

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



Second Magsaysay Bridge

1.1 Background

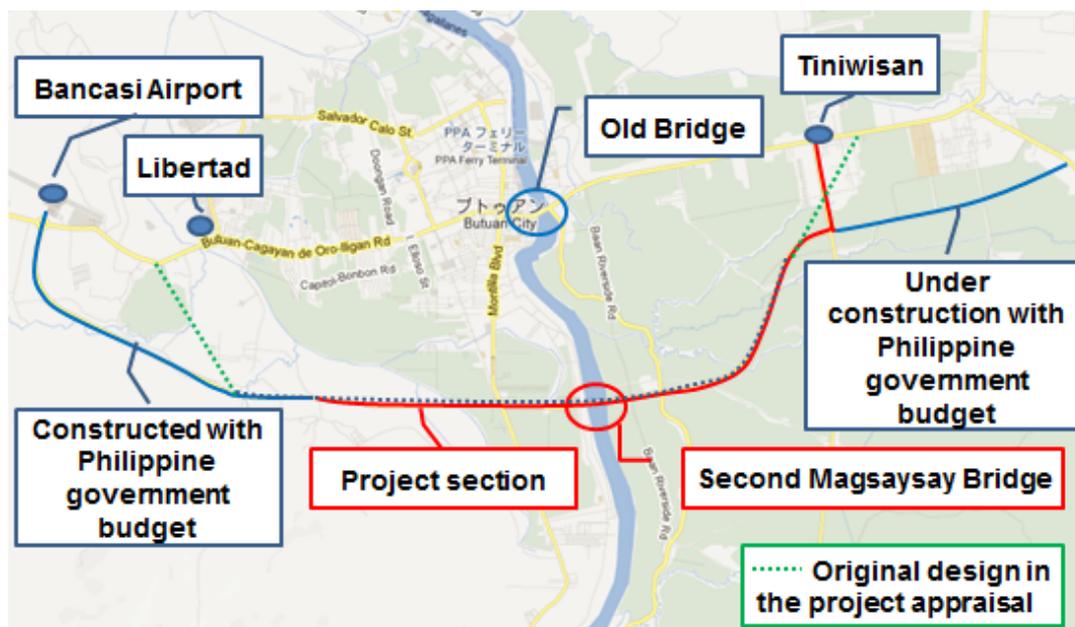
Road transportation is the most important transportation means in the Philippines, where the share of road transportation was approximately 90% of the total passenger transportation and approximately 50% of the total freight transportation at the time of project appraisal¹. The island of Mindanao, where 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	<p>Construction Works: Interest Rate: 0.95% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: Japan tied²</p> <p>Consulting Services: Interest Rate: 0.75% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: bilateral tied</p>
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: B³)

3.1 Relevance (Rating: ③⁴)

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 Plan⁷.

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 assets⁹. Moreover, the Caraga¹⁰ 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 period¹¹.

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 bridge¹², 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 constraint¹³. 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 policy¹⁴.

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 Effectiveness¹⁵ (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 survey¹⁶, 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 evaluation¹⁷. 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

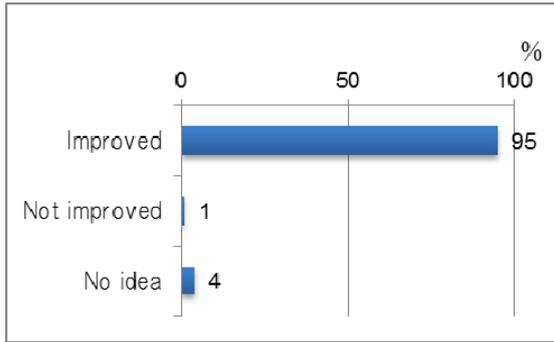


Figure 2: Traffic Congestion around the Old Bridge after Project Completion

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.

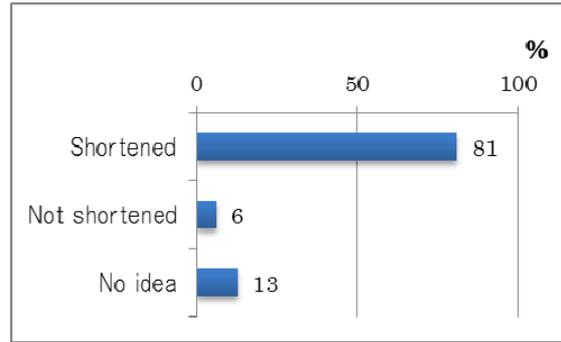


Figure 3: Travelling Time on the Old Bridge Route after Project Completion

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.

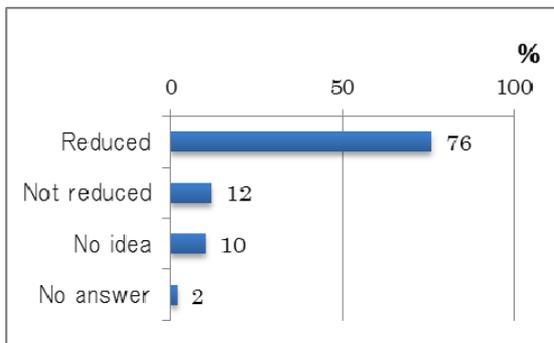


Figure 4: Travelling Cost after Project Completion

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.

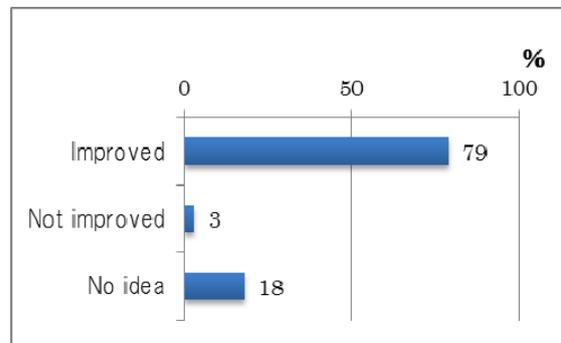


Figure 5: Accessibility to Key Places for Daily Life (shops, markets, schools, hospitals, and offices etc.) after Project Completion

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.

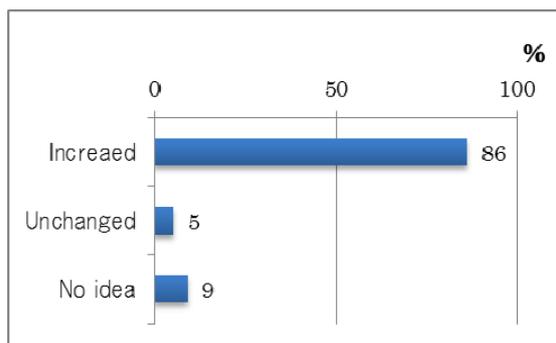


Figure 6: Changes on the Amount of Commercial Products Transported to Markets in the Region

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

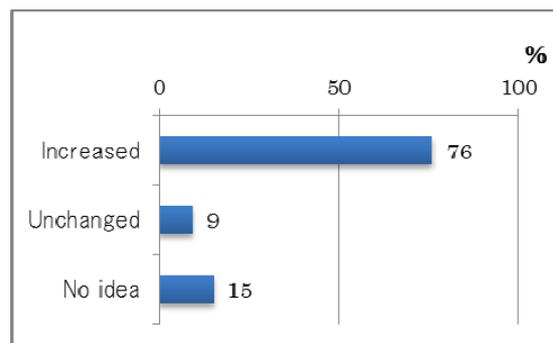


Figure 7: Changes on Local Economic Activities

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 road¹⁹, however, the actual area acquired was approximately 22 ha²⁰. 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	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 road²¹. 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 project²². 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 ground²⁴.

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 yen²⁵. 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 possible³². 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 2012³³, and that of the District Engineering Office is about 60 at the time ex-post evaluation³⁴. 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 Office³⁵.

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 labourers³⁶. Civil engineers have approximately 20 years of work experience³⁷.

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 provided³⁸.

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 allocated³⁹. 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 bridges⁴¹. 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

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	3,068 million yen	3,683 million yen
Amount paid in Local currency	1,107 million yen (395 million peso)	2,039 million yen (906 million peso)
Total	4,175 million yen	5,722 million yen
Japanese ODA loan portion	3,549 million yen	3,506 million yen
Exchange rate	1 peso = 2.8 yen (As of January 2000)	1 peso = 2.25 yen (Average between August 2000 and December 2008)