, it went from the red to the black in 2011 and the year 2012 ended in a slight surplus. The financial position of BCDA as of the end of fiscal year 2012 was as follows:

Assets: 130.3 billion peso
Liabilities: 41.3 billion peso
Equity: 89.0 billion peso

As shown in Table 12, the balance (toll revenue – operation and maintenance expenses) for the past three years has recorded surplus. However, in this balance sheet, financial costs (repayment of loans and others) and other non-operational income and expenditures are not included. The toll rates were revised and put into effect on Janaury, 2011. The current toll rate for a passenger car is 2.67 peso per km.

Table 12: Revenue and Expenditure for SCTEX

Unit: million peso

Item	2010	2011	2012
Toll revenue	629	769	865
Operation and maintenance expenses	481	382	458
Balance	148	387	407

Source: Responses to the Questionnaire

Currently, BCDA repays the JICA loan. From the current financial position of BCDA, repayment would not be a problem. Should BCDA has difficulties to repay the JICA loan, BCDA has received guarantee letters, dated August 13, 2001 and February 11, 2008 (for a supplemental loan) from Department of Finance, which state that the government would repay the loan for BCDA.

As stated above, operation of SCTEX is to be entrusted to Manila North Tollways Corporation (MNTC) with the 33-year concession period, and MNTC is to be responsible for repayment of loan without receiving any subsidies from the government. MNTC has been operating the North Luzon Expressway, and the total net profit of 2009, 2010 and 2011 was 256

million peso, 1,308 million peso and 1,580 million peso, respectively. Thus, its financial condition is stable.

3.5.4 Current Status of Operation and Maintenance

The daily routine maintenance has been regularly undertaken, and any defect or damages were not observed on the surface of the expressway. However, since the expressway is entering its fifth operational year, repavement and major rehabilitation works including those for toll plazas, slopes[6] and drainage facilities are planned to be conducted in addition to the regular maintenance work in 2013. Regarding maintenance equipment and spare parts, there are no specific items to be procured. However, some equipment may be due for replacement.

No major problems have been observed in the operation and maintenance system, and 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 promote human exchange and logistics system, improve transport efficiency, reduce transport costs and enhance highway safety by constructing an expressway with a total length of 90km connecting Subic with Tarlac via Clark, thereby contributing to promotion of the economic development in the Central Luzon Region. The project has been highly relevant to the development plans and needs of the Philippines, as well as Japan's ODA policies. Comparing the projected traffic volume with the actual figures (in 2011) in the Subic - Clark section and in the Clark – Tarlac section, the actual figure in each section is 70% and 77% of the projected traffic volume, respectively, which are lower than the planned. However, since the travel time was substantially shortened and the number of traffic accidents has been decreased year by year, the development of an efficient and safer expressway contributes to promotion of logistics. The project has somewhat achieved its objectives, and thus the effectiveness is fair. Since both project cost and project period exceeded the plan, efficiency of the project is considered fair. 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.

[6] Artificial slope created by cut and embankment.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None.

4.2.2 Recommendations to JICA

Although the operating right of the expressway was transferred to Manila North Tollways Corporation on July 20, 2011, it has not been approved by the government authority as of today. Since the expressway is entering its fifth operational year, major periodic maintenance work and rehabilitation work including overlay and improvement of service areas need to be conducted. Thus, JICA needs to regularly follow up the clearance progress on the concession agreement.

4.3 Lessons Learned

None.

Comparison of the Original and Actual Scope of the Project

Item	Original plan	Actual
1. Output Civil Work	・ divided 4-lane expressway (about 56 km between Subic – Clark) (about 34 km between Clark – Tarlac) ・ 8 interchanges ・ 2 long bridges, 35 medium/small bridges ・ 6 overbridges ・ 8 toll stations	・ divided 4-lane expressway (about 50 km between Subic – Clark) (about 40 km between Clark – Tarlac) ・ 12 interchanges ・ 4 long bridges, 33 medium/small bridges ・ 12 overbridges ・ 14 toll stations
Consulting Services	Foreign: 481 M/M Local: 879 M/M	Foreign: 619 M/M Local: 1,833 M/M
2. Project Period	Original Plan: September 2001 (L/A signing) – December 2006 (open to traffic) (total 64 months) Plan after supplemental loan provided: September 2001 (L/A signing) – April 2008 (open to traffic) (total 80 months) Completion of civil work was scheduled for April 2009.	September 2001 (L/A signing) – July 2008 (open to traffic) (total 83 months) Subic – Clark section was open to traffic in April 2008.
3. Project Cost Amount paid in Foreign currency	27,593 million yen	33,594 million yen
Amount paid in Local currency	21,721 million yen	38,140 million yen
Total	49,330 million yen	71,734 million yen
Japanese ODA loan portion	41,931 million yen	58,138 million yen
Exchange rate	1 Peso = 2.4 yen (as of January 2000)	1 Peso = 1.9 - 2.42 yen (Average between May2002 and July 2008)

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project

LRT Line 1 Capacity Expansion Project (II)

External Evaluator: Masami Tomita, Sanshu Engineering Consultant

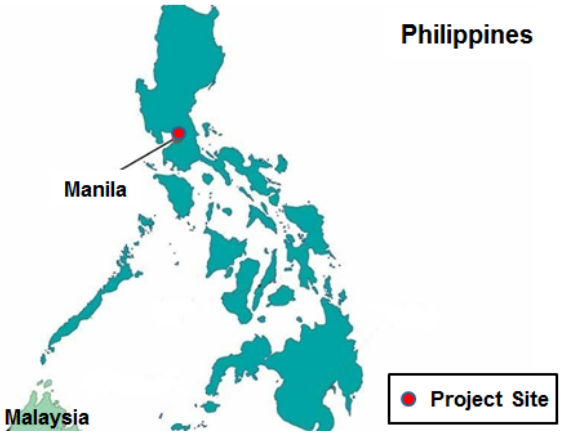
0. Summary

This project aimed at developing an urban transportation system in Metro Manila which was mainly dependent on road transport, reducing traffic congestions and materializing mass passenger transportation, by additionally procuring rolling stocks and improving signalling system etc. for Light Rail Transit (LRT) Line 1.

Relevance of this project is high, as the project is consistent with priority areas of Philippine's development plans and Japan's ODA policy, and moreover development needs for the project are high. While the actual number of passengers of Line 1 at the time of ex-post evaluation is about the half of the estimated number in the project appraisal, the number has been increasing steadily year by year, and evaluating comprehensively by taking into account the operating rate of rolling stocks, operation interval, and results of the beneficiary survey etc., effectiveness is judged to be fair. Efficiency of the project is also fair, as while actual project cost was lower than planned cost, actual project period significantly exceeded planned period. Sustainability of the project is also fair, as some problems were observed in the financial situation of the Light Rail Transit Authority (LRTA), which is responsible for operation and maintenance (O&M) of Line 1, and future O&M system.

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

1. Project Description



Project Location

Third Generation Vehicle Procured Under the Project

1.1 Background

At the time of project appraisal, traffic congestions in Metro Manila were reaching the limit of its capacity, due to increasing numbers of vehicles and travels accompanying the economic recovery since the 1990s (average velocity was 18km/hour)[1]. The number of vehicles in the main parts of Metro Manila had been regulated since 1995, in order to mitigate economic losses and air pollutions caused by heavy traffic congestions. In this situation, an earlier provision of a public mass transit system was required for safe, comfortable, economical and reliable transportation.

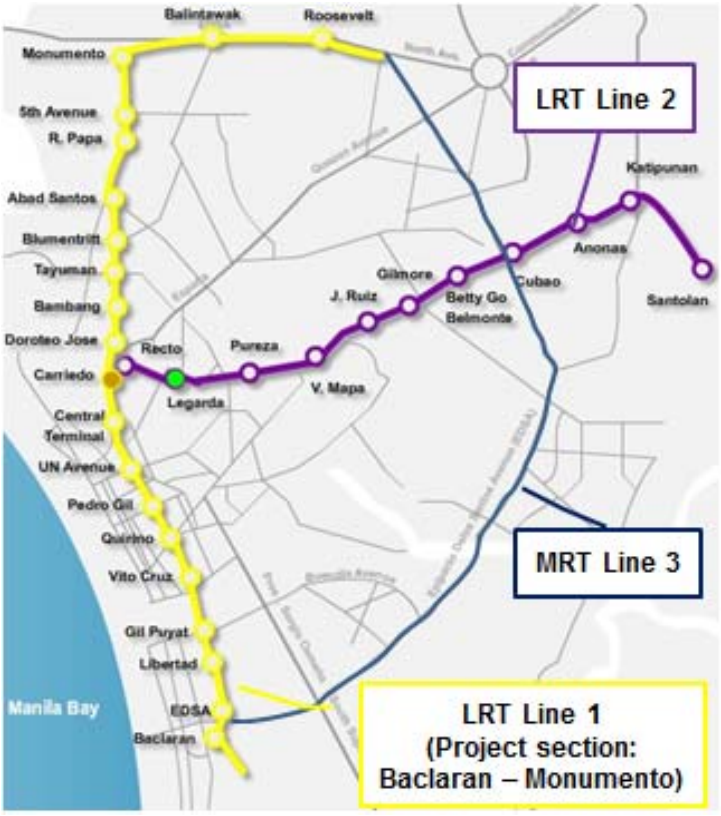
LRT Line 1, whose capacity was expanded by the project, was fully opened in 1985, and at the time of project appraisal, LRT Line 2 was being constructed with Japanese ODA loan and Mass Rapid Transit (MRT) Line 3 was being constructed with private sector capital, for development of railway networks in Metro Manila. LRT Line 1 was credited with its safety and reliability and the number of passengers increased, and as a result, it faced with a chronic shortage of transport capacity. Thus a project to expand its capacity by 50% was implemented with Japanese ODA loans as Phase 1 of this project, which was completed in 2002. However, its capacity was expected to become insufficient when the railway network in Metro Manila is completed, as there would be increased demands for Line 1 from transfer passengers from Line 2 and 3, as a synergy effect of improved convenience. Therefore, this project was implemented, as additional capacity expansion of Line 1 was deemed necessary.

1.2 Project Outline

The objective of this project is to develop an urban transportation system in Metro Manila which was mainly dependent on road transport, reduce traffic congestions and materialize mass passenger transportation, by additionally procuring rolling stocks and improving signalling system etc. for LRT Line 1, and thereby contributing to improvement of urban environment and reduction of global warming.

Figure 1 below shows the project site map.

[1] Source: Japan International Cooperation Agency (JICA) appraisal documents



Source: edited based on LRTA HP

Figure 1: Project Site Map

Loan Approved Amount/ Disbursed Amount	22,262 million yen / 20,540 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	April, 2000 / April, 2000
Terms and Conditions	Construction Works/Procurement: Interest Rate: 1.0% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: Japan tied[2] Consulting Services: Interest Rate: 0.75% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: bilateral tied

[2] This project was implemented utilizing the Special Yen Loan (SYL). SYL was introduced by the Government of Japan in 1998 as one of the financial relief measures for Asian countries suffered from the Asian economic crisis. SYL was to provide concessionary financial assistance for the development of infrastructures in the fields of transportation logistics, foundation for productive facilities and large-scale disaster prevention. The terms and conditions of SYL is set at greater concessionary level than standard terms and conditions of ODA loans, while the eligibility of the prime contractors under SYL is limited to Japanese nationals or judicial persons and procurement of goods and services under SYL is tied to Japanese goods and services (goods and services whose country of origin being other than Japan can be procured up to no more than 50% of the total loan amount), to promote participation of Japanese firms in projects.

Borrower / Executing Agency	Government of the Philippines / Light Rail Transit Authority (LRTA)
Final Disbursement Date	September, 2008
Main Contractor (Over 1 billion yen)	Marubeni Corporation (Japan) / Itochu Corporation (Japan) / Sumitomo Corporation (Japan) (JV)
Main Consultant (Over 100 million yen)	Japan Railway Technical Service (Japan) / Oriental Consultants Co., Ltd. (Japan) (JV)
Feasibility Studies, etc.	Feasibility Study by the Philippine government, 1998
Related Projects	・Japanese ODA Loan: LRT Line 1 Capacity Expansion Project (1994), Metro Manila Strategic Mass Rail Transit Development (I)(II)(III) (I: 1996, II: 1997, III: 1998) ・Belgian government: rehabilitation of LRT Line 1 vehicles ・French government: introduction of automatic fare collection system for LRT Line 1

2. Outline of the Evaluation Study

2.1 External Evaluator

Masami Tomita, Sanshu Engineering Consultant

2.2 Duration of Evaluation Study

Duration of the Study: October, 2012 – September, 2013

Duration of the Field Study: January 24 – February 9, 2013, April 14 – April 27, 2013

3. Results of the Evaluation (Overall Rating: C[3])

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of the Philippines

At the time of project appraisal, the Mid-Term Development Plan (1999-2004) stated that the railway sector was prioritized among development of urban transport infrastructures[5]. LRT Line 1 capacity expansion project (Phase 1) and Line 2 construction project were being implemented with Japanese ODA loans, and MRT Line 3 construction project was being implemented with private sector capital, to develop railway networks in Metro Manila where traffic congestions were exacerbated.

On the other hand, at the time of ex-post evaluation, in the Philippine Development Plan (2011-2016) Chapter Five (Transport Sector), to ensure an integrated and coordinated transport network, to address the overlapping and conflicting functions of transport and other concerned agencies, and to promote development of conflict-affected and highly impoverished areas etc.

[3] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[4] ③: High, ② Fair, ① Low

[5] Source: JICA appraisal documents

are stated as goals for the transport sector, and strategies to achieve these goals are; (1) adopting a comprehensive long-term national transport policy; (2) developing strategic transport infrastructure and maintaining and managing transport infrastructure assets; (3) developing an integrated multimodal logistics and transport system; (4) separating the regulatory and operation functions of transport and other concerned agencies; and (5) improving transport networks in underdeveloped regions and conflict-affected areas to open up economic opportunities etc.[6] Particularly, an priority to achieve (2) above is stated as upgrading the quality of the existing railroad tracks and services, and an priority to achieve (3) above is stated as establishing an efficient long-distance, high-speed mass transit system integrated with the mass transit commuter rail system in Metro Manila[7].

Therefore, development of railway networks is emphasized in Philippine's development plans both at the time of project appraisal and ex-post evaluation, and the project is consistent with development plans.

3.1.2 Relevance to the Development Needs of the Philippines

At the time of project appraisal, the traffic volume in Metro Manila was 17.43 million trips per day (as of 1996) and approximately 2% of the volume, which was equivalent to 350,000 to 400,000 passengers, was being transported by LRT Line 1 (fully opened in 1985)[8]. As explained above, Line 1 faced with a chronic shortage of transport capacity and the project to expand its capacity by 50% was implemented with Japanese ODA loan (completed in 2002), however, additional capacity expansion was required, since there would be increased demands for Line 1 from transfer passengers from Line 2 and 3 when the railway network in Metro Manila is completed, as a synergy effect of improved convenience, and the existing Line 1 was expected to be insufficient to absorb such increasing demand.

At the time of ex-post evaluation, LRT Line 1 and 2 and MRT Line 3 are operated in total, and Line 1 is connected with Line 3 at EDSA Station and with Line 2 at Doroteo Jose Station (a transfer from and to both lines is possible). Moreover, Line 1 was extended to North Avenue Station with Philippine government budget, and a project to extend Line 1 from Baclaran Station to Cavite region in the south is currently implemented with Japanese ODA loan[9]. The volume of passengers of Line 1 decreased to approximately 300,000 passengers per day in 2000, due to raising fares and slowdown of economic growth of the country stemming from Asian economic crisis etc.[10], however, the volume has grown to approximately 470,000 passengers per

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6 Source: http://devplan.neda.gov.ph/chapter5.php

7 Source: same as above

8 Source: JICA appraisal documents

9 Source: 50% of the project is being implemented utilizing the STEP (Special Terms for Economic Partnership) facility, and the rest of the project is being implemented by PPP (Public Private Partnership).

10 Source: ex-post evaluation report of LRT Line 1 Capacity Expansion Project Phase 1

day at the time of ex-post evaluation. The extension project of Line 1 from Baclaran Station to Cavite region mentioned above is expected to be completed in 2017, and the further increase of passenger volume is expected when the section is fully opened, and thus, the need for capacity expansion of Line 1 remains high.

On the other hand, Table 1 shows the transition of the number of registered vehicles in Metro Manila from the time of project appraisal to the time of ex-post evaluation.

Table 1: The Number of Registered Vehicles in Metro Manila

(Unit: vehicles/year)

Year	2001	2002	2003	2004	2005	2006
Number of Registered Vehicles	1,255,140	1,390,579	1,389,808	1,505,409	1,580,753	1,555,174
Year	2007	2008	2009	2010	2011	-
Number of Registered Vehicles	1,592,036	1,670,150	1,768,033	1,904,395	2,014,750	-

Source: Land Transportation Office, Department of Transportation and Communications

As shown above, the number of registered vehicles in Metro Manila at the time of ex-post evaluation is 1.6 times of the number at the time of project appraisal, and the number of vehicles in Metro Manila is still regulated today, and thus the need for LRT is high for reducing traffic congestions in Metro Manila.

Therefore, the number of registered vehicles in Metro Manila has been increasing since the time of project appraisal, and the volume of passengers of LRT Line 1 has also recently been increasing and is expected to further increase in future, and thus, the relevance of this project, which aimed at reducing traffic congestions in Metro Mania, remains high.

3.1.3 Relevance to Japan's ODA Policy

According to the Country Assistance Policy for the Philippines (2000), Japan emphasized the followings as prioritized areas for assistance based on the experience of Asian economic crisis; strengthening of industrial structures (particularly development of supporting industries) for medium to long term development and promotion of construction and management of economic infrastructures (transport and energy), lack of which becomes development constraint[11]. Moreover, the economic cooperation mission in March 1999 emphasized construction of mass transit system as an important assistance area as part of economic infrastructures needed for reduction of traffic congestions, and the Japanese government positively supported the policy, and this project was consistent with such policy[12].

[11] Source: The Country Assistance Policy for the Philippines, Ministry of Foreign Affairs

[12] Source: JICA appraisal documents

This project has been highly relevant with Philippine's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

3.2 Effectiveness[13] (Rating: ②)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

3.2.1.1 Volume of Passenger Transportation

Table 2 shows estimated and actual volume of passengers of LRT Line 1 subject to the project.

Table 2: Volume of Passenger Transportation of Line 1

(Unit: annual: million people, peak hour: people)

Year	2001	2004	2007	2010	2011	2012
Estimated Volume in Project Appraisal						
Annual	301.68	316.86	332.80	349.55	359.97	370.69
Peak Hour[14]	N/A	N/A	N/A	40,000	N/A	N/A
Actual Volume						
Annual	109.94	96.84	119.12	155.91	156.93	170.72
Peak Hour	N/A	N/A	N/A	17,866	17,130	17,839

Source: estimated: JICA appraisal documents, actual: documents provided by LRTA

Regarding annual volume, actual volume decreased from 2002 to 2004, due to aggravated operating rate of rolling stocks caused by difficulties of procuring spare parts and the increase of fares[15], however, the volume has been increasing afterwards. However, while the exact target figures were not set in project appraisal, comparing estimated and actual volume of passengers for 2012, the actual volume is largely below the estimated volume, which is 46% against the estimation.

Regarding peak hour volume, the maximum volume of passengers per peak hour per direction in 2010 (6 years after project completion) was estimated approximately 40,000 persons in project appraisal, however, the actual volume is approximately 18,000 persons and 45% against the estimation.

However, in project appraisal, it was expected that Lines 1 to 3 would be operational by 2000, and that Lines 1 to 5 would be operational by 2010, on the other hand, Lines 1 to 3 only are currently operational at the time of ex-post evaluation, which means that the precondition at the time of appraisal is different from the actual situation. Moreover, when the evaluator was on board of Line 1 during the field surveys, it was very congested and handing the further increase

[13] Sub-rating for Effectiveness is to be put with consideration of Impact

[14] This represents maximum cross-sectional passenger flow per peak 1 hour (between 7:00-9:00 am and 5:00-7:00 pm) per direction. Maximum cross-sectional passenger flow means maximum volume of passengers on board between certain sections. Figures for peak hour in Table 2 show maximum volume among cross-sectional volume between each station on Line 1.

[15] Source: LRT Line 1 Capacity Expansion Project Phase 1 Ex-Post Monitoring Report

of passenger volume would be difficult under the current situation, due to the limited numbers of operational rolling stocks and slowing down the running speed because of deteriorated rail tracks (maximum speed was planned to be 60km/hour in project appraisal, however, actual speed currently is 40km/hour), according to the executing agency. However, a project to rehabilitate rail tracks and rolling stocks is currently being implemented and fourth-generation of rolling stocks (120 vehicles) are planned to be procured under the south extension project of Line 1 through Japanese ODA loan, and conditions of rail tracks and operating rate of rolling stocks are expected to be improved in near future, which will enable Line 1 to handle the further increase of passenger volume.

3.2.1.2 Number of Operational Rolling Stocks / Operating Rate of Rolling Stocks

Table 3 shows actual numbers of operational rolling stocks and operating rate during peak hours in Line 1 from the time of project appraisal to the time of ex-post evaluation.

Table 3: Number of Operational Rolling Stocks / Operating Rate during Peak Hours in Line 1

(Unit: number of operational rolling stocks: vehicles, operating rate: %)

Year	2001	2002	2003	2004	2005	2006
Number of Operational Rolling Stocks	66	67	61	62	68	71
Operating Rate*	72.5	73.6	67.0	68.1	74.7	78.0
Year	2007	2008	2009	2010	2011	2012
Number of Operational Rolling Stocks	98	104	100	100	102	99
Operating Rate	70.5	74.8	71.9	71.9	73.4	71.2

Source: documents provided by LRTA

Note*: the total number of vehicles was 91 from 2001 to 2006, and it was 139 since 2007 onwards, and operating rate was calculated based on this (number of operational vehicles during peak hours / total number of vehicles x 100). Figures above include the number of first and second generation vehicles as well as third generation vehicles procured under the project (48 vehicles in total).

According to the executing agency, numbers of operational rolling stocks in the table above are all numbers that can be operated during peak hours and the rest are non-operational due to lack of spare parts etc. In general, operating rate of rolling stocks during peak hours should be approximately 80-90% excluding numbers of rolling stocks that are under inspection[16], and thus the actual operating rate of Line 1 is slightly lower than standard.

3.2.1.3 Number of Running Trains / Operation Interval

Table 4 shows numbers of running trains and operation interval during peak hours in Line 1 from the time of project appraisal to the time of ex-post evaluation.

[16] Source: JICA internal document

Table 4: Number of Running Trains / Operation Interval during Peak Hours in Line 1

(Unit: number of running trains: number/hour, operation interval: minutes)

Year	2001	2002	2003	2004	2005	2006
Number of Running Trains*1	14	15	13	13	15	15
Operation Interval*2	4.2	4.1	4.5	4.5	4.0	3.9
Year	2007	2008	2009	2010	2011	2012
Number of Running Trains	21	23	22	20	17	N/A
Operation Interval	2.8	2.6	2.7	3.0	3.6	N/A

Source: documents provided by LRTA

Note *1: number of running trains: data on numbers of operational vehicles during peak hour only was available from LRTA, and according to LRTA, the average number of vehicles per train is 3.5 (there are 3-car trains and 4-car trains at the time of ex-post evaluation), and thus, numbers in the table were calculated based on this (numbers of operational vehicles during peak hour / 3.5 vehicles).

Note*2: operation interval: calculated by using numbers of running trains per hour (60 minutes / number of running trains). Thus, figures in the table above are all approximate figures.

Minimum operation interval was planned to be two minutes in 2010 (6 years after project completion) in project appraisal, however, actual interval is three minutes at the time of ex-post evaluation, and as explained above, numbers of operational rolling stocks are currently limited, and thus the actual interval is 1.5 times longer than the plan. Numbers of running trains have reached its peak in 2008 and have been decreasing slightly afterwards, and this is considered to be mainly due to decreasing operating rate of rolling stocks and deterioration of rail tracks.

3.2.1.4 Rush Ratio during Peak Hours

According to documents provided by the executing agency, rush ratio during peak hour was 77.3% in 2011 and 90.2% in 2012[17]. However, when calculating rush ratio by using the average of maximum cross-sectional passenger flow during peak hours (7:00-9:00 am and 5:00-7:00 pm) (monthly)[18], the ratio becomes 107% in 2011 and 113% in 2012. Moreover, as explained below, in the beneficiary survey, majority of beneficiaries replied that the congestion situation of Line 1 is uncomfortable, and thus, the actual rush ratio is considered to be higher than the figures provided by the executing agency.

3.2.1.5 Required Travelling Time for Specific Sections

Travelling time from Baclaran station to Monument station (the project section) by LRT is approximately 38 minutes (length 15 km / current average speed 40km/hour). On the other hand, travelling by taxi on roads parallel to LRT Line 1 from Baclaran station to Monument station

[17] According to LRTA, it was calculated by the volume of passengers per peak hour / (passenger carrying capacity of train X numbers of running trains during peak hour) X 100.

[18] Calculated by (the average of maximum cross-sectional passenger flow during peak hours (7:00-9:00 am and 5:00-7:00pm) (total of northbound and southbound, monthly)) / ((passenger carrying capacity of Third generation vehicle 346 persons per vehicle x 3.5 vehicles per train) X (numbers of running trains per peak hour in 2011: 17 per hour))

(Taft Avenue and Rizal Avenue: 18km in total) during the field survey (7:00 am, Thursday, February 7th, 2013) required 1 hour and 10 minutes. Travelling time by LRT is almost half of that by road transport, and thus LRT is more efficient. In the beneficiary survey, 102 people out of 125 people in total (multiple answers) replied that the reason for using Line 1 was to save travelling time.

3.2.2 Qualitative Effects

The beneficiary survey was conducted in the ex-post evaluation in order to understand qualitative effects of the project[19]. The overview of the results of the survey is shown below.

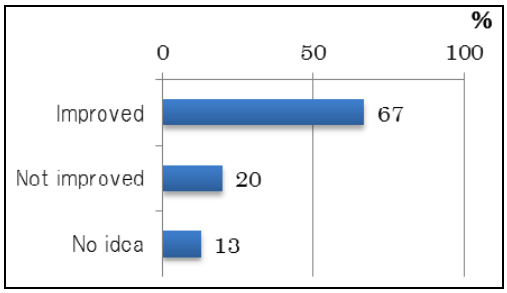

Figure 2: Comfort Level in LRT Line 1 after Project Completion

Main reason of improvement is due to trains being equipped with air conditioners in the project.

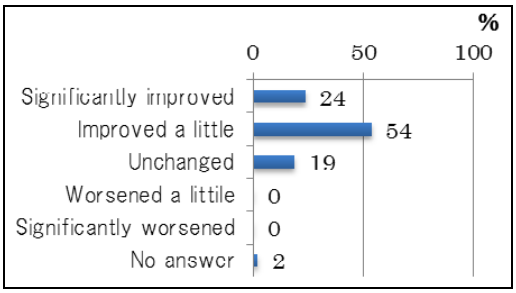

Figure 3: Conditions of Infrastructures in Stations after Project Completion

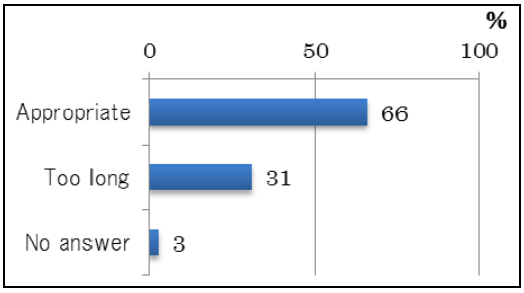

Figure 4: Operation Interval of Line 1

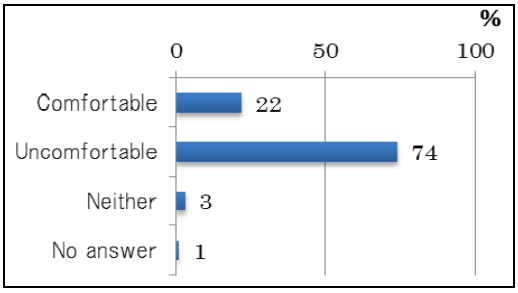

Figure 5: Congestion Situation of Line 1

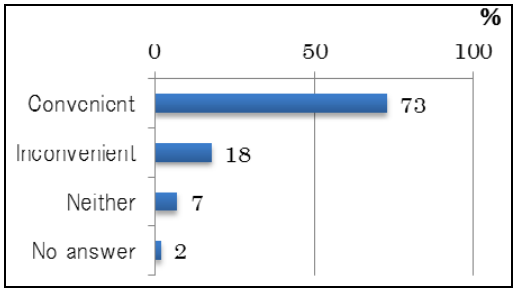

Figure 6: Connection of Line 1 with Other Lines

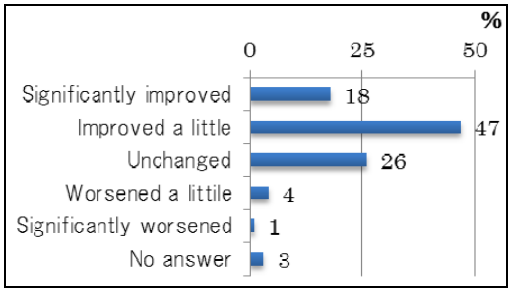

Figure 7: Traffic Congestion on Roads along Line 1 after Project Completion

[19] The beneficiary survey was conducted in the following manner. Time: February 2013, the number of samples: 125 in total (Blumentritt station 31, Doroteo Jose station 31, EDSA station 31, Monumento station 32 (male: 63, female: 62)), method: questionnaire survey

As direct effects of this project, approximately 70% of beneficiaries replied that the level of comfort in LRT Line 1 was improved mainly due to air conditioners being provided in this project, and approximately 80% replied that infrastructures in stations were improved after project implementation. Moreover, improvements were made at Doroteo Jose station and EDSA station to make transfers from Line 1 to Lines 2 and 3 more convenient in this project, and approximately 70% of beneficiaries replied that connection of Line 1 with other lines became convenient, and thus, this project is considered to contribute to the project objective to a certain extent, which is to develop an urban transportation system in Metro Manila which has been mainly dependent on road transport, by improving the level of comfort in trains and making transfers to other lines more convenient. Particularly, as the majority of beneficiaries replied that their means of transportation before starting to use Line 1 were jeepneys[20] and buses, this project is considered to contribute to reduction of numbers of these vehicles to some extent. On the other hand, while the majority of beneficiaries replied that operation interval of Line 1 is appropriate, approximately 30% replied that it is too long, and moreover, approximately 70% replied that the congestion situation in Line 1 is uncomfortable, and thus, it is required to solve problems of the limited numbers of operational rolling stocks and deteriorated rail tracks as mentioned above, in order to promote a further transfer of passengers from road transport to urban rail transport. Regarding traffic congestions on roads along Line 1, while the beneficiary survey asked about comparison of the situation before (about 10 years ago) and after project implementation, the result shown above is a pro forma figure, as not many people would remember precisely about the situation of 10 years ago. However, still, approximately 60% replied that they think traffic congestions on roads along Line 1 were improved after project implementation.

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Reduction of Urban Pollution Including Air Pollution and Traffic Noise Problems

Results of the beneficiary survey on changes of situation regarding air pollution and traffic noise problems along Line 1 after project completion are shown below.

[20] A share-ride taxi converted from a small motor truck that are widely used in the Philippines.

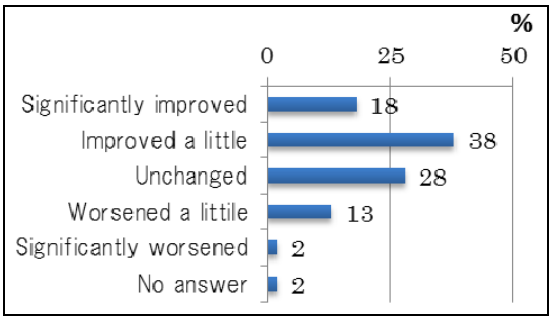

Figure 8: Air Pollution in Areas along Line 1

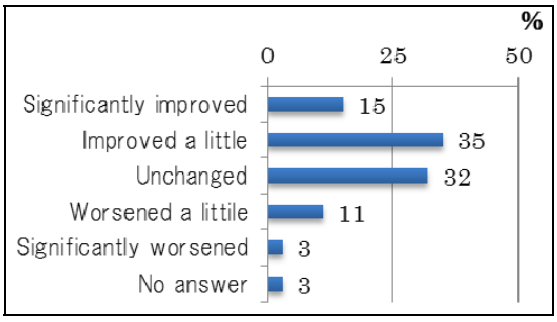

Figure 9: Traffic Noise in Areas along Line 1

As mentioned above, since the beneficiary survey asked about comparison of the situation before (about 10 years ago) and after project implementation, the result shown above is a pro forma figure, however, approximately 50% replied that they think air pollution and traffic noise were reduced after project implementation.

As explained above, the volume of passenger transportation by Line 1 at the time of ex-post evaluation is approximately 470,000 per day on average, and the majority of beneficiaries replied that their means of transportation before starting to use Line 1 were jeepneys and buses. Thus, converting the passenger volume of Line 1 into the number of jeepneys (assuming 8 passengers per vehicle on average) results in 60,000 jeepneys per day, and the same for buses (assuming 15 passengers per vehicle on average) results in 30,000 buses per day, which suggests that the project contributed to reduction of considerable traffic volume on roads, and this in turn suggests it also contributed to reduction of urban pollution such as air pollution and traffic noise to some extent.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

Contents of this project were almost the same sort as those of Phase 1, and thus, at the time of project appraisal, Department of Transportation and Communications (DOTC)/LRTA requested Department of Environment and Natural Resources (DENR) an issuance of an Environmental Compliance Certificate (ECC) of Non-coverage, which was to be issued shortly[21]. At the time of ex-post evaluation, according to the executing agency, ECC of Non-coverage was issued, which exempted environmental monitoring, and thus, monitoring of noise problems has not been conducted. However, monitoring on air pollution by the project was conducted at depot during project implementation (April 2006: baseline monitoring, July 2006: first monitoring, and October 2006: second monitoring), and figures of total suspended particles, sulphur dioxide and nitrogen dioxide were below standards set by the government[22].

[21] Source: JICA appraisal document

[22] Source: document provided by LRTA

3.3.2.2 Land Acquisition and Resettlement

At the time of project appraisal, land acquisition was planned only for entrances of stations of Line 1 that were to be added and the depot that was to be expanded, and the land for depot expansion was already acquired and cleared[23]. Acquisition areas for entrances of each station were planned to be small, and no problem was seen, as these were commercial areas and there was no illegal settler in these areas[24]. At the time of ex-post evaluation, according to the executing agency, there was no resettlement and land acquisition only was conducted, however, data on the area acquired was not provided and unknown.

While the actual passenger volume is approximately half of estimated figures, taking into account the fact that the current situation of development of urban rail networks is different from preconditions of project appraisal, other indicators such as operating rate of rolling stocks and operation interval and the results of the beneficiary survey etc., this project has somewhat achieved its objectives, therefore its effectiveness and impact are fair[25].

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

Outputs of the project (planned and actual) are shown in Table 5.

[23] Source: JICA appraisal document

[24] Source: same as above

[25] According to JICA's rating system, effectiveness and impact are rated as follows; if the achievement rate of actual figures against targets is over 80%, then they are rated as ③, if the achievement rate is over 50% and below 80%, then they are rated as ②, and if the achievement rate is below 50%, then they are rated as ①. Among operation and effect indicators of this project, comparison of planned (estimated) and actual figures is possible for volume of annual passenger transportation, volume of peak hour passenger transportation, operating rate of rolling stocks and operation interval. Then the achievement rate of these indicators against planned figures is 62% on average. As the importance is higher for volume of passenger transportation compared with other indicators, when calculating the weighted average of the achievement rate by doubling the weight of annual and peak hour passenger volume resulted as 56%. Thus, effectiveness and impact are evaluated as fair, by judging comprehensively including the results of the beneficiary survey.

Table 5: Comparison of Outputs (Planned/ Actual)

Item	Planned	Actual
Package A (Procurement of rolling stocks / Civil works)	・Procurement of rolling stocks (4 car-train x 12 sets = 48 cars, air-conditioned) ・Procurement and installation of signalling system (ATC/ATP/ATO/ ATS) ・Upgrading of the existing communication system ・Procurement of additional equipment for the existing automatic fare collection system (AFCS) ・Track-work within depot ・Upgrading of power distribution equipment ・Civil works (upgrading of stations and depot)	Below were added to the original scope: ・Structural soundness study of Line 1 structures ・Replacement and strengthening of walls at 15 stations ・Replacement of a roof and walls of the depot
Package B (Procurement of air conditioners for exiting rolling stocks)	・Procurement of air conditioners for existing (first generation) rolling stocks (64 cars)	Below were added to the original scope: ・Renovation of existing rails and sleepers (approximately 4km) ・Replacement of faulty air conditioning units of the 2nd generation vehicles ・Procurement and installation of equipment for AFCS (automatic gates / ticket machine) delivered by French company, as some of them were non-usable ・Procurement of equipment and spare parts for track works
Consulting Service	・Procurement assistance ・Supervision of civil (construction) works ・Assistance for preparation of operating plans ・Assistance for management of LRTA ・Environmental management through monitoring of compliance with conditions set in ECC and providing instructions for contractors etc.	Below were added to the original scope: ・Structural soundness study of Line 1 structures ・Assistance for contract management and supervision of civil works related to additional outputs ・Supervision of civil works for Package B ・Assistance for LRTA business improvement study
	International CS: 344M/M Local CS: 677M/M	International CS: 440M/M Local CS: 1,038M/M

Source: planed: JICA appraisal document, actual: documents provided by LRTA, interviews with LRTA, JICA internal documents

As shown above, outputs were added to the original scope according to necessity in the field as far as possible during project implementation. The reason for walls at 15 stations and a roof and walls at the depot being replaced was because a segment of the pre-cast fell off on a street in September 2005 due to deterioration of Line 1 structures[26]. Responding to this accident,

[26] Source: documents provided by LRTA

LRTA conducted the structural soundness study of Line 1 structures.

Expansion of Platform (EDSA station)

Signalling (Operation) System

3.4.2 Project Inputs

3.4.2.1 Project Cost

The planned project cost at the time of project appraisal was 26,190 million yen (foreign currency: 19,639 million yen, local currency: 6,551 million ten), of which Japanese ODA loan portion was 22,262 million yen[27]. On the other hand, the actual project cost was 21,841 million yen[28] (breakdown of foreign and local currencies is unknown), of which Japanese ODA loan portion was 20,540 million yen, and it was lower than planned (83% against the plan). The actual cost exceeds the planned cost in Philippine pesos by approximately 10% due to additional outputs explained above, however, the actual cost is lower than the planned cost in Japanese yen even including additional outputs due to fluctuation of exchange rates (the exchange rate at the time of project appraisal was 1 peso = 3.0 yen). The actual cost for civil works and procurement of equipment etc. was lower than the planned cost as a result of competitive bidding[29]. As explained above, this project was implemented utilizing the Special Yen Loan (SYL), and the customer satisfaction survey was conducted regarding SYL. The executing agency replied that the bid price was almost the same level as in other projects implemented in the Philippines and that they are satisfied with the quality of contractors' works.

3.4.2.2 Project Period

The planned project period at the time of project appraisal was 46 months in total from April 2000 (signing of the loan agreement) to January 2004 (project completion was defined as

[27] Source: JICA appraisal document

[28] Calculated by multiplying the actual cost by the average exchange rate of 1PHP=2.27JPY (the average exchange rate of the Japanese ODA loan disbursement period of April 7, 2000 –September 4, 2008), based on documents provided by LRTA.

[29] Source: documents provided by LRTA

completion of civil works/procurement and start of operation)[30]. On the other hand, the actual project period was 111 months in total from April 2000 (signing of the loan agreement) to June 2009 (completion of civil works/procurement)[31], and it was significantly longer than planned (241% against the plan). The reasons for the actual project period significantly exceeding the planned period were; 1) the executing agency requested a selection method of a consultant that was not allowed in Japanese ODA loan, and it took a long time within the executing agency to deal with comments from JICA regarding the issue, and as a result, the entire process of consultant selection was delayed; 2) it required a long time to prepare bidding documents particularly for parts related to conditions for SYL and detailed design, as the project was the first project that utilized SYL and a first design-build project for the executing agency; 3) the bidding process was delayed, as it required a long time for the executing agency to handle legal issues raised by losing bidder; and 4) outputs were added to the original scope as explained above, etc.[32] Based on these reasons, the expiry date of the Japanese ODA loan was extended from September 2006 to September 2008. The actual project period excluding time required for additional outputs was 89 months in total from April 2000 to August 2007, which is 193% against the planned period and still significantly longer than planned.

Table 6: Comparison of Planned and Actual Project Period

Content	Planned	Actual
Package A (Procurement of Rolling Stocks and Civil Works)		
Selection of Consultant	November 1999 – October 2000 (12 months)	Unknown – January 2002
Detailed Design	November 2000 – April 2001 (6 months)	February 2002 – August 2002 (7 months)
Bidding/Contracting	November 2000 – January 2002 (15 months)	August 2002 – March 2005 (32 months)
Procurement/Civil Works	February 2002 – January 2004 (24 months)	March 2005 – August 2007 (30 months)
Additional Outputs	-	April 2008 – December 2008 (9 months)
Package B (Procurement of Air Conditioners for Exiting Rolling Stocks)		
Detailed Design	November 1999 – April 2000 (6 months)	Unknown
Bidding/Contracting	November 1999 – January 2001 (15 months)	Unknown
Procurement/Civil Works	February 2001 – January 2002 (12 months)	April 2002 – April 2004 (25 months)
Additional Outputs	-	May 2008 – June 2009 (14 months)

Source: planned: JICA appraisal document, actual: documents provided by LRTA

[30] Source: JICA appraisal document

[31] Source: documents provided by LRTA

[32] Source: JICA internal documents

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

3.4.3.1 Financial Internal Rate of Return (FIRR)

Results of calculation of FIRR both at the time of project appraisal and ex-post evaluation are shown below. FIRR at the time of ex-post evaluation is lower than that of project appraisal, as the passenger volume and the rate of fare revision were overly estimated in the appraisal, and the actual project cost was slightly more than the planned cost (in Philippine pesos) etc. FIRR is approximately 2%, assuming that O&M cost is constant and fares of Line 1 will be increased by 0.5 peso each year since 2013.

Table 7: Comparison of FIRR

Time of Calculation	Conditions for Calculation	Result
Project Appraisal (1999)	Cost: Investment Cost, O&M Cost Benefit: Fare Revenue Project Life: 30 years	6.4%
Ex-Post Evaluation (2012)	Same above	2.2%

Source: project appraisal: JICA appraisal document, ex-post evaluation: calculated based on documents provided by LRTA[33]

3.4.3.2 Economic Internal Rate of Return (EIRR)

Due to the fact that detailed information on the basis for calculation of EIRR at the time of project appraisal was not available, analysis for EIRR was not possible.

Although the project cost was within the plan, the project period significantly exceeded the plan, therefore efficiency of the project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

At the time of project appraisal, operation and maintenance (O&M) of LRT Line 1 was outsourced to METRO Inc. which was under LRTA's 100% shareholding, however, the contract was terminated in July 2000, and maintenance of Line 1 has been outsourced to CB&T-PMP-GRAS (CPG) joint venture (JV) since 2009[34]. The company is responsible for

[33] Conditions for calculation: in JICA appraisal document, fare revenue was calculated based on an assumption that the increase of the passenger volume by this project would be approximately 10% of the entire passenger volume of Line 1, and thus, the same assumption was used in ex-post evaluation. For the annual passenger volume, actual figures were used until 2012, and the volume after 2013 was increased by 8% per year, which is the actual average of volume increase from 2007 to 2012. For fare revenue per passenger, 14.5 pesos per passenger was used until 2012, which was the actual average from 2007 to 2012, and it was assumed to be increased by 0.5 peso each year after 2013 onwards. O&M cost was assumed constant at 10 pesos per passenger, which was the actual cost in 2009.

[34] According to LRT Line 1 Capacity Expansion Project Phase 1 Ex-Post Monitoring Report, CPG JV seems to have been selected through competitive bidding. Moreover, maintenance of Line 1 seems to have been outsourced to a different company from July 2000 to 2009.

preventive maintenance, corrective maintenance and management of consumables including spare parts etc. for Line 1, and LRTA supervises the performance of the company. At the time of ex-post evaluation, bidding is being conducted for implementation of the south extension project of Line 1 from Baclaran station to Cavite region and O&M of Line 1 (they are planned to be conducted under public-private partnership (PPP)), and O&M of existing Line 1 is planned to be handed over to a private company in 2015[35]. The south extension project is expected to be completed in 2016, and concession period is expected to be 32 years and concession contract amount paid by a private company is expected to be 16 billion pesos in total[36]. According to the executing agency, the concession contract will probably be signed among DOTC, LRTA and a private company, however, which organization to receive the concession contract amount has not been determined, and there are many uncertainties regarding the concession contract.

The number of permanent staff in LRTA is 357 in total and that of contract staff is 1,319 in total, as of the end of September 2012[37]. Among these, 50 permanent staff and 842 contract staff are assigned in the Line 1 Operations Department, 41 permanent staff are assigned in the Line 1 and 2 Engineering Department, of which 19 staff are assigned for Line 1[38]. The number of staff in CPG JV company is 463 in total as of January 2013, of which 154 staff are assigned in Rolling Stock Department, 67 staff are assigned in Tracks and General Repair Department, 110 staff are assigned in Infrastructure Department, and 84 staff are assigned in Electronics Department (48 staff in other departments)[39]. LRTA checks performances of CPG JV company through check lists and regular reporting is required from the company based on the monitoring procedure for engineering and maintenance activities, and proper supervision is conducted by LRTA.

In summary, while currently sufficient numbers of staff are assigned for O&M of Line 1 and no major problem is seen in institutional aspects of O&M, there are many uncertainties regarding details of future O&M system, and future steps need to be monitored.

3.5.2 Technical Aspects of Operation and Maintenance

Majority of permanent staff assigned for Line1 in LRTA's Engineering Department are engineers, and majority of staff assigned in Rolling Stock Department, Tracks and General Repair Department, Infrastructure Department and Electronics Department in CPG JV company are also engineers and technicians[40]. Various manuals for proper O&M are prepared in LRTA, and trainings are provided based on these manuals, and a check test is conducted once or twice a

35 Source: interviews with LRTA
36 Source: same as above
37 Source: documents provided by LRTA
38 Source: same as above
39 Source: same as above
40 Source: documents provided by LRTA

year to check the level of proficiency[41]. Trainings have been provided on train driving of first to third generation vehicles on Line 1 (360 hours in total), vehicle and infrastructure control and operating system (for operation supervisors) (32 hours in total), Automatic Train Protection (ATP) system (8 hours in total), and automatic fare collection system (96 hours in total) etc.[42]

At the time of ex-post evaluation, sufficient numbers of technical staff are assigned, various O&M manuals are in place and trainings have also been provided, and thus, no major problem is seen in technical aspects of O&M.

3.5.3 Financial Aspects of Operation and Maintenance

Fares of Line 1 have been fixed at 12 to 15 pesos, and while the proposed fare revision was approved by LRTA Board of Directors in February 2011, it was deferred by DOTC due to the public nature of urban railways[43]. Due to fares being fixed at low levels, LRTA's net operating profit has been in chronic deficit (net income has been largely in deficit even with government subsidy) as shown in Table 8, and farebox ratio (operating revenue / operation cost except for depreciation cost) for recent three years has been 101-115%, which is just to cover operation cost. Moreover, at the time of project appraisal, while LRTA's capital was approximately 2.9 billion pesos, accumulated deficit was approximately 5.2 billion pesos, which resulted in capital deficit of approximately 2.3 billion pesos[44]. In order to improve the financial standing of LRTA, the Philippine government planned to amend LRTA's charter to enable an increase of its authorized capitalization, however, according to the executing agency, the proposed Bill to increase its capitalization to 100 billion pesos is still at the stage of proposal, and the amount of liabilities in 2012 is 3.3 times of the 2001 level, and capital deficit has been continued to the present as shown in Table 9. As explained above, O&M of Line 1 is planned to be conceded to a private company in the near future and four companies have bid for the contract so far, however, which organization to receive the concession contract amount has not been determined, or a government guarantee for a certain portion of fare revenue is not planned to be provided to a private company, despite the fact that it is difficult to revise fares, and under this situation, hundreds of questions have been raised by bidders[45]. Thus, it will require a long time to conclude a concession contract, and currently it is unforeseeable whether O&M of Line 1 will really be conducted through concession. However, as shown in Table 10, cash flows of LRTA have been positive due to regular subsidies from the Philippine government. While major improvement of LRTA's financial status is desired, cash flows in recent years have been positive

41 Source: documents provided by LRTA and LRT Line 1 Capacity Expansion Project Phase 1 Ex-Post Monitoring Report
42 Source: documents provided by LRTA
43 Source: same as above
44 Source: JICA appraisal document
45 Source: interviews with LRTA

and the possibility for the Philippine government to provide LRTA with financial support continuously would be high due to LRT's highly public nature, even if O&M of Line 1 is not conducted through concession.

Table 8: Profit and Loss Statement of LRTA

(Unit: million pesos)

	2010	2011	2012
Operating Revenue	3,079	3,127	2,858
Direct Operating Expense	1,989	2,122	1,818
Maintenance Cost	628	709	606
Gross Profit	1,090	1,005	1,040
Net Operating Profit	▲1,780	▲1,204	▲614
Net Income	▲5,932	▲1,772	▲1,549

Source: prepared based on documents provided by LRTA

Note: figures of 2012 are results of transactions until October 2012.
Net operating profit was calculated by gross profit - selling and general administrative expenses (salary, depreciation cost, bad debts etc.).
Recovery of net income in recent years is mostly attributed to fluctuation of exchange rates.

Table 9: Balance Sheet of LRTA

(Unit: million pesos)

	2010	2011	2012
Asset			
Fixed Asset	46,262	45,886	44,981
Current Asset	6,046	12,593	11,864
Asset Total	52,308	58,479	56,846
Capital/Liability			
Capital	▲17,056	▲18,824	▲20,375
Fixed Liability	62,947	65,092	66,117
Current Liability	6,417	12,211	11,104
Capital/Liability Total	52,308	58,479	56,846

Source: prepared based on documents provided by LRTA

Note: figures of 2012 are results of transactions until October 2012.

Table 10: Cash Flows of LRTA

(Unit: million pesos)

	2010	2011
Cash Flows from Operating Activities	▲298	1,632
Cash Flows from Investing Activities	▲501	▲1,619
Cash Flows from Financing Activities	371	4,485
Net Increase in Cash and Cash Equivalents	▲428	4,498
Cash and Cash Equivalents at the Beginning of the Year	783	356
Cash and Cash Equivalents at the End of the Year	355	4,854

Source: audit report on LRTA HP (2012)

3.5.4 Current Status of Operation and Maintenance

At the time of ex-post evaluation, preventive maintenance of rolling stocks and other equipment and facilities is conducted regularly by CPG JV company, in which inspection, functional testing, cleaning, lubrication, and replacement of parts are conducted at accumulated operational distance and certain intervals of time, and corrective maintenance, in which equipment and facilities in a faulty condition are restored, is also conducted (preventive and corrective maintenance is regularly conducted for rail tracks, power supply systems, signalling systems, telecommunication systems, automatic fare collection systems, and buildings and facilities including stations and depot etc.)[46].

Table 11 shows a list of facilities that were not operational at the time of inspection in January 2013 and still not operational at the time of ex-post evaluation (April 2013), among those procured under this project.

Table 11: List of Non-Operational Facilities

Facility	Quantity	Situation
Automatic Gates (AFCS)	6	Waiting for delivery of spare parts
Passenger Agent Machine (AFCS)	11	Waiting for delivery of spare parts
On-board ATP System	27	Parts are under procurement by LRTA (most parts from depleted rolling stocks were cannibalized and used for operational rolling stocks, and hence no impact on train operation currently)
Air Conditioning Unit for First Generation Rolling Stocks	30	Under replacement of spare parts
Third Generation Rolling Stocks	3	Three cars are non-operational due to a collision accident in 2011 and waiting for procurement by DOTC

Source: documents provided by LRTA

According to the executing agency, facilities above that were procured under this project are all under the procurement process of spare parts etc. and there is no difficulty in procuring these parts. On the other hand, while not subject to this ex-post evaluation, among 28 in total of second generation rolling stocks that were procured under the phase 1 of this project, only 8 are currently operational[47]. For second generation rolling stocks, defects started to be found as early as one to two years after the start of operation, and spare parts are not easily available in markets, as the number of suppliers is limited, which has resulted in unsatisfactory bidding for such parts[48]. According to the executing agency and JICA Philippine Office, spare parts for first generation rolling stocks are also becoming obsolete, and first and second rolling stocks will be phased out in the concession of O&M for Line 1, and fourth generation rolling stocks (120

[46] Source: documents provided by LRTA
[47] Source: documents provided by LRTA
[48] Source: LRT Line 1 Capacity Expansion Project Phase 1 Ex-Post Monitoring Report and interviews with LRTA

vehicles) are planned to be procured under the south extension project of Line 1 with Japanese ODA loan. Operating rate of rolling stocks is hoped to be improved by these actions.

Some problems have been observed in terms of institutional and financial aspects of O&M, therefore sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed at developing an urban transportation system in Metro Manila which was mainly dependent on road transport, reducing traffic congestions and materializing mass passenger transportation, by additionally procuring rolling stocks and improving signalling system etc. for Light Rail Transit (LRT) Line 1.

Relevance of this project is high, as the project is consistent with priority areas of Philippine's development plans and Japan's ODA policy, and moreover development needs for the project are high. While the actual number of passengers of Line 1 at the time of ex-post evaluation is about the half of the estimated number in the project appraisal, the number has been increasing steadily year by year, and evaluating comprehensively by taking into account the operating rate of rolling stocks, operation interval, and results of the beneficiary survey etc., effectiveness is judged to be fair. Efficiency of the project is also fair, as while actual project cost was lower than planned cost, actual project period significantly exceeded planned period. Sustainability of the project is also fair, as some problems were observed in the financial situation of the Light Rail Transit Authority (LRTA), which is responsible for operation and maintenance (O&M) of Line 1, and future O&M system.

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

4.2 Recommendations

4.2.1 Recommendations to the Philippine Government

(1) Due to fares being fixed at low levels, LRTA's net operating profit has been in chronic deficit. It would continue to be in deficit without revising fares for Line 1, and while an approval from the government is required, it is desirable to revise fares for LRTA's sustainable management.

(2) There are currently many uncertainties regarding the concession contract for O&M of Line 1. It is desired for the government to follow up the concession to process it smoothly.

4.2.2 Recommendations to the Executing Agency

According to interviews with the executing agency, spare parts that can be shared among second and third generation rolling stocks, which were procured under the phase 1 and 2 of the

project respectively, are only 5%, and the executing agency is faced with difficulties to procure parts for second generation rolling stocks. While first and second generation rolling stocks are planned to be phased out and fourth generation rolling stocks (120 vehicles) are planned to be procured with Japanese ODA loan in the near future, it is desirable to carefully consider the specification of spare parts when preparing bidding documents for fourth generation rolling stocks, so that parts can be commonly used among third and fourth generation rolling stocks as much as possible.

4.2.3 Recommendations to JICA

None

4.3 Lessons Learned

When implementing railway capacity expansion projects over several phases, procurement of spare parts would become time-consuming and might result in unsuccessful biddings, which might lead to lower operating rate of rolling stocks, if there are few spare parts that can be commonly used among different generations of rolling stocks. It is desirable to carefully consider the specification of spare parts that can be commonly used across generations and that are widely available in the market when preparing bidding documents.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	**Package A (procurement of rolling stocks / civil works):** ・ Procurement of rolling stocks (4 car-train x 12 sets = 48 cars, air-conditioned) ・ Procurement and installation of signalling system (ATC/ATP/ATO/ATS) ・ Upgrading of the existing communication system ・ Procurement of additional equipment for the existing automatic fare collection system (AFCS) ・ Track-work within depot ・ Upgrading of power distribution equipment ・ Civil works (upgrading of stations and depot) **Package B (procurement of air conditioners for exiting rolling stocks):** ・ Procurement of air conditioners for existing (first generation) rolling stocks (64 cars)	**Package A (procurement of rolling stocks / civil works):** Below were added to the original scope: ・ Structural soundness study of Line 1 structures ・ Replacement and strengthening of walls at 15 stations ・ Replacement of a roof and walls of the depot **Package B (procurement of air conditioners for exiting rolling stocks):** Below were added to the original scope: ・ Renovation of existing rails and sleepers (approximately 4km) ・ Replacement of faulty air conditioning units of the 2nd generation vehicles ・ Procurement and installation of equipment for AFCS (automatic gates / ticket machine) delivered by French company ・ Procurement of equipment and spare parts for track works
2. Project Period	April 2000 – January 2004 (46 months)	April 2000 – June 2009 (111 months)
3. Project Cost Amount paid in Foreign currency Amount paid in Local currency Total Japanese ODA loan portion Exchange rate	 19,639 million yen 6,551 million yen (2,184 million pesos) 26,190 million yen 22,262 million yen 1 peso = 3.0 yen (As of August 1998)	 Unknown Unknown 21,841 million yen 20,540 million yen 1 peso = 2.27 yen (Average between April 2000 and September 2008)