

Republic of Burundi

FY2015 Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Rehabilitation of Roads and Infrastructures for Bujumbura City”

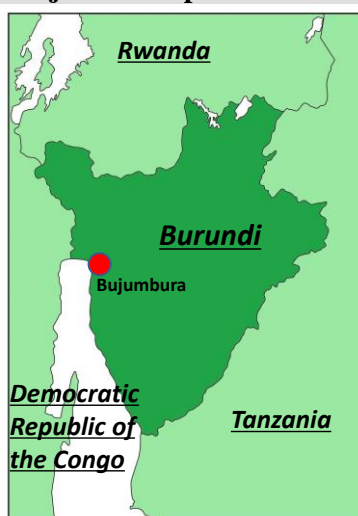
External Evaluator: Keisuke Nishikawa, Japan Economic Research Institute Inc.

0. Summary

In this project, a road network was developed to reduce transportation costs through smoother traffic flows by mitigating congestion in Bujumbura City. This project is consistent with the development plans and needs of Burundi as well as the priority areas in Japan’s ODA policy. Therefore, the relevance is high. With regard to project implementation, while there were some changes observed such as additional development of a section of road, both the project cost and the project period were within the plan. Therefore, the efficiency is high. With respect to project effectiveness, some of the quantitative changes were difficult to capture as some data related to traffic volume had not been compiled, but it was considered that the effects of this project expected during the planning stage such as (1) a reduction in travel time, (2) a reduction in the number of days with occurrences of road flooding, (3) an easing of congestion in the city center, and so forth have been achieved. Additionally, some positive impacts such as smoother flows of goods and better access to social services were observed. Therefore, the effectiveness and impact of this project are high. Regarding sustainability, there were no issues in terms of institutional aspects of operation and maintenance, and the budget had been generally increasing, but the sustainability of the effects generated in this project is fair as there were some issues found in the technical aspects and the current status of operation and maintenance.

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

1. Project Description



Project Location



A Road Section Improved in this Project
(Avenue de la Plage)

1.1 Background

Due to both a civil war, which started in 1993 and lasted for more than 10 years, and economic sanctions imposed upon them by neighboring countries after 1996, Burundi experienced a stagnation in economic activity. During that period, transportation networks were poorly developed and maintained. Concurrently with the economic recovery after the end of the civil war, the number of vehicles increased in the capital city of Bujumbura and chronic traffic congestion was occurring in the city center where roads were not wide enough.

The road sections targeted in this project comprise part of the ring road system in Bujumbura. Among these targeted road sections, Boulevard Yaranda in particular was an earthen road in poor condition making the passage of vehicles difficult while other targeted sections were all narrow with only two lanes (one-lane for each direction), among which the first 1km section at the northern end of Avenue du Lac was heavily damaged due to flooding from the river located in the northern part of the city, hindering safe and smooth traffic flow. As vehicles generally avoided this section by passing through inner-city roads, traffic congestion in the city center was being aggravated.

1.2 Project Outline

The objective of the project was to ensure a safe and smooth traffic flow and to mitigate traffic congestion by developing road networks in Bujumbura, thereby contributing to the reduction of transportation costs, and thus leading to social and economic revitalization as well as improvements in the lives of the local people.

<Grant Aid Project>

E/N Grant Limit or G/A Grant Amount / Actual Grant Amount	2,700 million yen / 2,700 million yen
Exchange of Notes Date (/ Grant Agreement Date)	June, 2010 (/ June, 2010)
Implementing Agency	Ministry of Transport, Public Works and Equipment
Project Completion Date	March, 2013
Main Contractor	World Kaihatsu Kogyo Co., Ltd.
Main Consultant	CTI Engineering International Co., Ltd.
Basic Design	March, 2010
Detailed Design	May, 2011
Related Projects	[Technical Cooperation] • Emergency Study on Urban Transportation in

	<p>Bujumbura (2007) ('Urban Road Network Development Pilot Project' in the Study)</p> <p>[Grant Aid]</p> <ul style="list-style-type: none"> • Road Development Equipment Provision (1992) <p>[Other International and Aid Organizations]</p> <p>(European Union (EU))</p> <ul style="list-style-type: none"> • Road Development Project in Bujumbura City Phase I (1989 – 1991) • Road Development Project in Bujumbura City Phase II (2007 – 2009) <p>(African Development Bank)</p> <ul style="list-style-type: none"> • Road Development Project in Bujumbura City Phase II (1995 – 1997) <p>(International Development Association (World Bank))</p> <ul style="list-style-type: none"> • Road Development Project in Bujumbura City (implemented four times: 1994 – 1995, 1997 – 1998, 2006 – 2007, 2007 – 2009)
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2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa, Japan Economic Research Institute Inc.

2.2 Duration of Evaluation Study

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

Duration of the Study: December, 2015 – October 2016

Duration of the Field Study: March 28 – 31, 2016, and May 24 – 27, 2016

2.3 Constraints during the Evaluation Study

In Burundi, after the domestic situation became unsteady with the 2015 presidential election, security had not been sufficiently stable even at the time of this ex-post evaluation. As a result, a field study, including site visits and a beneficiary survey, was substituted for by the local survey assistant. The external evaluator sent a questionnaire about the project in advance and collected information by inviting the implementing agency's officer in charge to Kenya once and the local survey assistant twice to have discussions directly. Therefore, the external evaluator could not conduct an actual inspection of the project site and some of the information was obtained

through the local survey assistant.

3. Results of the Evaluation (Overall Rating: A¹)

3.1 Relevance (Rating:③²)

3.1.1 Relevance to the Development Plan of Burundi

At the time of planning of this project, ‘Promoting sustainable and equitable economic growth’ was listed as one of the priority programs for Burundi in the “Poverty Reduction Strategy Paper (2007)”, also in which transportation network development was listed as an urgent issue. The project road adjacent to the Port of Bujumbura, which was a key facility for Burundi’s export and import activity, was included as a road to be developed in the program. In the ‘Government Programme toward 2010’, set by the Government of Burundi, development of a transportation network including roads was also listed as a priority.

With regard to the national development policy at the time of ex-post evaluation, “Vision 2025”, a long-term development plan formulated in 2011, sets the development of infrastructure to promote productive activities as a priority and specifies an improvement of transportation infrastructure including road networks. Following the formulation of “Vision 2025”, “Poverty Reduction Strategy Paper II” was prepared in 2012, and the development of a transportation network was positioned in the strategy as a key to stronger connectivity between rural areas and markets, stronger competitiveness of productive activities and the promotion of regional integration. The need for an enhancement of road network maintenance was also listed. At a sectoral level, the maintenance and rehabilitation of existing roads were listed as major tasks for the Ministry of Transport, Public Works and Equipment in the ‘Sector Policy Letter (2010-2015)’ of the ministry formulated in 2010. As the medium to long-term development effects are to be seen through maintaining the good condition of the project road, it was important for this project that the policy on road maintenance be listed.

Based on the above, this project can be said to be consistent with the development plans at the time of planning and ex-post evaluation.

3.1.2 Relevance to the Development Needs of Burundi

In Burundi, economic activities were stagnant due to the civil war since the 1990s and due to economic sanctions by neighboring countries. Under such circumstances, a transportation network was neither well developed nor adequately maintained. As a result, the economic recovery after the end of the civil war produced chronic occurrences of traffic congestion in

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

² ③: High, ②: Fair, ①: Low

the capital city of Bujumbura. The road sections targeted in this project had heavily damaged surfaces and some sections were unpaved earthen road, aggravating the traffic congestion in the city center.

According to the implementing agency, the road sector in Burundi had issues such as a lack of maintenance, dilapidation, inadequate road development standards and so forth. In the development plans such as “Vision 2025” and “Poverty Reduction Strategy Paper II”, various issues are listed in addition to insufficient road maintenance, such as insufficient road planning, a lack of surveys, inspections and data, dilapidation of equipment, an unstable supply of spare parts, an insufficient budget and so forth.

With regard to road development in Burundi, various donors were providing project-based assistance through the avoidance of duplications in order to mitigate traffic congestion in and around Bujumbura at the time of planning this project, all of which were according to the implementing agency. This project comprised a part of those projects. Also, while other donors were rehabilitating roads in the city center, this project enabled smooth north-south access in Bujumbura without having to go through the city center by developing part of the ring road in Bujumbura, thus contributing to smoother traffic flows in the entire city.

Therefore, this project was highly prioritized in terms of mitigating traffic congestion in the capital city of Bujumbura, and is thought to have been complementary to the projects done by other donors. It was also confirmed that the roads in Burundi, including the ones in Bujumbura, had a wide range of issues such as insufficient road development and inadequate maintenance, as stated above, at the time of planning and ex-post evaluation. Therefore, this project, which supported road development, can be said to have been consistent with the development needs.

3.1.3 Relevance to Japan’s ODA Policy

In response to the bilateral policy discussion on economic cooperation held in 2006 between Japan and Burundi, Japan resumed its full-fledged assistance through grant aid and technical cooperation schemes. One of the priority programs was the ‘Development of Economic Infrastructure’ and this project was in line with said priority. In the ‘Yokohama Action Plan’ put forward at the Fourth Tokyo International Conference on African Development (TICAD IV) held in 2008, ‘Boosting Economic Growth’ became a priority area in which domestic infrastructure development was to be supported.

This project can be said to have been consistent with Japan’s ODA policy at the time of planning as this project conformed to both Japan’s cooperation priority for Burundi, which endeavored to support economic infrastructure development, and the action plan of TICAD IV designed for the African region.

In light of the above, this project has been highly relevant to Burundi's development plans 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

In this project, a total of 4.4kms of road in Bujumbura City was planned for development. Table 1 summarizes the original and actual project scope obtained in the ex-post evaluation.

Table 1: Original and Actual Scope of this Project

	Original	Actual
Components Borne by Japan	[Road Network Development (including an improvement in drainage capacities of some road sections): 4.4km] - Avenue du Lac (840m) - Avenue de la Plage (920m) - Avenue du la 13 Octobre (260m) - Avenue du Large (980m) - Boulevard Yaranda (1,408m) - Improvement of seven major intersections, including the connecting point of Boulevard Yaranda and Boulevard du 28 Novembre (including the installation of street lights) - Development of the foundations for traffic signals, road signs, bus bays*, road markings and parking bays	[Road Network Development (including an improvement in drainage capacities of some road sections): 4.6km] - Avenue du Lac (800m) - Avenue de la Plage (950m) - Avenue du la 13 Octobre (250m) - Avenue du Large (981m) - Boulevard Yaranda (1,393m) - Rue de la Cathédrale (248m) - Improvement of seven major intersections, including the connecting point of Boulevard Yaranda and Boulevard du 28 Novembre (including the installation of street lights) - Development of the foundations for traffic signals, road signs, bus bays*, road markings and parking bays
	[Consulting Services] - Designing and Construction Supervision	[Consulting Services] - Designing and Construction Supervision

	Original	Actual
Components Borne by Burundi	<ul style="list-style-type: none"> - Removal of ground obstacles - Securing a temporary yard; necessary for construction work, a space for construction materials and a section for the site office, etc. - Securing a quarry of raw stones, aggregate and soil, a waste disposal site and obtaining permissions and approvals - Installation of electricity terminals at the site office - Obtaining a construction site 	<ul style="list-style-type: none"> - Removal of ground obstacles - Securing a temporary yard; necessary for construction work, a space for construction materials and a section for the site office, etc. - Securing a quarry of raw stones, aggregate and soil, a waste disposal site and obtaining permissions and approvals - Installation of electricity terminals at the site office - Obtaining a construction site

Source: Preparatory Survey Report and the information provided by JICA

* A parking space designated for buses in front of bus stops, concaving into the sidewalk to prevent the occurrences of traffic congestions caused by the stopping of buses



Source: Provided by the project consultants

Figure 1: Location of the Improved Road Sections

A major change in project outputs was the addition of paving Rue de la Cathédrale (248m), which is connected to Boulevard Yaranda. According to the implementing agency and the project consultant, the change was implemented in response to an additional request made by the Burundian side in an attempt to mitigate traffic congestion occurring daily around the church. As the road was adjacent to Boulevard Yaranda and led to smoother traffic flow in the surrounding area, it can be judged to have been an adequate change.

The following points can be noted for other items changed:

- Change in the cross-sectional road alignments of Boulevard Yaranda (to make it easier to access the houses along the road).
- Replacement of the road bed of Avenue du Large (due to the detection of ground water and soft ground under the widened part of the road).
- Application of improved asphalt (to increase durability in consideration of the passing of heavy vehicles at a total of five locations such as the starting point and the roundabout at the ending point of Boulevard Yaranda, etc.).
- Change in the location of a new culvert connection at the starting point (to prevent sediment deposition).
- Reinforcement of existing buried water pipes.
- Protection of buried pipes (for electricity and communication lines at the roundabout at the ending point of Boulevard Yaranda).

These changes were thought to have been appropriate as they were mainly intended to improve the durability of the roads.

In addition to the components shouldered by Japan, Burundi was also obliged to implement the components indicated in Table1. According to the implementing agency and the project consultant, all of these items were actually implemented.



Roundabout at the ending point of
Boulevard Yaranda



Rue de la Cathédrale additionally developed

3.2.2 Project Inputs

3.2.2.1 Project Cost

This project was planned at a cost of 2,743 million yen, including Japan's cooperation amount of 2,700 million yen. The actual amount contributed by Japan was 2,032 million yen as shown in Table 2.

Table 2: Breakdown of the Actual Amount of this Project (Japanese portion)

(Unit: million yen)

	Local currency portion (Procured domestically)	Foreign currency portion (Procured from Japan)	Foreign currency portion (Procured from third countries)	Total
Construction	547.8	547.9	786.5	1,882.1
Direct construction	426.7	251.9	522.2	1,200.8
Other construction	121.0	296.0	264.3	681.3
Design and supervision	30.0	120.1	0	150.1
Total	577.8	667.9	786.5	2,032.2

Source: Data provided by JICA

As a result of the change described in ‘3.2.1 Project Outputs’, the cooperation amount from Japan increased from that of the contract amount by approximately 92 million yen. However, as the construction contract had been signed at significantly below the planned amount, the overall cooperation amount from Japan was within the plan. It was considered that the revised amount had been appropriate as confirmation procedures had always been taken by those concerned whenever these changes took place.

The actual amount of contribution from Burundi was initially planned at 43 million yen and designated for the components listed in Table 1, banking fees, land acquisition and so forth. However, as a larger amount was actually required for land acquisition, the actual amount was 56 million yen³ (922 million Burundian francs), thus exceeding the planned amount. As a whole, the actual amount of the overall project cost was within the plan at 2,088 million yen (76% of the planned amount [Table 3]).

Table 3: Comparison of Original and Actual Project Cost

(Unit: million yen)

	Original	Actual	Comparison against the original plan
Amount borne by Japan	2,700	2,032	75%
Amount borne by Burundi	43	56	130%
Total project cost	2,743	2,088	76%

Source: Preparatory Survey Report, Data provided by JICA and the implementing agency

³ Calculated based on the average exchange rate in the International Financial Statistics between June 2010 and March 2013 (project implementation period)

3.2.2.2 Project Period

The planned implementation period of this project was 30.1 months including 7.5 months for detailed designing and tender assistance and 22.6 months for construction (a period from detailed designing till the completion of construction). The actual project period, commencing with the detailed designing in the same way as the planning period, was 29.8 months from September 2010 to March 2013 (8.2 months for detailed designing and tender assistance and 24.2 months for construction, including a 2.7month overlapping period)⁴.

Although there was a factor for the delay such as a need to extend the construction period by one month due to the design change and additional work during the project implementation as stated above, the overall project period was within the plan (99% of the plan).

In this project, there were seven changes such as the addition of the further development of Rue de la Cathédrale, leading to the corresponding increase in project cost. Also, the contribution by Burundi slightly exceeded the planned amount though the overall project cost was within the plan at 76%. The project period was also within the plan at 99%.

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

3.3 Effectiveness⁵ (Rating:③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

At the time of planning of this project, the effect indicators of this project were expected to be (1) a reduction in the travel time, (2) a decrease in the traffic flow into the city center, and (3) a reduction in the number of days with occurrences of flooding around the starting points of the sections to be developed in this project.

⁴ In the Preparatory Survey Report, the project period was described as 'a total of 30.1 months including 7.5 months for detailed designing and tender assistance and 22.6 months for construction'. On the other hand, in the Ex-ante Project Evaluation Sheet, it was 'a total of 31 months from June 2010 to December 2012 including a detailed designing and tender assistance period', but it could not be judged if this period included the period of processing the contract for consultancy work from the date of G/A signing till the commencement of detailed designing. Therefore, the evaluation judgement in this ex-post evaluation was based on the commencement of detailed designing as both the planned and actual commencing points were clearly the same.

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

Table 4: Effect Indicators of this Project

	Baseline	Target	Actual
	2009	2014	2015
	Year of Planning	1 Year After Completion	2 Years After Completion
Time required (travel time for a 3.0km* section except Boulevard Yaranda)	6 minutes	3 minutes	3 minutes
Time required (Travel time on Boulevard Yaranda)	8 minutes	1.7 minutes	1 minute
Traffic inflow into the urban area (vehicles/day) (inflow into the 4 major routes in the city center)	86,000	76,700	No data
Number of days with occurrences of flooding around the starting point (days/year) and the length of flooding each time (hours/flooding)	Days of flooding: 90 Hours of flooding: 6	Days of flooding: 45 Hours of flooding: 3	Days of flooding: less than 20 Hours of flooding: 0

Source: Preparatory Survey Report and information provided by the implementing agency

* A 3.0km section on Avenue du Lac – Avenue de la Plage – Avenue de 13 Octobre – Avenue du Large

As the data had not been routinely measured by the implementing agency, only the data measured by the implementing agency requested as part of the ex-post evaluation was provided. The result is shown in Table 4.

Regarding the reduction in travel time, the section at Boulevard Yaranda (1.4km section) reduced from eight minutes to one minute and the travel times of other sections (3.0km) became shorter, from six minutes to three minutes, meaning that the target figures had been sufficiently achieved. As Boulevard Yaranda was an unpaved earthen road before this project was implemented, a remarkable time reduction effect was observed. In the beneficiary survey⁶ conducted as part of the ex-post evaluation, a result was obtained in that the time required for moving a total distance of 4km, from the starting point (the northern end of Avenue du Lac) to the ending point (the eastern end of Boulevard Yaranda) of the project road, was reduced from 15 minutes (before the project) to six minutes (after the project). The

⁶ An interview survey with a total of 100 people (the number of valid responses) using the road sections developed in this project; 49 drivers of vehicles, buses and trucks, 30 bus passengers, and 21 local residents, were selected through judgment sampling (72 men and 28 women). Therefore, it is thought that road users were not evenly and randomly extracted, leaving certain biases in the survey result. The main questions were as follows: reduction in time required, increase in the flow of goods and people, improvements in road safety, improvement in safety at night time due to street lights, smoother traffic flow, improvement in travel speed, improvement in access to (a) markets, (b) hospitals and (c) schools, changes in vehicle longevity, environmental impacts, occurrences of land acquisition and resettlement, and so forth.

result of the beneficiary survey is an average of all information given by respondents and was slightly different from the data provided by the implementing agency. However, it was commonly seen that the time was significantly reduced, confirming the generation of project effects.

Prior to this project, the majority of vehicles travelling between the northwestern and the southern areas of Bujumbura were passing through the city center, causing traffic congestion there. As a bypass would be developed by implementing this project, it was expected that the traffic volume in the city center would decrease. Although the volume of traffic inflow into the city (baseline data) was captured by the project consultant with their own survey, which was done during the preparatory survey of this project, the traffic volume at the time of ex-post evaluation could not be obtained as no surveys on traffic volume were conducted by the implementing agency after that. According to the implementing agency, the traffic volume of the four routes in the city center (Route Nationale 3, Boulevard du 1 Novembre, Boulevard Patrice Lumunda [a road connecting Route Nationale 7 and the city center] and a road between the connecting points of Routes Nationale 1 and 9 and the city center) decreased by implementing this project. In the beneficiary survey, a question on the extent to which the traffic flow in the city center had become smoother was asked. 57% of the respondents replied that the traffic flow in the city center after the implementation of this project had become ‘a lot smoother’ and another 33% responded ‘smoother’. Therefore, it was considered that 90% of the respondents had been experiencing smoother traffic flows and a certain degree of effects had been generated.

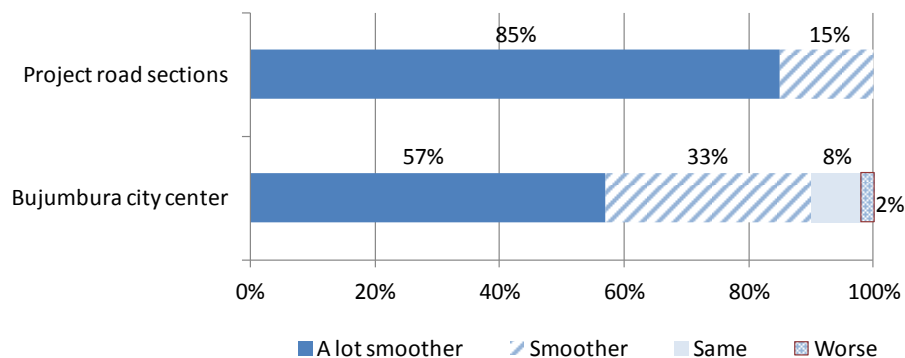


Figure 2: Smoother Traffic Flow after the Project (Beneficiary Survey)

Ntakangwa River runs through Bujumbura City, causing frequent flooding around the starting point of the project road sections. In order to mitigate the events of flooding, improvement measures to increase drainage capacities were taken in this project. By instituting these measures, it was expected that the number of days with occurrences of

flooding and the number of hours that they entailed would be halved. According to the implementing agency, no events of flooding that would block traffic have happened in the sections improved through this project from after its implementation. It improved to the point where only water from flooding in areas outside of this project flowed onto the project roads. While there are still less than 20 days of occurrences of flooding, these events do not block the traffic. Therefore, the implementing agency responded that the number of hours of flooding was zero. Even in the beneficiary survey, 96% of the respondents were noticing reductions of flooding on Avenue du Lac, the starting point of the project road, demonstrating that the indicators related to the improvement of flooding had been achieved as a whole.

3.3.2 Qualitative Effects (Other Effects)

When this project was being planned, two qualitative effects were expected: (1) a separation of vehicle lanes and footpaths would improve the safety of road users, and (2) street lights installed at major intersections would ensure safety for nighttime traffic.

In this project, footpaths were installed in some sections, potholes and cracks on road surfaces were eliminated throughout the project roads and the roads were widened. In the beneficiary survey, it had become clear that 95% of the respondents were feeling safer on the road, showing a high appreciation for the improvement of travel safety.

With regard to the improvement of nighttime travel safety, a total of 75 street lights were installed on some sections and intersections of the roads targeted in this project. However, the lights have not been illuminated mainly due to the lack of budget of Bujumbura City, the administrator. Therefore, securing and improving the safety of nighttime traffic as initially expected have not been achieved.

3.4 Impacts

3.4.1 Intended Impacts

The following five impacts through project implementation were expected:

- (1) The development of target roads would ease traffic congestion along major trunk roads, thereby contributing to the reduction of CO₂ emissions from vehicles.
- (2) Distribution of goods would be promoted, leading to positive economic impacts due to the reduction of transportation costs.
- (3) This project would be part of the development of an international north-south highway, thereby contributing to increases in the international flow of goods from neighboring countries (Tanzania and Rwanda).

- (4) Improvements in travel conditions for operating vehicles would reduce travel time and improve accident and emergency care.
- (5) Travel conditions for operating vehicles would improve and the lifetime of vehicles would become longer.

These impacts were checked in the ex-post evaluation and it was confirmed that the following effects had been generated.

Regarding (1) the reduction of CO₂ emissions, while it was difficult to show quantitative results as no emission survey had been conducted in Burundi, the length of time required to travel the project roads became significantly shorter as described. As the beneficiary survey results also showed that the traffic flow became smoother, it can be inferred that the CO₂ emission from a single vehicle has practically been reduced due to the shorter time needed when travelling the project road sections. The traffic flow in Bujumbura's city center has also become smoother as shown in Figure 2, and it was thought that a certain volume of CO₂ emissions had been reduced due to the mitigation of traffic congestion.

Concerning (2) the promotion of goods distribution, the implementing agency stated that trucks heading to the Port of Bujumbura (near the starting point of the project road) from the southern part of the city could hence travel on the project road without passing through the city center, where four major routes merge, leading to an overall smoother traffic flow in the city. As indicated in Figure 2, the beneficiary survey also confirmed that the traffic flows had improved along the project road sections and throughout the city center. Therefore, it was assumed that this project had contributed somewhat to the reduction of the cost of transportation between the northern and southern parts of the city. However, it was difficult to measure the economic impacts generated. There were comments from the implementing agency that political unrest since 2015 has stagnated economic activities in Burundi and that they judged that the traffic volume had not increased though no data had been collected.

The impact (3) refers to the level of contribution the project road makes to the flow of goods in Africa's eastern region. In relation to Bujumbura City, this project can be said to have contributed to smoother traffic flows of the entire Bujumbura City area without having to go through the city center by improving a part of the ring road connecting major roads such as Routes Nationale 4, 5 and 9 in the north, and 3 and 7 in the south. In terms of the improvement in the flow of goods to and from neighboring countries, another donor agency stated that although the most common route to transport goods from the eastern part of the Democratic Republic of the Congo to Tanzania's Dar Es Salaam Port was the route traversing Rwanda then moving south through Tanzania, a new international highway including the project road would be viable once the construction of a highway connecting the

north and the south of Rwanda was completed in 2017, thus making it possible to travel the eastern part of the Democratic Republic of the Congo and Tanzania in a shorter time. In this regard, this project could be regarded as one that would contribute to an increase in the international transportation of goods from Tanzania and Rwanda⁷.

With regard to (4) the improvement in accident and emergency care due to shorter travel time, interviews with hospitals in the city revealed that the project road had been effectively utilized in transporting patients and as a bypass when traffic in the city center was heavy. For the fire service, as the water to extinguish fire was pumped from Tanganyika Lake, the project road section adjacent to the lake had been frequently used and the time required to the scene of a fire had become shorter and enabled quicker response in firefighting. In the beneficiary survey, 89% replied 'Improved a lot' and 11% replied 'Improved' to a question on the degree of improvement in access (reduction in required travel time) to markets, hospitals and schools. Therefore, it was observed that the road was playing a significant role in improving accident and emergency care activities.

With respect to (5) an increase in the lifetime of vehicles, it was in fact difficult to confirm. However, one of the hospitals interviewed commented that the maintenance expenses for their ambulance had been reduced. Also, it became clear that 96% of the respondents in the beneficiary survey were feeling that the lifetime of vehicles had become 'A lot longer' and 4% feeling 'Longer'.

As described above, it was assumed that the expected impacts had been generated as road users were noticing improvements in traffic flows and increases in vehicle lifetimes through reductions in travel time and improvements in travel conditions for operating vehicles.

3.4.2 Other Impacts

3.4.2.1 Impacts on the Natural Environment

An initial environmental examination for this project was conducted, in which an environmental impact assessment was also conducted. As a result, an approval for implementation of this project was granted from the environmental authority in November 2009. Therefore, no negative impacts to the natural environment were anticipated, in particular when implementing this project.

However, mainly the following measures needed to be taken upon implementing this project:

- Soil and gravel procured from the locations would be designated by the Government

⁷ According to the implementing agency, both the international flow of goods and the overall traffic volume have decreased due to unstable domestic situations in recent years.

of Burundi.

- The construction sites would be regularly sprinkled with water to avoid dust in the air. The asphalt plant would be installed in the industrial area and sprinkled with water as necessary to prevent negative impacts on the residential area.
- When reclaiming the shoreline of Tanganyika Lake, the slope would be protected to prevent the inflow of soil. The industrial waste water would also be treated appropriately.
- Construction and general wastes would be transported to a landfill designated by the Government of Burundi.
- The waste soil would be reduced and disposed of in a designated landfill.
- No construction work would be carried out early in the morning or late at night. Construction materials would not be transported through residential areas.

According to the implementing agency and the project consultant, planned environmental mitigation measures were implemented as planned, and no particular issues emerged during or after project implementation. Even in the beneficiary survey, 99% of the respondents replied that there were no negative impacts on environment (the remaining 1% replied 'I don't know'). Therefore, it was considered that there had been no problems as a whole.

3.4.2.2 Land Acquisition and Resettlement

In this project, an existing road was planned for widening and small-scale land acquisition was expected at the five locations listed in Table 5.

Table 5: Original and Actual Land Acquisition in this Project

Location of Land Acquisition	Original	Actual
Construction of a new road at the starting point	Approximately 3,400m ²	Approximately 3,400m ² , entirely owned by the government
Setback of a tobacco factory wall at 170m from the starting point	Approximately 60m ²	85m ²
Setback of a warehouse wall around 550m from the starting point	Approximately 2,000m ²	1,321m ²
At the intersection of the main road and Boulevard Yaranda, setback of house walls on both sides of the road	Approximately 35m ²	35m ²
At the end of Boulevard Yaranda. Setback of church wall	Approximately 50m ²	53m ²

Source: Preparatory Survey Report, Information provided by JICA

In addition, resettlement of one kiosk was necessary due to the widening of the road, but it was not thought to be a problem in particular as the kiosk was only temporarily operating within the land for road.

While the amount of land actually acquired was changed from that which had been planned, the land acquisition was carried out at the planned locations in accordance with the ministry ordinance pertinent to land acquisition, officially announced in 2008. The existing kiosk was operating illegally and it disappeared by the time the project commenced, causing no influences on the actual project implementation. In the beneficiary survey, a result was obtained that 99% of the respondents had never heard of residents negatively affected by this land acquisition. (The remaining 1% replied 'I don't know'.)

Therefore, it was considered that there were no problems with land acquisition as a whole.

3.4.2.3 Other Impacts

Boulevard Yaranda, running east to west in the southern part of the urban district, was originally an unpaved earthen road, but after the improvement, it became a road where significant effects could be felt, as observed in form of the substantial reduction in travel time. The Mayor of Bujumbura expressed the city's gratitude for the road developed in this project, and Boulevard Yaranda was renamed as 'Boulevard du Japon' when this project was completed.

While some of the quantitative changes were difficult to capture as the traffic volume data were not built, it was confirmed that effects such as (a) the reductions in travel time and (b) a decrease in the number of days with occurrences of flooding, (c) easing of traffic congestion in the city center, and (d) improvements in travel safety were generated. On the other hand, there was little change in nighttime safety as the street lights had yet to be illuminated.

Regarding the impacts, there was observation of a possibility of CO₂ reduction, an improvement in traffic flow, an increase in the lifetime of vehicles and so on. Neither negative impacts on the environment nor issues on land acquisition were observed.

In light of the above, this project has largely achieved its objectives. Therefore, the effectiveness and impact of the project are high.

3.5 Sustainability (Rating:②)

3.5.1 Institutional Aspects of Operation and Maintenance

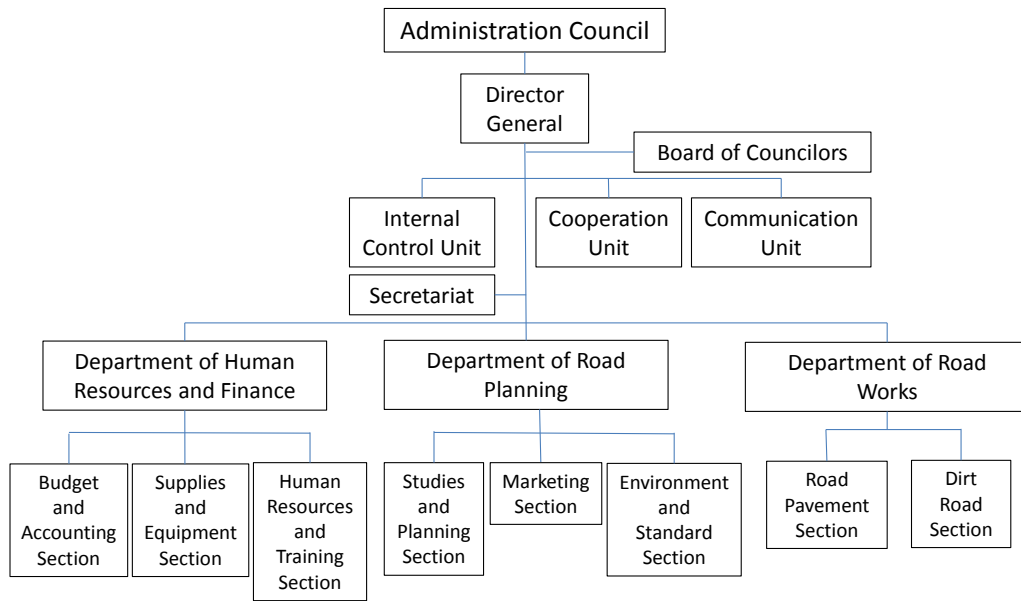
The implementing agency of this project is the Road Office of the Ministry of Transport, Public Works and Equipment, which is in charge of maintenance of national roads and other major roads in Burundi. The Road Office is also responsible for the maintenance of road surfaces and other structures for the roads (66km) in Bujumbura and utilizes private companies in actually carrying out the maintenance work. The Services Techniques Municipaux (SETEMU), an internal organization of the Bujumbura Municipal Council, has been conducting routine cleaning of roads and management of street lights as well as renting out their trucks.

The Road Office of the Ministry of Transport, Public Works and Equipment consists of 124 staff members under the Director General, with three departments: the Department of Human Resources and Finance, the Department of Road Planning, and the Department of Road Works. The Department of Road Planning has six engineers and four technicians, and the Department of Road Works, which is in charge of maintenance planning and works, has 13 engineers and 11 technicians.

The Ministry of Transport, Public Works and Equipment has the Office of Road Fund and the Office of Road Equipment, in addition to the Road Office⁸. The Office of Road Fund is responsible for the financial management of road development and maintenance, and the Office of Road Equipment rents out the equipment to companies that win maintenance contracts, but it doesn't handle routine operation and maintenance.

According to the implementing agency, as the actual works are delegated to private companies, the number of officers in charge of maintenance at the Road Office has been sufficient. It is assumed that there are no particular issues in this regard.

⁸ The Administration Council is established within the Ministry to coordinate the Road Office, the Office of Road Fund and the Office of Road Equipment (refer to Figure 3).



Source: Provided by the implementing agency

Figure 3: Organization Chart of the Road Office, the Ministry of Transport, Public Works and Equipment

3.5.2 Technical Aspects of Operation and Maintenance

According to the implementing agency, technicians with a certain level of skills and experiences on road maintenance are in the Road Office and have been deepening their knowledge through seminars held when national road development projects had been implemented in recent years by other donors such as the African Development Bank and the EU. However, apart from the seminars on maintenance held as part of the aid projects of donors, their own systematic training mechanism could not be observed. In other words, while the Road Office is tasked with preparation of maintenance plans and supervision of road works, they are not necessarily able to utilize the acquired knowledge in their actual work as there is no systematic mechanism to improve their skills. Moreover, the ‘Road Maintenance Manual’ was prepared and passed to the implementing agency in this project, but it became clear when checked during the ex-post evaluation study that this manual had not been utilized due to insufficient recognition and understanding of it. No maintenance guideline in particular had been presented to private contractors undertaking the actual maintenance work.

As stated above, maintenance skills of the Road Office and domestic private companies cannot be said to have been sufficient as there were issues in the systematic maintenance mechanism and in terms of non-utilization of the manual.

3.5.3 Financial Aspects of Operation and Maintenance

In Burundi, road maintenance has been carried out with the budget allocated from a road fund, administered by the Office of Road Fund. At the time of project planning, budget and expenditure amounts for maintenance from the road fund were both increasing. Even after 2010 (when this project commenced) the budget had been on an increasing trend, as shown in Table 6, though there were some years when the amount from the road fund had decreased. However, although the breakdown for 2009 was not obtained, the budget includes the expenses for road development, operating expenses of the Road Office, salaries and so forth. Considering that the proportion of the amount for road rehabilitation against the total expenditure in 2008 was 38.5%, according to JICA's Preparatory Survey Report (2010), and that the budget for road rehabilitation was not necessarily sufficient, according to the interviews with the implementing agency conducted at the time of ex-post evaluation, it was assumed that the budget allocated for rehabilitation of existing road and purchase of maintenance equipment was not sufficient even after that.

Table 6: Budget and Expenditure for Maintenance from the Road Fund

(Unit: million Burundian francs)

	2008	2009	2010	2011	2012	2013	2014	2015
Budget	6,774	7,382	10,112	9,425	12,769	19,856	23,061	18,210
Expenditure	6,470	6,278	9,916	8,003	11,516	19,042	23,061	21,815

Source: Preparatory Study Report, Data provided by the implementing agency

The Road Office is responsible for operation and maintenance of road structures and Bujumbura City is in charge of cleaning roads and managing the facilities on roads. However, according to the implementing agency, the issue of street lights pointed out in '3.3 Effectiveness' has remained unsolved as the street lights had always remained unlit due to a shortage in Bujumbura City's budget. According to SETEMU, in charge of managing street lights, they cannot conduct maintenance work as they haven't had any allocation of budget from Bujumbura City in recent years other than that for road cleaning.

As a whole, while the road maintenance budget has been largely secured, concerns were observed in that the budget for maintenance such as that for rehabilitation and so forth was limited, and that the budget for street lights had not been allocated.

3.5.4 Current Status of Operation and Maintenance

At the time of defect inspection, conducted one year after this project was completed, the project consultant pointed out issues in terms of operation and maintenance such as (1) a shortage of materials and equipment for repair work, (2) a blockage of the flow channels for

drainage causing road flooding, (3) a lack of electricity supply to street lights due to the budget issue, and (4) a series of thefts of street light bulbs and electric wires in control panels.

Operation and maintenance statuses of the road sections developed in this project were checked at the time of ex-post evaluation, and the following points were observed:

- Although a plant to produce asphalt would be necessary to pave roads appropriately, the only asphalt plant in the country was owned by a foreign company. At the time of ex-post evaluation, repair work was possible by securing asphalt through outsourcing the task of asphalt supply to that particular foreign company from the Road Office.
- According to the site survey by the local survey assistant, while the road conditions were generally favorable, there were some locations seen where drainage lids and street lights were damaged. However, according to the implementing agency, there were no particular damages such as vandalization of project roads in association with the ongoing political unrest since 2015.
- Street light bulbs and electric wires in control panels were left unreplaced, and the street lights had never been illuminated since the completion of this project. There was no prospect of utilizing the street lights effectively in the future.
- Annual maintenance plans were prepared by the Department of Road Planning and carried out by the Department of Road Works.

The maintenance plans are prepared every year and a certain level of budget had been allocated, but some of the road sections remained damaged mainly due to the lack of equipment of private companies undertaking the maintenance work. Concerns were felt in terms of a stable supply of repair materials in the medium to long term as there was no asphalt plant permanently established in the country apart from the one owned by the foreign company and the implementing agency had no plan to procure one of its own. Also, as the maintenance manual was not utilized, as stated above, it was not clear whether the maintenance work of a certain quality had been carried out.

While there were no issues in terms of institutional aspects of operation and maintenance and the budget had been largely increasing, there was not enough budget allocated for the repair of existing roads and the purchase of maintenance equipment. Also, there were few opportunities to develop the capacities of technicians, leaving concerns about their technical skills. Other issues such as uncertainty related to a stable supply of materials and equipment, insufficient maintenance in some sections and the disuse of the maintenance manual in such sections were also observed.

In light of the above, some minor problems had been observed in terms of technical and

financial aspects as well as the current status of operation and maintenance. Therefore, the sustainability of this project is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

In this project, a road network was developed to reduce transportation costs through smoother traffic flows by mitigating congestion in Bujumbura City. This project is consistent with the development plans and needs of Burundi as well as the priority areas in Japan's ODA policy. Therefore, the relevance is high. With regard to project implementation, while there were some changes observed such as additional development of a section of road, both the project cost and the project period were within the plan. Therefore, the efficiency is high. With respect to project effectiveness, some of the quantitative changes were difficult to capture as some data related to traffic volume had not been compiled, but it was considered that the effects of this project expected during the planning stage such as (1) a reduction in travel time, (2) a reduction in the number of days with occurrences of road flooding, (3) an easing of congestion in the city center, and so forth have been achieved. Additionally, some positive impacts such as smoother flows of goods and better access to social services were observed. Therefore, the effectiveness and impact of this project are high. Regarding sustainability, there were no issues in terms of institutional aspects of operation and maintenance, and the budget had been generally increasing, but the sustainability of the effects generated in this project is fair as there were some issues found in the technical aspects and the current status of operation and maintenance.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

- At the time of ex-post evaluation, it became clear that the street lights developed in this project were not utilized and that nighttime travel safety had not improved. In order to achieve the safe use of the roads improved through this project, the implementing agency needs to urge the administrator of Bujumbura City to secure a budget for the street lights in order to illuminate them throughout the nighttime.
- It will be indispensable to supply asphalt, i.e., the material for road surfaces, in a stable and sufficient manner to maintain various kinds of roads in the country including the roads targeted in this project. Over a long period of time, there had been no asphalt plant in Burundi, and even at the time of ex-post evaluation, the only one was owned by a foreign company. With a view to achieving sufficient maintenance in a stable manner, it will be important for the implementing agency to have a permanent asphalt plant in the

country to keep the roads in good condition as they will be the foundation for economic activities.

4.2.2 Recommendations to JICA

One of the sections of the project road was renamed ‘Boulevard du Japon’ as a show of appreciation by the local government. As the section will be recognized for a long time as a road constructed through the assistance of Japan, it is assumed to be important to provide assistance for the improvement of the technical skills of the technicians at the Road Office once the political unrest is settled and the political system becomes stable enough so that the project road will always be kept in good condition.

4.3 Lessons Learned

Cooperation toward the realization of good maintenance

In the ex-post evaluation, concerns over technical skills on road maintenance and a shortage of road repair materials and equipment were raised as an issue. When a similar road development project is planned in the future, and if the road maintenance status is expected to be insufficient with its cause being judged as a shortage of maintenance capacities and equipment, it will be desirable, from a perspective of project sustainability, to provide important equipment and assistance for improvement of the skills of technicians in line with the structure of the implementing agency of the recipient country, all of which are in addition to the provision of road development assistance.