

Republic of Zambia

FY2017 Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for the Improvement of the Living Environment in the Southern Area of Lusaka”

External Evaluator: Satoshi Nagashima, INTEM Consulting Inc.

## **0. Summary**

This project was implemented with the target of improving the social infrastructures through improving access to the workplace and improving the situation of accumulation of water on the roads in the rainy season by constructing the inner ring road in the capital, Lusaka City, the access road to the multi facility economic zone, and the associated drainage facilities, thereby contributing to facilitate logistics in the capital and to improve the living environment.

This project is consistent with the development policy of Republic of Zambia (hereinafter referred to as “Zambia”) at the time of planning and ex-post evaluation. In Lusaka City, problems caused by undevelopment of roads have not been solved, and development needs are high. In addition, this project was consistent with Japan’s aid policy, and the relevance is high.

Project cost and project period of this project were within the plan. Therefore, the efficiency of this project is high.

Target indicators related to improvement of congestion to confirm the outcome of this project have not been achieved due to the problem of setting of indicators and subsequent deterioration of congestion in Lusaka City, but a certain level of effect of improving congestion was confirmed. On the other hand, since there were users’ voices concerning improvement of convenience due to the construction of bus stops near residential area due to the road construction, improvement of water accumulation on the roads in the rainy season associated with reduction of diseases due to improvement of the hygiene situation, and improvement of access to basic social infrastructure etc., and the effectiveness/impact are high.

The operation and maintenance structures of this project are not well established. The executing agencies have sufficient technical level for the operation and maintenance. The budget for the operation and maintenance of Lusaka City Council (hereinafter referred to as “LCC”) is decreasing, and the sustainability in terms of finance is low. In addition, there is no prospect of repairing road unevenness occurring at the time of ex-post evaluation, and the operation and maintenance situation also faces challenges. Therefore, the sustainability is low.

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

## 1. Project Description



Project Location



Part of constructed road

### 1.1 Background

Zambia had achieved an economic growth rate of more than 6% per year at the time of project implementation, on the other hand, it also had problems of high transportation costs compared to the other countries due to inefficient road network, structural weakness of land infrastructure and geographical conditions as an inland country. The pavement rate still remained at around 65% in Lusaka City due to lack of financial resources, it was muddy everywhere in the rainy season as drainage facilities were not in the vicinity of the unpaved road area and the hygiene situation was poor, and infectious diseases such as cholera, etc. occurred. In addition, due to poor drainage, traffic became difficult and there was a serious obstacle to access basic social infrastructures such as hospitals and schools. Further, the expansion of low-income residential areas promoted the friction between the rich and the poor and increased social unrest, and planned urban development including road improvement was considered an urgent task.

In response to these circumstances, “The Study on Comprehensive Urban Development Plan for the City of Lusaka” (hereinafter referred to as “Development Study”) was implemented from August 2007 to March 2009 by Japan for a comprehensive urban development of Lusaka City, the capital city of Zambia, including improvement of the current status of the road network. In the Development Study, the development plan of Lusaka City in the short, medium and long term was formulated. With regard to the road network of Lusaka City, traffic was concentrated in the city centre due to the radial structure, and it was suggested to eliminate traffic congestion by constructing an inner ring road in the short term. In addition, it was also expected that it a contribution to eliminating traffic congestion and improve access to the Lusaka South Multi Facility Economic Zone (herein after referred to as “LS-MFEZ”) would be made by constructing a road connecting to LS-MFEZ, which was under development in the southern part of Lusaka City. Under these circumstances, the Zambian government made a request to Japan for a grant aid project related to construct the inner ring road (southern and western areas) and the access road to LS-MFEZ. Subsequently, the project was further examined by the

“Preparatory study on Industrial Infrastructure Support Program<sup>1</sup>” conducted in January 2010, which was positioned as a preliminary survey for this project, and this project was implemented.

## 1.2 Project Outline

The objective of this project is to improve the social infrastructures for residents through improving access to the workplace etc. and improving the situation of accumulation of water on the road in the rainy season by constructing the inner ring road in the capital, Lusaka City, the access road to LS-MFEZ, and the associated drainage facilities, thereby contributing to facilitating logistics in the capital and to improve the living environment.

Grant Limit / Actual Grant Amount	2,776 million yen / 2,737 million yen
Exchange of Notes Date /Grant Agreement Date	June, 2011 / June, 2011
Executing Agency	Ministry of Local Government and Housing (Currently Ministry of Local Government), LCC
Project Completion	November 2014
Main Contractor	Shimizu Corporation
Main Consultant	Katahira & Engineers International
Preparatory Survey	July, 2010 – April, 2011
Related Projects	The Study on Comprehensive Urban Development Plan for the City of Lusaka (2009)

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Satoshi Nagashima, INTEM Consulting Inc.

<sup>1</sup> This project was requested by the Zambian government based on the recommendations of the Development Study, but since the scale of the project was large, proposals were made to classify the survey scope in the first phase and the second phase. However, due to ambiguousness of validity of dividing phases of the survey scope and the implementation framework concerning the environmental and social consideration of the Zambian government, the survey was carried out. Please refer to “3.1.4 Appropriateness of the Project Plan and Approach” for further examinations of the targets to be implemented.

## 2.2 Duration of Evaluation Study

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

Duration of the Study: October, 2017 – December, 2018

Duration of the Field Study: January 7<sup>th</sup>, 2018 – February 8<sup>th</sup>, 2018

April 15<sup>th</sup>, 2018 – April 28<sup>th</sup>, 2018

## 3. Results of the Evaluation (Overall Rating: B<sup>2</sup>)

### 3.1 Relevance (Rating: ③<sup>3</sup>)

#### 3.1.1 Consistency with the Development Plan of Zambia

In the road infrastructure development program of the *Fifth National Development Plan (2006-2010)* at the time of planning, the goals were to promote the construction of road infrastructure, to establish standards and to develop the nation, and the means were to formulate a road infrastructure development plan, to provide technical information and specifications to constructing companies and consultants, to enforce quality standards, to provide technical advice on public works to governmental organizations and construction industries, to strengthen registration systems for construction companies and consultants and to formulate training programmes for small scale contractors and engineers etc.

The *Seventh National Development Plan (2017-2021)* at the time of ex-post evaluation has listed improvements in transport systems and infrastructures as one of the development goals, and it mentions that improvement of transport systems including road and the infrastructures will expand economic interests such as supporting growth and creation of employment, enhancing economic production capacities, increasing efficiency and increasing international competitiveness.

As described above, in the national development plan at the time of planning and ex-post evaluation, there is no difference in the direction of promoting the construction of road infrastructures for economic development and it is consistent with this project, which aimed at making an impact on promoting economic activities through construction of a part of the inner ring road and improvement of access to economic zone.

#### 3.1.2 Consistency with the Development Needs of Zambia

At the time of planning, the hygiene situation was poor due to muddy places in the rainy season because of undeveloped drainage facilities around the unpaved road areas, and there was a serious obstacle for access to the basic social infrastructures such as hospitals and schools in Lusaka City. Furthermore, the expansion of disorderly low-income residential areas

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<sup>2</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>3</sup> ③: High, ②: Fair, ①: Low

around unpaved roads had promoted the friction between the rich and the poor and it increased social unrest, and a systematic urban development including road construction was regarded as an urgent task.

At the time of ex-post evaluation, according to a result of qualitative survey<sup>4</sup> for residents on target roads of this project, there were some positive opinions expressed such as perceptions of improvements in hygiene conditions and decrease of diseases such as cholera and malaria in areas where drainage facilities were constructed through implementation of the project. In addition, as the result of the implementation of this project, there were stated opinions that there was alleviation of congestion on roads parallel to the road constructed in this project and dramatic improvement of access to basic social infrastructures. Friction between the rich and the poor were not observed at the time of field survey in the ex-post evaluation.

On the other hand, according to the information from LCC, there are places that have been paved but do not have sufficient drainage facilities along other roads outside the scope of this project, and many water-borne diseases such as cholera<sup>5</sup> and mosquito-borne infections such as malaria are still occurring. In addition, according to the on-site survey, it was confirmed that chronic congestion still occurred in the centre of the city. Furthermore, disorderly habitations of low-income people are still expanding on roads that are not covered by this project, and an increasing number of illegal stores on the road side and illegal parking of minibuses create congestion and worsen the hygiene situation, leading to increased social unrest.

As described above, residents in the area around the road have recognized that the development needs such as poor hygiene conditions, occurrence of diseases, and difficulty concerning access to basic social infrastructures were largely solved due to implementation of this project in the area surrounding the target road of this project. On the other hand, those problems have not been resolved on roads adjacent to this project's target road. Therefore, development needs are still high.

### 3.1.3 Consistency with Japan's ODA Policy

There is no difference between this project and Japan's aid policy, including "Support for

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<sup>4</sup> Interview survey was conducted targeting the residents living around the roads constructed by this project. A semi structured interview was conducted for 13 places selected along the road constructed by this project for residents living in the vicinity (about two to eight persons at each place). Major question items were access to the main social infrastructures before and after the project, effects of installation of bus stops, the traffic volume of the vehicles, effects of improvement of the drainage facilities, effects of the road pavement, and other positive and negative effects etc.

<sup>5</sup> A serious cholera infection occurred in Lusaka City in January 2018 when the primary survey of this ex-post evaluation was conducted. From October 6<sup>th</sup>, 2017 to January 11<sup>th</sup>, 2018, a total of 2,905 people were infected and 67 people died. In order to prevent infection, a curfew was announced at Kanyama where there was a high population density. In addition, the start of the school's new term was delayed (Express, January 11<sup>th</sup>, 2018). The infected areas were Chipta, Kanyama, Shawama, Matero, Chilenge and Chelston as of December 7<sup>th</sup>, 2017 (reliefweb, December 11<sup>th</sup>, 2017).

efforts to formulate balanced economic structures” in priority fields in the *Country Assistance Program* formulated in 2002, and it is highly consistent with this project.

#### 3.1.4 Appropriateness of the Project Plan and Approach

Prior to implementing the above-mentioned “Preparatory study on Industrial Infrastructure Support Program”, there was a request from the recipient government to divide the project activity into two phases and implement the project such as construction of the inner ring road (southern part) and an access road to Chilimbulu road as the first phase and construction of the inner ring road (western part)<sup>6</sup> and the access road to LS-MFEZ as the second phase. On the other hand, it was announced as a policy in the survey to prioritise and implement construction of the inner ring road (southern part) and the access road to LS-MFEZ but not to conduct construction in the inner ring road (western part) due to higher traffic volume at the inner ring road (southern part) and high possibility of large scale resettlement occurring in the inner ring road (western part) while the implementation structure on the *Zambian* side was insufficient. By making the plan to exclude the inner ring road (western part) from the scope of the project in this way, the risk factor that could lead to a large delay of the project was eliminated, and it contributed to the improvement of the efficiency of the project<sup>7</sup>.

Meanwhile, since construction of the inner ring road (western part) has not been implemented as the Phase two, it cannot fully demonstrate the effect of the road to be fulfilled such as alleviating congestion and increasing traffic volume to LS-MFEZ, and some adverse effects were observed such as the project’s originally intended effects were not fully demonstrated due to emphasis on the environmental monitoring implementation structure.

Although emphasis was placed on efficiency, problems were observed slightly on the generating effects concerning the effectiveness of the project, such as the limited effect of improving congestion, there was no influence sufficient to lower the evaluation result of relevance of the project.

From above, this project has been highly relevant to the country’s development plan and development needs, as well as *Japan’s* ODA policy. Therefore, its relevance is high.

### 3.2 Efficiency (Rating: ③)

#### 3.2.1 Project Outputs

Difference between the Plan and the actual outputs of the project are shown in Table 1 below.

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<sup>6</sup> Inner Ring Road (western part) was planned to start from Kafue road through Chibolya and Kanyama to Mumbwa road.

<sup>7</sup> In fact, even in the ex-post evaluation in this time, some problems were seen in the implementation structure of environmental and social considerations at the *Zambian* side, such as the fact that LCC did not periodically prepare monitoring reports on environmental impact assessment and resettlement.

Table 1 Difference between the Plan and the actual outputs of the project

Name of the road	Plan	Actual
Inner Ring Road	4.88km	4.88km
Extension of inner ring road	2.58km	2.58km
Access road to LS-MFEZ	4.95km	5.22km
Mini Bypass Link	1.22km	1.22km
Ben Bella Road	0.95km	0.95km
Total	14.58km	14.85km

Source: Material provided by JICA

As for the output of Japanese side, the end point was extended by about 0.27 km from the basic design period, and the access road to LS-MFEZ has been extended by 0.27 km. It is reasonable as it was a change before the detailed design, the reason for the change was appropriate, and it was determined through formal procedures. In addition, this change is reflected in the amount of the G/A.

Furthermore, according to an interview conducted in the executing agency, it was confirmed that the output by the Zambian side was as planned.

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

Regarding the project cost, it was estimated at 2,776 million Japanese yen in the plan, but the actual result was 2,737 million Japanese yen (99% of plan), which was lower than planned. In addition, the obligation of the Zambian side was estimated at about 738 million Japanese yen<sup>8</sup> in the plan due to resident resettlement expenses, obstacle relocation expenses, banking arrangement fees, etc. and at about 528 million Japanese yen (72% of plan) was spent in the actual and it was lower than planned.

#### 3.2.2.2 Project Period

Regarding the project period, the project was supposed to be completed in a total of 42 months in the plan and the project was actually completed in 41 months, which was shorter than planned (98% of the planned).

From above, both the project cost and project period were within the plan. Therefore, efficiency of the project is high.

<sup>8</sup> Converted at the average annual rate of 2011, US\$1 = 79.807 Japanese yen (International Financial Statistics: Yearbook 2011)

### 3.3 Effectiveness and Impacts<sup>9</sup> (Rating: ③)

#### 3.3.1 Effectiveness

##### 3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

The level of achievement of the indicators set for measuring the quantitative effect of this project (travel time, average speed per hour on Chilenge - city centre (8.2 km) and Kanyama - city centre (3.0 km)) are as shown in Table 2 below (For travel route on the survey of travel time and the average speed per hour, see Figure 1).

Table 2 Travel time and average speed per hour on Chilenge - city centre (8.2 km) and Kanyama - city centre (3.0 km) (peak hour)<sup>10</sup>

	Baseline	Target	Actual
	2010	2018	2018
		4 Years After Completion	4 Years After Completion
Travel time and average speed per hour on Chilenge - city centre (8.2 km) <sup>11</sup>	Travel time: 35 mins Average speed per hour: 14km/h	Travel time: 14 mins Average speed per hour: 35km/h	Travel time: 30 mins Average speed per hour: 16km/h
Travel time and average speed per hour on Kanyama - city centre (3.0 km)	Travel time: 12 mins Average speed per hour: 15km/h	Travel time: 5 mins Average speed per hour: 35 km/h	Travel time: 12 mins Average speed per hour: 15km/h <sup>12</sup>

Source: Actual measurement by the evaluator

<sup>9</sup> Sub-rating for Effectiveness is to be put with consideration of Impacts.

<sup>10</sup> A condition of the baseline value was confirmed with the designing consultant and the measurement timing was around 7:30 am on weekdays, and the survey was implemented according to the condition. It is the average value of eight times on Chilenge - city center and 10 times on Kanyama - city center.

<sup>11</sup> At the design stage of this project, there was no roads at all in some sections scheduled to develop roads in this project. Therefore, the baseline (travel time and average speed per hour) for confirming the outcome of this project is the data when passing through the Independence Avenue. The actual value is a route which passes Chilimbulu road, Yotam Muleya road and a part of the road developed by this project indicated by the dotted orange line since the starting point is not connected to the road constructed by the project.

<sup>12</sup> It took 40 minutes to reach the city centre from Kanyama on the first day of the survey (January 10<sup>th</sup>, 2018) when caught in a heavy traffic jam. However, since it was confirmed that such congestion is extremely rare in the subsequent eight surveys, the data on the first day is excluded when calculating the average value.



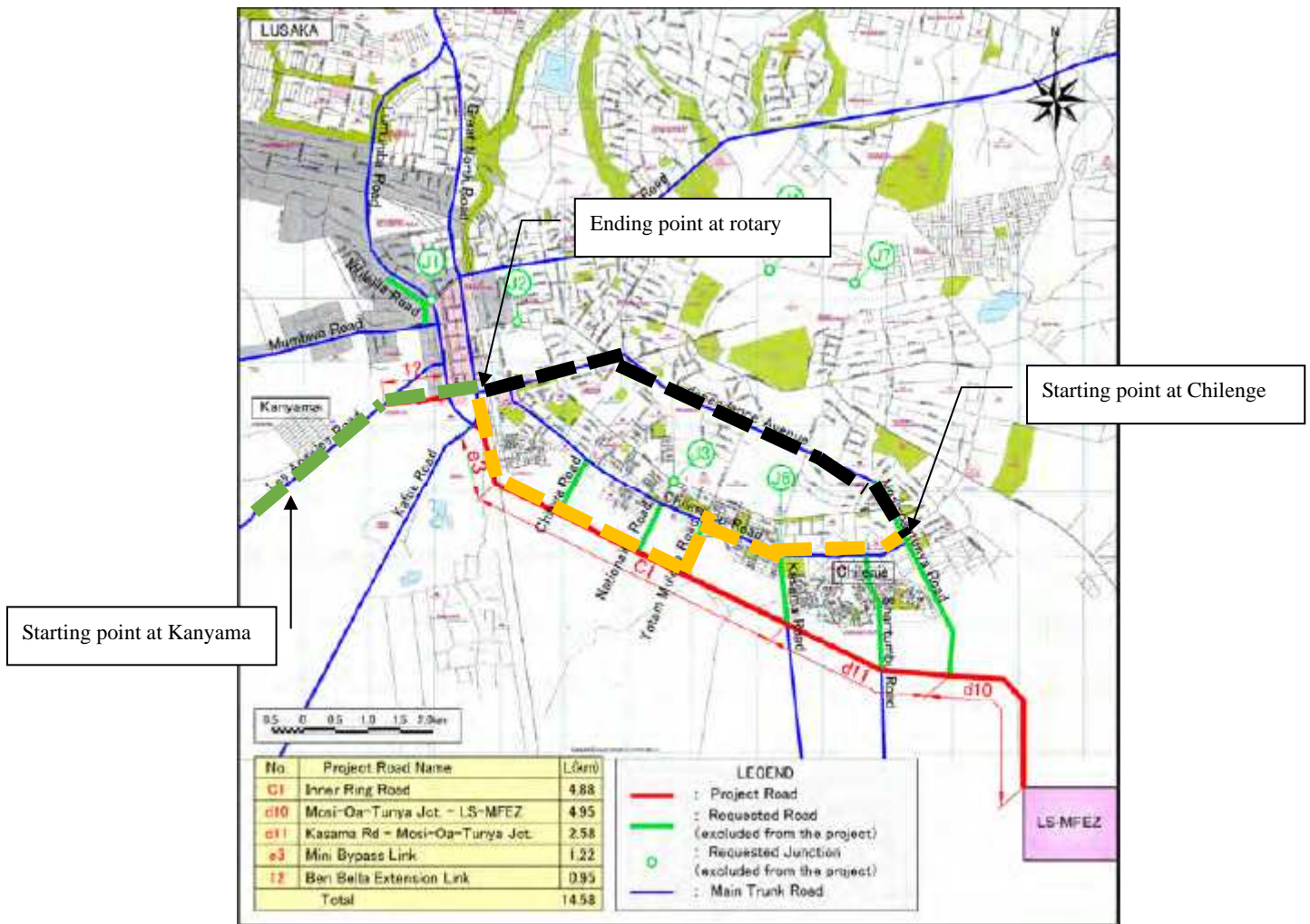


Figure 1 Road map constructed by this project and the running route for the survey of travel time and average speed per hour<sup>13</sup>

Source: Evaluator adds on the figure of the preparatory survey report

As mentioned above, indicators on the travel time and average speed per hour from Chilenge to city centre, from Kanyama to city centre have not been achieved. Regarding the one from Chilenge to city centre, though it was confirmed by interview survey that the project contributed to alleviate congestions in the Chilimbulu road etc. running in parallel by road constructed by this project, and congestion has rarely occurred at the inner ring road itself developed by this project, the travel time and average speed per hour from Chilenge to the city centre and from Kanyama to the city centre are the same as before implementation of the project. The following factors may be considered as reasons for not achieving the target value.

<sup>13</sup> Black dotted line: Assumed route of Chilenge - city centre before implementation of the project (baseline)  
 Orange dotted line: Assumed route of Chilenge - city centre after implementation of the project  
 Green dotted line: Assumed route of Kanyama- city centre after implementation of the project

(1) The target value of the indicator was set higher than the actual situation

The results of the survey on the travel time and average speed per hour of the same section at the time after the peak hour of the traffic congestion in the morning or day time are shown in Table 3 below.

Table 3: Travel time and average speed per hour (time other than peak of traffic congestion) of Chilenge - city centre (8.2 km) and Kanyama - city centre (3.0 km)<sup>14</sup>

	Target	Actual
	2018	2018
(For reference) Travel time and average speed per hour of Chilenge - city centre (8.2km) (Route passing through constructed section of the project (Orange dotted route))	Travel time: 14 mins Average speed per hour: 35km/h	Travel time: 21 mins Average speed per hour: 23km/h
(For reference) Travel time and average speed per hour on Kanyama - city centre (3.0 km)	Travel time: 5 mins Average speed per hour: 35 km/h	Travel time: 10 mins Average speed per hour: 18km/h
(For reference) Travel time and average speed per hour of Chilenge - city centre (7.7km) (Route passing through baseline route (Black dotted route))		Travel time: 14 mins Average speed per hour: 34km/h

As shown in Table 3, the travel time did not reach the target value when passing through the assumed route (via the Chilimbulu road and constructed section of this project) even if the measurement was carried out in the time zone without congestion. Many of the assumed courses are one lane, and there are many factors to prevent smooth running such as obstruction to passing intersections such as insufficient function of signals, sudden crossing of roads by pedestrians and sudden getting on and off of buses at locations other than bus stops etc., and it is difficult to run at a stable speed. Therefore, there is a possibility that the target value was set too high. On the other hand, as for the route of Chilenge - city centre which passed through the same running route of the baseline (via the Independence Avenue), it was close to the target value of the indicator. Since Independence Avenue has two lanes and there are few elements that impede traffic as described above, smooth passage is possible except at peak hours.

<sup>14</sup> It is the average value of measurement of nine times on Chilenge - city centre, six times on Kanyama - city centre and three times on Chilenge - city centre via baseline route.

(2) Base of baseline value has been changed

According to the interview survey at LCC, it is pointed out that traffic congestion has been getting worse since this project covers a part of the inner ring road and there are undeveloped sections of the inner ring road, and the situation in which traffic is concentrated in the centre of the radially spreading road network of Lusaka City has not been changed. In fact, the end point of the project's road is joined to the Kafue Road via the mini-bypass link and it leads to the rotary of the city centre, and the function of the rotary of the city centre malfunctions especially during the morning rush and it causes congestions of the road (traffic control by police officers is done in some cases, but it has not led to alleviation of congestion). Therefore, as shown in Table 4 below, it was confirmed that the travel time from Chilenge to city centre in case of passing through the baseline route also deteriorated from the target value of 35 minutes to 46 minutes.

Table 4 Travel time and average speed per hour of Chilenge - city centre (8.2 km) (in the case of passing through the same route as the baseline) <sup>15</sup>

	Target	Actual
	2010	2018
(For reference) Travel time and average speed per hour of Chilenge - city centre (7.7km) via the Independence Avenue	Travel time: 35 mins Average speed per hour: 14km/h	Travel time: 46 mins Average speed per hour: 10km/h

It is conceivable that the increase in the population of Lusaka City and the number of vehicles in Lusaka City have exerted influence as factors that have changed the base of the baseline as mentioned above. According to the statistics on the number of registered vehicles of whole of Zambia and Lusaka Province<sup>16</sup> from 2005 to 2017 (Figure 2) obtained from the Road Transport and Safety Agency, it is confirmed that the number of registered vehicles is increasing year by year, and the increase is more than around 2.2 times at 430,000 registered vehicles. Of course, such an increase in the number of vehicles is supposed to be assumed at the time of creation of indicators, but there is a possibility that the number of vehicles in Lusaka City has increased by more than the assumption.

<sup>15</sup> It is the average value of measurement of six times on Chilenge - city centre via the baseline route.

<sup>16</sup> Statistic of Lusaka Province was used as the statistic on the number of registered vehicles in Lusaka City could not be obtained. Since 76.2% of the urban population of Lusaka Province lives in Lusaka City, it is considered that many of the vehicles registered in Lusaka Province are used in Lusaka City.

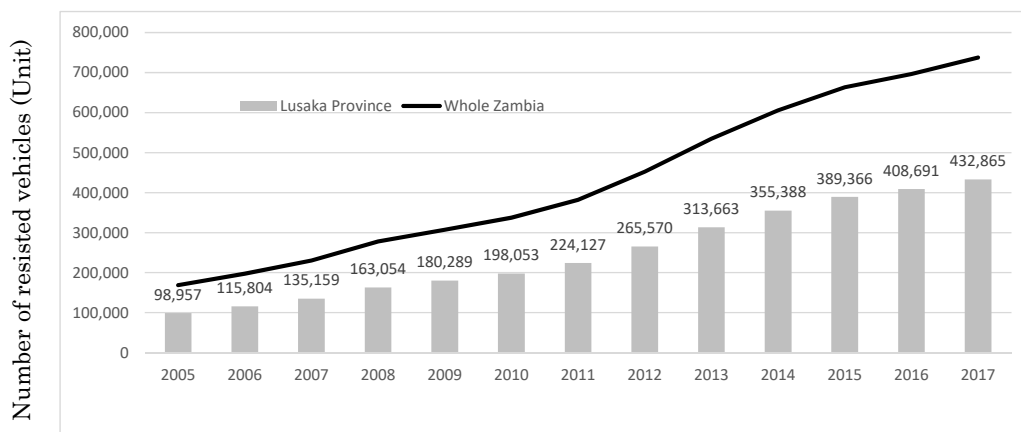


Figure 2 Trends in the number of registered vehicles from 2005 and 2017 in whole Zambia and Lusaka Province

Source: Road Transport and Safety Agency

In addition, according to the data prepared by the Central Statistical Office of Zambia, the population growth rate of Lusaka Province including Lusaka City is expected to be high during the period from 2011 to 2020 and it is the second highest after Muchinga Province in Zambia. The population growth rate of Lusaka City is predicted to be 4.2% per year, compared to a population growth rate of 3% per year in the whole of Zambia. In the Development Study, the population increase was assumed as shown in Table 6. However, according to the result of the population census of 2011 conducted by the Central Statistical Office of Zambia, it is almost the same as the population prediction in 2020 of the Development Study, and population growth is occurring at a faster pace than the assumption of the Development Study.

Table 5 Prediction of population growth for the whole of Zambia and Lusaka City, and the growth rate during the period

	2011	2020	Population growth rate
Whole of Zambia	13,718,722	17,885,422	3.0%/ year
Lusaka City (Trial calculation as 76.2% of population in Lusaka Province)	1,800,581	2,560,460	4.2%/year

Source: Central Statistical Office of Zambia

Table 6 Population forecast of Lusaka City in the Development Study

	2007	2015	2020	2030
Lusaka City	1,385,000	1,696,000	1,828,000	2,483,000

Source: Final report of the Study on Comprehensive Urban Development Plan for the City of Lusaka

According to the interview survey at the LCC, it was pointed out that due to the development

of this project, the southern part of Lusaka City, which had been unpaved and considered to have poor public safety before the project, became an attractive area, and there is a special trend of population increase.

Furthermore, regarding the route from Kanyama to the city centre, although only Ben Bella Road was developed by this project, information was obtained in the interview survey at LCC that the population is increasing year by year in Kanyama. On the Los Angeles Road which is passing Kanyama, traffic congestion is caused by hindrance of traffic due to sudden stops of buses other than bus stops and narrow road width due to illegal street vendors. Since the traffic congestion on the Los Angeles Road has not been improved, it is considered that just improving Ben Bella Road has not led to improvements of travel time and average speed per hour on Kanyama - city centre.

As described above, the target values of the travel time and the average speed per hour have not been achieved due to development of the road by this project. However, other than the problems of setting of indicators such as the target values were too high in the first place, several factors are considered to be responsible for the further deterioration of the traffic congestion in the road of Lusaka City such as the number of vehicles and population increase, in addition to the incomplete development of the inner ring road. Under such circumstances, it is considered that a certain level of effects are obtained even though it is not as same as expected, since it is possible to reach the city centre in the same or lower travel time than the baseline travel time at an average speed per hour via the road developed by this project.

#### 3.3.1.2 Qualitative Effects (Other Effects)

##### (1) Improvement of convenience of public transportation etc.

According to the results of the qualitative survey targeting the residents along the target road of this project, the constructed section of this project was unpaved or the road was not completely constructed before implementation of this project, and there was no bus stop in the neighbourhood of residence. Therefore, residents had to walk to Chilimbulu Road running parallel to the road by foot and take the bus and head for the destination from there. However, due to the construction of the road by this project, new bus stops were set up along the road, and it was possible to go from the nearby bus stops to the city centre without making connections to other buses. In this way, the convenience of public transportation for the residents around the target road was greatly improved by implementation of this project.

##### (2) Increase in traffic volume

As a result of confirmation with LCC, there was only a forecast data of the traffic volume prepared by the Development Study, and there was no traffic volume data as baseline and

measured traffic volume data at the time of ex-post evaluation. However, according to the interview survey with LCC, there was an answer that though it is highly possible that the traffic volume on the inner ring road has not reached the traffic volume predicted in the Development Study that the traffic volume has been increased compared to before since the area used to be unpaved or have no road before. It was also mentioned that the reason why the traffic volume predicted in the Development Study has not been reached is that the roads covered by this project are developed as a part of the inner ring road plan and development of LS-MFEZ is yet to be conducted. In the results of the qualitative survey targeting the residents on the target road of this project, there were many areas where the roads were not paved or there were no roads before, and there was no traffic or very little. However, several responses were obtained that the traffic volume has steadily increased due to implementation of the project.

(3) Retention of water on the roads in the rainy seasons is improved through construction of drainage.

As a result of the qualitative survey targeting the residents along the roads covered by this project, in areas where drainage was improved through implementation of this project, several opinions were obtained that there was no retention of water on roads in the rainy season and also no floods in the surrounding residential areas<sup>17</sup>.

### 3.3.2 Impacts

#### 3.3.2.1 Intended Impacts

In this project, it was assumed to contribute to smoothing the logistics in Lusaka City, as a result of construction of the inner ring road, the access road to LS-MFEZ and the connecting road to existing roads in Lusaka City as the impacts. The impacts of this project and contribution of this project are described below.

(1) Improvement of resident's standard of living by improving access to hospitals, schools and work places

As a result of the qualitative survey on the neighbouring residents (27 men, 20 women, 47 persons in total) around the target roads of this project, interview survey results showed that access to hospitals, schools and work places has been improved due to setting up bus stops in the neighbourhood after construction of the project and it was possible to reach destinations in 50% of the time and 25 to 30% of the time in cases where there were no traffic jams compared with the previous situation. In addition, due to improvement of the access, the number of households which were attracted by the target area and moved in has increased, and the

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<sup>17</sup> However, in January 2018, when the first survey was conducted, there was almost no rain in the capital, Lusaka City even during the rainy season. As a result, it was not possible to actually confirm whether floods were completely solved on the whole target road of the project when rainfall was continuous.

number of people who are targeting the increase of the population in the surrounding area and newly starting business along the road is also increasing. As a result of the effects, there were some opinions that the residents in the surrounding area do not need to go far away for shopping, and at the same time, those who do business do not need to go to the city centre and can do business near their residential area, and the sales have increased compared with the past, and a certain level of effects were observed.

(2) Traffic volume of heavy-duty vehicles going to LS-MFEZ increases.

As a result of confirmation with LCC, there was no data on the actual traffic volume of the access road to LS-MFEZ (An evaluator actually visited the gate of LS-MFEZ, but they did not keep a record of the vehicles). According to the interview with the environmental planning officer of the City Planning Division of LCC, there was an answer that though these places were previously vacant lots, a beer factory was constructed and transportation of products has been increased, and construction of other factories and employees' houses are also progressing and transportation of materials for housing construction has also been increased, and the amount of transport of goods to LS-MFEZ has been increased.

However, same as according to the environmental planning officer of the City Planning Division of LCC, there was a reply that the road constructed by this project had highly likely not reached the traffic volume assumed by Lusaka City. The reason for this is considered to be that the development of the inner ring road is underway and development of LS-MFEZ is also underway<sup>18</sup>.

For this reason, a certain effect was seen in the increase of the traffic volume to LS-MFEZ.

### 3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

According to the interviews with LCC, an environmental impact statement was prepared by a local consultant company in December 2010 and approved by the Zambian Environmental Management Agency in December 2011. During construction and after service, environmental monitoring was conducted by LCC in accordance with the environmental impact statement, but no monitoring report was prepared<sup>19</sup>. Therefore, the level of achievement of the indicators in the environmental impact statement was confirmed by a questionnaire survey. According to the results of this survey, measures were taken during the construction period and it was confirmed that there was no particular impact on the natural environment, and it is concluded

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<sup>18</sup> An evaluator visited LS-MFEZ but there were no conspicuous buildings except for the beer factory, and many plots of land have remained vacant lots. According to the interview survey at LCC, most of the land has already been sold and factories and residences for the workers are expected to be constructed in the same area in the future.

<sup>19</sup> An evaluator asked the reasons for LCC, and there was an answer that they did not know that there was an obligation to periodically prepare and submit the monitoring reports.

that the negative impact of the project did not occur.

## (2) Resettlement and Land Acquisition

According to LCC, resettlement of residents was made in accordance with the law of Zambia, a resident resettlement plan was prepared by the local consultant company in December 2010 and it was implemented according to the plan. In the data obtained from LCC, compensation was made for 75 buildings (including shops), and it was noted that resettlement of residents was done without problems. However, no monitoring report on resettlement was prepared<sup>20</sup>.

According to the interview with the environmental planning officer at LCC, sufficient amounts to buy land and house and compensation were paid to residents who moved according to the plan, and provision of alternative land was not conducted. Although there was a complaint regarding resettlement from the residents at the beginning of the plan, agreement was reached by seeing the reasonable amount of the compensation, and complaints did not occur after that. Regarding the situation of recovery of the livelihood of residents after the resettlement, since the survey was not conducted at LCC afterwards there was no information. According to the interview survey at LCC, the resettlement of residents was carried out according to the resident relocation plan and no major problem occurred. Therefore, it is highly likely that resettlement of residents was done properly, but it was difficult to confirm the fact sufficiently.

## (3) Other Impacts

### 1) Reduction of disease through improvement of hygiene situation

Since it was difficult to obtain health statistics specialized for the target area, the qualitative survey for residents on the target road of this project was conducted. According to the results of the survey, there were opinions that retention of the water on the roads and surrounding areas due to construction of drainage has been decreased and cholera has been reduced in a part of the areas. However, the population density around the target area was originally low and most of the area was not even a cholera outbreak area. On the other hand, many opinions were heard that the number of mosquito has decreased in most of the areas and the malaria infection rate has been also decreased due to the disappearance of the water retention.

### 2) Reduction of dust associated with road pavement

According to the qualitative survey targeting the residents around the target road of this project, problems of dust during the dry seasons were particularly serious, since there was no road or even if there was, it was not paved road before the project. Many opinions were expressed that even if the laundry was dried, it got soiled, or even if cleaning inside of the

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<sup>20</sup> Same as footnote 18



house was made, it was soiled with dust immediately, and it caused symptoms such as coughing. Many opinions were expressed that after implementation of this project, dust was reduced in areas around the road and symptoms such as coughing have decreased.

### 3) Improvement of security situation around the area along the roads

According to the qualitative survey targeting the residents around the target road of this project, the surrounding areas were covered with forests before the project, and it was the best place for criminals to hide. As a result, there was information that robbery and rape, etc. occurred frequently in the areas but as the forest was cut down due to the road construction, the places where the criminals hid disappeared and the security situation has been improved. In addition, there is also other information that robberies on the road at night have become less frequent through installation of street lights along the road.

### 4) Revitalization of economic activities accompanying construction of roads

According to the qualitative survey targeting the residents around the target road of this project, the construction of roads has resulted in the construction of new houses around the road and new residents have also increased. For this reason, there are opinions from many residents that economic activities in the surrounding areas are activated such as that the number of retail stores has increased and construction of a new shopping mall etc. are confirmed in the on-site survey.



Photo: Shopping mall under construction along the road



Photo: Newly launched yogurt sales business along the road

From above, this project has largely achieved its objectives. Therefore effectiveness and impacts of the project are high.

## 3.4 Sustainability (Rating: ①)

### 3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

Daily inspection/cleaning and small-scale repair were supposed to be done at the Civil

Engineering Division, Operation Department, LCC in the ex-ante evaluation. Following the restructuring of the organization, it is conducted by Road and Drainage section, Road and Drainage Division, Operation Department, Engineering Services Bureau, LCC at the time of ex-post evaluation. The staff of Roads and Drainage section consists of 109 people. The organization chart of LCC is shown in Figure 3 below.

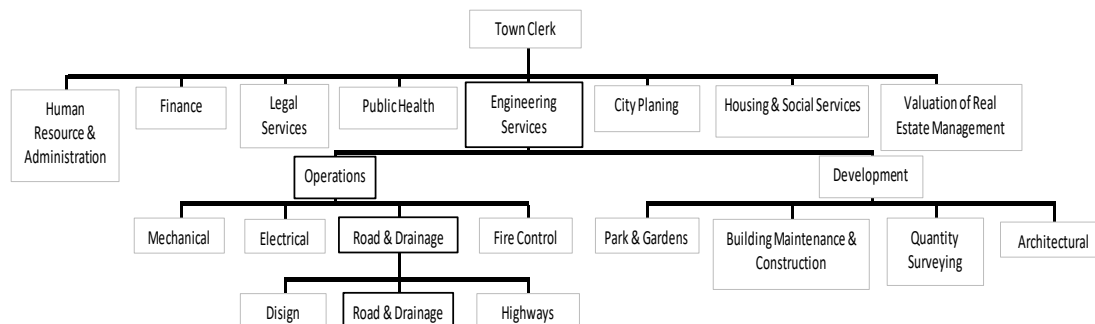


Figure 3 Organization chart of LCC

Source: LCC

In addition, if there is a large repair, it was supposed that support would be requested from LCC to Road Development Agency (hereinafter referred to as “RDA”) and it would be carried out by RDA in the plan. The Organization Chart of RDA is shown in Figure 4 below.

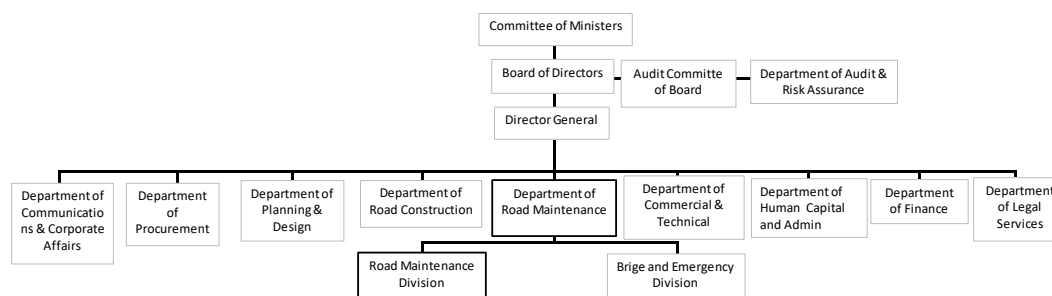


Figure 4 Organization chart of RDA

Source: RDA

According to the interview survey at LCC and the RDA at the time of the ex-post evaluation, there is no change in the structures which LCC become a central role to the daily operation and maintenance. On the other hand, according to the interview with the RDA, RDA was not involved in the design and implementation process during the project implementation stage. In addition, concerning the operation and maintenance structures when a large-scale repair is required on the road constructed in this project, they mentioned that they did not have any opportunity to discuss about the operation and maintenance structure concretely. For this reason, there is inconsistent response when large-scale repair is necessary, such as a road unevenness that occurred at the time of ex-post evaluation (see 3.4.4 Status of Operation and

Maintenance). As described above, since LCC has not discussed concrete collaboration structures with RDA at the project implementation stage, LCC does not have sufficient technologies and budget for large-scale repair, and meanwhile, RDA which has them does not know how it should be involved in this issue at the time of ex-post evaluation when the road unevenness occurs, and the current state is one where it is impossible for both sides to respond adequately.

The operation and maintenance structures of the road constructed by this project are under discussion for improvement between LCC and RDA but the system is not well established at the time of ex-post evaluation, and the evaluation on the operation and maintenance structures is low.

#### 3.4.2 Technical Aspect of Operation and Maintenance

According to the interview survey conducted at LCC and RDA, operation and maintenance of existing roads have been carried out in each organization, and there are no technically difficult problems on the road maintenance and management works at the level required to be carried out by the implementation structures. However, neither organization has technical manuals. Regarding the trainings of engineers, there is no internal training system, and human resource development is carried out through OJT or trainings in overseas.

Although both LCC and RDA have no internal technical transferring mechanisms, they have sufficient technical skill at the level required by the implementation structures for the operation and maintenance of the road constructed in this project, and it is regarded that the sustainability in terms of technologies is high.

#### 3.4.3 Financial Aspect of Operation and Maintenance

The trend of the budget between 2010 and 2017 of LCC which is in charge of operation and maintenance is shown as Table 7 below.

Regarding LCC, the overall budget tends to increase in recent years. However, the budget related to road operation and maintenance declined rapidly, peaking in 2013. It is impossible to procure US\$ 422,800 (about 4.1million kwacha<sup>21</sup>) of annual expenses required for operation and maintenance which was estimated in the preparatory survey report, and it seems that it is a very difficult situation in terms of finance as LCC is responsible for managing all the roads in the city, and the sustainability in terms of finance is low. According to the interview survey at LCC, the reason for this is that the priority of the budget for road maintenance is low, as there are many issues to be addressed at LCC.

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<sup>21</sup> US\$=9.72 kwacha (February 2018, Oanda.com)

Table 7 Trend of the overall budget of LCC and the budget for the operation and maintenance of the road between 2010 and 2017 (Unit: million kwacha)

Year	Budget in total	Budget related to operation and maintenance of the road
2010	79,565	5,124
2011	100,969	1,345
2012	163,620	1,132
2013	184 (183,472)	3 (2,983)
2014	176 (176,012)	2 (2,140)
2015	186 (185,712)	0.5 (512)
2016	208 (207,510)	0.1 (89)
2017	376 (376,079)	0.1 (99)

Source: LCC

\* Since the currency of Zambia has been devalued from January 1<sup>st</sup>, 2013 and 1,000 kwacha (ZMK) has become 1 kwacha (ZMW), it is shown by ZMK until 2012 and by ZMW after 2013. The figures in parentheses are converted into currency value (ZMK) before currency devaluation.

On the other hand, the transition of the budget between 2011 and 2017 of RDA, which was supposed to support LCC when large-scale repair is necessary is shown in Table 8 below.

Table 8 Trend of the overall budget of RDA and the budget for the operation and maintenance of the road between 2010 and 2017 (Unit: million kwacha)

Year	Budget in total	Budget related to operation and maintenance of the road
2011	3,043,988	559,853
2012	4,272,698	967,082
2013	3,289 (3,289,000)	250 (250,000)
2014	4,943 (4,943,000)	957 (957,000)
2015	5,462 (5,462,000)	893 (893,000)
2016	6,630 (6,630,000)	774 (774,000)
2017	8,624 (8,624,000)	714 (714,000)

Source: RDA

\* Since the currency of Zambia has been devalued from January 1<sup>st</sup>, 2013 and 1,000 kwacha (ZMK) has become 1 kwacha (ZMW), it is shown by ZMK until 2012 and by ZMW after 2013. The figures in parentheses are converted into currency value (ZMK) before currency devaluation.

Regarding RDA, the overall budget has been increasing in recent years, but budget concerning operation and maintenance of the road tends to decrease year by year. In addition, regarding the problem of road unevenness as described later on the status of operation and of the road, there is no budget for hiring a private consultant company to confirm the situation, and the sustainability in term of finance is considered to be low.

#### 3.4.4 Status of Operation and Maintenance

After the rainy season in 2016-2017, road unevenness occurred in a part of the road constructed in this project. Further, as of November 2017, a new surface layer gap etc. has been confirmed. As of January 2018, repair by the Zambian side has not been done.

According to a material provided by JICA, it is analysed that there is a high possibility that it is caused by gaps between existing roads or rocks in the road floor, water stagnant due to heavy rain, erosion of existing top soil due to groundwater flow, softening and vibration due to traffic, etc.

According to the interview survey at LCC, they have already dispatched engineers, conducted on-site surveys, and reported to Ministry of Local Government, but there is no prospect of securing budget for repair. In addition, it was observed during the on-site survey that there were several places where the guardrails along the road were also left damaged.



Photo: One of part of road unevenness  
(The part surrounded by the red frame is sinking)



Photo: Damaged guardrails

Furthermore, according to the interview survey at RDA, though there is a plan to hire a private consultant company to conduct a technical audit to investigate the present condition of this road and grasp the problems, they have not secured the budget to hire the private consultant company and it is unknown when this technical audit will be implemented as of January 2018. Therefore, it is unknown when the repair of this road unevenness part will also be done and how it will be done.

In this way, road unevenness has occurred in the roads constructed in this project, but the future repair plans of LCC and RDA are unknown, and it is judged that the operation and

maintenance has not been done sufficiently at the time of ex-post evaluation.

From above, major problems have been observed in terms of the institutional aspect/ financial aspect/ current status. Therefore sustainability of the project effects is low.

#### **4. Conclusion, Lessons Learned and Recommendations**

##### 4.1 Conclusion

This project was implemented with the target of improving the social infrastructures through improving access to the workplace and improving the situation of accumulation of water on the roads in the rainy season by constructing the inner ring road in the capital, Lusaka City, the access road to the multi facility economic zone, and the associated drainage facilities, thereby contributing to facilitate logistics in the capital and to improve the living environment.

This project is consistent with the development policy of Zambia at the time of planning and ex-post evaluation. In Lusaka City, problems caused by undeveloped roads have not been solved, and development needs are high. In addition, this project was consistent with Japan's aid policy, and the relevance is high.

Project cost and project period of this project were within the plan. Therefore, the efficiency of this project is high.

Target indicators related to improvement of congestion to confirm the outcome of this project have not been achieved due to the problem of setting of indicators and subsequent deterioration of congestion in Lusaka City, but a certain level of effect of improving congestion was confirmed. On the other hand, since there were users' voices concerning improvement of convenience due to the construction of bus stops near residential area due to the road construction, improvement of water accumulation on the roads in the rainy season associated with reduction of diseases due to improvement of the hygiene situation, and improvement of access to basic social infrastructure etc., and the effectiveness/impact are high.

The operation and maintenance structures of this project are not well established. The executing agencies have sufficient technical level for the operation and maintenance. The budget for the operation and maintenance of Lusaka City Council (hereinafter referred to as "LCC") is decreasing, and the sustainability in terms of finance is low. In addition, there is no prospect of repairing road unevenness occurring at the time of ex-post evaluation, and the operation and maintenance situation also faces challenges. Therefore, the sustainability is low.

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

## 4.2 Recommendations

### 4.2.1 Recommendations to the Executing Agency

#### (1) Establishment of a collaborative structure for operation and maintenance of roads in Lusaka City

RDA is responsible for the operation and management of roads in Zambia, whereas LCC is responsible for the operation and maintenance of the road in Lusaka City, thus part of the duties are overlapping at the time of ex-post evaluation. In addition, although it was supposed to be supported by RDA at the time of large-scale repair, there was a possibility that a sufficient operation and maintenance structure was not considered during this project, and the coordination system is unclear. It is desirable for both organizations to continue discussions concerning demarcation and cooperation of operation and maintenance, and also to establish an effective and efficient operation and maintenance structure.

#### (2) Allocation of budget for operation and maintenance for roads by LCC

In LCC, the budget allocated for operation and maintenance for roads has been rapidly reduced in recent years. In the future, operation and maintenance of the roads becomes important due to deterioration of roads etc. Since the city's overall budget is increasing, it is recommended to consider increasing allocation of budgets for operation and maintenance of roads.

#### (3) Immediate repair of the part of road unevenness

Some of the road unevenness that occurred during the rainy season in 2016-2017 is extremely dangerous, especially it is hard to see it during night time driving. Although LCC and RDA are conducting surveys to investigate the cause, it is necessary to identify the cause as soon as possible. In addition, it is desirable to allocate the budget for repairing the road at the earliest possible stage after the survey and repair the road unevenness sections as soon as possible.

### 4.2.2 Recommendations to JICA

#### (1) Examination of follow-up cooperation on road unevenness sections

Although LCC and RDA are conducting surveys to investigate the cause of the road unevenness that occurred during the rainy season in 2016-2017, it is currently difficult to secure even the cost of the surveys due to the severe financial circumstances. In case it is judged that repairs by LCC and RDA are difficult, it is desirable to consider examining the follow-up cooperation for the repair of the road unevenness parts as one of the solutions.

## (2) Continuing support for the inner ring road plan

The inner ring road constructed in this project is a part of the inner ring road plan of the total of four stages that LCC is examining. Moreover, as described in the section on the effectiveness, the effects of alleviating congestion and increase of traffic volume have not reached the level assumed by the Development Study. In order to maximize the effect of this project, it is desirable to continue to provide continuous support for the construction of the inner ring road.

### 4.3 Lessons Learned

#### Implementation of a capacity building programme (soft component) to LCC for implementation and monitoring of environmental impact assessment and resettlement

In this ex-post evaluation, some of implementation structures were inadequate such as the LCC did not regularly prepare monitoring reports on environmental impact assessment and resettlement. In the future, when the second phase, which is being requested by the government of Zambia, is adopted, it will include densely populated residential areas and it is predicted that there will be further difficulties on implementation and monitoring of environmental impact assessment and resettlement. When projects are implemented for executing agencies that are judged not to have adequate implementation structures for environmental impact assessment, it is necessary to conduct technical assistances such as implementing soft components related to implementation and monitoring of environmental impact assessment

#### Establish a structure when local governments conduct operation and maintenance of roads

During the planning stage of this project, LCC was supposed to operate and maintain the road, but it was planned that RDA would provide assistance when large-scale repair of the road is necessary. However, involvement of RDA during implementation stage of the project was insufficient, and there was no sufficient discussion for the establishment of a concrete collaborative structure of operation and maintenance between LCC and RDA. Therefore, in the situation where there was a necessity for large-scale repair such as road unevenness at the time of ex-post evaluation, LCC carried out its own investigation and reported it to the Ministry of Local Government and RDA is planning their own survey and the measures are unstructured. As described above, since there is no collaboration system between LCC and RDA at the stage of project implementation, LCC does not have sufficient technologies and budget for large-scale repair, and meanwhile, RDA which has them does not know how it should be involved in this issue at the time of ex-post evaluation when the road unevenness occurs, and the current state is one where it is impossible for both sides to respond adequately. When local governments are in charge of operation and maintenance of the roads as is the case in this project, local governments have limited capabilities such as technologies and budget for large-scale repair of



roads. For this reason, it is desirable to establish concrete collaboration and communication structures and define each role with ministries and agencies that have a jurisdiction over road construction and have considerable experience ranging from the process of designing to the implementation of projects.