Republic of Malawi

FY2018 Ex-post Evaluation of Japanese Grant Aid Project

"Project for Improvement of Blantyre City Roads (Phase I, II, III)"

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0. Summary

The project aimed to reduce transportation time and alleviate traffic congestion, as well as to reduce annual maintenance costs by rehabilitating and widening targeted sections of the trunk road which created bottlenecks, thereby contributing to ensuing safe and smooth transportation in Blantyre City, the largest commercial city in Malawi. The objectives of the project have been relevant to the Malawian development policy from the time of planning to ex-post evaluation, development needs, and the Japanese ODA policy at the time of planning. As it is considered that both the change of the commissioned consultant in Phase I[1] and the reduction in the project scope in Phase II were unavoidable, the relevance is high. The relevance of the change of the commissioned consultant and the reduction in planning scope was recognized. Therefore, by comparing the achievement with the revised plan, the project cost and period exceeded the original plan, due to the revision of the plan and delays in the measures to be taken by Blantyre City Council (hereinafter referred to as "BCC"), the implementing agency. Therefore, efficiency is fair. The project aimed to increase the average speed and decrease maintenance costs. However, traffic congestion has not been mitigated as anticipated due to the population increase in Blantyre City, and the average speed was less than that of the target figure. By contrast, the target for the reduction in maintenance costs was achieved, with significantly lower costs. There were positive impacts to some extent, in the form of a reduced number of traffic accidents. Thus, the effectiveness and impact of the project are fair. The BCC's organizational structure for maintenance is set with support of the National Road Authority (hereinafter referred to as "NRA"). It is expected that BCC will receive technical support from NRA, which will repair the large-scale roads in the future. However, BCC's financial status for road maintenance is uncertain. Additionally, it cannot be assessed that BCC's maintenance techniques are adequate and that maintenance is thoroughly conducted in every necessary place in a timely manner. Therefore, sustainability of the project effects is fair.

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

[1] The official title does not include Phase I; the evaluator noted this to clearly distinguish it from Phase II and Phase III.

1. Project Description

Project Location

Blantyre City

The Chipembere Highway
Rehabilitated by the Project

1.1 Background

Since Malawi is a landlocked country, transportation for passengers and supplies depends on overland transportation. Therefore, infrastructure maintenance, including for roads, is an important issue for economic development of the country. However, maintenance for most of the existing roads is not carried out sufficiently due to financial limitations. Therefore, deterioration and damage to the road surface have progressed, and the pavement rate of the main highway was approximately 43%.

Blantyre City is located about 250km south from the capital city, Lilongwe. It is the center of commerce and industry in Malawi. Most of the city roads were built in the 1950s. With increases in traffic and deterioration of the road facilities (drainage, pavement, shoulders, etc.) over the years, pavement destruction continued to increase. In addition, chronic traffic jams and accidents occurred due to increases in motor vehicles, which seriously affected civic life.

The Malawian Government requested a grant aid to conduct repairs of 42 existing road routes in Blantyre City. As a result, JICA conducted the preliminary survey in 2006.

Based on the survey results, which included 42 road routes, Chipembere Highway and Livingstone Avenue were identified as playing an important role in civic life, industry and commerce in Blantyre City. On the other hand, pavement deterioration of these two roads had increased remarkably, and traffic volume exceeded 30,000 vehicles per day due to the inflow of traffic from four main national roads which adjoin from outside the city. The survey revealed that this inflow caused chronic traffic congestion, and as a result, these two roads were selected as targets for the project.

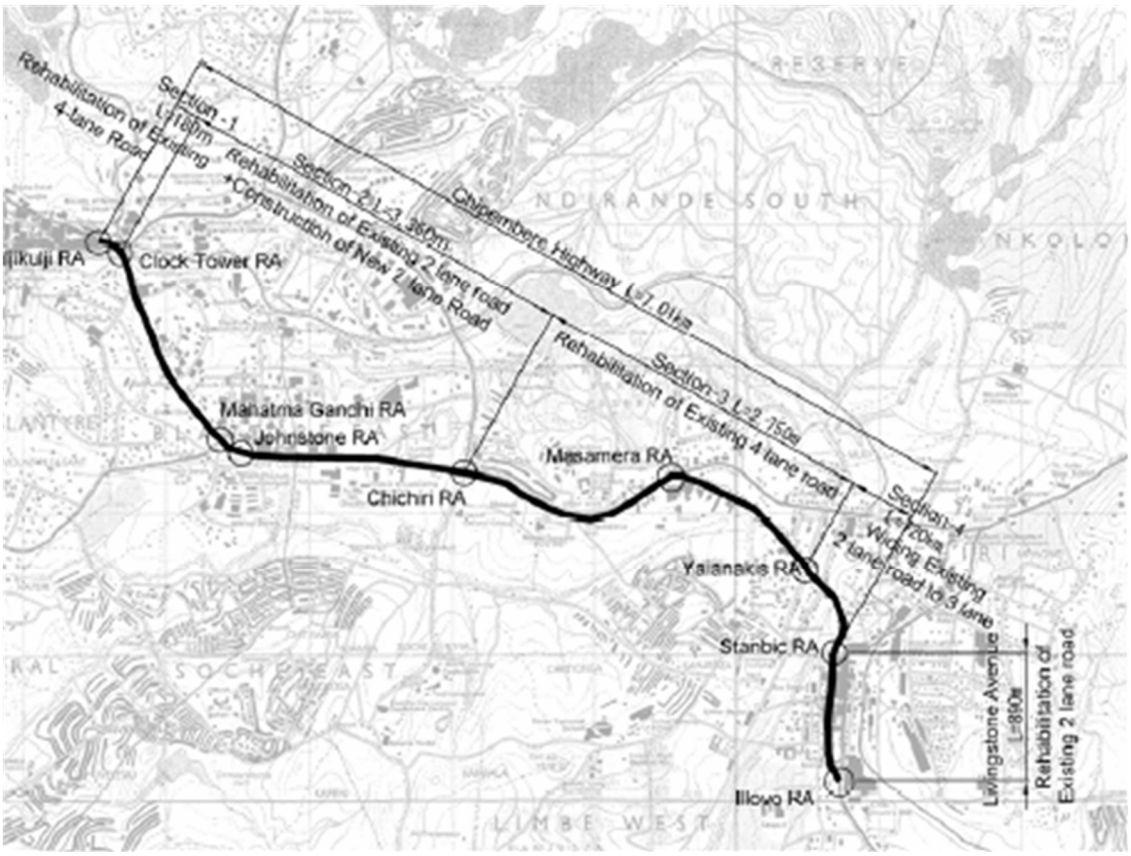

Figure 1: Target Road of the Project

1.2 Project Outline

The objective of this project is to reduce transportation time, alleviate traffic congestion, and reduce annual maintenance costs in Blantyre City, the largest commercial city in Malawi, by rehabilitation and expansion of the bottlenecked sections of the main roads, thereby assuring safe and smooth traffic flows. As indicated in Figure 1, the project phases and sections have been divided as per Table 1.

Table 1: Stage of Each Project and Target Section

Name of the project	Name of road	Section	Distance (m)
The Project for Improvement of Blantyre City Roads I/II, II/II (Phase I)	Chipembere Highway	Section1	180
		Section2	3,360
The Project for Improvement of Blantyre City Roads (Phase II)		Section3	2,750
The Project for Improvement of Blantyre City Roads (Phase III)	Livingstone Avenue	Section4	720
		Section5	890
Total			7,900

E/N Grant Limit / Actual Grant Amount	(1) “The Project for Improvement of Blantyre City Roads I/II, II/II” 1,383 million yen / 743 million yen (I/II) (Section 1, 2) (2) “ditto Phase II” 899 million yen/ 646 million yen (Section 3) (3) “ditto Phase III” 684 million yen/ 684 million yen (Section 4, 5)
Exchange of Notes Date/ Grant Agreement Date	(1) “The Project for Improvement of Blantyre City Roads I/II, II/II” July, 2007 (2) “ditto Phase II” June, 2010 (3) “ditto Phase III” December, 2013
Executing Agency	Blantyre City Council (BCC)
Project Completion	(1) “The Project for Improvement of Blantyre City Roads I/II, II/II” September, 2009 (I/II) (Section 1, 2) (2) “ditto Phase II” July, 2013 (Section 3) (3) “ditto Phase III” October, 2015 (Section 4, 5)
Target Area	Blantyre City
Main Contractors	(1) “The Project for Improvement of Blantyre City Roads I/II, II/II” Shimizu Corporation (2) “ditto Phase II” NIPPO Corporation (3) “ditto Phase III” World Kaihatsu Kogyo Co., Ltd.
Main Consultants	(1) “The Project for Improvement of Blantyre City Roads I/II, II/II” Eight-Japan Engineering Consultants Inc. (2) “ditto Phase II” Katahira & Engineers International (3) “ditto Phase III” Katahira & Engineers International
Basic Design/ Preparatory Survey	(1) “The Project for Improvement of Blantyre City Roads I/II, II/II” Basic Design: November to December, 2006 (2) “ditto Phase II” Preparatory Survey: October to November, 2009 (3) “ditto Phase III” Preparatory Survey: August, 2013
Related Projects	・EU “Rehabilitation project of Golomoti - Monkey bay (M10）” (2000 - 2006) (Loan) ・EU “Blantyre City Road Management Support Program” (2007) (Grant) ・World Bank “Rehabilitation of Selected Urban Roads in Blantyre” (2004 – 2006)

2. Outline of the Evaluation Study

2.1 External Evaluator

Kazuko Shirai, Kaihatsu Management Consulting, Inc.

2.2 Duration of Evaluation Study

The ex-post evaluation study was conducted with the following schedule.

Duration of the Study: November 2018 - December 2019

Duration of the Field Study: February 4th, 2019 - February 15th, 2019

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

3.1 Relevance (Rating:③[3])

3.1.1 Consistency with the Development Plan of Malawi

At the time of the project planning, high priority was given for pavement maintenance, periodic maintenance, and repairs outlined in the plan of NRA, *Road Sector Investment Plan* (2003-2012, hereinafter referred to as "ROADSIP"). *Malawi Growth and Development Strategy* (2006-2010, hereinafter referred to as "MGDS"), the medium- and long-term development strategy of the Malawian Government, declared the provision of safe and economical services. *The MGDS II* (2011-2016) promoted maintenance and improvement of the road.

At the time of the ex-post evaluation, the *Strategic Business Plan* (2017-2022) of NRA, which is the strategic plan of the road sector, aims to conduct the following: periodic inspection of 814km of paved roads, periodic inspection of 150 km of dirt roads, repair of 540km of paved roads, repair of 190km of dirt roads, pavement of762km of dirt roads, and the establishment of 50km of new roads by 2022. Thus, at the time of project planning through project completion and during the ex-post evaluation, it can be said that the government's development program placed importance on road infrastructure maintenance.

The BCC's overall development plan, established in 1999, had not been updated or implemented at the time of the project plan's development in 2006. Additionally, no plan was newly established by the time of the ex-post evaluation. Furthermore, BCC formulated *the Investment Development Plan_Long Term* (2018 to 2028) (hereinafter referred to as "IDP2018/28") as a road repair plan at the time of the ex-post evaluation of Blantyre City. Repair and extension maintenance of the targeted roads are planned in IDP2018/28. Therefore, the consistency of the targeted roads maintenance by Blantyre City is high from a policy perspective at the time of the ex-post evaluation.

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

[3] ③: High, ②:Fair, ①:Low.

3.1.2 Consistency with the Development Needs of Malawi

Malawi depends on land transportation for supplies and passenger movement. However, deterioration of the road surface has increased. Therefore, road infrastructure maintenance was considered one of the most important issues for Malawi. Most of the roads in Blantyre City, a commercial and industrial metropolis, were built in the 1950s. However, the pavement rate was low at 24%, and notable pavement destruction due to road traffic had occurred. Chronic traffic jams and traffic accidents due to too many vehicles affected everyday life. In this context, the targeted routes were selected following a comprehensive and systematic selection process. After 2011, road infrastructure maintenance for economic development in Malawi was extremely important following the suspension of the general financial assistance by some donors and economic growth stagnation caused by inflation in 2012.[4]

It can be said that Blantyre City's road maintenance project was consistent with the development needs of Malawi during the planning period.

The importance of the targeted roads has not changed at the time of ex-post evaluation for Blantyre City, and maintenance needs remain extremely high.

3.1.3 Consistency with Japan's ODA Policy

At the commencement of the project, the Japanese Government considered several policy elements, including synergies with "*Vision 2020,*" the long-term national development strategy; the MGDS, cooperation with economic and social development indicators of the Millennium Development Goals achievement; and cooperation with other donors. The Japanese Government also noted in its policy that it would support Malawi on the basis of the Tokyo International Conference on African Development process. One of the important sectors of Japan's ODA for Malawi in FY2008 included economic infrastructure maintenance in sustained economic development.[5] In FY2010, when Phase II began, the Japanese Government regarded infrastructure development including road transportation infrastructure as an important sector for support. At the start of Phase III, the Japanese government declared the maintenance of the industry base as one of the most important sectors in the assistance policy for Malawi (April 2012), and supported the infrastructure maintenance such as the road transportation sector to promote an international corridor and the effective transportation of passengers to surrounding areas.

Therefore, it can be said that the Japanese policies were consistent during all phases of the project.

3.1.4 Appropriateness of the Project Plan and Approach

The project amended its plan due to two issues: (1) re-exchange of commissioned consultant

[4] Preparatory Survey Report for Phase II p.4-2 and Preparatory Survey Report for Phase III p.1-2.
[5] Country Databook (FY2008)【40】Malawi p.655.

contract, execution of the second preparatory survey, and re-exchange of Exchange of Note (hereinafter referred to as "E/N"), and (2) reduction in scope. The evaluator of the ex-post evaluation examined the appropriateness of these approaches as follows.

(1) Re-exchange of Consultant Contract, Execution of the Second Preparatory Survey, and Re-exchange of E/N

The specifications of Phase I were modified in the Basic Design (hereinafter referred to as "B/D") of 21 items, such as (a) from cement stabilization roadbed to a granular adjustment, (b) from half flexible pavement to reforming asphalt pavement, (c) thinning the thickness of a concrete block, and change in specification of curbstone. While these modifications were agreed, the project was delayed because the negotiations over the amendment proved time-consuming. As a result, the commissioned consultant could not allocate its staff.[6] Due to this background, JICA conducted the second preparatory survey and the E/N conclusion, and the project schedule was adjusted with approximately two years of delay from the original plan.

Sections 1 to 5 were included in one package, and Phase I project implemented Sections 1 and 2. The commissioned consultant who undertook Phase II (Sections 3 to 5) took over after Section 3 without changing the B/D concept.[7]

Because the commissioned consultant who conducted Phase I of the project declined a detailed design and construction management duties, a second preparatory survey and the E/N conclusion were necessary to continue the project.

(2) Reduction in Scope

The section of 1.61km (Yianakis Roundabout, [hereinafter referred to as "RA"] to Illovo RA), which was consequently included in Phase III, was originally included in Phase II. However, Phase II was delayed due to delays in the measures to be taken by BCC,[8] unavailability of oil products due to the lack of foreign currency in Malawi, and the inappropriate construction of the Malawian subcontractor.[9] Especially, the lack of foreign currency from 2011 to 2012 and the

[6] Source: Interview with the commissioned consultant.

[7] One road is usually developed with the same specification. The second consultant recognizes that the concept changed in the phase I is more appropriate than the specifications before the change of the project.

[8] During the construction of Phase II, BCC had difficulties to secure the budget for the transport of underground facilitates. Water pipes, electrical cables, telecommunication lines were not managed by BCC, and it was difficult to use these facilities for other purposes. Therefore, BCC needed to procure new materials (imported goods). BCC could not start to transport these facilitates until it could provide 100% of the pre-payment. Due to the shortage of foreign currency at that time, the managing institutions also had difficulty to procure those imported materials. BCC eventually completed the payment for these facilities, then it implemented the transportation (source: answer from the questionnaire to the commissioned consultant).

[9] According to the construction company, the company selected the subcontractor by evaluating mainly of estimation among several candidate Malawian subcontractors, which had been selected by the evaluation of experiences to participate in the Japanese grant-funded road construction in Malawi. The main construction company re-outsourced the overall construction, procurement of major equipment and materials, quality test of construction materials, and examination of daily management. However, despite management by and instructions from the main construction company, the subcontractor had fallen into the situation that it could not handle with its capacity by redundant sub-

influence of the fuel crisis were so severe that they had a significant impact on economic activities in Malawi as well as the everyday lives of the Malawian people.[10] It was extremely difficult for the construction company and the commissioned consultant to maintain services without assurances of project continuation, while expenses increased.

Although BCC expected the construction to continue, the scope of Sections 4 and 5 was cut and Phase II included Section 3 after nearly a year of discussions among the Japanese Embassy in Malawi, JICA Malawi office, the commissioned consultant, the construction company and BCC. Consequently, Sections 4 and 5 were undertaken as part of Phase III after the review survey was conducted in 2013.

A reduction in the scope of Sections 4 and 5 was, therefore, necessary as a result of this background, including re-examination.

Therefore, the implementation of the project is highly relevant to the Malawian development policy, the country's development needs, and the Japanese assistance policy at the time of both planning and the ex-post evaluation. Since the change of the project plan was a necessary measure, it can be concluded that there is no issue regarding the adequacy of the approach. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

Table 2 indicates the planned and actual outputs of the project. As discussed in Relevance, the change of commissioned consultant of Phase I, the preparatory survey and the E/N conclusion were undertaken again since the contract for the consultant of Phase I was reconsidered. In addition, problems of oil procurement and the delay in measures to be taken by BCC, which were occurred during the implementation of Phase II, caused a scope reduction of a part of Phase II which was implemented as Section 3.

As for the construction and rehabilitation of roads and facilities during the implementation of Phase I, it became difficult for the construction company to procure cement and an appropriate Malawian subcontractor. The measures taken by BCC, such as the transfer of the underground facilities, were also considerably delayed. In order to improve construction speed and to complete the construction, the specifications were largely modified from the B/D. At the time of the ex-post evaluation, BCC noted that these modifications of the design were appropriate for the local conditions. As durability was not negatively affected by the revised road specifications at the time of the ex-post evaluation, it is safe to conclude that the output was achieved upon project completion.

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contractor's contracts among several large-scale constructions. This caused the correspondence order to the project was subordinate to other projects. Due to this, staffing and construction equipment placement, and most of other preparatory works did not proceed as scheduled, which caused a large delay for construction.

[10] Interview with the World Bank and the Malawi Confederation of Chambers of Commerce and Industry.

Table 2: Contents of the Plan of Outputs and Actuals per Phase

Original Plan (2007) The Project for Improvement of Blantyre City Roads (I/II, II/II)	Actual: (1) The Project for Improvement of Blantyre City Roads (I/II, II/II) (Phase I)	Actual: (2) The Project for Improvement of Blantyre City Roads (Phase II)	Actual: (3) The Project for Improvement of Blantyre City Roads (Phase III)
The Project for Improvement of Blantyre City Roads (I/II)			
Section 1: renovate asphalt of existing 4-lane (0.18km)	Renovate asphalt of existing 4-lane construction extension: 0.18km		
Section 2: repair existing 2-lane + install 2 new lanes (3.36km), repair existing asphalt, improve roundabout, install drainage (side ditch), bus stop and bus turnout space, streetlights, curbstone, walkway	Renovate existing 2-lane of 2.36km, newly constructed 2-lane 3.36km, 10 bus stops (both ways), no results in bus turnout, 46 streetlights, 6 signals, 14,072m of curbstone installation, 10,993m^{2}concrete panel block footpath, 1,217m^2 asphalt pavement		
The Project for Improvement of Blantyre City Roads (II/II)			
Section 3: repair pavement of existing 4-lane (2.75km), bus stop, bus turnout for 5 minibuses, install of streetlights, drainage facility (trapezoid ditch), repair existing curbstone and walkway	Not implemented	Construction extension: 2.75km, bus stop: L=40m, 6 bus stops, bus turnout: not implemented, lights: 45, drainage pipe=195m, U- type +V-type side ditch=702m, repairment of curbstone=5,884m, footpath rehabilitation=5.555m^2, street sign 46, 1 set of mark line	

Original Plan (2007) The Project for Improvement of Blantyre City Roads (I/II, II/II)	Actual: (1) The Project for Improvement of Blantyre City Roads (I/II, II/II) (Phase I)	Actual: (2) The Project for Improvement of Blantyre City Roads (Phase II)	Actual: (3) The Project for Improvement of Blantyre City Roads (Phase III)
Section 4: extent from existing 2-lane to 3-lane, repair existing pavement, install bus stop, minibus turnout, install street lights and drainage facility (U-type ditch with cover), develop drainage course maintenance until an end, structure (culvert), install curve stone, newly construct a walkway	Not implemented	Not implemented	Expanded existing 2-lane to 4 lane (720m)[11], change from lower subbase, newly construct one bus stop (both ways), no results in minibus turnout, newly installed 33 streetlights, U-type ditch with cover interlocking block pavement, repair drainage route until the end, extended 2 existing arch culverts φ1,500 total 23.1m with expansion of asphalt base course and surface course, install interlocking block asphalt on right side (A=1,900m^2) and new U-type ditch with cover （L=1,249m）, newly constructed curbstone and walkway (L=1,422m)
Section 5: repair existing 2-lane, install drainage facility (U-type ditch), repair and newly construct curbstone, repair walkway	Not implemented	Not implemented	Change from lower base as repair of existing 2-lane (A=9,068m2), construct asphalt surface course (A=8,408m^2), Newly installed U-type ditch with cover (L=1,585m) and repair drainage until the end and walkway, inter blocking asphalt A=2,735m2, repair drainage until the end (L=257m), newly installed curbstone and walkway (L=1,561m)

Source: The evaluator synthesized Table 2 by referring to the planning documents, completion reports of three phases and interviews with the commissioned consultants

[11] Two lanes in Section 4 (720m) were planned to be extended to three lanes at the planning stage of Phase I. Afterward, BCC requested to extend up to four lanes during the planning of Phase II. After technical examination by the commissioned consultant, it was determined that four lanes were appropriate. There is no actual impact to the project period and cost of Phase III.

As discussed above, the construction distance of the output of the project was developed according to the revised plan. BCC noted that the durability of the output was more or less secured during the time of project operation. There was significant downsizing from the B/D of Phase I, including the change from the half flexible pavement to reforming the asphalt pavement, as a solution to overcome the difficulties in procuring cement and an appropriate Malawian subcontractor and improving construction speed. At the time of the ex-post evaluation, however, the degradation of durability due to change in specifications had not occurred.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual amount of the project expense from the Malawian side planned in the B/D and the project preparatory survey was not available during the ex-post evaluation.[12] Therefore, the evaluator focused her efficiency analysis on the input based on the project expense from the Japanese side. With regard to output, the evaluator examined the achievement of the roads and facilities to be constructed and procured with grant aid from the Japanese side.

The review of the plan was carried out by the preparatory survey and a project formation survey following the start of the project. As indicated in "3.1.4 Appropriateness of the Project Plan and Approach," validity of the plan change at each stage was confirmed. Therefore, in this project evaluation, the evaluator judged each phase based on the comparison of planned expenses and results for Phase 1, and the expenses based on the amended plan and results for Phases II and III.

Table 3 indicates the planned and actual costs at each phase. The expense for Section 3 of Phase II increased due to delays in the measures to be taken by BCC, an increase in fuel costs due to the shortage of foreign currency, and prolonged construction owing to delays in preparatory works such as placement of Malawian subcontractor staff and construction machinery.

Table 3: Plan and Actual of the Project Cost

(million yen)

Project Name	Bears by the Japanese Side			Bears by the Malawian Side	
	Plan	Actual	%	Plan	Actual
The Project for Improvement of Blantyre City Roads I/II, II/II (Phase I)	I/II (Section1,2): 854	743	87	19	Unknown
	II/II (Section 3,4,5): 529	Not implemented	— —		
The Project for Improvement of Blantyre City Roads (Phase II)	Section3: 465	Section3: 649	140		
	Section4: 229	Section4: Not implemented	— —		
	Section5: 205	Section5: Not implemented	— —		
The Project for Improvement of Blantyre City Roads (Phase III)	Section4: 343	Section4: 343	100		
	Section5: 341	Section5: 341	100		
Total	2,003*	2,076	104		

*The cost for unimplemented parts were deducted from the total amount.

Source: Evaluator synthesized based on information from JICA and interviews from the commissioned consultants.

[12] BCC insisted that it had installed the streetlights all the alongside of target roads. However, this information was not included in the evaluation, since the backup information and data were not submitted by BCC.

The project cost was planned at 2,003 million yen, whereas the actual cost incurred was 2,076 million yen. Therefore, the project cost exceeded the plan (104% of the plan). The key reason for the cost increase relates to materials,[13] especially gasoline and oil.

3.2.2.2 Project Period

In the examination of the project period in this evaluation, as discussed in "3.2.2.1 project expense," the evaluator compared the plan and the results with the project period for each phase.[14] The start of Detailed Design was set at the start of the project period.

The primary reason for the delay in Phase I is the change of the commissioned consultant and the delays in BCC's measures. The cause of the delay in Phase II was that it took time for BCC to move out underground facilities such as telephone wires and water pipes. Procurement difficulty of oil products including the fuel due to the lack of foreign currency and the other oil-related materials also occurred, and the discussion between concerned stakeholders prolonged while the reduction in the scope of Phase II was discussed. Consequently, the construction was suspended. In Phase III, fuel shortages occurred, but it was within the tolerance level of the commissioned consultant and the construction company. In addition, store and office managers alongside the targeted roads voluntarily cooperated to close their shops and offices.[15] The project was completed earlier than planned because of these factors.

The planned and actual implementation period in each stage are presented in Table 4.

Table 4: Planned and Actual Project Period

Target Project	Period (months)		
	Plan	Actual	%
The Project for Improvement of Blantyre City Roads I/II, II/II (Phase I)	I/II (Sections 1, 2): 18	27	150
The Project for Improvement of Blantyre City Roads (Phase II)	Sections 3, 4, 5: 18	Section 3: 37 Sections 4, 5: not implemented	206
The Project for Improvement of Blantyre City Roads (Phase III)	Sections 4, 5: 16	Sections 4, 5: 14	86
Total	52	78	150

Source: Information from JICA and interviews with the commissioned consultants.

[13] In 2012, the Malawi Government utilized the Extended Credit Facility (ECF), a financing system of the International Monetary Fund (IMF) to carry out long-term restructuring to improve international trade balance. When Malawi used a financing system, IMF required the devaluation of its currency. However, the financing was frozen at one time because former President Mutharika continued to refuse the devaluation of kwacha. The political power was replaced, and the Malawian Government carried out a devaluation of large kwacha of 50% for the dollar for the reopening of ECF in May 2012. As a result, a price hike was caused in Malawi, particularly for fuel costs. (sources: Country Assistance Evaluation of the Republic of Malawi, 2012, Ministry of Foreign Affairs; Mitsubishi Research Institute, February 2013)

[14] The project plans of each section of Phases II and III were not available. Since the contents of the project and distance are different from each section, the evaluator decided to compare the plan and result by phase.

[15] Source: Interview with the commissioned consultant. BCC also observed that store and office managers voluntarily cooperated because they were aware that they would benefit from the project by witnessing the construction of roads in Phase I and II.

The project period exceeded the plan by 150%, as 52 months were planned whereas the actual implementation period was 78 months. The major reasons for the excess were preparatory survey and re-conclusion of the E/N due to the change of commissioned consultant (Phase I), the difficulties to obtain fuel due to shortage of foreign currency, BCC's delay in moving out the facilities , the reduction in scope (Phase II), which led to implement Phase III.

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

3.3 Effectiveness and Impacts[16] (Rating: ②)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

Table 5 Quantitative Effect Indicators and Results

	Baseline	Target	Actual
	2009	2018	2018/2017[17]
		3 Years After Completion	3 Years After Completion (Time at Ex-post Evaluation)
Indicator 1: Average moving speed at morning and evening peak time (morning at 7-8 am, evening 5-6 pm) will be improved. All the Sections of 7.9km will be targeted.	Average 36km/h	Average 55km/h	Average 31km/h (2018)
Indicator 2: Maintenance cost of road rehabilitation will be reduced. (million MWK)	1.4 million MWK (101,400USD)	6.63 million MWK (48,000 USD)	1.5 million MWK (2,083USD) (2017)

Source: Synthesized by the evaluator based on the information from JICA, BCC and the result of actual measurement.

(1) Indicator 1: Increase in average moving speed in morning and evening peak time

As a result of the actual measurement of each section at peak time by applying the average moving method, the average speed was below the baseline (36km/h)[18] at the time of ex-post evaluation. Therefore, this indicator was not achieved. The reasons which prevented the achievement of the target average speed (55km/h)[19] were: (a) economic growth in Blantyre City (average economic growth rate of 4.98% from 2008 to 2017),[20] was accompanied by population growth, with a 23% increase in the number of residents from 650 million (in 2008) to 800 million (in 2018)[21]; (b) even though target roads were rehabilitated, the other roads are connected as a

[16] Sub-rating for Effectiveness is to be put with consideration of Impacts.
[17] the JICA document.
[18] The target figure of 55km/h was achieved on some straight roads.
[19] According to the commissioned consultant, it set the target figure of 55km for the average speed based on the design speed (60km in section 3, 50km in sections 4 and 5) and expected future traffic volume by considering the GNI and GDP growth rate.
[20] Source: https://www.imf.org/en/Countries/MWI#countrydata (accessed on September 26, 2019).
[21] Source: *2018 Malawi Population and Housing Census*, Table 2.5. Population density by region and district (P14) http://www.nsomalawi.mw/images/stories/data_on_line/demography/census_2018/2018%20Malawi%20Population%

road network, and in this circumstance, it can be presumed that more vehicles would enter the target roads unless adjacent roads were equally developed; and (c) the traffic congestion occurred especially at all the roundabouts[22] on all the target sections. During the ex-post evaluation, the evaluator tried to obtain data on the number of vehicles in Blantyre City for a causal analysis of the present situation regarding driving speed. However, the BCC does not measure traffic volume. The Road Transportation Directorate under the Ministry of Transportation is amending the vehicle registration system. The Road Transport Operation Association also does not capture vehicle registration numbers accurately.

(2) Indicator 2: Reduction in Annual Maintenance Cost for the Target Road

BCC conducts maintenance works such as cleaning of roads and drainages and exchanging of bulbs of streetlights. According to BCC,[23] the maintenance cost for target roads decreased significantly to approximately one-fiftieth of cost as indicated in Table 6. Therefore, this indicator was achieved against the target.

Table 6: Comparison of Maintenance Costs (MWK）(USD）

Baseline in 2009	Target in 2018	Actual in 2017
14million MWK (101,400 USD)	6.63million MWK (48,000 USD)	1.5million MWK (2,083 USD)

Source: Synthesized by the evaluator based on the information from JICA and BCC.

According to BCC, the maintenance cost was reduced for two reasons: (a) expenditure of maintenance was reduced because the road was rehabilitated and became smooth, and (b) drainage rehabilitated by the project prevented roadside damage. BCC recognizes that the target roads after rehabilitation are structured to be durable against heavy rain. Therefore, the damage level stays at minimum when compared with other roads in the city.

3.3.1.2 Qualitative Effects (Other Effects)

The evaluator interviewed BCC and the National General Hospital, located alongside the target roads in Blantyre City, about shortening the deployment time which was identified as a qualitative effect at the time of planning. Since the National General Hospital does not own an ambulance, and the patients are brought to the hospital by vehicles arranged by themselves, the hospital was not aware of the change in emergency transportation time.

20and%20Housing%20Census%20Main%20Report.pdf (accessed on September 26, 2019).

[22] Rarjikuruji RA, Clock tower RA, Mahatma Ganj RA, Chichili RA, Masamera RA, Yianakis RA, Stanbick RA, and Illovo RA.

[23] Response to the questionnaire shared with BCC and the JICA document. The exchange rate in 2017 in the JICA document (1USD=720MWK) was used.

3.3.2 Impacts

3.3.2.1 Intended Impacts

(1) Quantitative Impacts

1) Decrease in Traffic Accidents

During planning, the project was expected to ensure smooth traffic flow by road development and ensure safe transportation by installing streetlights and improving junctions. The number of traffic accidents was 2,590 at the time of the preliminary survey. The annual number of accidents in the target road at the time of the B/D survey in FY2005 was 533 cases. According to the information obtained from the Southern Province Police Headquarters, the number of accidents according to the severity in the target roads is shown in Table 7.

Table 7: Number of Accidents According to Severity Along the Targeted Roads

	Characteristics of Accidents				
Year	Death	Serious	Minor	Damage to vehicle	Total
2016	8	5	82	108	203
2017	6	2	69	96	173
2018	3	6	79	156	244
Total	17	13	230	360	620

Source: Answers to the questionnaire by the Southern Province Police Headquarters.

Zebra Pad Constructed During the Project (section 2)

As indicated in Table 7, the number of annual traffic accidents decreased by more than a half from the pre-project (533) to the post-project completion time (203,173 and 244). Most facilities, such as zebra pads and traffic signs, which were constructed under this project, are appropriately used. Therefore, it can be assumed that the project contributed to a decrease in traffic accidents to some extent. In addition, in recent years, fatal accidents tend to decrease according to the results presented in Table 7. According to the explanation of the Southern Province Police Headquarters, the space between curbstones placed by the project contributed to the mitigation of shock that vehicles would receive during an accident and reduced the seriousness of accidents. Therefore, it can be considered that the project's specifications have contributed to reducing the seriousness of traffic accidents.

2) Increase in Traffic Volume

The traffic survey is not included in the normal duties of BCC; therefore, it is difficult to

precisely comprehend the traffic volume along target roads. The Transport Operation Association, which consists of private companies in the road sector in Malawi, carries out a project to promote safe driving. According to the Association, the number of registered vehicles has been increasing in Blantyre City. However, the ground data was not provided by the Road Transportation Bureau under the Ministry of Transport. Even if the number of registered vehicles does not increase, it is difficult to regard the increased or decreased number of registered vehicles as the increased or decreased traffic volume, since traffic congestion may occur even when vehicles just make a detour to use the rehabilitated roads.

3.3.2.2. Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

Regarding the planting, which was indicated in the Environment Impact Assessment (hereinafter referred to as "EIA"), BCC argues that it has continuously planted trees and flowers along the target roads and median strips. It also recognizes that air pollution has been reduced to some extent due to smoother traffic flow on the target roads.[24] The evaluator confirmed that the felling and tree planting on the roadside were done appropriately by BCC, and the negative impact on the environment was not observed. The EIA report was obtained from BCC, however, monitoring reports were not available. Although BCC argued that it followed the items indicated in the EIA report, there is no evidence obtained by the commissioned consultant or the evaluator. Therefore, it could not be confirmed that BCC took appropriate measures to mitigate negative impacts on natural resources.

(2) Resettlement and Land Acquisition

The agreement was formulated among the neighboring people concerned[25] through the stakeholder meeting conducted at the time of planning in Phase I. During the planning of Phase II, based on the discussion with Blantyre City, it was confirmed that the project would undertake the narrowing of the footpath width but would not transfer any part of the existing buildings that had crossed the border on the roadside, because such transfer would be difficult. During the planning of Phase III, it was also confirmed that the owners agreed on the transfer of underground facilities and that the compensation for transfer and the transfer itself were completed.[26] It was reconfirmed in the ex-post evaluation that despite the time required for negotiations, the BCC compensated the owners of underground facilities without major issues.

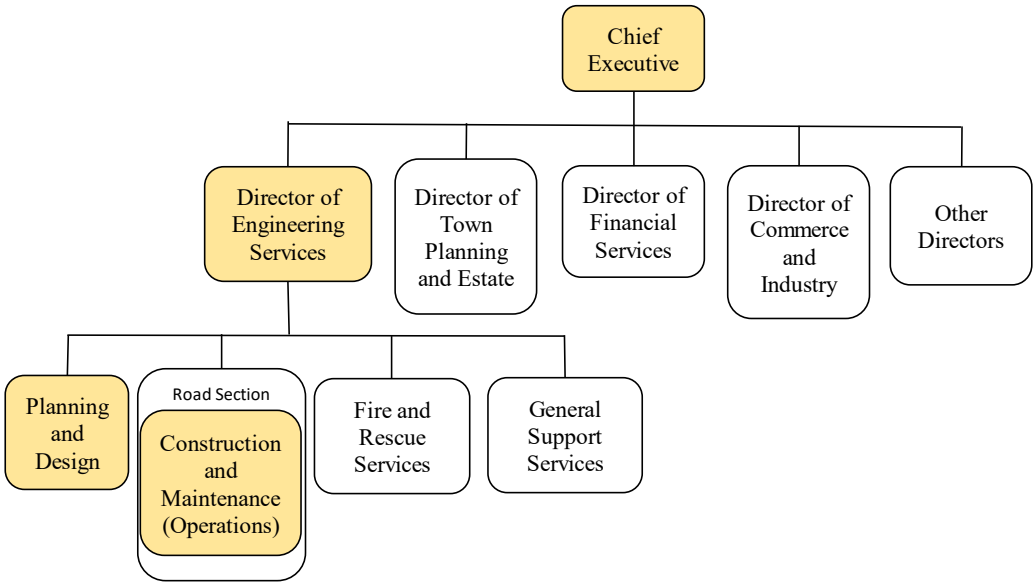
This project has achieved its objectives to some extent. Therefore, effectiveness and impacts of the project are fair.

[24] Source: Responses to the questionnaire shared with the BCC.
[25] This included people from public institutions such as schools, hospitals, residents, shop/office managers, local authorities, and owners of bus and truck.
[26] Source: Preparatory Survey Reports for Phase II and Phase III.

3.4 Sustainability (Rating: ②)

3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

BCC is responsible for the rehabilitated roads and the maintenance of their facilities, which did not change from the initial project planning stage. Figure 2 shows the organizational chart, indicating BCC's operating structure of the Directorate of Engineering Service in charge of road maintenance management at the time of the ex-post evaluation. The organizational structure of BCC has not changed since project planning, with the exception of the creation of the Directorate of Commerce and Industry.



*The colored parts indicate the department and sections in charge of maintenance.

Source: Prepared by the evaluator based on the answers to the questionnaire from BCC.

Figure 2: Organizational Chart of BCC

The number of technical staff belonging to the Road Section of Directorate of Engineering Service in BCC falls short of the planned number, as Table 8 indicates. Only four staff are placed while the number of planned posts is eleven. According to BCC, there is a high turnover of engineers in the Directorate due to their tendency to change jobs to private companies that pay higher wages. As a result, it is difficult to fill vacant positions.

Table 8: Staff Allocated to the Road Section of the Directorate of Engineering Services

	No. of Planned Posts	No. of Allocated Posts
Manager	1	1
Technical Staff in the Road Section	11	4
Technical Staff in Other Sections and Office Clark	-	298
Total	-	303

Source: BCC

In Malawi, NRA is in charge of the pothole rehabilitation and overlay in five and ten years respectively after the completion of the local road. NRA also provides technical support concerning road maintenance management by providing the staff of the Road Section in the Directorate of Engineering Service. Demarcation between BCC and NRA is clear as it was at the time of planning. As shown in Table 9, the staff positions have been filled as planned for both head and regional offices within NRA. As these staff accomplish the duties mentioned above and supplement the maintenance activities of the BCC, the shortage of BCC engineers does not affect the maintenance of the target roads and facilities that much.[27]

Table 9: Placement of NRA Staff

＜Head Quarters＞

Position	no. of post	no. of actual placement
Chief Executive Officer	1	1
Department Directors	4	3
Managers	5	5
Chief Engineers	4	4
Senior Engineers	7	7
Environmental Specialist	1	1
Transport Economist	1	1
Others	38	36
total in HQs	61	58

＜Regional Office＞

Position	no. of post	no. of actual placement
Chief Engineers	3	3
Maintenance Engineers	12	11
Road Inspectors	15	15
Others	30	20
total in regional office	60	49

Total in HQs and regional office	121	107

Source: NRA

Since the future maintenance plan of the target roads is incorporated in IDP2018/28, which is an investment project for all of Blantyre City, it is expected that policy support from the city will continue.

Therefore, sustainability of maintenance activities from the institutional/organizational aspect is anticipated to a certain degree.

3.4.2 Technical Aspect of Operation and Maintenance

BCC conducts repair works including the re-application of traffic signs, the sealing of cracks, patching, and other breakages regularly under IDP2018/28 are monitored by a maintenance supervisor of NRA. BCC and NRA collaborate in the non-periodical maintenance. Engineers of BCC hold bachelor's degrees, with one engineer holding a master's degree, and receive additional technical support from a maintenance supervisor of NRA. The BCC staff attend the infrastructure maintenance training from the National Construction Industry Council. NRA conducts human resource development for the NRA staff in domestic technical schools and it dispatches lecturers irregularly to conduct training. The training is carried out for the BCC engineers on the project base, and the training for NRA does not target them. However, NRA recognizes that BCC

[27] Source: Interviews with BCC and NRA.

engineers have the necessary technical capacity to some degree.[28] In addition, concrete technical assistance for BCC provided by the NRA regional office was not identified by the evaluation survey directly.

Therefore, the sustainability of the maintenance of the targeted roads in the technical aspect is expected to some degree. However, the sustainability of operation and maintenance cannot help being judged as fair because the NRA regional office did not indicate either in writing or verbally the concrete contents of technical support to BCC.

3.4.3 Financial Aspect of Operation and Maintenance

As indicated in Table 10, the financial status of BCC is provided for four years, indicating both positive and negative annual balances. Based on these figures, a trend is difficult to extract. The expenditure for maintenance over the past several years is unknown because the Department of Engineering Service which is in charge of the road maintenance cost, and the Department of Finance which integrates the overall budget of BCC did not disclose the expenditure of road maintenance. In addition, whereas the IDP2018/29 includes the maintenance plan for the targeted roads in the future, the budget for the plan is not stated, and as a result, the financial status for future maintenance is unclear. According to NRA, it will allocate its budget for overlay in Sections 1 and 2, which will be over 10 years after completion of the construction, if NRA determines that the overlay is necessary as the result of the survey. As for Sections 3 to 5, the necessity of overlay will be discussed by NRA 10 years after completion. The ex-post evaluation confirmed that NRA partially bore the maintenance cost for the roads including rehabilitation of potholes in Blantyre City.[29]

In summary, the maintenance costs of BCC are not clearly identified, and it cannot be assumed that the budget will be met even with support from the NRA.

[28] Source: Response to the questionnaire shared with NRA.
[29] NRA spent 306,692.26MWK on pothole restoration in 2017/2018, and 2,880,688.18MWK for pothole and drainage restorations in 2018/2019 (source: NRA).

Table 10: Financial Status of Blantyre City Council

(0,000MWK)

Annual income	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Project income of BCC	2,958,723	2,309,104	3,368,205	4,283,795
Government subsidy	532,405	2,335,184	873,695	689,288
total	**3,491,128**	**4,644,288**	**4,241,900**	**4,973,083**
Annual expenditure	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Human resource	931,502	1,188,466	1,142,604	1,734,888
General expense	2,225,815	935,858	1,810,275	2,270,337
Maintenance	697,566	751,438	748,501	886,459
Fixed assets	45,916	1,724,990	34,283	37,391
Repayment	48,052	22,000	100,050	238,138
Total	**3,948,851**	**4,622,752**	**3,835,713**	**5,167,213**
Annual balance	**(457,723)**	**21,536**	**406,187**	**(194,130)**

Source：BCC

3.4.4 Status of Operation and Maintenance

BCC, with the technical support of NRA, conducts periodic inspections, such as cleaning of road surfaces, drainage facilities, and the road facilities and daily maintenance, such as planting, repairs, the sealing of road cracks, patching, re-application of markers on the road surface, and the repair of damaged roads. Thus, significant damages to the roads were not observed.

On the other hand, according to the observation by the evaluator at the time of the ex-post evaluation, damages to the sidewalk of the targeted roads were noted. According to BCC, the reasons for the damages are (i) leakage from underlying water pipes, (ii) settling of subgrade material, and (iii) dislodging or cracking of weakly compacted material. On the other hand, BCC also recognizes that the budget is insufficient, and they cannot repair points that they cannot judge clearly by observation as dangerous to pedestrians and drivers. Some plates, which indicate that the Japanese supported the rehabilitation of the road, were stolen[30]. It cannot help but say that careful maintenance by BCC has been lacking for this reason.

Footpath near a large shopping mall (section 2)

Footpath in Livingstone Av. (section 5)

Stolen plate at Yainakis Av. (section 3)

[30] BCC explained that these plates were damaged when many people gather for meetings.

As stated above, the organization of this project is expected to be sustained to some extent, and technology and management are regarded as fair. However, some minor problems have been observed in terms of the organizational and financial aspects. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendation

4.1 Conclusion

The project aimed to reduce transportation time and alleviate traffic congestion, as well as to reduce annual maintenance costs by rehabilitating and widening targeted sections of the trunk roads which created bottlenecks, thereby contributing to ensuring safe and smooth transportation in Blantyre City, the largest commercial city in Malawi. The objectives of the project have been relevant to the Malawian development policy from the time of planning to ex-post evaluation, development needs, and the Japanese ODA policy at the time of planning. As it is considered that both the change of the commissioned consultant in Phase I and the reduction in the project scope in Phase II were unavoidable, the relevance is high. The relevance of the change of the commissioned consultant and the reduction in planning scope was recognized. Therefore, by comparing the achievement with the revised plan, the project cost and period exceeded the original plan, due to the revision of the plan and delays in the measures to be taken by BCC, the implementing agency. Therefore, the efficiency is fair. The project aimed to increase the average speed and decrease maintenance costs. However, traffic congestion has not been mitigated as anticipated due to the population increase in Blantyre City, and the average speed was less than that of the target figure. By contrast, the target for the reduction in maintenance costs was achieved, with significantly lower costs. There were positive impacts to some extent in the form of a reduced number of traffic accidents. Thus, the effectiveness and impact of the project are fair. The BCC's organizational structure for maintenance is set with support of NRA. It is expected that BCC will receive technical support from NRA, which will repair the large-scale roads in the future. However, BCC's financial status for the road maintenance is uncertain. Additionally, it cannot be assessed that BCC's maintenance techniques are adequate and that maintenance is thoroughly conducted in every necessary place in a timely manner. Therefore, sustainability of the project effects is fair.

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

4.2 Recommendation

4.2.1 Recommendations to the Executing Agency

(1) Implementation of appropriate road rehabilitation as part of a city plan

The project rehabilitated the targeted roads and improved comfortability for walkers and drivers. However, it did not achieve improvement with regard to traffic congestion or the average

moving speed as envisaged. The primary reason is, even if one road is rehabilitated, traffic congestion will not be relieved unless the other connected roads are rehabilitated.[31] The BCC should formulate the appropriate city planning including the road network and carry it out. In addition, BCC is expected to mitigate the traffic congestion by securing an appropriate budget and executing works promptly along with its city road development plan.

(2) Conducting Maintenance Based on Budget Planning and Prevention Measures

Notable damage was not observed on the roads rehabilitated by the project. Environmental safeguarding measures including planting in the safety zone are in place, and the roads are maintained to some extent. However, some heavy damage was observed particularly on sidewalks. According to BCC, even though the damage of the sidewalks is found, BCC restores it only after that damage causes accidents. BCC should identify all the damaged points on the sidewalks of the targeted roads, secure the budget in advance and restore them before the actual harm is caused. In addition, BCC is recommended to conduct maintenance by setting restoration priorities based on appropriate monitoring of roads in consideration of the City's unstable financial status. Furthermore, BCC should consider taking preventive measures such as stocking spare materials (standardized illumination pillars in particular) before provision and building awareness of facility users.

(3) Early Enforcement of Traffic Jam Reduction through Adjustment of the Traffic Directions

BCC examined the traffic directions (e.g. one-way traffic at a roundabout in Section 1) as a solution to reduce traffic. As it is an effective method to create a smooth flow of vehicles, BCC should carry it out soon.

(4) Improving Accountability through Appropriate Project Documentation

BCC argued that there was no delay in the measures to be taken by BCC, such as transportation of underground facilities during Phase II. However, based on the information from the commissioned consultants and the construction company with the grounding documents, it became clear that there was a delay on BCC's side. In addition, even though the report made by BCC about the implementation of Phase II seemed to include important information such as the delay in the construction commencement time and the contract between the commissioned consultant and Malawian subcontractor, both the objectives and to whom the report was to be submitted were unclear. Therefore, the report was not referred to in the ex-post evaluation. It is necessary for BCC to enhance its skills to manage documents appropriately for ensuring accountability for public road development projects.

[31] Opinions of JICA and NRA

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

(1) Social and Economic Analysis to Set Appropriate Indicators

When a change in moving speed is used as an indicator of a roads project, JICA should set the target figure based not only on the design speed, but also on considerations for future changes in population, increases in the number of vehicles, and the development of surrounding roads. In addition, JICA should include this analysis into the terms of reference of project consultants and confirm this point. It may be useful to consider the increase in traffic volume as an indicator to show the effective use of the targeted roads.[32]

(2) Joint Monitoring During the Implementation Period and Appropriate Documentation

One of the indicators of the project was identified as below the baseline at the time of ex-post evaluation. It is effective to conduct joint monitoring by the JICA country office and the implementing agency so that the implementing agency can implement a project within the scope of the original plan appropriately and steadily. It is expected that these stakeholders monitor and review the achievement of indicators and the progress of construction. In addition to that, relevance of indicators itself should be examined during the monitoring process. As a result of monitoring, if it is not possible to calculate an indicator or it provides unintended results, the implementing agency and JICA country office can examine the circumstances, reformulate the indicator if required, and improve the project during the implementation period. Furthermore, if the indicators are re-set, or the designs are changed, the background and process of changes should be recorded so that it will be easier to confirm the facts at the time of ex-post evaluation even though the stakeholders of the project may have moved into other positions. This will contribute to the smooth implementation of future ex-post evaluations. Such joint monitoring is also expected to become a communication tool between the implementation agency and JICA country office and be utilized for more effective project management.

[32] It is possible to set the change of number of passengers and/or volume of freight flow as additional indicators for traffic volume. However, these numbers depend on the type of vehicle. It will be necessary to collect data by interviewing multiple owners. Therefore, it should be noted that when using these figures as an indicator for road projects with grant-aid, a significant volume of surveys will be necessary during planning and ex-post evaluation.