



# **ROAD IMPROVEMENT AND REHABILITATION PROGRAM (GY-L1027, 2215/BL -GY)**

## **Project Completion Report (PCR)**

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## TABLE OF CONTENTS

Required Electronic Links .....	ii
Optional Electronic Links .....	ii
List of Abbreviations.....	iii
BASIC PROJECT INFORMATION.....	iv
I. INTRODUCTION .....	7
II. CORE CRITERIA.....	7
2.1. Relevance.....	7
a. Alignment with country economic/development needs .....	7
b. Country's sector strategy/Bank's strategy alignment .....	8
c. Relevance of program concept and design .....	9
2.2. Effectiveness .....	16
a. Declaration of Project Objectives .....	16
b. Project Results.....	16
c. Counterfactual Analysis .....	20
d. Unanticipated outcomes.....	20
2.3. Efficiency .....	21
a. Cost-Benefit Analysis .....	21
b. Earned Value Analysis.....	22
2.4. Sustainability.....	25
a. General Sustainability Aspects.....	25
b. Environmental and Social Safeguards .....	25
III. NON-CORE CRITERIA .....	26
3.1. Bank's Performance.....	26
3.2. Borrower/Executing Agency Performance.....	26
IV. FINDINGS AND RECOMMENDATIONS .....	28
Annex 1 – Financial Progress .....	32
Annex 2 – Outputs Matrix .....	33
Annex 3 – Output achievement Matrix .....	34

### **Required Electronic Links**

1. [Development Effective Matrix \(DEM\)](#)
2. [Result Matrix Changes](#)
3. [Performance Monitoring Report \(PMR\) Final Version](#)
4. [PCR Checklist](#)

### **Optional Electronic Links**

1. [Draft Evaluation Report \(2018\)](#)
2. [Ex-ante Cost-Benefit Analysis Report \(2004\)](#)
3. [Ex-post Cost-Benefit Analysis Report East and West Canje \(2019\)](#)
4. [Ex-post Cost-Benefit Analysis Report Entrance to CJIA \(2019\)](#)
5. [Final Audited Financial Statements \(1 January 2018 to 30 September 2018\)](#)

## **List of Abbreviations**

CBA	Cost-Benefit Analysis
CJIA	Cheddi Jagan International Airport
CS	IDB Country Strategies
EBDR	East Bank Demerara Road
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
ENPV	Economic Net Present Value
ESG	Environmental and Social Safeguards
ESMP	Environmental and Social Management Plan
EU	Executing Unit
GDP	Gross Domestic Product
GOG	Government of Guyana
GPF	Guyana Police Force
IDB	Inter-American Development Bank
LAC	Latin American and the Caribbean
LP	Loan Proposal
MEP	Monitoring and Evaluation Plan
MOPI	Ministry of Public Infrastructure
NDS	Guyana National Development Strategy 2010 - 2018
PCR	Project Completion Report
VOC	Vehicle Operating Cost
WSG	Works Services Group

## BASIC PROJECT INFORMATION

PROJECT NUMBER: GY-L1027  
 TITLE: ROAD IMPROVEMENT AND REHABILITATION PROGRAM  
 PROJECT TYPE: LOAN OPERATION  
 COUNTRY: GUYANA  
 BORROWER: CO-OPERATIVE REPUBLIC OF GUYANA  
 LOAN NUMBER: 2215/BL-GY  
 SECTOR/SUBSECTOR: TRANSPORT/ROADS

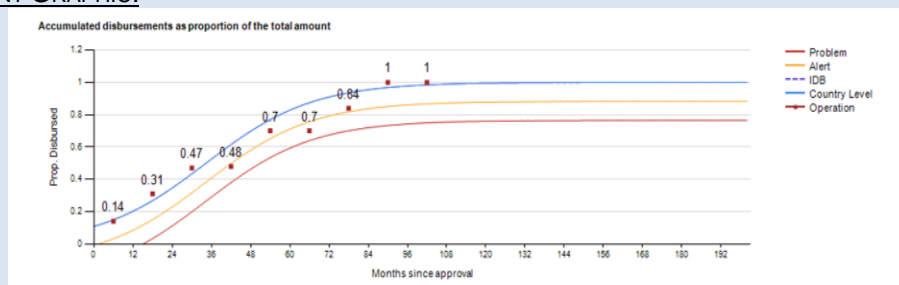
APPROVAL DATE BY DIRECTORY: OCTOBER 28, 2009  
 EFFECTIVENESS OF CONTRACT LOAN DATE: MARCH 21, 2010  
 ELIGIBILITY DATE FOR FIRST DISBURSEMENT: JUNE 29, 2010

TOTAL COST AND SOURCE:  
 ORIGINAL IDB: US\$24,800,000.00  
 CURRENT IDB: US\$24,800,000.00  
 PARI PASU: NOT APPLICABLE  
 TOTAL COST PROJECT: US\$24,514,444.71

MONTHS AT IMPLEMENTATION PHASE:  
 FROM APPROVAL: 107  
 FROM CONTRACT EFFECTIVENESS: 102

DISBURSEMENT DATES:  
 ORIGINAL FINAL DISBURSEMENT DATE: MARCH 21, 2015  
 ACTUAL FINAL DISBURSEMENT DATE: SEPTEMBER 30, 2018  
 CUMULATIVE EXTENSION (MONTHS): 42  
DISBURSEMENTS:  
 TOTAL DISBURSEMENT TO DATE: US\$24,514,444.71 (98.8%)

### DISBURSEMENT GRAPHIC:



REDIRECTION  
 HAS THIS PROJECT?  
 RECEIVED FUNDS FROM ANOTHER PROJECT: NO  
 SENT FUNDS TO ANOTHER PROJECT: YES (GY-L1030)

**PMR PROJECT PERFORMANCE RATINGS:**

No.	PMR DATE	PMR STAGE		ACTUAL DISBURSEMENTS (US\$)
1	December 2010	1	NA*	3,522,973.56
2	December 2011	2	SATISFACTORY	4,221,555.18
3	December 2012	2	SATISFACTORY	3,864,871.70
4	December 2013	2	SATISFACTORY	320,850.63
5	December 2014	2	SATISFACTORY	5,316,464.25
6	December 2015	2	SATISFACTORY	0.00
7	December 2016	2	SATISFACTORY	3,500,000.00
8	December 2017	2	SATISFACTORY	3,767,729.39
9	December 2017	2	SATISFACTORY	0.00
<b>Total</b>				<b>24,514,444.71</b>

ECONOMIC ANALYSIS METHODOLOGY: PRESCRIBED HDM-4 ECONOMIC MODEL, LINKED TO THE TRANSPORT PLANNING MODEL (CBA EX-ANTE AND EX-POST)

EX-POST EVALUATION METHODOLOGY: COST-BENEFIT ANALYSIS (CBA)

DEVELOPMENT EFFECTIVENESS CLASSIFICATION:

**RECOMMENDED OVERALL RATING:**

PARTLY SUCCESSFUL

**I. CORE CRITERIA****RATING****WEIGHT**

1. RELEVANCE

3.00

20%

2. EFFECTIVENESS

2.00

40%

% OF OUTCOMES THAT WERE ACHIEVED

76.1%

3. EFFICIENCY

4.00

20%

4. SUSTAINABILITY

3.00

20%

**II. DEVELOPMENT EFFECTIVENESS - NON-CORE CRITERIA**

BANK'S PERFORMANCE

PARTIALLY UNSATISFACTORY

BORROWER'S PERFORMANCE

SATISFACTORY

**BANK STAFF**

POSITION	IN PCR	IN APPROVAL
VICEPRESIDENT VPS	ANA MARÍA RODRÍGUEZ-ORTIZ	SANTIAGO LEVY
VICEPRESIDENT VPC	ALEXANDRE MEIRA DA ROSA	ROBERTO VELLUTINI
COUNTRY MANAGER	THERESE TURNER-JONES	GERALD JOHNSON
SECTORIAL MANAGER	AGUSTÍN AGUERRE	FEDERICO BASAÑES
DIVISION CHIEF	NÉSTOR ROA	NÉSTOR ROA
COUNTRY REPRESENTATIVE	SOPHIE MAKONNEN	MARCO NICOLA
PROJECT TEAM LEADER	EDGAR ZAMORA	CHRISTOPHER PERSAUD
PCR TEAM LEADER	EDGAR ZAMORA	N/A

TIME AND COST (DIRECT) OF PERSONNEL

PROJECT LIFE-CYCLE	# OF WEEKS OF PERSONNEL	US\$ (INCLUDING TRAVEL AND CONSULTING EXPENSES)
Preparation	18	66,670
Supervision	129	457,770
<b>Total</b>	<b>147</b>	<b>524,440</b>

PROJECT OBJECTIVE/DESCRIPTION:

THE MAIN OBJECTIVE OF THE PROJECT IS TO ENHANCE URBAN AND SUBURBAN MOBILITY AND SAFETY, IMPROVE ACCESSIBILITY TO AN IMPORTANT AGRICULTURAL ZONE, LOWER TRANSPORT COSTS AND REDUCE ACCIDENT RATES, THROUGH THE REHABILITATION AND IMPROVEMENT OF THE EAST AND WEST CANJE ROADS, THE URBAN ARTERIAL NETWORK IN GEORGETOWN, THE ACCESS ROAD TO THE AIRPORT FROM THE EAST BANK DEMERARA ROAD (EBDR), AND LOCALIZED INTERVENTIONS ON THE EBR BETWEEN THE CRICKET STADIUM AND DIAMOND / GROVE. SPECIFIC OBJECTIVES OF THE PROGRAM WILL BE THE IMPROVEMENT OF THE ROAD RELIABILITY AND DRIVING CONDITIONS BY REHABILITATING AND IMPROVING THE DIFFERENT ROAD CORRIDOR.

RESTRUCTURING TO CLARIFY ON THIS PROJECT COMPLETION REPORT (PCR). THE SPECIFIC OBJECTIVES OF THE PROJECT ARE:

- (i). IMPROVING ROAD MOBILITY;
- (ii). IMPROVING ROAD SAFETY CONDITIONS;
- (iii). REDUCING TRANSPORT COSTS.

## **I. INTRODUCTION**

The present PCR of the Road Improvement and Rehabilitation Program (GY-L1027, 2215/BL-GY) was carried out guided by the Results Matrix (Annex II of the Loan Proposal [LP]—see [link](#)), and following the 2018 PCR guidelines. The program was structured under the modality of an investment loan and was approved by the Bank's Board of Directors on October 28th, 2009, for an amount of US\$24,800,000 (IDB with resources of the Fund for Special Operations and Ordinary Capital). The final disbursement of this loan occurred on September 30th, 2018, after accumulating 42 months of extension.

The program contributed to the mitigation of the main problem identified in its preparation phase, associated with difficulty in maintaining the country's roads in good condition, evidenced by the fact that more than 90% of the overall national network had not been rehabilitated and was in regular to very poor conditions, resulting in longer journey times, high transport costs, difficulties in access to schools. The direct causes associated with the main problem were linked to the deterioration of the rural and suburban roads.

At approval, the main objective of the project was to enhance urban and suburban mobility and safety, improve accessibility to an important agricultural zone, lower transport costs and reduce accident rates, through the rehabilitation and improvement of the East and West Canje Roads, the urban arterial network in Georgetown, the access road to the Cheddi Jagan International Airport (CJIA) from the EBDR, and localized interventions on the EBR between the Cricket Stadium and Diamond / Grove. The specific objectives of the program were: (i) improvement of the roads reliability and driving conditions; and (ii) improvement of the management and maintenance of the roads. For this completion report, the objectives were clarified following the current PCR guidelines (2018). Details are provided in the following sections.

The purpose of this PCR is to document the performance of the program at the end of its execution, in relation to the goals originally proposed. The following sections present an assessment of the relevance of the goals outlined in the context of the Guyana economy, as well as an assessment of compliance with the proposed development results and the efficiency in their execution, objectively analyzing the main factors that could have affected the achievement of them. Likewise, the main lessons learned during the implementation of the program are presented, hoping that they can serve to improve future IDB programs.

## **II. CORE CRITERIA**

### **2.1. Relevance**

#### **a. Alignment with country economic/development needs**

The program was aligned with the [Guyana National Development Strategy 2010-2018](#) (NDS) which set out the country's overall development framework, focusing on “transformations for competition”—actions to accelerate and sustain economic growth through enhanced competitiveness and social development. The country's strategy for the road subsector consisted of: (i) rehabilitation, improvement, and extension of the road network, financed by external resources; and (ii) routine maintenance of the rehabilitated network financed by recurrent resources. This strategy aimed to reduce transportation costs, improve market access, overall competitiveness, and increase coverage of maintenance activities of main roads, bridges and other infrastructure. Government of Guyana (GOG) has been actively restoring infrastructure that in most cases has exceeded its life service by improving traveling conditions and road safety along public roads. Maintenance programs have been implemented without interruption with funds from the treasury since 2003 and include the involvement of the private sector by means of



contracting out continuous performance-based routine maintenance activities, as well as the strengthening of the Ministry of Public Infrastructure's (MOPI) capacity to administer and maintain the road network. The program strictly aligned with GOG's strategy in the road subsector.

Furthermore, the program was aligned to the GOG's Medium-Term Strategic Vision, which focused on improving institutional capacity and creating a prosperous climate for private sector development. To this end, various budget speeches by the GOG enunciated that this Strategic Vision, considered fundamentally the GOG's development agenda until 2020, placed priority on (i) infrastructure (transnational highway and port, hinterland roads, and airports); (ii) renewable energy and energy conservation; (iii) public sector management and governance; (iv) information and communication technology-enhanced framework; and (v) climate change adaption/resilience.

In sum, other operations on the transport sector and the present project responded to GOG's objective of rehabilitating and expanding the main road network, supporting growth and competitiveness, through the restoration of accessibility, mobility, safety, and reliability of the road network. This operation also built upon the efforts undertaken by the ongoing loans supporting the institutionalization of improved, modernized and sustainable routine road maintenance (e.g. GY-L1030 and GY-L1031).

Hence, throughout the complete project lifecycle, the project was aligned with the Country's development transport needs.

#### **b. Country's sector strategy/Bank's strategy alignment**

The IDB is the largest multilateral partner supporting Guyana's development. Since 1992, the IDB's involvement in the development of road infrastructure in Guyana has comprised long-term capital investments aimed at the rehabilitation of infrastructure that has reached the end of its service life, the extension of the secondary and tertiary road network, the support of regional and international integration projects and the improvement of road safety conditions. Throughout the different stages of the project GY-L1027 (i.e. program design, approval, and implementation), there were three IDB Country Strategies (CS) for the following periods: 2008-2012, 2012-2016 and another for 2017-2021.

The general objective of 2008-2012 CS was to "contribute to accelerating economic growth through economic diversification and targeted social development," consistent with the government's development framework. Interventions related to this objective were divided among three pillars – (i) strategic infrastructure investments; (ii) enhanced competitiveness; and (iii) social development for growth—which were very similar to the objectives of the previous CS. The project was aligned with the first pillar, strategic infrastructure investments, which according to the CS, aimed to promote the improvement of the quality and coverage of the road network as a pillar of the strategic infrastructure investments, supporting the economic diversification objective. The main areas of focus of the transport sector strategy during this period were: (i) developing a balanced transport system; (ii) developing criteria to prioritize projects rationally within a general strategy; (iii) providing for the improvement and the regulation of the transport system; and (iv) improve the performance of the main logistic chains which sustain the economic growth of the country. The project aligned with the area (iii).

For 2012-2016, the CS presented four "priority areas" for IDB support, one "cross-cutting theme," and three "areas for continued strategic dialogue". The CS included a results matrix for the strategic objectives related to the four priority areas: sustainable energy, natural resources management, private sector development, and public sector management. It also included three areas for strategic dialogue<sup>1</sup>: (i) water and sanitation; (ii) transport; and (iii) citizen security. The transport area had three specific objectives, being: (a) to support the shift from rehabilitating the

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<sup>1</sup> Called sectors in the previous CS.

road system to expanding its capacity; (b) improve urban transportation in a sustainable manner; and (c) align legislative regulation, operational aspects, and the restructuring of the sector to improve its efficiency. The project aligned with the area of strategic dialogue (ii), and with the transport-specific objectives (a) and (b).

For 2017-2021, the CS aims to support reducing constraints to achieving inclusive growth, supporting GOG's vision for accelerating economic growth through economic diversification and targeted social development. The GOG and the IDB jointly agreed on four areas of intervention: (i) establishing a modern national strategy and planning framework; (ii) strengthening fiscal policies and the corresponding framework for the management of natural resource revenues; (iii) facilitating private sector development; and (iv) delivering critical infrastructure. The operation was aligned with the area of intervention (iv).

### **c. Relevance of program concept and design**

**Technical justification of the project.** With a population density of 3.6 people/km<sup>2</sup>, Guyana is a sparsely populated country whose Gross Domestic Product (GDP) per capita is ranked the third-lowest in Latin American and the Caribbean (LAC), and whose economy is the second-smallest in the Region.<sup>2</sup> Guyana is 214,970 km<sup>2</sup>, with 768,888 inhabitants mostly concentrated in urban areas along the northern coast (Guyana Bureau of Statistics)<sup>3</sup> with a predominantly agricultural-based economy. Most of the population lives on the 430 km long by 16 km wide arable coastal plain.<sup>4</sup> Due to this high level of concentration, the GOG has stressed the need to improve the efficiency and the physical infrastructure of the country's transport sector, with the long-term goal of developing and maintaining an efficient, modern, reliable, secure, competitive and high-quality transport system.

Regarding the Transport sector, in 2010 the road network of Guyana had in total 3,995 km, serving a national fleet of about 82,000 vehicles, and connecting Guyana with neighboring countries. In 2010, about 410 km (approximately 10% of the 3,995 km) corresponded to the national main road network, consisting of six main roads, all of which have two lanes, except for two short segments along the East Coast and East Bank Demerara, which had four lanes<sup>5</sup>. According to the Global Competitiveness Index 2010-2011 (GCI), out of 139 economies, in 2010 Guyana ranked 69th in terms of road infrastructure, 103rd in port infrastructure, and 105th in air transport infrastructure<sup>6</sup>.

The East Canje Road that runs from Sheet Anchor towards Harmony with about 14.5 km long was paved but of narrower width (5 to 6 m wide), with a "poor" to "very poor" condition and serves generally rural residential and farming communities. Beyond km 7.3, the existing roadway was unpaved, narrow (about 4.5 m wide) and very lightly trafficked. The first part of the section features generally residential and sporadic, strip commercial development. The final stretch of the route served predominantly as an access roadway to a few rural areas and finally reaches the Guyana Power and Light Company power plant alongside the Canje River near Harmony. The West Canje Road that runs from Stanley Town towards the community of Wyburg with approximately 4.4 km long was paved (approximately 4.0 m wide) in generally "poor" conditions. The road served

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<sup>2</sup> The July 2012 World Bank Development Indicators database estimated real GDP per capita purchasing power parity to be US\$3,442.

<sup>3</sup> Country Program Evaluation Guyana 2008-2012 (IDB, 2011).

<sup>4</sup> The rural interior is very sparsely populated, with communication being predominately along waterways, and/or by air and road to the coast. Georgetown, the capital city, has the largest concentration of population.

<sup>5</sup> Other Guyana transport infrastructure included: 98 km of railroads entirely dedicated to ore transport, one international airport, one regional (short range international) airport and 45 additional airstrips with short runways. The country has a single general cargo seaport in Georgetown, and 4 specialized bulk loading facilities.

<sup>6</sup> World Economic Forum. Global Competitiveness Report 2010-2011.

mainly as an access route to residential and agricultural areas. Streets in the area generally were in poor condition.

For both roads, East and West Canje, important superficial damage to the pavement was reported in 2009. There were potholes on the pavement surface, the edge of the pavement was broken and localized deformations were noticeable along the wheel path at different locations of the road<sup>7</sup>.

The Cheddi Jagan International Airport Access Road, the only access to the CJIA, the most important to the country, and the relatively large Timehri community, presented rough conditions due to the quality of the surface, and several sections of the pavement had failed and were replaced with asphaltic concrete fills. The EBDR had been widened to four lanes between the outskirts of Georgetown to the new Cricket Stadium<sup>8</sup>; however, at the south of the stadium the road continued with two lanes, providing access to the ever-developing residential areas of Diamond and Grove villages on the East Bank of Demerara.

**Program objectives and indicators.** At approval, the main objective was to enhance urban and suburban mobility and safety, improve accessibility to an important agricultural zone, lower transport costs and reduce accident rates, through the rehabilitation and improvement of the East and West Canje Roads, the urban arterial network in Georgetown, the access road to the airport from the EBDR, and localized interventions on the EBDR between the Cricket Stadium and Diamond/Grove. The specific objectives of the program were: (i) improvement of the roads reliability and driving conditions; and (ii) improvement of the management and maintenance of the roads.

The achievement of the project results was organized to be carried out through three components, measured with output indicators as follows:

**Component 1. Improvement and rehabilitation of the East and West Canje:** measured using the total amount of kilometers of existing roads rehabilitated, reduction in journey times, reduction in travel costs and reduction in fatalities/injuries.

**Component 2. Improvement and rehabilitation of main roads:** measured using the total amount of kilometers of existing roads rehabilitated, reduction in journey times, reduction in travel costs and reduction in fatalities/injuries.

**Component 3. Implementation support:** the component funded the technical and environmental supervision services for the projects and the provision of the accounting software, the finance comptroller and the social-environmental experts.

For clarification and analysis, in the present PCR the main and specific objectives defined in the Loan Proposal were restructured into three specific goals<sup>9</sup>: (i) improving road mobility; (ii) improving road safety; and (iii) reducing transport costs.

In order to measure the achievement of the three specific objectives that were rephrased and mentioned in the previous paragraph, five outcomes were defined: (i.a) reduction of vehicle travel time; (i.b) increase in the length of the road network in good/fair conditions; (i.c) more efficient and effective planning; (ii.a) reduction of fatal road crashes/incidents and fatalities; and (iii.a) reduction of Vehicle Operating Costs (VOC). To measure these outcomes, ten outcome

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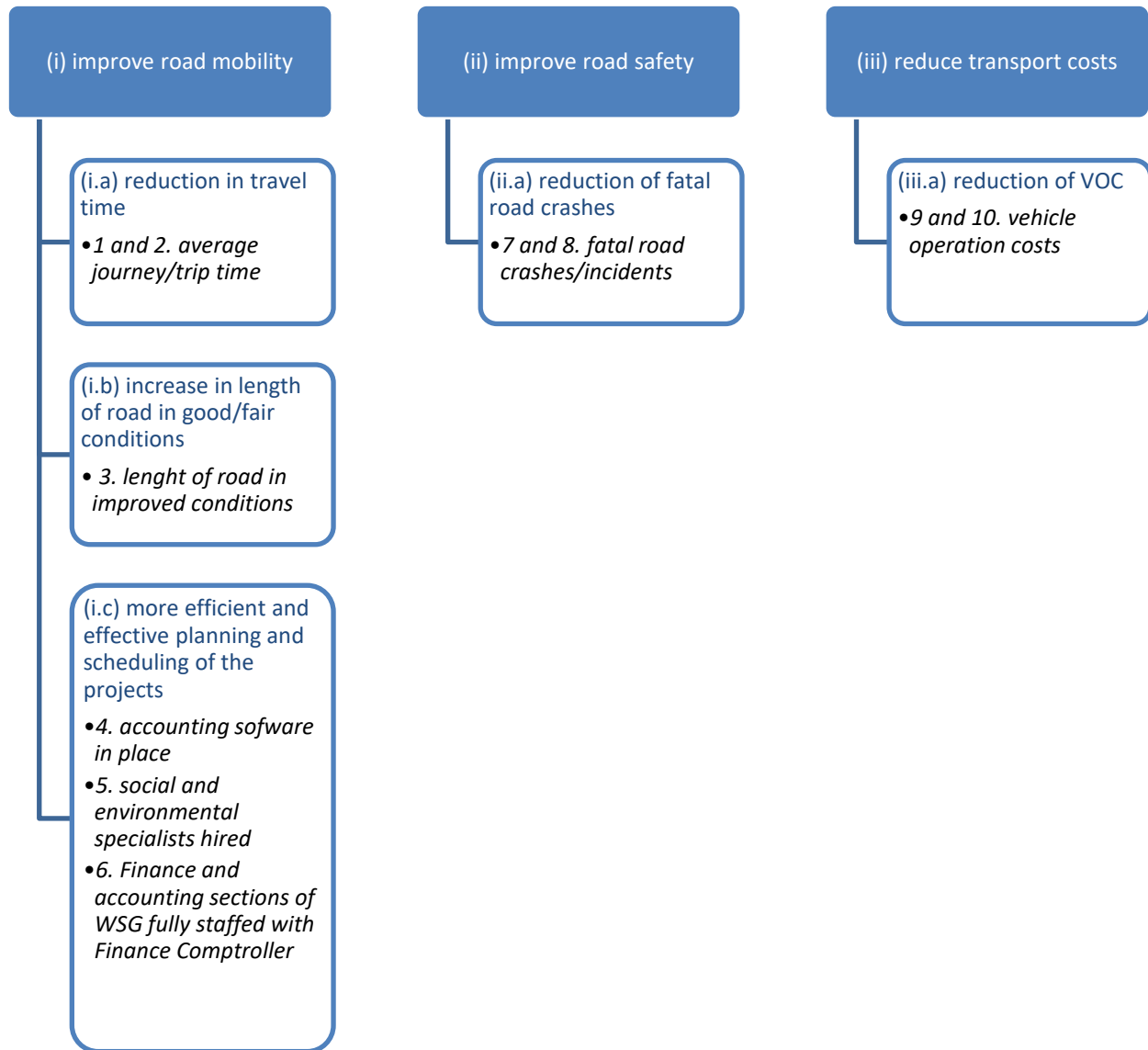
<sup>7</sup> G. Carrubba. Feasibility Study and Design for East and West Canje Rehabilitation, 2009.

<sup>8</sup> Financed with GY-L1030.

<sup>9</sup> Since the general and specific objectives defined at approval were very similar, in order to have a clear and transparent completion report (following the PCR guidelines of 2018), the three main goals stated at approval were defined as the project's specific objectives.

indicators<sup>10</sup> were planned: (1 and 2) journey/trip times, (3) length of road in improved conditions, (4) accounting software in place, (5) social and environmental experts hired, (6) finance and accounting sections of WSG<sup>11</sup> fully staffed with Finance Comptroller, (7 and 8) fatal road crashes/incidents and fatalities and, (9 and 10) vehicle operation costs. Figure 1 below shows the breakdown of the restructured Results Matrix.

**Figure 1. Breakdown of the Results Matrix (restructured)**



However, 6 out of 10 outcome indicators achieved or exceeded the EOP target, as presented in the following section, the non-achievement of some of them relates to some extent to design/implementation issues faced:

<sup>10</sup> Reduction in travel time, Reduction of fatal road crashes/incidents and Reduction of VOC are reported each using two indicators, one for each project (East-West Canjes and Entrance to CJIA).

<sup>11</sup> WSG, the EU within the MOPI.

**Cost overruns in the EBDR project.** During the execution of the project, the borrower, with the Bank's no objection, decided to use US\$11.02 million from this operation (44.4%), as a complement to the operation GY-L1030, to finance the cost overruns for the reconstruction and expansion of the EBDR. The cost overruns were due to a design change from the use of earthen to concrete drains on the project. The design change to the concrete drain caused specific utilities (power and telecommunication lines and poles, water pipes) to be realigned and implemented in a manner consistent with the concrete drainage system construction and placement, causing increases to some other items of the project. Those changes generated an additional cost of US\$7.18 million (including US\$1 million of counterpart financing). Other US\$5.23 million were used for the construction and supervision of five elevated pedestrian crossings along the EBDR and the acquisition of a package of road safety devices for the MOPI.

Considering the availability of resources in the operation GY-L1027 and the nature of multi-works<sup>12</sup> of that operation, the GOG requested that they also were financed with its resources, rather than opting for a supplementary operation.

These contracts financed with GY-L1027 for the completion of the EBDR project were only complementary to the main works (financed with GY-L1030) and were foreseen since the design of the operation, however, no performance indicators associated with these investments were included. This undoubtedly constitutes a bad design practice since it does not allow for the evaluation of the effectiveness of the use of these resources in GY-L1027. However, it is necessary to clarify that in the ex-post CBA of EBDR presented in the GY-L1030 PCR, these investments were indeed accounted for as part of the project costs.

**Deficiencies in the design and implementation of the Monitoring and Evaluation Plan (MEP).** During the design of the operation, the baseline data for the indicators for the results (i.a) reduction in travel time and, (iii.a) reduced vehicle operating time (VOC), was not available but also was not collected or properly documented. These indicators were proposed as indexes in the Result Matrix of the Loan Proposal, and the baseline values were assigned a value of 100. The EOP values were assigned lower values, according to the expected reduction in each case. This required, therefore, the collection of information for the calculation of baseline and EOP values for each case, before and after the execution of the works; however, these tasks in the MEP were not duly included in the operational plans and budgets, and therefore were not executed on time.

In order to have an approximation to evaluate the achievement of these indicators, data from the cost-benefit evaluation, carried out through HDM-4, were used. This model allows calculating, as a basis for the Cost-Benefit Analysis (CBA), the values of travel times and VOCs for pre<sup>13</sup> and post-project conditions. The HDM-4 uses information on the physical conditions of the pavement, road geometry, vehicle traffic levels, and other characteristics of the road to estimate the travel time and VOC for the different types of vehicles in the fleet. While these estimations cannot be considered primary information, they can be considered a good proxy method for evaluating the project results.

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<sup>12</sup> Multi-Works Program Loans are investment loans that are designed to finance similar groups of works (a sample of which has been fully defined), when these works are: (i) physically similar, but independent of each other; and (ii) their feasibility does not depend on the execution of a particular number of work projects.

<sup>13</sup> For the estimation of non-project (ex-ante) conditions, the HDMD-4 model was fed with all available information on the conditions of the roads to be reversed. This includes their geometric characteristics, pavement condition, vehicle fleet flows and distribution, circulation speeds, costs of operating supplies, fuels, lubricants, etc. This allows to obtain a reliable estimation of travel times and costs before the intervention. The same exercise is repeated for the condition with project (ex-post), feeding the model with the new values of those variables. For more information, see the CBA reports ([Canjes](#) and [Entrance to CJIA](#)).

With respect to road fatality information, there were also deficiencies in the planning and implementation of monitoring tasks. The baseline accident data is only available for the East and West Canje projects and the EOP data was not collected for any of the projects financed with this operation. Despite this deficiency, accident data for the year 2012 is available for the Canje project. Since this information coincides with the entry in operation of the road, it is considered a good intermediate measure for this objective. To take this information into account, it has been included as a new indicator in the results matrix.

In terms of the defined outcome indicators, it is also important to highlight some aspects. The first outcome indicator, (i.a).1 average journey/trip time, was an index in the Approved Results Matrix (Annex II in the LP), but in the subsequent PMRs and EOP Matrix, the unit of measurement was changed to minutes. The indicators (i.b).2 length of road in improved conditions; (i.c).3 accounting software in place; (i.c).4 social and environmental specialist hired; and (i.c).5 although planned as outcome indicators, are indeed output indicators.

Finally, in the different PMRs, there are intermediate years reported for most of the indicators, although in the LP only final EOP measures were considered (which is coherent for reporting results in road completion projects).

Despite the issues discussed above, the vertical logic of the project was quite consistent. The intervention generated outputs and defined outcomes indicators focused on achieving the three specific objectives rephrased and clarified as: (i) improving road mobility; (ii) improving road safety; and (iii) reducing transport costs. These specific objectives sought to attend the transport issues faced by Guyana, specifically the ones related to limited mobility, traffic congestion, accidents/fatalities, long journey times, high transport costs, and difficulties in access to basic services. The identification of these issues was consistent with the needs of the country, which in turn reflects the project relevance and consistency with the Government's plans and throughout IDB's different CSs in the country.

By rephrasing the specific objectives, the revised vertical logic (Figure 2), reflects the causal path of the project (already considering the outcome indicators grouped by specific objectives, as explained in the Effectiveness section). Table 1 shows that from approval to closing the project didn't face any changes in the indicators proposed to measure the objectives. Finally, for clarity and consistency, all results in Table 1 (and the following ones) were reported following the specific objectives rephrased, as explained above.

The PCR team carried out an independent analysis of the vertical logic of the program, considering three levels of verification, as presented in Figure 2 below.

Figure 2. Vertical Logic at the level of impacts, results and products (GY-L1027)

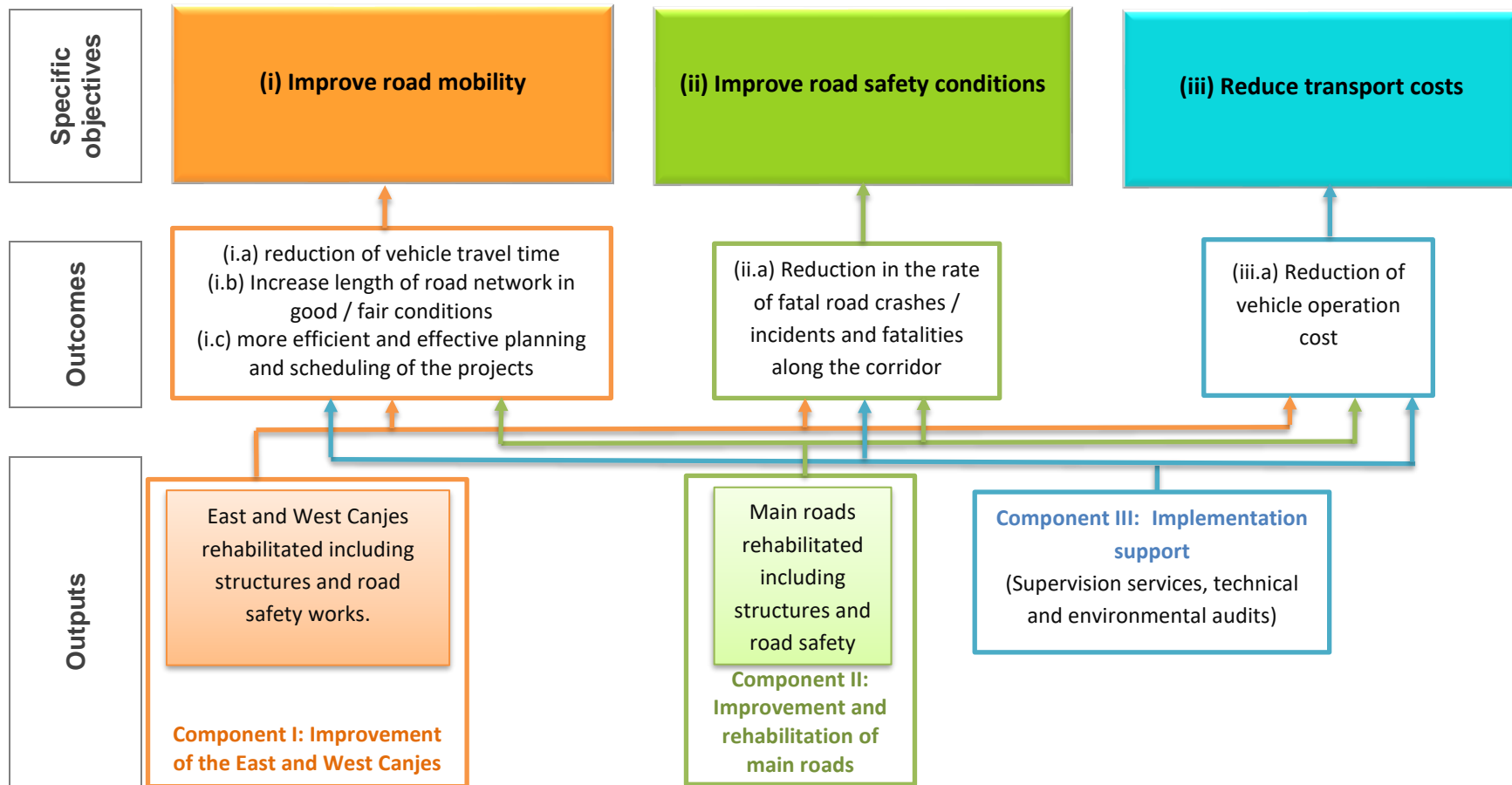


Table 1. Results Matrix (GY-L1027)\*

Outcome Indicators	Approved (Annex II)			+60 days after eligibility			End of project (PCR)			Comments
	Unit of measure	Baseline	Target (P)	Unit of measure	Baseline	Target (P)	Unit of measure	Baseline	(A)	
Specific Objective 1: Improving road mobility										
Average journey/trip time	Index	100	82	Index	100	82	Index	100	East and West Canje: 84	Source: Estimated with data from Ex-post CBA (Gagliardi, 2019) Baseline and EOP index values estimated using the sum of the weighted average travel time (related to traffic composition and volumes), for each project (Canje and Entrance to the Airport).
									Entrance to CJIA: 78	
Length of road in improved conditions	km	0	30	km	0	30	km	0	23.6 <sup>(14)</sup>	Source: Final Evaluation Report (Singh, 2018)
Accounting software in place	software	0	1	software	0	1	software	0	1	Source: Final Evaluation Report (Singh, 2018)
Social and environmental specialists hired	expert	0	2	expert	0	2	expert	0	2	Source: Final Evaluation Report (Singh, 2018)
Finance and accounting sections of WSG fully staffed with Finance Comptroller	comptroller	0	1	comptroller	0	1	comptroller	0	1	Source: Final Evaluation Report (Singh, 2018)
Specific objective 2: Improve road safety conditions										
Fatal road crashes/ incidents and fatalities	Index	100	80	Index	100	80	Index	100	N/A	EOP data was not collected for any of the projects.
Fatal road crashes/ incidents and fatalities (intermediate indicator)	Index	100	80	Index	100	80	Index	100	Intermediate value (2012) East and West Canje: 67	Source: Estimated wit data from Final Evaluation Report (Singh, 2018). EOP data available only for East and West Canje for 2012.
Specific objective 3: Reduce transport costs										
Vehicle operation cost (VOC).	Index	100	79	Index	100	79	Index	100	East and West Canje: 68	Source: Estimated with data from Ex-post CBA (Gagliardi, 2019) <sup>15</sup> Baseline and EOP index values estimated using the sum of the weighted average VOC (related to traffic composition and volumes), for each project (Canje and Entrance to CJIA).
									Entrance to CJIA: 86	

Sources: Original Matrix (Annex II-LP) and Convergence Project Results Matrix.

<sup>14</sup> West Canjes: 4.4 km; East Canjes: 14.5 km; and entrance to airport: 4.7 km.

<sup>15</sup> Due to the lack of details in the CBA ex-ante document, it was not possible to follow the exact same modelling used at approval to update for the actual end of project values to estimate the VOC. So, to ensure comparability of baseline and EOP values in the matrix (index), the CBA ex-ante was run again using the ex-ante scenario. More details are provided in the Efficiency section of this PCR.



## **2.2. Effectiveness**

### **a. Declaration of project objectives**

In the LP, the main objective of the project was to enhance urban and suburban mobility and safety, improve accessibility to an important agricultural zone, lower transport costs and reduce accident rates through the rehabilitation and improvement of the East and West Canje Roads, the urban arterial network in Georgetown, the access road to the airport from the EBD, and localized interventions on the EBD between the Cricket Stadium and Diamond/Grove. The specific objectives of the program were to increase the reliability of roads and to improve the conditions for driving vehicles by rehabilitating and improving the various road corridors.

The specific objectives of the program defined at the project design phase and included in the LP were: (i) improvement of the roads' reliability and driving conditions; and (ii) improvement of the management and maintenance of the roads.

So, for the clarity of the PCR, the objectives were rephrased and clarified in a way that three specific objectives were listed, and no general objective was redefined. The three specific objectives rephrased are: (i) improving road mobility; (ii) reducing transport costs; and (iii) improving road safety conditions.

### **b. Project results**

As stated before, the achievement of the three specific objectives was supposed to be measured through ten outcome indicators, grouped in this PCR as follows:

#### **Specific Objective 1: Improving road mobility**

- Outcome Indicators 1 and 2. **Average journey/trip time (one indicator for each project)**
- Outcome Indicator 3. **Length of road in improved conditions**
- Outcome Indicator 4. **Accounting software in place**
- Outcome Indicator 5. **Social and environmental specialists hired**
- Outcome Indicator 6. **Finance and accounting sections of WSG fully staffed with Finance Comptroller**

#### **Specific Objective 2: Improve road safety conditions**

- Outcome Indicators 7 and 8. **Fatal road crashes/incidents and fatalities (one indicator for each project)**

#### **Specific Objective 3: Reduce transport costs**

- Outcome Indicators 9 and 10. **Vehicle operation cost (one indicator for each project)**

At the end of the project, 6 out of 10 of the outcome indicators achieved the EOP target. These achievement ratios indicate the status of the specific objective's accomplishment, as discussed below:

*The Specific Objective 1 - Improving road mobility - was partially achieved*

**Reduction of vehicle's travel time.** In the case of the East and West Canje, the vehicle travel time (average journey/trip time indicator) reduced from the baseline index of 100 (28.0 minutes in

2010<sup>16</sup>) to an index value of 84 (23.6 minutes in 2019), reducing the average travel time for the route by 16% of the baseline value, just a bit above of the EOP target (P), achieving 89% of it. For the road Entrance to the Airport, the vehicle travel time reduced from the baseline index of 100 (5.2 minutes in 2011<sup>17</sup>) to an index value of 78 (4.0 minutes in 2019), reducing the average travel time for the route by 22% of the baseline value, and surpassing the EOP target (P), achieving 122% of it.

**Increasing the length of the road network in good/fair conditions.** The length of road in improved conditions indicator increased from 0 km in 2009 to 23.6 km in 2019 (West Canjes: 4.4 km; East Canjes: 14.5 km; and entrance to airport: 4.7 km), below the EOP target (P) of 30 km. This means achievement of 79% of the expected change. Even though this is, in essence, an output indicator, it helps to argue that the mobility objective was not completely achieved by the implementation of the projects financed with this operation.

The reasons for the failure to reach the 30 km target set in the design of the operation are explained below:

- As discussed above, the decision of using 44% of the resources of this loan to finance additional works in EBDR (GY-L1030) and the purchase of road safety equipment for stocking MOPI, undoubtedly affected the possibility of achieving the results planned in the design, since these resources do not count towards the goals of the GY-L1027 program.
- It is also important to mention that this operation was initially intended to finance the rehabilitation and expansion of 7 km in the Sheriff St. - Mandela Ave. corridor (SSMA). However, this was not done due to two factors: (i) the use of resources to finance the completion of the works in the EBDR and the acquisition of road safety equipment; and (ii) the higher cost of the SSMM project, which was subsequently contracted for a price of about US\$31 million with financing of a new operation (GY-L1031).

**More efficient and effective planning and scheduling of the project.** The institutional strengthening indicators, which as mentioned above should have been output rather than outcome indicators, were all 100% achieved. The accounting software was purchased and put in operation, the social and environmental specialists for WSG were hired and the finance and accounting sections of WSG were fully staffed with a finance comptroller.

*The Specific Objective 2 - Improve road safety conditions – was partially achieved*

**Reduction in the rate of fatal road crashes/ incidents and fatalities.** As a consequence of the deficiencies in the implementation of the MEP of the program, the EOP information required to estimate the fulfillment of this objective was not collected for any project. However, there is data on traffic fatalities for 2012 in the Canje project, the year the road was put back on service after the intervention. In 2012, the rate of fatal road crashes reduced from an index of 100 at baseline to 67, thus if this trend would maintain to the EOP, it would represent an achievement of 165% of the target. This can be considered a good proxy to evaluate the trend of compliance with the

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<sup>16</sup> Although in the original Results Matrix, the baseline refers to 2009, the ex-ante values in the CBA are reported taking into account the beginning of the works in 2010. To keep the consistence between Convergence and the original matrix, in Convergence it was kept 2009 as the baseline year, but in this PCR all baseline values are reported accordingly to its precise date of measurement to keep the transparency.

<sup>17</sup> Idem. CBA reports ex-ante values referred to the beginning of works in 2011.

objective, for this reason, during the elaboration of the PCR, it was included as a new intermediate indicator in the result matrix.

*The Specific Objective 3 - Reduce transport cost - was partially achieved*

**Reduction of VOC.** For the East and West Canje, the VOC indicator decreased from the baseline value – from 100 (2010<sup>18</sup>) to 68 (2019) - representing an achievement of 152% of the target defined. In the case of the Entrance to the CJIA, the indicator decreased from an index of 100 (2011<sup>19</sup>) to 86 (2019), achieving 67% of the planned reduction.

The estimation of the variation of VOC was made using the HDM-4 results from the ex-post CBA. The model calculated the VOCs for each type of vehicles analyzed (motorcycles, cars, light trucks, trucks, buses, etc.), for both conditions, without and with the interventions. Finally, the values were weight-averaged according to the composition of the vehicle fleet, through the average daily annual traffic for each type of vehicle, to obtain the average VOC values, ex-ante and ex-post. Following the methodology proposed in the result matrix, the ex-ante VOC was normalized to a base equal to 100, and the value ex-post was estimated proportionally to that.

Table 2 shows the progress and achieved results by EOP.

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<sup>18</sup> See footnote 16.

<sup>19</sup> See footnote 17.

**Table 2. Project Results Matrix**

Outcome/ Indicator	Unit of measure	Baseline	Baseline Year	Target and Achieved		% Achieved	Mean of Verification
Specific Objective 1: Improving road mobility							
Average journey/trip time	Index	100	2010 (Canje)  2011 (Ent. CJIA)	P	82	Canje: 89%  Ent. CJIA: 122%	Source: Estimated with data from Ex-post CBA (Gagliardi, 2019) Baseline and EOP index values estimated using the sum of the weighted average travel time (related to traffic composition and volumes), for each project (Canje and Entrance to the Airport)
				P(a)	82		
				A	Canje: 84 Ent. Airport: 78		
Length of road in improved conditions	km	0	2009	P	30	79%	Source: Semi-annual progress report submitted on 28/2 and 31/8 of each year. EOP(A) from Draft Evaluation Report (Singh, 2018)
				P(a)	30		
				A	23.6		
Accounting software in place	software	0	2009	P	1	100%	Source: Final Evaluation Report (Singh, 2018)
				P(a)	1		
				A	1		
Social and environmental specialists hired	expert	0	2009	P	2	100%	Source: Final Evaluation Report (Singh, 2018)
				P(a)	2		
				A	2		
Finance and accounting sections of WSG fully staffed with Finance Comptroller	comptroller	0	2009	P	1	100%	Source: Final Evaluation Report (Singh, 2018)
				P(a)	1		
				A	1		
Specific objective 2: Improve road safety conditions							
Fatal road crashes/ incidents and fatalities	Index	100	2009	P	80	N/A	EOP data was not collected for any of the projects
				P(a)	80		
				A	N/A		
Fatal road crashes/ incidents and fatalities (intermediate indicator)	Index	100	2009	P	80	Canje: 165%	Source: Estimated wit data from Final Evaluation Report (Singh, 2018). Data available only for East and West Canje
				P(a)	80		
				A (2012)	67		
Specific objective 3: Reduce transport costs							
Vehicle operation cost	Index	100	2010 (Canje)  2011 (Ent. CJIA)	P	79	Canje: 152%  Ent. CJIA: 67%	Source: Estimated with data from Ex-post CBA (Gagliardi, 2019) Baseline and EOP index values estimated using the sum of the weighted average VOC (related to traffic composition and volumes), for each project (Canje and Entrance to CJIA)
				P(a)	79		
				A	Canje: 68 Ent. CJIA: 86		

\*% achieved estimated with respect to the target (P), using the achievement ratio formulas from PCR guidelines. Where: P = Planned; P (a) = Adjusted target; A = real.  
Source: Convergence System.

### **c. Counterfactual analysis**

It was not clearly established in the LP the monitoring and evaluation system to be in place to measure project results. As stated before, the project managed to obtain partial results for the outcomes reduction of vehicle travel time, increasing the length of the road network in good/fair conditions, improving road safety conditions and reduction of VOC. It is important to note that during project execution, project data was not properly uploaded in PMRs and CONVERGENCE systems, creating difficulties to address the project results.

However, some empirical studies have analyzed how changes in the physical structure of the road impact travel times and transport costs<sup>20</sup>. An impact evaluation conducted in Georgia employed three quasi-experimental methodologies to evaluate various levels of outcomes resulting from rehabilitation of the Samtskhe-Javakheti Road. The evaluation confirmed that travel speeds along the road increased by 24.4%<sup>21</sup>. Self-reported travel times also generally decreased. Another impact evaluation applied to a rehabilitation project in Honduras (49.5 km of CA-5 highway), employing both quasi-experimental and road economic modeling approaches confirmed that the investment reduced travel times and costs as expected. Finally, performance evaluation for a project in Vanatu confirmed that traffic counts on both national roads had increased and VOC had decreased. Elvik & Vaa (2009)<sup>22</sup> report expected reductions of 7% when upgrading urban roads to current design standards (comparable to the treatments applied in the Canje and Entrance to the Airport projects).

Regarding the improvement in road safety conditions, there is vast literature<sup>23</sup> analyzing the beneficial impacts in the reduction of road accidents and fatalities, due to better quality roads, considering factors such as the road type, the number of traffic lanes, pavement, and the median shoulder and lane widths.

Nevertheless, researchers coincide in the convenience of applying a wider approach that considers both infrastructure/traffic conditions and regulatory interventions as determinants of road safety outcomes.

In this sense, it is arguable that the outcomes obtained in this project, even if they are partial in some cases, are the result of the products delivered, in a way that, in the absence of the project, these outcomes would not have been achieved.

The economic benefits of this program have resulted in lower VOC, which not only save money for the vehicle owners, but it also increases the lifespan of their vehicles. Further, the economic benefits of the completed East and West Canje roads include opening up entire new areas to residential, commercial, and farming development, which brings its own spinoff increases in economic activity. For example, the latter half (7 km length) of the East Canje Road which was previously inaccessible has now become open to new development.

The societal benefits of this program include the preservation of lives which would have otherwise been lost and reduction in vehicular accidents. Needless to say, the lives saved are of immense value. The reduction in the disruptive effects of damages and injuries also benefits the economy, and especially the families and households of road users in the beneficiary areas.

### **d. Unanticipated outcomes**

The positive externalities of this program are mainly economic and societal. A positive externality of this program is that during the rehabilitation of the East and West Canje roads,

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<sup>20</sup> Patel, Shreena et al. Lessons from MCC's Investment in Roads. Millennium Challenge Corporation, USA, 2017.

<sup>21</sup> Increases in travel speed are directly related with reduction of travel time along the same distance.

<sup>22</sup> Elvik, Rune and Vaal, Truls. The Handbook of Road Safety Measures. Elsevier, USA, 2009.

<sup>23</sup> Albalade D. et al. The road against fatalities: Infrastructure spending vs. regulation? Accident Analysis and Prevention 59 (2013) 227–239.

the presence of the road made easier construction of an irrigation pump station which was financed by the European Union and which improved drainage and irrigation of the beneficiary area. This benefitted farmers in the area and increased the total area of accessible arable land for farming.

The construction activities financed by this program have provided employment in local communities and increased capacity in Guyana's construction sector. The Contractor who implemented Component 1 set up the second pre-stress concrete facility in the country as part of the project and this facility became available for use to provide materials for other projects.

**Negative externalities.** The construction delays caused greater inconveniences than normally would have occurred. Given that this was an infrastructural project with large roadwork components, a certain degree of traffic disruption and environmental displacement during construction phases was inevitable. Recognition of this was incorporated into the loan design, and the use of precast culverts, Environmental Impact Assessments (EIA), environmental management plans, and specifying pollution impact mitigation measures in bidding and contract documents helped to minimize the overall negative externalities resulting from this loan operation.

## 2.3. Efficiency

### a. Cost-Benefit Analysis

Ex-post CBAs were conducted in 2019 to determine the accomplishment of the project goals, especially reduction in travel time and costs, and to confirm the economic profitability of the projects<sup>24</sup>. For this analysis, the traditional methodology that considers the benefits of the changes in the consumer surplus (VOC savings and travel times savings) and the changes in the road agency's costs for managing these roads (investment and maintenance costs), between the scenarios "Without Project" and "With Project" was used. The Highway Development and Management (HDM-4) model was used for this analysis as it is currently the usual tool for assessments of road investments. For the ex-post CBA, all the cost overruns explained in section 2.1 (c) were included.

The results of the CBAs are shown in the table below:

**Table 3. Results of the CBA**

Project	ENPV (US\$ million)	EIRR (%)	BCR	ENPV/Investment
East and West Canje	1.20 (2010)	14.1	1.17	0.13
Entrance to CJIA	0.18 (2011)	12.6	1.05	0.04
<b>Overall</b>	<b>1.36 (2010)</b>	<b>13.6</b>	<b>1.11</b>	<b>0.10</b>

The results of the ex-post CBA determined, for the whole program, an overall Economic Net Present Value (ENPV [discount rate of 12%]) of US\$ 1.36 million and an EIRR of 13.3%, while the BCR is 1.11. The ENPV is positive and the EIRR is above the cut-rate of 12.0%, while the Benefit/Cost ratio (BCR) and ENPV/Investment ratio<sup>25</sup> are satisfactory.

Both projects have positive ENPV [discount rate of 12%] and Economic Internal Rate of Return (EIRR) over 12% (the cut-rate) and Benefit/Cost Ratios (BCR) above 1. In this case, for both projects, although those values are low, they are still positive.

<sup>24</sup> An ex-post CBA for the EBRD project, partially financed with GY-L1027, was included in the GY-L1030 PCR. Document available [here](#).

<sup>25</sup> The ENPV/Investment, usually known as the "profitability", quantifies the amount of value created per unit of investment.

Based on the results of the CBAs, both, the whole program and the two projects independently can be considered profitable from an economic point of view.

In addition to the calculation of the efficiency parameters described above, the ex-post CBA was also used to estimate, through the use of the HDM-4 model, the values of VOC without project (2010) and with the project (2019). This was done because comparable VOC values were required to estimate the net change in the VOC indicator (presented as an index in the Result Matrix), and due to the lack of details in the M&E, not all the information used for the calibration of the HDM-4 for the ex-ante evaluation included in the LP was available. The VOC is basically composed of two groups of costs: i) those that are exogenous to the project, i.e. are not affected by the intervention, such as fuel and lubricants costs, salaries, depreciation of vehicles, etc.; and ii) VOC that are influenced by the intervention, related to operating speed, level of congestion, pavement roughness, geometric parameters of the road, etc. To achieve an evaluation of the net effect of the intervention on the VOC, external factors must be kept constant throughout the ex-ante vs ex-post comparison. Finally, adding to the effectiveness section argument, in practical terms, what is relevant is the net change in the VOC as a result of the intervention. This was achieved, as indicated, by performing a calibration of HDM-4 with the same exogenous cost factors, but updating all the road physical characteristics<sup>26</sup> and operational conditions such as travel speed, traffic, and traffic distribution<sup>27</sup>, according to the end of the project situation, allowing to measure the result achieved.

#### **b. Earned Value Analysis**

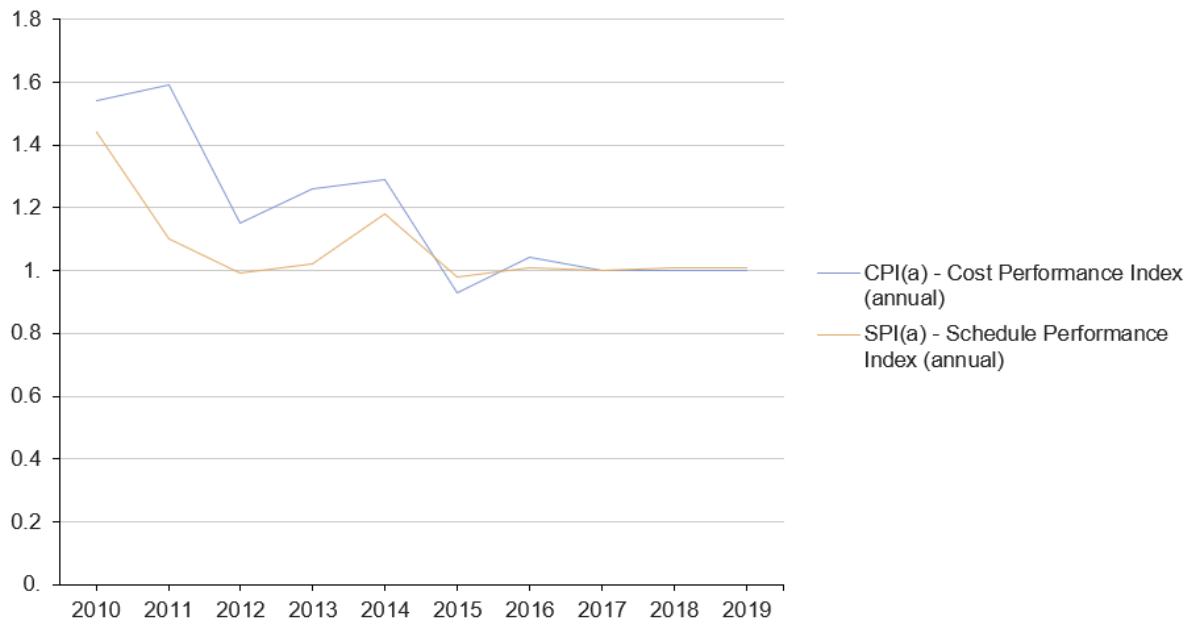
In addition to the CBA analysis, it is also presented an Earned Value Analysis using the PMR indicators. The project's Performance Index Annual (SPI(a)) and Cost Performance Index Annual (CPI(a)) - the operations' efficiency indices - were both classified as "Satisfactory" in the last PMR of the operation (First period, 2019). The SPI(a) and CPI(a) measure whether a project was overrunning time and costs, respectively. Average index values between 0.8 and 2 are considered satisfactory. For the years of project execution, the values of the CPI(a) and SPI(a) indices were 1.00 and 1.01 respectively, forming a Synthetic Index (SI) of 2.60 which is also considered as Satisfactory (taking as reference a limit value of 2.5).

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<sup>26</sup> When it applies. In the case of the projects financed with this loan, the geometrics of the roads (lane width, number of lanes, curves, slopes, etc.) were not modified.

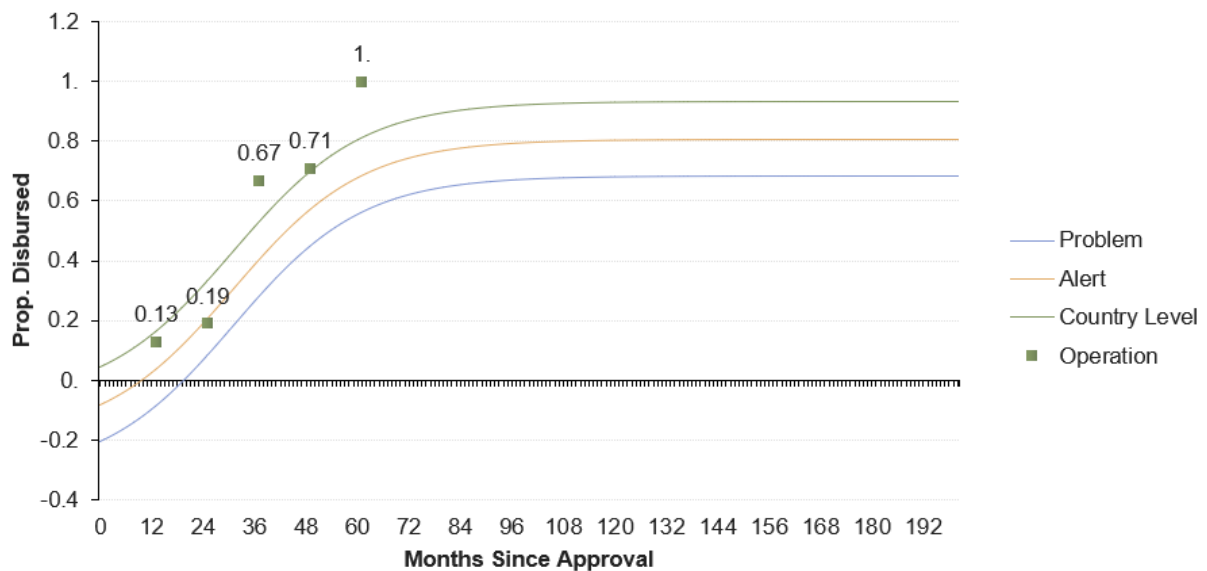
<sup>27</sup> The values used for the ex-post evaluation were taken from the field study (Younge, 2019).

**Figure 3. Annual CPI and SPI Evolution Chart**



The financial progress of the operation has also been classified as Satisfactory and the program has performed satisfactorily regarding the country's historical disbursements.

**Figure 4. Disbursements Evolution Chart**





**Table 4. Project Costs**

Outputs		2010	2011	2012	2013	2014	2015	2016	2017	2018	Cost
Rehabilitation of existing roads, including structures (bridges, culverts, drainage, etc.) and road safety works.	P	2,820,982.98	4,942,000	1,749,486	0	-	-	-	-	-	9,512,468.98
	P(a)	2,970,000	4,942,000	3,976,000	700,000	500,000	-	0	0	-	9,134,514.25
	A	2,820,982.98	2,715,320	2,384,726	202,595	1,010,890.27	0	0	0	0	9,134,514.25

#### Improvement and Rehabilitation of Main Roads

Component Revised Cost

**13,760,276.77**

Outputs		2010	2011	2012	2013	2014	2015	2016	2017	2018	Cost
Rehabilitation of existing roads, including structures (bridges, culverts, drainage, etc.) and road safety works.	P	0	2,200,000	2,880,000	3,900,000	1,320,000	-	-	-	-	10,300,000
	P(a)	0	2,200,000	1,000,000	2,000,000	3,525,000	2,600,000	2,402,488	4,800,373.80	-	13,760,276.77
	A	0	1,198,872	778,828	102,677.09	1,709,542.66	3,172,703.22	1,997,280	4,800,373.80	-	13,760,276.77

#### Implementation Support

Component Revised Cost

**1,272,207.80**

Outputs		2010	2011	2012	2013	2014	2015	2016	2017	2018	Cost
Supervision Services	P	201,990.58	358,000	280,000	280,000	280,000	-	-	-	-	1,399,990.58
	P(a)	280,000	358,000	280,000	280,000	0	120,000	130,512.20	200,000	-	1,272,207.80
	A	201,990.58	307,361	451,317	15,578.54	93,240.68	0	2,720	200,000	247,446.12	1,519,653.92

#### Financial Audit

Component Revised Cost

**0**

#### Contingencies

Component Revised Cost

**0**

Other Costs		2010	2011	2012	2013	2014	2015	2016	2017	2018	Cost
Audit Services	P	0	-	50,000	-	50,000	-	-	-	-	100,000
	P(a)	20,000	-	50,000	-	50,000	50,000	20,000	-	-	100,000
	A	0	0	0	0	11,749.63	68,250.37	0	20,000	-	100,000
None	P	-	-	-	-	2,000,000	0	-	-	-	2,000,000
	P(a)	-	-	-	-	0	0	0	-	-	0
	A	-	0	-	0	0	-	0	0	-	0

Total Costs include inactive outputs

Total		2010	2011	2012	2013	2014	2015	2016	2017	2018	Cost
Total cost	P	3,022,973.56	7,500,000	4,959,486	4,180,000	3,650,000	0	0	0	0	23,312,459.56
	P(a)	3,270,000	7,500,000	5,306,000	2,980,000	4,075,000	2,770,000	2,553,000	205,000,373.80	0	24,266,998.82
	A	3,022,973.56	4,221,553	3,614,871	320,850.63	2,825,423.24	3,240,953.59	2,000,000	5,020,373.80	247,446.12	24,514,444.94

## 2.4. Sustainability

### a. General sustainability aspects

The present operation financed a series of interventions aimed at enhancing urban and suburban mobility and safety, improve accessibility to an important agricultural zone, lower transport costs, and reduce accident rates, through the rehabilitation and improvement of the East and West Canje Roads, the urban arterial network in Georgetown, the access road to the airport from the EBDR, and localized interventions on the EBR between the Cricket Stadium and Diamond / Grove. For this PCR, the specific objectives of the program were rephrased as: (i) improving road mobility; (ii) improving road safety; and (iii) reducing transport costs.

Based on the objectives and results achieved, the PCR team carried out an evaluation of the main factors regarding the sustainability of these results:

**Maintenance budget:** Although Guyana, like many countries in the region, has low levels of resources for the maintenance of its infrastructure, no particularly high risk of deterioration is anticipated in the works financed by this program. Both corridors are included in the regular maintenance plan of the MOPI. During the last 3 years (2017 to 2019), the net budget for maintenance of the road network has grown (in current values), representing figures of 0.18% of GDP (2016) and 0.20% of GDP in 2018 and 2019<sup>28</sup>. This shows a consistent policy of the GOG in the allocation of resources for the maintenance of infrastructure, which can be considered a factor in reducing the risk of deterioration of the works financed by the Bank.

**Continued material shortages:** There is a risk of continued shortages of aggregate stone and cement in the Guyana market. For stone, local quarries have ramped up production, new quarries have come on stream, and imports continue. However, the lead time that it takes to increase capacity can still result in shortages. For cement, new importers and sources constantly enter the market, but there is still a tightness of availability at times. A revamping of the available tax incentives to quarry producers and cement importers may be helpful in facilitating increased supplies of these items to the market. GOG can make demand projections based on its upcoming projects and publicize these ahead of time so that the market can respond by increasing supplies.

### b. Environmental and social safeguards

The operation was classified as Category “B” and was intended to have no significant negative environmental and social impacts that would put the natural and/or social environment at risk. The Road Improvement and Rehabilitation Project was considered environmentally and socially viable and to improve the living, safety and transportation conditions of the communities along the East and West Canje roads, as well as those of the urban communities in Georgetown and Diamond Grove. The representative sample for this multiple work’s investment program consisted of the East and West Canje roads, where feasibility and engineering studies, as well as environmental reviews, had been prepared.

The most significant potential risks identified were: (i) increase in traffic congestion and accidents during the construction, mitigated through traffic safety management plan and a communications plan; (ii) water pollution, soil contamination and erosion mitigated with the implementation of waste management procedures and construction measures to protect the soil layers on the construction sites; and (iii) reallocation and economic temporary economic displacement, managed through consultation and negotiation process leading to agreements on timely and fair compensations for the loss of goods and dwellings, based on legal regulations and on Bank’s Policy (OP-710).

Given the type, size and moderated technical simplicity of the civil works, as well as the fact that they took place mostly within the existing right-of-way of a corridor that traverses a consolidated semi-urban area in both the East and West Canje road projects and the

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<sup>28</sup> Based on national budget data, according to information from the Ministry of Finance.

Georgetown - Diamond/Grove areas were not anticipated any permanent, widespread or irreversible significant negative environmental impacts, and those that expected to occur were mainly social in nature. Negative impacts occurred temporarily during construction and included traffic congestion, noise, relocation of utilities and other minor local infrastructure and some other common impacts of small-scale civil works programs. The long-lasting impacts of the project are most beneficial and include improvement of drainage and water flow conditions in the local canals that border the roads, improved sanitary conditions, a reduction in the probability and severity of car accidents, as well as those involving pedestrians and cyclists, and reduction of travel time and travel costs.

An Environmental and Social Safeguards (ESG) mission was carried out in April 2016. The performance of the project was classified as Satisfactory since the Executor was following IBD's Social and Environmental Policies (see [ESG report](#)). The construction works were carried out in accordance with the agreed environmental and social-technical specifications and in accordance with the EIA and the Environmental and Social Management Plan (ESMP), prepared during the design phase and included in the LP.

### **III. NON-CORE CRITERIA**

#### **3.1. Bank's performance**

At the time of project design, a MEP was prepared and included as an annex to the LP. The baseline data for the indicators for the results (i.a) reduction in travel time and (iii.a) reduced vehicle operating time (VOC), included in the M&E scheme, did not have values and these had to be determined at the beginning of the execution of the operation. Despite this, no major effort was made to collect the baseline of these indicators from the beginning of implementation. For this reason, at the time of carrying out this PCR, the information had to be reconstructed in the best possible way, as explained in detail in the effectiveness section.

Despite that, according to the various interviews carried out by the PCR preparation team with the authorities involved in the preparation and execution of the program, all were unanimous that the Bank generated all the conditions for the Program to be executed efficiently, with appropriate supervision, guaranteeing that its objectives could be achieved within the stipulated deadlines and with quality.

The Bank's supervision of the operation was well done as it worked with the Executing Agency (EA) to resolve issues with the start-up of the execution and procurement. These challenges were related to the delay in the execution of the works and the learning curve for the project execution unit. This is reflected in the disbursement curve of the operation, which shows a slow pace of project execution (measured by its disbursements), being after the third year of the execution below the average parameters of the Bank's operations in Guyana, and only recovering after the 42-months extension of the disbursement period.

#### **3.2. Borrower/executing agency performance**

The MOPI through its Works Services Group (WSG) is the Executing Agency (EA) responsible for implementing the program and accountable to the GOG and the IDB. A program coordinator, reporting to the MOPI was responsible for the execution of the project. The WSG also has its own procurement and finance departments, and a complement of engineers with various specialties. As such, compliance with the appropriate procurement process for materials, works and services; approved requests of funds and authorization of payments; and submissions of project reports by the program managers in charge of the subcomponents were adequately done. Other responsibilities included implementing the procurement plan, following up on consultants' work/deliverables, on-going reporting to the Ministry and Bank and coordination with other agencies.

The EA carried out the following responsibilities during program implementation: (a) prepare and obtain Bank approval for all bidding documents required to hire the civil work contractors

and consulting firms; (b) carry out, control and register all administrative and accounting procedures needed; (c) coordinate the bidding processes according to the Bank and GOG rules; (d) monitor the civil works and construction contracts through consulting firms specifically hired to that effect; (e) maintain adequate accounting and financial controls as well as appropriate support documentation filing systems for verification by the Bank and the external auditing firm; (f) prepare and submit to the Bank disbursement requests and corresponding justification of expenses; (g) prepare and submit to the Bank semiannual reports on the revolving fund, program execution including annual updates of the Annual Plan of Operations, audited financial reports, and other financial reports as required by the Bank; (h) record and control the results of the program through the agreed indicators; and (i) address and resolve contractor claims and address related contract adjustments. In addition, the EA maintained separate files for the operations of the program, allowing for financial and accounting monitoring of the Bank resources, and the local counterpart, in accordance with Bank requirements.

To monitor the program, the EA used the indicators identified in the following documents: (i) the Results Matrix; (ii) the Annual Operating Plan; (iii) the M&E; (iv) the Risk Matrix; and (v) the Procurement Plan. The PMR was used to record and monitor the project's results indicators, as well as the product indicators and their disbursement progress.

The institutional arrangements for project implementation and monitoring were partially satisfactory, considering the lack of institutional coordination and effort to collect the full road safety data, which resulted in absence of key evidence of the effectiveness of the program.

Commitment from the government keeps most of the objectives of the project moving forward, but inadequate enforcement of axle weights can compromise the longevity of new infrastructure. Project records of operations conformed compliance to both GOG and IDB regulations, and there were no issues of records being unavailable during the preparation of the mid-term and final evaluations.

Procurement followed well synchronized GOG and IDB rules and procedures. A procurement plan was prepared which was approved by the MOPI and submitted for the Bank's "no objection". The procurement processes were carried out by the WSG and monitored by the National Procurement and Tender Administration Board; with the Bank reviewing at each step under its "no objection" procedure. The selection of contractors and consultants by the WSG for the execution of the program components was adequate. In most cases, the publication of the RFP of the Bid Document, bidding, evaluation and award were done within four months.

#### IV. FINDINGS AND RECOMMENDATIONS

Table 4 below presents the lessons learned, the findings and recommendations regarding the design and implementation of the evaluated operation.

Table 5. Summary of Findings and Recommendations

Dimension	Category	Finding/Lesson	Recommendation
Technical-Sectorial/ Organizational and Managerial	Project Monitoring and Evaluation/ Project Management Capacity	<b>Lesson 1. Insufficiently qualified personnel to carry out project execution and management can result in low quality of the interventions implemented and their maintenance.</b> It is common for executors to set up Executing Units (EU) with staff that, in theory, would be fully dedicated to the projects, however it is quite common that in situations of limited resources within the institution, EU staff are shared between multiple projects or needs of the institution. This creates a deficit of key staff to deal with technical and administrative tasks of the programme.	<b>Recommendation 1. Strengthening of the WSG's program staff.</b> The main recommendation that emerges from this lesson learned is the need to provide the EU with sufficient staff to meet the needs of the project. The main strategy that can be implemented is to set up an execution unit with senior professionals but also to incorporate more junior professionals with a good technical profile who can be mentored by their more senior colleagues and to whom project responsibilities can be delegated, thus alleviating the workload for senior professionals. This requires that, from the design stage, including the Operations Manual, flexible working mechanisms and incentives are provided for junior professionals to stay on the project and benefit from the transfer of knowledge from more experienced ones. WSG needs to review and update its compensation packages to ensure that it attracts and retains quality staff in view of the realistic compensation that they can earn in the construction industry. In cases where the WSG cannot match private-sector salaries precisely, they can make their overall compensation package more attractive by offering incentives such as training and scholarships, targeted incentives, bonuses, etc. On its side, the Bank could promote the staffing of the EU through innovative mechanisms such as the outsourcing of the financial administration and planning for a local accounting firm.

Dimension	Category	Finding/Lesson	Recommendation
Organizational and Managerial	Inter/ Intra- institutional coordination	<b>Lesson 2. Coordination among WSG, Ministries &amp; utility companies.</b> A critical success factor for undertaking infrastructure works was meaningful and strategic coordination among Government Ministries and utility-oriented organizations. Specifically speaking, the road projects usually required to develop critical task of the project such as relocation of public services and utilities, through third-party institutions, which usually lack of resources and priority for the project.	<b>Recommendation 2. Utility Coordination Oversight Committee.</b> For future infrastructure developments, it will be prudent to incorporate and collaborate with the various utility companies during the design and construction phases. In the case of Guyana, it is key to develop and maintain close relationships and collaboration with the Ministry of Housing and Water, Ministry of Local Government, the National Drainage and Irrigation Authority, Guyana Power and Light, Guyana Telephone & Telegraph Company and Guyana Water Incorporated. For this, it is critical to developing a Utility Coordination Oversight Committee inclusive of all utility organizations in Guyana, members of WSG and Municipal Corporations. Memorandum of Understanding (MoU) or a Memorandum of Agreement (MoA) can be used to formalize the relationship among the specific stakeholders. An adequate budget should be included in the work contracts in order to cover these costs as the unforeseen situations appear.
Technical-Sectorial	Sustainability	<b>Lesson 3. Traffic weight control is key for optimal use of the infrastructures.</b> The absence of specialized equipment for the police to enforce road weight restrictions delayed to put into operation the weight control system, generating faster deterioration of the roads financed by the project.	<b>Recommendation 3. Weigh control policies.</b> The MOPI and the Guyana Police Force need to aggressively enforce weight restrictions and controls on all roads. Use of the mobile scales financed by the Bank is especially important in implementing this, and these should be used focusing on areas of know frequent overloaded trucks, and having a random unpredictability so that offenders a harder time avoiding them. It is recommended that the legislative gaps for enforcement of axle loads and weight limits be corrected urgently and that permanent weigh stations to be established at various key points along the road network to ensure maximum enforcement of these limits. An adequate budget for maintenance is required to keep the system working. It can be included as part of the operation during the desing and the Bank should enforce through the loan contract the compromise of the government for its sustainability.

Dimension	Category	Finding/Lesson	Recommendation
Technical-Sectorial/ Organizational and Managerial	Project Monitoring and Evaluation	<b>Lesson 4. Design and implementation of the MEP.</b> The collection of the baseline and result data was limited, which affected the evaluation of the project outcomes. Thus, it is important to establish the baseline data and methodology for collecting outcome data before the civil works start.	<b>Recommendation 4.</b> To ensure the implementation of the MEP and in particular the collection of data for the construction of the project's outcome and product indicators, the Bank must require that the activities provided for in the MEP be included in the program's Implementation Plan, that the necessary resources be allocated to them in the budget, and that contracts are included in the Procurement Plan. Additionally, the Bank must request the Executor to include in the semester progress report a specific section devoted to the implementation of the MEP, replicating the LP Results Matrix and in accordance with the matrices included in Convergence. The EU must have within its key personnel a professional dedicated to the tasks of Monitoring and Evaluation, as well as to the control of the Annual Operational Plan. This person must be directly responsible for the implementation of the MEP and the reporting of project indicators.
Technical-Sectorial/ Organizational and Managerial	Project Monitoring and Evaluation/ Project Management Capacity	<b>Lesson 5. Management of the supervising consultant.</b> Contracts with supervisory companies did not have sufficient mechanisms or adequate scope of the responsibilities to ensure that WSG received timely information on issues regarding construction execution and to allow for decisions to be made on critical technical and general program management mattered.	<b>Recommendation 5.a Improve the reporting responsibilities in the supervision contracts.</b> Incorporate in the supervision contracts the specific instances of reporting in time and form necessary for the Supervisor to be obliged to give timely information to the Executor for decision making. A communication control mechanism can be implemented as a technological support to this task.  <b>Recommendation 5.b Scheduling regular status meetings with contractors:</b> These meetings could have allowed for open communication, escalation of critical issues and the collaborative generation of solutions, actions, and decisions.
Fiduciary	Cost and Budgetary Aspects	<b>Lesson 6. Bank accounts for foreign firms.</b> The difficulty for the contractors to use foreign currency presents an unnecessary but severe bureaucratic process to import specialized equipment for any purpose, introducing delays in project execution, as well as to manage their maintenance.	<b>Recommendation 6. Allowing foreign currency accounts.</b> Commercial Banks in Guyana do not allow local contractors to hold foreign currency accounts. This presented an unnecessary but severe bureaucratic hurdle for some contractors who had to import specialized equipment for the pedestrian overhead passes. Since contractors on Bank-funded programs can be paid in foreign currency; and the commercial banks already hold foreign currency accounts for allowing local exporters, doing so for contractors would not be a stretch, and there is no valid or legal reason for them not to. The MOPI should clarify this

Dimension	Category	Finding/Lesson	Recommendation
			restriction with the Central Bank of Guyana and have the issue an advisory to the commercial banks to indicate that contractors should in fact be allowed to keep foreign-currency accounts. The Bank should make sure this provisions are taken and included in the fiduciary arrangements of Project Operations Manual.
Technical-Sectorial	Project Design	<p><b>Lesson 7. Critical team-based design reviews.</b> WSG must carefully examine the design parameters proposed by the design consultants. These examinations should be undertaken to assess the suitability, feasibility, appropriateness, and realism of the proposed designs. For example, the use of earthen drains was not appropriate for this project, and the design modification during construction to correct this added to both the construction costs and the duration. In addition, the design did not adequately anticipate the scale of utility realignment works that became necessary.</p>	<p><b>Recommendation 7.</b> The learnings from this, suggests that more team-based design reviews should be undertaken. Subsequently, the contract with the supervising firm should include as its first task the total revision of the designs. Project implementation planning should have allowed sufficient time from the time the designs were received for both the Bank and the Executor with the support of the Supervisor to discuss and review the designs in detail. This would have required the creation of a multidisciplinary task force, consisting of experts in road design, hydrology, hydraulics, pavement and road safety, at least. There needs to be an increased length of time and quality control in conducting the necessary analysis and evaluations of current topographical and geotechnical conditions on sites identified for infrastructural/road development. Sufficient time must also be allocated to evaluate existing infrastructures such as bridges, culverts, etc. It would have been more convenient to take the time to review the designs and identify the necessary changes before launching the tender, to reduce the impact on time and costs when requesting changes from the contractor after the contract was awarded. The increase in time would have allowed for more robust, critical and detailed technical design considerations and perhaps scenario planning which can mitigate against variations and consequently program delays and cost overruns. Bank should request that critical tasks such as value engineering be performed through a peer-review team appointed to check the designs in detail. An independent road safety audit should also be requested by the Bank before launching the bidding, to contribute improving the quality and safety of the designs.</p>



## Annex 1 – Financial Progress

Outputs			2010	2011	2012	2013	2014	2015	2016	2017	2018	Costs
1 Improvement and Rehabilitation of East and West Canje Roads												
1.1	Rehabilitation of existing roads, including structures (bridges, culverts, drainage, etc.) and road safety works.	P	\$2,820,982.98	\$4,942,000.00	\$1,749,486.00							\$9,512,468.98
		P(a)	\$2,970,000.00	\$4,942,000.00	\$3,976,000.00	\$700,000.00	\$500,000.00					\$9,134,514.25
		A	\$2,820,982.98	\$2,715,320.00	\$2,384,726.00	\$202,595.00	\$1,010,890.27					\$9,134,514.25
2 Improvement and Rehabilitation of Main Roads												
2.1	Rehabilitation of existing roads, including structures (bridges, culverts, drainage, etc.) and road safety works.	P	\$0.00	\$2,200,000.00	\$2,880,000.00	\$3,900,000.00	\$1,320,000.00					\$10,300,000.00
		P(a)	\$0.00	\$2,200,000.00	\$1,000,000.00	\$2,000,000.00	\$3,525,000.00	\$2,600,000.00	\$2,402,488.00	\$4,800,373.80		\$13,760,276.77
		A	\$0.00	\$1,198,872.00	\$778,828.00	\$102,677.09	\$1,709,542.66	\$3,172,703.22	\$1,997,280.00	\$4,800,373.80		\$13,760,276.77
3 Implementation Support												
3.1	Supervision Services	P	\$201,990.58	\$358,000.00	\$280,000.00	\$280,000.00	\$280,000.00					\$1,399,990.58
		P(a)	\$280,000.00	\$358,000.00	\$280,000.00	\$280,000.00	\$0.00	\$120,000.00	\$130,512.20	\$200,000.00		\$1,272,207.80
		A	\$201,990.58	\$307,361.00	\$451,317.00	\$15,578.54	\$93,240.68	\$0.00	\$2,720.00	\$200,000.00	\$247,446.12	\$1,519,653.92
Other Costs												
	Audit Services	P	\$0.00		\$50,000.00		\$50,000.00					\$100,000.00
		P(a)	\$20,000.00		\$50,000.00		\$50,000.00	\$50,000.00	\$20,000.00			\$100,000.00
		A	\$0.00	\$0.00	\$0.00	\$0.00	\$11,749.63	\$68,250.37	\$0.00	\$20,000.00		\$100,000.00
	None	P					\$2,000,000.00	\$0.00				\$2,000,000.00
		P(a)					\$0.00	\$0.00	\$0.00			\$0.00
		A		\$0.00		\$0.00	\$0.00		\$0.00	\$0.00		\$0.00
Total Costs												
		P	\$3,022,973.56	\$7,500,000.00	\$4,959,486.00	\$4,180,000.00	\$3,650,000.00					\$23,312,459.56
		P(a)	\$3,270,000.00	\$7,500,000.00	\$5,306,000.00	\$2,980,000.00	\$4,075,000.00	\$2,770,000.00	\$2,553,000.20	\$5,000,373.80		\$24,266,998.82
		A	\$3,022,973.56	\$4,221,553.00	\$3,614,871.00	\$320,850.63	\$2,825,423.24	\$3,240,953.59	\$2,000,000.00	\$5,020,373.80	\$247,446.12	\$24,514,444.94

Source: Convergence System

## Annex 2 – Outputs Matrix

Output Indicators	Approved (Annex II)			+60 days after eligibility			End of project (PCR)			Comments
	Unit of measure	Baseline	Target (P)	Unit of measure	Baseline	Target (P)	Unit of measure	Baseline	(A)	
Rehabilitation of existing roads, including structures (bridges, culverts, drainage, etc.) and road safety works. (East and West Canje)	km	0	19	km	0	19	km	0	19	Source: Final Evaluation Report (Singh, 2018)
Rehabilitation of existing roads, including structures (bridges, culverts, drainage, etc.) and road safety works. (Other roads)	km	0	11	km	0	11	km	0	4.7	Source: Final Evaluation Report (Singh, 2018)
Supervision services <sup>29</sup>	N/A	N/A	N/A	%	0	95	%	0	100	Source: Final Evaluation Report (Singh, 2018), PMR reports

<sup>29</sup> It did not exist in the original results matrix and although it could not be considered a product, it was included in the PRM.

### Annex 3 – Output achievement Matrix

Output	Unit of measure	Baseline	Baseline Year	Target and Achieved		% Achieved*	Mean of Verification
Rehabilitation of existing roads, including structures (bridges, culverts, drainage, etc.) and road safety works. (East and West Canje)	km	0	2010	P	19	100%	Source: Final Evaluation Report (Singh, 2018)
				P(a)	19		
				A	19		
Rehabilitation of existing roads, including structures (bridges, culverts, drainage, etc.) and road safety works. (Other roads)	km	0	2010	P	11	43%	Source: Final Evaluation Report (Singh, 2018)
				P(a)	7.7		
				A	4.7		
Supervision services	%	0	2010	P	95	105%	Source: Final Evaluation Report (Singh, 2018)
				P(a)	95		
				A	100		