Document of
The World Bank

Report No: ICR00004193

IMPLEMENTATION COMPLETION AND RESULTS REPORT

ON A CREDIT FROM INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA-47670)

IN THE AMOUNT OF SDR 119.60 MILLION

AND

ON A GRANT FROM GLOBAL ENVIRONMENT FACILITY (TF-97347)

IN THE AMOUNT OF US$4.50 MILLION

TO THE

FEDERAL REPUBLIC OF NIGERIA

FOR THE

LAGOS URBAN TRANSPORT PROJECT 2 (LUTP2)

October 25, 2017

Transport and ICT Global Practice
Africa Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective June 30, 2016)

Currency Unit = Nigerian Naira (NGN)
US$1.00 = NGN 279.70

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AFD	*Agence Française de Développement* (French Development Agency)
BCR	Benefit–Cost Ratio
BRT	Bus Rapid Transit
CMS	Church Missionary Society
CBD	Central Business District
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
DCIP	Department of Corporate and Investment Planning
EA	Environmental Assessment
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
ESMF	Environmental and Social Management Framework
FCS	Fare Collection System
FGN	Federal Government of Nigeria
FMS	Fleet Management Systems
FM	Financial Management
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIS	Geographic Information System
ICR	Implementation Completion and Results Report
IFR	Interim Financial Report
ISR	Implementation Status and Results Report
ITS	Intelligent Transport System
KAMATA	Kano Area Metropolitan Transportation Authority
KUTPO	Kano Urban Transport Project Office
LAMATA	Lagos Metropolitan Area Transport Authority
LCDA	Local Council Development Area
LGA	Local Government Area
LSEEDS	Lagos State Economic Empowerment and Development Strategy
LSG	Lagos State Government
LUTP	Lagos Urban Transport Project
M&E	Monitoring and Evaluation
MD	Managing Director
MOF	Ministry of Finance

MOT	Ministry of Transport
MOW	Ministry of Works
NEEDS	National Economic Empowerment and Development Strategy
NMT	Non-motorized Transport
NPV	Net Present Value
O&M	Operation and Maintenance
NURTW	National Union of Road Transport Workers
PAP	Project-affected Person
PDO	Project Development Objective
PMS	Pavement Management System
PPP	Public–Private Partnership
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
TBS	Tafawa Balewa Square
TPU	Transport Planning Unit
UIS	User Information Systems
WTP	Willingness-to-Pay

Regional Vice President:	Makhtar Diop
Country Director:	Rachid Benmessaoud
Senior Global Practice Director:	Jose Luis Irigoyen
Practice Manager:	Benedictus Eijbergen
Task Team Leader:	Roger Gorham
ICR Team Leader:	Fatima Arroyo Arroyo

FEDERAL REPUBLIC OF NIGERIA
LAGOS URBAN TRANSPORT PROJECT 2 (LUTP2)
CONTENTS

Data Sheet

A. Basic Information			
Country:	Nigeria	Project Name:	Nigeria Lagos Urban Transport Project 2 (LUTP2)
Project ID:	P112956, P114762	L/C/TF Number(s):	IDA-47670, TF-97347
ICR Date:	10/25/2017	ICR Type:	Core ICR
Lending Instrument:	Specific Investment Loan (SIL), SIL	Borrower:	GOVERNMENT OF NIGERIA
Original Total Commitment	SDR 119.60 million, US$4.50 million	Disbursed Amount:	SDR 119.21 million, US$4.49 million
Revised Amount:			
Environmental Category: B (P112956), A (P114762)			
Focal Area: C-Climate Change			
Implementing Agencies: LAGOS METROPOLITAN AREA TRANSPORT AUTHORITY (LAMATA)			
Cofinanciers and Other External Partners: Global Environment Facility (GEF), *Agence Française de Développement* (French Development Agency/ AFD)			

B. Key Dates				
Nigeria Lagos Urban Transport Project 2 - P112956				
Process	**Date**	**Process**	**Original Date**	**Revised / Actual Date(s)**
Concept Review:	03/18/2009	Effectiveness:	05/25/2011	05/16/2011
Appraisal:	09/24/2009	Restructuring(s):		08/16/2011 12/03/2012 06/18/2015
Approval:	06/29/2010	Mid-term Review:	03/25/2013	03/18/2013
		Closing:	06/30/2015	05/31/2017
Lagos Urban Transport Project 2 - P114762				
Process	**Date**	**Process**	**Original Date**	**Revised / Actual Date(s)**
Concept Review:	03/19/2009	Effectiveness:	05/25/2011	11/25/2010
Appraisal:	09/24/2009	Restructuring(s):		
Approval:	06/29/2010	Mid-term Review:		
		Closing:	06/30/2015	05/31/2017

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Satisfactory
Risk to Development Outcome:	Moderate
Bank Performance:	Satisfactory
Borrower Performance:	Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	**Ratings**	**Borrower**	**Ratings**
Quality at Entry:	Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Highly Satisfactory
Overall Bank Performance:	Satisfactory	**Overall Borrower Performance:**	Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Nigeria Lagos Urban Transport Project 2 – P112956			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating**
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		
Lagos Urban Transport Project 2 – P114762			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating**
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes		
Nigeria Lagos Urban Transport Project 2 - P112956		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
Transportation		

Rural and Inter-Urban Roads	6	6
Public Administration - Transportation	17	17
Urban Transport	77	77
Theme Code (as % of total Bank financing)		
Urban and Rural Development		
Urban Development	100	100
Urban Infrastructure and Service Delivery	100	100
Lagos Urban Transport Project 2 – P114762		
Sector Code (as % of total Bank financing)		
Transportation		
Public Administration–Transportation	22	22
Urban Transport	78	78
Theme Code (as % of total Bank financing)		
Urban and Rural Development		
Urban Development	100	100

E. Bank Staff

Nigeria Lagos Urban Transport Project 2 - P112956

Positions	At ICR	At Approval
Vice President:	Makhtar Diop	Obiageli Katryn Ezekwesili
Country Director:	Rachid Benmessaoud	Onno Ruhl
Practice Manager/Manager:	Benedictus Eijbergen	C. Sanjivi Rajasingham
Project Team Leader:	Roger Gorham	Ajay Kumar
ICR Team Leader:	Fatima Arroyo Arroyo	
ICR Primary Author:	Fatima Arroyo Arroyo Yin Qiu	

Lagos Urban Transport Project 2 - P114762

Positions	At ICR	At Approval
Vice President:	Makhtar Diop	Obiageli Katryn Ezekwesili
Country Director:	Rachid Benmessaoud	Onno Ruhl
Practice Manager/Manager:	Benedictus Eijbergen	C. Sanjivi Rajasingham
Project Team Leader:	Roger Gorham	Ajay Kumar
ICR Team Leader:	Fatima Arroyo Arroyo	
ICR Primary Author:	Fatima Arroyo Arroyo Yin Qiu	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document**)**
The project development objectives are to (a) improve mobility along prioritized corridors and (b) promote a shift to more environmentally sustainable urban transport modes.

Revised Project Development Objectives (as approved by original approving authority)
The original PDO has not been revised.

Global Environment Objectives (from Project Appraisal Document)
The global environment objectives are to promote an incremental shift to more environmentally sustainable urban transport modes among users with relatively high carbon footprint.

Revised Global Environment Objectives (as approved by original approving authority)
The original GEO has not been revised.

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	**Average time spent by individuals on travel along project corridor per trip (minutes)**			
Value (quantitative or qualitative)	120.00	90.00	90.00	87
Date achieved	09/07/2010	06/30/2015	05/31/2017	05/31/2017
Comments (including % achievement)	The target objective has been met. The average time corresponds to the Bus Rapid Transit (BRT) travel from Ikorodu to Tafawa Balewa Square (TBS) (including the existing BRT-lite from TBS to Mile 12 and the new BRT constructed from Mile 12 to Ikorodu).			
Indicator 2:	**Average money spent monthly by individuals on bus travel along project corridor**			
Value (quantitative or qualitative)	4,120.00	3,500.00		2,141.00
Date achieved	06/15/2010	05/31/2015		05/31/2017
Comments (including % achievement)	The target objective has been met. Figures above (under “Actual” as well as “End-Target”) are converted to 2012 Naira, accounting for both inflation and devaluation of the Naira in 2016.			
Indicator 3:	**Average number of passengers carried per standard bus per day along BRT corridors**			
Value (quantitative or qualitative)	500.00	800.00	800.00	458.00
Date achieved	09/07/2010	06/30/2015	05/31/2017	05/31/2017

Comments (including % achievement)	The target objective has not been met. This indicator measures bus utilization efficiency. The main reasons that justify this value are lower-than- expected demand and lower seat-rotation because of the higher-than-anticipated prominence of long trips.			
Indicator 4:	**Road rehabilitated, Non-Rural (kilometers)**			
Value (quantitative or qualitative)	5.50	17.80		17.05
Date achieved	10/15/2014	05/31/2017		05/31/2017
Comments (including % achievement)	The target value has been achieved by 94%, although all the works of planned rehabilitation have been completed. The actual rehabilitated distance came from the 13.5km of Ikorodu-Mile 12 corridor plus 3.55km of Akin Adesola and Wempco Roads.			
Indicator 5:	**Number of direct beneficiaries**			
Value (quantitative or qualitative)	0.00	300,000	300,000	440,000
Date achieved	09/07/2010	06/30/2015	05/31/2017	05/31/2017
Comments (including % achievement)	The target objective has been met. Direct beneficiaries of corridor improvement are considered public transport users in the corridor, of which 156,000 are BRT users and 284,000 are users of *danfos* and LAGBUS.			
Sub Type: Supplemental	**Number of women direct beneficiaries**			
Value (quantitative or qualitative)	0.00	60,000		73,320.00
Date achieved	09/07/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met. The number of women beneficiaries was measured as number of women direct beneficiaries in BRT. The actual number of women direct beneficiaries of the BRT services is 73,320 per day, above the target of 60,000 women users per day.			
Indicator 6:	**Number of indirect beneficiaries**			
Value (quantitative or qualitative)	437,987.00	721,031.00		721,031.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met. Indirect beneficiaries are the number of people given access to Mile 12 market within 45 minutes. This threshold accessibility enhancement has been provided for an additional 283,000 people under the project.			
Global Environmental Objective Indicators				
Indicator 7:	**Percent of BRT users who report owning a car or two-wheeler**			
Value (quantitative or qualitative)	14.00	20	21.00	30.00
Date achieved	09/07/2010	06/30/2015	05/31/2017	05/31/2017
Comments (including % achievement)	Target objective met.			
Indicator 8:	**CO_2 emissions from vehicles along BRT corridors (metric ton)**			

Value (quantitative or qualitative)	371,000.00	359,000.00		349,000.00
Date achieved	09/07/2010	05/31/2017		05/31/2017
Comments (including % achievement)	Target objective met. CO2 emissions were reduced by 6%. Taking into consideration the counterfactual scenario, the weighted average reduction of CO2 emissions is 13 percent when the 2016 scenario is compared with BRT and the equivalent without BRT (detailed explanation in section 3.2 Achievement of Project Development Objectives and Global Environmental Objectives).			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	**Number of Transport Planning Units established and functioning**			
Value (quantitative or qualitative)	2.00	5.00	5.00	5.00
Date achieved	09/07/2010	06/30/2015	03/30/2017	
Comments (including % achievement)	The target objective has been met.			
Indicator 2:	**Percent of activities in annual training plan achieved on target**			
Value (quantitative or qualitative)	65.00	85.00		100.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Indicator 3:	**Updated travel demand and network models, and databases are available for use**			
Value (quantitative or qualitative)	No model available	Travel-demand databases systemized		Model completed and running; being integrated in LAMATA evaluation system.
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Indicator 4:	**Concept for hubs and terminals program in Kano developed**			
Value (quantitative or qualitative)	No concept available	Concept developed and actionable		Achieved.
Date achieved	06/15/2010	05/31/2017		05/31/2017

Comments (including % achievement)	The target objective has been met.			
Indicator 5:	**Physical completion of works (percentage)**			
Value (quantitative or qualitative)	0.00	100.00		100.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Indicator 6:	**Average travel speed of public transport services along BRT corridors (kph)**			
Value (quantitative or qualitative)	10.00	18.00		23.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Indicator 7:	**Average travel time of formal public transport Mile 12- Ikorodu (minutes)**			
Value (quantitative or qualitative)	120.00	90.00		24.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Indicator 8:	**Percent of public transport users rating their BRT service as satisfactory**			
Value (quantitative or qualitative)	20.00	60.00		80.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Indicator 9:	**Percent of two wheelers and car owners who report having a somewhat or highly favorable impression of BRT services**			
Value (quantitative or qualitative)	42.00	65.00		67.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Indicator 10:	**Average travel speed along resurfaced and rehabilitated roads (kph)**			
Value (quantitative or qualitative)	12.00	18.00		50.00

Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Indicator 11:	**Financial and technical performance of project based on audits**			
Value (quantitative or qualitative)	Satisfactory	Satisfactory		Satisfactory
Date achieved	10/15/2014	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Indicator 12:	**Traffic accident rate along project corridor**			
Value (quantitative or qualitative)	139.00	112.00		96.00
Date achieved	09-07/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Sub Type: Breakdown	**Fatal**			
Value (quantitative or qualitative)	14.00	11.00		3.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Sub Type: Breakdown	**Serious**			
Value (quantitative or qualitative)	31.00	25.00		15.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			
Sub Type: Breakdown	**Minor**			
Value (quantitative or qualitative)	94.00	76.00		48.00
Date achieved	06/15/2010	05/31/2017		05/31/2017
Comments (including % achievement)	The target objective has been met.			

G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	GEO	IP	Actual Disbursements (US$, millions)	
					Project 1	Project 2
1	10/21/2010	S	S	S	0.00	0.00
2	05/03/2011	S	S	S	0.00	0.00
3	10/09/2011	S	S	MS	0.00	0.00
4	06/12/2012	S	S	MS	9.44	0.31
5	01/21/2013	S	S	S	25.87	0.31
6	10/01/2013	S	S	S	61.27	0.31
7	06/09/2014	S	S	S	90.38	0.81
8	01/12/2015	S	S	S	99.77	1.97
9	10/15/2015	S	S	S	149.77	3.15
10	06/30/2016	S	S	S	160.67	3.48
11	01/05/2017	S	S	MS	160.67	3.48
12	31/05/2017	S	S	MS	175.11	4.49

H. Restructuring (if any)

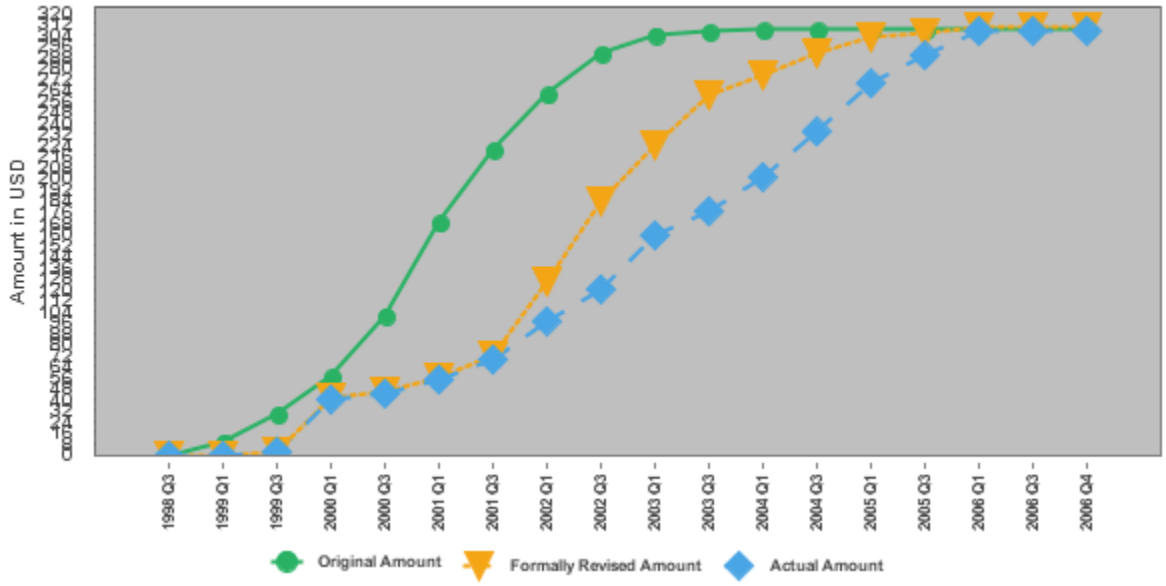
Restructuring Date(s)	Board Approved		ISR Ratings at Restructuring			Amount Disbursed at Restructuring in US$, millions		Reason for Restructuring and Key Changes Made
	PDO Change	GEO Change	DO	GEO	IP	Project1	Project 2	
08/16/2011	No	No	S	S	S	0	0	Substantial changes made in the first restructuring include: (a) increased US$6.8 million of LSG contribution in Component 1 to finance additional cost of the LAMATA building construction from the savings from Component 3 for routine maintenance; (b) in Component 2, reallocated IDA funds previously earmarked for the Oshodi–Mile-2–Obalende corridor to the Mile 12–Ikorodu corridor to support LSG priority and augment AFD funds allocated to it.

								Main reasons for the restructuring were the delays in effectiveness of the AFD co-financing agreement, changes in the focus of the Lagos Government's development plans, and the commencement of works by the federal government along the Oshodi–Obalende corridor. Details of context can be referenced in section 2.2 of the ICR's main text.
12/03/2012	No	No	S	S	MS	17.96	0.31	Minor changes made in the second restructuring include: (a) dropped Component 1B (head office of LAMATA) and thus reduced US$19.8 million of funding, with US$6.8 from LSG and US$13 million from IDA; (b) increased investments for Component 2B to enable IDA financing for civil works for station platforms, shelters, and footbridges along the entire Mile 12–Ikorodu corridor. IDA increased US$13 million and LSG increased US$3.4 million, with saving resources of the dropped Component 1B; (c) increased US$3.4 million of LSG funding to cover cost overruns in Component 3C; support to development of pavement management system (PMS) was originally included in Component 3B (dropped) and this activity is then moved to 3C (renamed as rehabilitation and pavement management system). Main reasons for the restructuring were to respond to changes in project activity descriptions and the reallocation of resources across project categories in order to facilitate implementation progress. Details of context can be referenced in section 2.2 of the ICR's main text.
04/25/2015	No	No	S	S	S	131.52	1.97	The M&E framework was formally modified in the third restructuring (Type II) to improve the precision of the indicators in measuring project outcomes and outputs. Details of

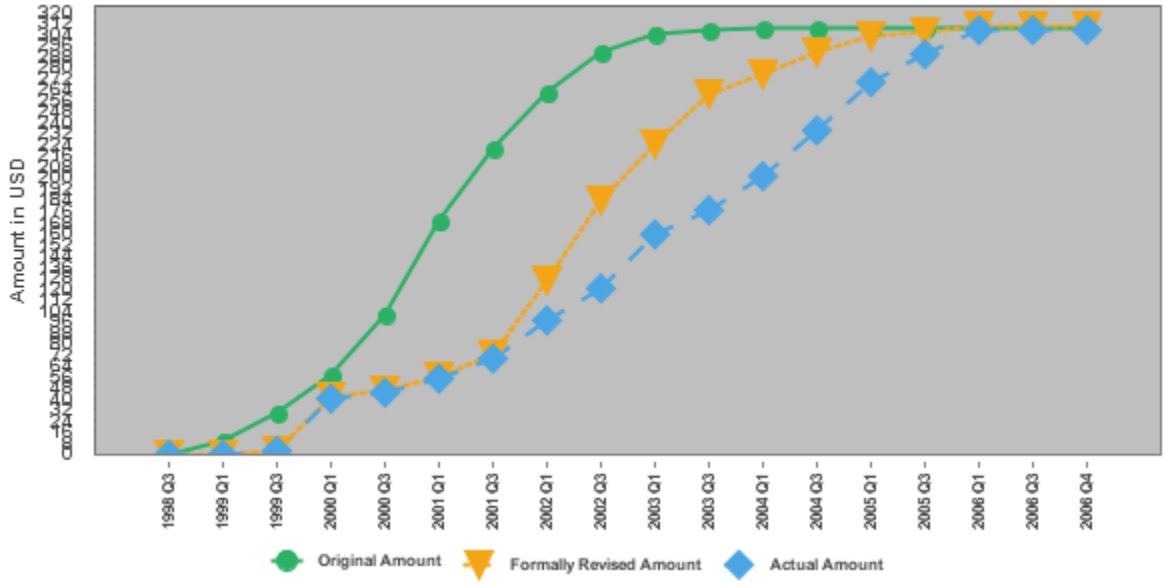
								context can be referenced in section 2.3 of the ICR's main text. Other minor changes made in the third restructuring include: (a) reallocated US$1.44 million from Component 4 to Component 2, to upgrade and rationalize system operation and complement GEF resources to support the ITS equipment procurement; (b) Component 4D, Air Quality Monitoring, was dropped. Main reasons for the fund reallocation were: (a) the air-quality component was no longer operational in the project while a separate project under development would serve as a more appropriate engagement for this purpose; (b) the cost for the ITS component was underestimated and required additional resources to support. Details of context can be referenced in section 2.2 of the ICR's main text.

I. Disbursement Profile

P112956 (IDA)



P114762 (GEF)



1. Project Context, Development Objectives and Rationale

1.1 Context at Appraisal

1. **Population and macroeconomic context.** By 2010, Nigeria had a population of about 151 million people, with about half residing in urban areas. The Lagos metropolitan area was the largest city in Sub-Saharan Africa, with a population of over 17.5 million by 2008 and an annual growth rate above four percent.[1] As the principal commercial center and gateway to the country, Lagos constituted the national engine of economic development. Lagos's seaport and international airport handled over 70 percent of the nation's cargo. It contained the largest manufacturing sector and provided employment for over 45 percent of the country's skilled manpower. The commercial sector was dominant with its vibrant local trading tradition. Since the relocation of the federal capital, the level of efficiency and productivity in Lagos was adversely affected by the declining quality of infrastructure necessary to support the basic needs of the growing population and production sectors.

2. **Public transport context.** Transport infrastructure and services in Lagos remained at levels that supported a population of no more than six million since the 1990s. The density of the road network (about 0.4 km per 1,000 population) was quite low even by African standards, and the provision of bus public transport was highly fragmented with multiple private operators operating poor-quality minibuses *(danfos)*[2] and midibuses *(molues)*. The very few organized mass transit systems included the Bus Rapid Transit (BRT) constructed during the Lagos Urban Transport Project (LUTP), LAGBUS, and a handful of inland waterway ferries. Bus fares were high and consumed over 20 percent of the average household's disposable income. Congestion, a major issue in the city, affected the cost of production and the quality of life.

3. **Institutional and regulatory context.** Nigeria's institutional structure comprises three levels: federal, state, and local. At the federal level, the Ministry of Transport (MOT) sets the national transport policy and the Ministry of Works (MOW) develops the federal road network. The 1999 Constitution devolved urban transport to the states, which made their own laws on traffic and transport. Federal agencies with divisions in the states included the Nigeria Police's Lagos State Traffic Division, which included traffic wardens, and the Federal Road Safety Commission, which was responsible for traffic control and enforcement, primarily on federal roads. In the Lagos State Government (LSG), the MOT was the primary agency for transport policy formulation and implementation, while the Lagos Metropolitan Area Transport Authority (LAMATA) was created during the LUTP and empowered to plan an integrated transport system for the state, with specific focus on implementing and regulating mass-transit systems. The local government councils were responsible for local traffic management schemes, parking control, and management of public transport terminals. The Lagos metropolitan area comprised 18 of the state's 20 local government areas (LGAs), each with its own elected government. Later, 37 Local Council Development Areas (LCDAs) were created from the 20 LGAs. These LCDAs had works departments and traffic

[1] Source: Lagos Central Bureau of Statistics.

[2] *Danfos* are the unregulated substandard yellow minibuses that constitute the informal bus fleet in Lagos. Lagos State Governor Ambode intends to reform the bus sector and remove all *danfos* by the end of 2017.

management units that were responsible for road maintenance and traffic management on local government roads.

4. At appraisal, government authorities had difficulty in meeting the service demands of the growing population, particularly the poor who were most dependent on public provision of all types of services including public transport. However, the effects of rapid growth affected all segments of society. The absence of policies on land use and economic development led to urban sprawl, which multiplied the challenge posed by rapid growth. The declining population density associated with sprawl had increased travel distances and raised the price of public transport. These developments affected the poor disproportionately, often effectively excluding them from work and social services. Meanwhile, the increasing use of private cars choked the roads and endangered the safety of pedestrians and the health of city residents who breathed in automobile emissions.

5. The key weaknesses in the management of Lagos' transport system were: (a) the absence of an articulated and adopted policy and strategic framework for the transport sector; (b) the fragmentation of institutional responsibilities among over 100 agencies at the three levels of government with no coordination framework; (c) the absence of a well-equipped traffic management institution, inadequately trained transport/traffic engineering staff, and involvement of traffic police with traffic management planning due to lack of a professional civilian alternative; (d) inadequately defined public transport planning and regulatory functions; and (e) the absence of standard procedures for the technical and economic evaluation of programs and projects, resulting in a strong bias toward capital expenditure rather than making better use of existing investments through better management and maintenance practices.

6. **With the achievements and systematic preparation under the LUTP, the LUTP2 was created to continue Bank support, in line with national and state development strategies.** Besides the other achievements in institutional capacity building, road network efficiency, bus services enhancement, and waterway transport promotion, the LUTP successfully launched the first BRT line in Lagos (the 22 km BRT-lite between Mile 12 and Church Missionary Society [CMS])) where the daily ridership was over 220,000. A series of planning and stakeholder consultations were conducted under the LUTP in order to prepare for the LUTP2. Subjects included feasibility studies, route selection and design by appointed consulting firms, study tours, high-level meetings with Union[3] executives and involvement of senior government management. In particular, the formation of the Cooperative of Union Members in the BRT corridor and a steering committee comprising LAMATA and financing banks was critical to ensure that all stakeholders were fully involved and taking ownership by acquiring and operating buses and hiring and training drivers for the BRT operation.

7. **Overall, the LUTP2 was designed to remove some of the key bottlenecks to sustainable transport by facilitating market transformation, strengthening institutional capacity, and laying the foundation for acceptability of the reform program.** After systematic preparation in technical, financial, political and operational aspects, the LUTP2 was established as

[3] National Union of Road Transport Workers (NURTW), a Nigerian organization which functions as a mixture of a public transport company, street gang, and transport workers' union. Each *danfo* and *molue* is affiliated with one of several associations, the largest of which is the NURTW. Engagement with the NURTW was considered as a key to stakeholders' engagement in transforming public transport into a more regulated form.

a continuation of Bank support to Lagos' urban transport. The project's objectives and activities were consistent with the government's overall strategy for non-oil-dependent growth, as stipulated in the National Economic Empowerment and Development Strategy (NEEDS) and the Lagos State Economic Empowerment and Development Strategy (LSEEDS). The project built on the success of the Bank-supported Urban Transport Project in Lagos, especially the LUTP, to promote the government's agenda. The project also supported the Nigeria Vision 20:2020 developmental blueprint adopted by the federal government and the Country Partnership Strategy (CPS)[4] approved by the World Bank in 2009.

8. **Rationale of IDA and Global Environment Facility (GEF) support.** The World Bank's continued involvement in the sector was intended to ensure: (a) consolidating and building on the achievements of the past five years under the LUTP; (b) scaling up the results achieved in Lagos and working toward support for initiatives in other large cities (for example, Kano); (c) providing confidence to the private sector and minimizing its perceived risks in undertaking public–private partnerships (PPPs) related to public transport; (d) using technical expertise for policy analyses and project formulation, coordinating and leveraging financing from other development partners (aid harmonization); and (e) helping to raise awareness of the need to go beyond investments in infrastructure and address mobility issues in the broader contexts of increasing urbanization, economic development, poverty reduction, and climate change.

9. The project also fit under the GEF-4's climate-change focal area strategy by facilitating market transformation for sustainable mobility in urban areas, thus leading to reduced greenhouse gas (GHG) emissions. The project's activities were in line with the GEF-4 Strategic Program CC-SP5 because it was designed to promote the long-term shift toward low emissions and sustainable transport operations by strengthening the institutional and regulatory framework for sustainable urban transport and monitoring and evaluation (M&E) of GHGs. The addition of GEF funds was meant to help Lagos to not only prioritize investment in service delivery and poverty alleviation but also, as the BRT system expanded and enhanced, to focus on issues related to service integration, improved operations and acceptability, modal integration, and, particularly, outreach and marketing to attract current non-users of public transport.

1.2 Original Project Development Objectives (PDO), Global Environmental Objectives (GEO), and Respective Key Indicators

10. The project development objectives are to: (a) improve mobility along prioritized corridors, and (b) promote a shift to more environmentally sustainable urban transport modes.

11. The key indicators of the expected project outcomes along the BRT corridors were the following:

- Reduced travel times;
- Reduced household expenditures on transport;
- Increase in bus operational efficiency (number of passengers carried per standard bus per day);

[4] The CPS, which was jointly developed by the World Bank and the U.K. Department for International Development on July 28, 2009, was aligned with the pillars of both the NEEDS and LSEEDS, especially the second pillar which focuses on improved environment and services for non-oil growth.

- Length of road network rehabilitated in the Lagos metropolitan network;
- Number of direct beneficiaries by gender; and
- Number of indirect beneficiaries by gender.

12. The GEO is to promote an incremental shift to more environmentally sustainable urban transport modes among users with a relatively high carbon footprint.

13. The key indicators of the expected global environmental objective outcomes were:

- Increase in the percent of trips made by BRT among households owning cars or motorbikes; and
- Reduced carbon dioxide (CO_2) emissions from vehicles along the BRT corridors.

1.3 Revised PDO and GEO (as approved by original approving authority) and Key Indicators, and reasons/justification

14. The original PDO and GEO have not been revised. However, modifications to key indicators were agreed on the mid-term review and formally adopted in the 2015 restructuring to help reflect the achievement of the PDO, in two ways: (i) the revised framework clarified and removed inconsistencies between indicator statements in different parts of the PAD and the Financing and Grant Agreements, thereby harmonizing the indicators and their intent; and (ii) some indicators required proper definition and simplification to clearly reflect the intended outcome and streamline measurement. The detailed modifications to the indicators can be referenced in Annex 5 of the Aide Memoire for the mission on April 20-25, 2015.

1.4. Main Beneficiaries

15. The project was designed under the strategic guidance of the NEEDS and the CPS, with the goal of contributing to the three pillars of the NEEDS: (i) empowering people and improving social service delivery; (ii) fostering economic growth, in particular in the non-oil private sector; and (iii) enhancing the government's effectiveness and efficiency while improving governance.

16. With regard to project activities that contributed to each pillar, the main beneficiaries identified are:

(a) On empowering people and improving social service delivery, the project supported the development of information, education, and communication strategies that guided the involvement of transport users and beneficiary communities while monitoring and evaluating the project's impact. The main beneficiaries included commuters with access to the planned bus corridor who benefited from improved accessibility, safety, efficiency, and affordability in public transport service.

(b) On fostering economic growth, the project focused on developing an enabling environment for private-sector participation in the transport sector and improving service delivery, particularly affordable mobility in Lagos. The main beneficiaries included private companies involved in bus operations, maintenance, infrastructure

construction; and potentially individuals receiving new employment opportunities because of project operations or improved mobility.

(c) On improving governance, the project strengthened institutional capacity in terms of budget accountability and transport planning and programming capacity, while establishing a model of public-sector governance for other government agencies. The main beneficiaries were the relevant planning and implementing government agencies, especially LAMATA.

1.5 Original Components (as approved)

17. The original project design included the following four components. Annex 2 references the details of each of these components. Annex 8 presents the allocation per component and the co-financing distribution of different components.

- Component 1: Institutional Development and Capacity Building;
- Component 2: Improvement of Public Transport Infrastructure and Enhancement of Traffic Management Systems;
- Component 3: Improvement of Lagos State Metropolitan Road Network; and
- Component 4: Project Management and System Monitoring.

1.6 Revised Components

18. Project components were revised in the 2011, 2012 and 2015 restructurings. The changes in components included revision of activities and reallocation of funds. A major change in Component 2 was made in the 2011 restructuring. At appraisal, Component 2 included the BRT infrastructure construction and supervision of Oshodi–Mile 2–Obalende. However, this corridor was the responsibility of the Federal Government of Nigeria (FGN). After the project was approved, the FGN moved ahead with civil works for traffic-flow improvements along the corridor. It was therefore necessary to restructure the project, remove this activity, and reallocate resources. The World Bank reallocated resources to finance the Ikorodu–Mile 12 corridor, which initially was financed only by the French Development Agency (*Agence Française de Développement,* AFD) and counterpart funding.

19. The tables included in Annexes 2 and 8 reflect the full set of adjustments in component activities. Section H of the Data Sheet presents additional descriptions of changes in components during the restructurings.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design, and Quality at Entry

20. **A sound background analysis was prepared as part of the previous urban transport project in Lagos, and lessons learned were incorporated in the design.** The LUTP2 was the second phase of the LUTP implemented by the same government agency, LAMATA. The LUTP included necessary studies and preparatory activities for the next phase of the policy and strategy implementation. The project design built on the lessons learned from the previous project and other urban transport projects: (a) maintaining a strong institutional basis, LAMATA, for coordinated

planning and regulation as a critical element to the success of urban transport projects; (b) holding considerable up-front discussions, consensus building, and extensive consultations with stakeholders and senior government officials; and (c) establishing a monitoring unit in LAMATA and providing training to staff on project monitoring and evaluation, which is necessary for effective management.

21. **The government's and stakeholders' commitment to the project was evidenced during preparation.** The government's significant buy-in to the urban transport development strategy and LAMATA was demonstrated by two successive elected governors' support. Government support was extended to continue and expand the BRT system in Lagos. As part of the LUTP's implementation, the LSG also demonstrated ownership by introducing institutional, legal and regulatory reforms in the public transport sector. In an effort to build local ownership and reflect local needs in project design, extensive user surveys and focus group discussions were conducted to understand specific concerns and the best ways to accommodate them during implementation. LAMATA built a strong sense of ownership with the transport union as part the project design. This design was based on the premise that the project's success depends on promoting social inclusion in transport policies and investments.

22. **Risks were assessed diligently, considering the World Bank's previous engagement in urban transport in Lagos, although some risks were underestimated.** Main risks were identified during project preparation, and mitigation measures were defined. Social risk was identified during preparation. Urban transport projects usually generate interference with multiple urban-space users, including commuters, residents, schoolchildren, and street traders at sites along the selected corridors. In this project, however, social risks associated with street traders were underestimated at appraisal and materialized during project implementation.

2.2 Implementation

23. **The project was restructured for the first time in 2011, which moved apace project implementation after an initial phase of delayed activities and disbursements.** The main reasons for the first restructuring were a delay in the effectiveness of the AFD co-financing agreement and changes in the focus of the federal government's development plans for the Oshodi–Obalende corridor. Oshodi–Obalende corridor is a federal road leading to the port, which was the section initially identified for BRT investments under the project. After the project was approved, the federal government unilaterally changed the focus for this corridor and decided to finance the road's rehabilitation with its own financing and commenced works incompatible with BRT construction. The federal government had jurisdiction in the corridor and political discussions did not achieve a change in the federal decision. As a result, this component was dropped from Bank financing. The first disbursement was delayed until December 2011 after the client set up the Designated Account. AFD co-financing for this project (US$100 million) was soon approved and became effective as of March 28, 2012. After the 2011 restructuring, all project activities were proceeding apace. The disbursement of IDA and AFD funds began to catch up and substantially improved.

24. **A second restructuring took place in 2012 to respond to changes in project activity descriptions and reallocation of resources across project categories, and resulted in good implementation progress.** The contracts for the 13-km Ikorodu BRT extension corridor were

awarded in the latter half of 2012. However, the project was restructured to adapt to the needs of fund reallocation and minor changes in project activities, resulting in slight delays in procurement for ancillary civil works contracts (construction of bus stations, footbridges and terminals) and the rehabilitation of Wempco Road. Project implementation progressed smoothly after restructuring.

25. **The third and last restructuring in 2015 allowed the reallocation of resources from the Air-Quality Monitoring subcomponent to support the high-standard Intelligent Transport System (ITS).** The Air-Quality Monitoring subcomponent was dropped in this restructuring because it was designed to measure before and after air quality in the BRT corridor, Because baseline data were not gathered before BRT started operating due to delays in procurement, the funds to procure the air-quality monitoring devices would no longer serve its function. Meanwhile, a separate air-quality monitoring and source apportionment project for Lagos State was under discussion at the time of the restructuring, and could constitute a more appropriate engagement for the Bank to address air quality in Lagos. Simultaneously, the ITS allocation was initially underestimated and negatively affected by the exchange rate. Therefore, there was identified a need for additional resources to supplement GEF resources in support of ITS equipment procurement.

26. **The ITS procurement process proved successful on the second attempt after additional resources were reallocated and guidance was provided by the ITS expert who was brought on board.** An initial attempt in January 2015 to procure the supply and installation of the ITS received poor and insufficient response because of the estimated scope and cost. Additional resources for the ITS component were then allocated through the third restructuring, and the Bank's ITS expert was brought on board to provide guidance to LAMATA on preparing sufficiently for the bidding process. LAMATA launched a second bid in July 2015 that was successful in identifying a preferred bidder. The ITS contract was awarded to a consortium of international firms in association with a local firm. The ITS was fully deployed by the closing date, as evidenced during the Implementation Completion and Results Report (ICR) mission in May 2017.

27. **Persistent issues with the fare-collection system reduced BRT performance during the first months of operation.** The system was initially installed directly on the BRT buses prior to shipment to Nigeria. However, the tap-on/tap-off system that had been intended to be used as the main fare-collection system did not accurately record fares, resulting in substantial underpayments. Therefore, the use of smart-card payment was suspended and replaced with a backup interim solution in which one or two staff members at each BRT station can print paper tickets from the hand-held Electronic Ticketing Machine (ETM) before passengers board. After the initial adjustment phase, this interim ticketing mechanism was working by the project's closing date. The preferred option of a smart-card fare-collection system is expected to be fully rolled out by the end of calendar year 2017.

28. **State government transition in 2015 affected LAMATA, although its institutional resilience allowed it to overcome the political transition and perform highly.** LAMATA has been active under three state administrations, with transitions in 2007 and 2015. Although the transition in 2007 did not cause changes to LAMATA's management, state administration support to LAMATA was undermined in some instances. The last transition in 2015, and the only one that occurred during the project, caused a complete turnover of LAMATA;s senior management,

including the managing director who had served LAMATA for 13 years. Nevertheless, this administration was supportive of LAMATA's vision, recognizing its key role as urban transport planner and regulator, and considering urban transport as one of the State's key development priorities.

29. **Political challenges and violence by an anti-government terror campaign in Kano during project implementation caused delays and challenged the achievement of results in that city.** Violence and disruption in Kano, associated with a terror campaign by anti-government forces, were concerns during implementation. This terrorism directly affected the project by delaying the start of the concept design studies (and related data collection) for the proposed pilot bus corridor scheme, which were expected to have started in January 2012. Consultants and World Bank staff were restricted from traveling to Kano for security reasons. The extraordinary circumstances in Kano State caused delays in implementation and made it difficult for the World Bank and LAMATA[5] to closely support Kano.

30. **Changes to the Lagos State financial management and payment authorization process in the first quarter of 2016 slowed down procurement, disbursement and payments.** In February 2016, the LSG directed that all government revenues and inflows needed to be in the Treasury's Single Account and managed through the project's Financial Management Unit in the State Treasury Office. The changes to the Lagos State financial management and payment authorization process led to substantial delays in payments to consultants and contractors, and the extended processing time adversely affected LAMATA's operations. The situation of slowed procurement, disbursement and payments continued until the project's closing date.

31. **Fluctuations of the Naira against SDR and the US dollar challenged LAMATA's implementation planning.** Fluctuations of the exchange rate of the Naira versus SDR and the US dollar have challenged resource planning during implementation. Exchange-rate fluctuations had both positive and negative impacts in different phases of the project. For instance, the ITS component was negatively affected by the exchange rate in 2015. On the other hand, a positive exchange rate in mid-2016 made it possible to identify additional resources available under the IDA credit to construct the Ikeja terminal. LAMATA moved quickly to use these resources for the terminal, which was nearly completed by May 2017, as the ICR team observed during its mission.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Use

32. **At appraisal, the project included a comprehensive M&E framework design based on qualitative and quantitative outcome and intermediate indicators. However, some of the data collection methods could have been simplified.** At appraisal, the M&E framework had nine outcome indicators. The indicators properly captured different dimensions of the transportation system, such as affordability, availability, accessibility and acceptability. The M&E framework includes transport, social, environmental, and capacity development indicators. The data collection methods for some indicators resulted in complexity and could have been simplified at appraisal. For instance, the indicator "Transport share of household expenditure on BRT corridor" needed to

[5] Technical cooperation outlined in the Memorandum of Understanding between the Kano State Transport Authority (KSTA) and LAMATA.

construct the share of household expenditure in order to calculate the indicator value. This indicator was simplified in the July 2015 restructuring.

33. **The midterm review took proactive action to modify the M&E framework and performance indicators in order to better monitor and reflect progress toward the PDO and GEO.** During the midterm review in March 2013, the project team, the World Bank and the AFD agreed that the M&E framework should be modified to improve the precision of the indicators in measuring project and intermediate outcomes and reflect more accurately the project's results. The modification of performance indicators required a change to the legal agreements (Type II restructuring), which was then approved and formally documented in the June 2015 restructuring paper.

34. **Issues in the use of the M&E framework were resolved by contracting technical support, which reinforced the project monitoring unit in LAMATA.** M&E of the project was the responsibility of LAMATA's Department of Corporate and Investment Planning (DCIP). Limitation of the DCIP's capacity was evidenced by the monitoring of a revised structure for performance indicators and baseline values after the 2013 midterm review. LAMATA strengthened its M&E team with a consultant team to proceed with the proposed changes in the M&E framework. Technical consulting support for monitoring helped collect data on a monthly basis to track progress toward the project closing date.

2.4 Safeguards and Fiduciary Compliance

35. Safeguards under this project complied with the three World Bank safeguards policies triggered: (i) OP/BP 4.01 Environmental Assessment; (ii) OP/BP 4.11 Physical Cultural Resources; and (iii) OP/BP 4.12 Involuntary Resettlement. At project preparation, given the nature of this project's co-financing, all counterparts agreed that the World Bank was responsible for reviewing and approving all safeguard instruments applicable to the LUTP2, regardless of the source of financing. The Environmental and Social Management Framework (ESMF) and the Resettlement Policy Framework (RPF), including several site-specific environmental management plans (EMPs) for known project activity sites, were prepared, reviewed and disclosed as required. At project completion, the overall safeguards rating was Moderately Satisfactory.

36. **On environmental safeguards, the project complied with safeguards policy OP/BP 4.01.** A number of environmentally sensitive areas along the sites (Mile 12–Tafawa Balewa Square [TBS] BRT-lite upgrade, Mile 12–Ikorodu extension, and Ikeja bus terminal) were identified at appraisal and as the project evolved. In compliance with OP/BP 4.01, the final EA documents (Environmental and Social Impact Assessment for Mile 12–Ikorodu Road and Ikeja bus terminal, EMPs for rehabilitation of Wempco and Akin–Adesola Roads) were prepared and disclosed in Nigeria and the World Bank's Infoshop.

37. **On physical cultural resources safeguards, the project triggered safeguards policy OP/BP 4.11 at project appraisal due to the substantial civil works**. However, until project completion, no cultural resources were identified and therefore no corresponding measure was taken.

38. **On social safeguards, the project complied with safeguards policy OP/BP 4.12.** Active public consultations took place with affected villages and households regarding locations of bus stations and terminals, selection of bus corridors, compensation rates, relocation arrangements, and livelihood restoration approaches and measures. These helped optimize project design and reduce project impacts. Resettlement Action Plans (RAPs) were prepared, reviewed and disclosed for the affected sites along the Mile 12–Ikorodu corridor and the Mile 12–TBS corridor as well as the Ikeja bus terminal and the Ojota bus depot. The same compliance was met for the ESMF and RPF for the relevant sites, including Wempco and Akin Adesola Roads, Ikeja bus terminal, Ojota depot, and Ikorodu–Palmgrove. In total, acquired land along the BRT corridors and other sites affected 2,231 individuals[6] and all have been compensated appropriately as planned. Some social safeguards issues were not finalized by project closing and resulted in the Moderately Satisfactory rating for social safeguards. However, LAMATA and the LSG made substantial efforts after project closing to resolve all the remaining social issues by September 2017, as explained below.

- First, initial plans were to relocate street traders at Ikorodu Roundabout to the newly built Oluwo Oduikan Market at Agric (constructed under the project) in order to improve traffic flows and safety around Ikorodu station. Since 2016, some of the traders, identified as Project-affected Persons (PAPs), unilaterally moved back to trade near Ikorodu station. LAMATA convened meetings in February and March 2017 with all stakeholders (Lagos State Ministry of Physical Planning and Urban Development, Ikorodu LGA, Markets Board, Markets Association, traders, and the Ikorodu traditional institution) to agree on a timeline and actions, but the PAPs then refused to comply in May 2017. After project closing, the Ikorodu West Council Development (local government) officially took over the operations of the new market. The local government then met with all stakeholders, including the PAPs, to finally reach an agreement: the PAPs have moved into the market at Agric and the market is operational.

- Second, a group of plantain market traders was originally relocated from the Mile 12 terminal site to the nearby Ajelogo market, under a three-year lease agreement. Since the lease expired in 2017, these traders had to move to another location. The concerned plantain traders sent a petition letter to the World Bank in April 2017. After project closing, State Ministry of Local Government and Community Affairs led the reconciliation efforts to reach a final resolution in September 2017. An official agreement, signed by all stakeholders, stated that the LSG would move the plantain traders to a permanent site at Imota, Ikorodu once the construction is complete. The plantain traders expressed satisfaction with the final deal and pledged to work with the LSG to reestablish their livelihood.

- Third, eight of the PAPs identified in the Ikeja Bus Terminal RAP failed to collect their compensation by project closing in May 2017. However, all PAPs had come to receive the compensation by September 2017.

39. **Financial management (FM) of the project complied with World Bank policies and procedural requirements.** The project had adequate and efficient internal control systems and satisfactory banking arrangements, and there was compliance with report-based disbursement, IFR

[6] The total number of PAPs at all sites comprised 473 at Ikorodu, 572 at Ikorodu Market, 134 at Agric, 15 at Ogolonto, 55 at Ajegunle, 40 at Owode Section, 75 at Owode Market, and 867 at Mile 12.

quarterly submission, and external audits as required. The project was adversely affected by the exchange-rate fluctuation of the US dollar against SDR and the Naira, resulting in a loss of US$14,890,705 against the original IDA allocation. The project was still able to achieve most of its budgeted activities. The quarterly interim financial report (IFR) provided explanations for variances between actual and planned activities. In addition, from early 2016, due to the changes to the Lagos State financial management and payment authorization process, the project experienced significant delays in payments to civil works contractors, although the process stabilized over time.

40. **Procurement under this project complied with World Bank policies and procedural requirements.** Overall, the procurement of goods, civil works, and consultancy service contracts was arranged in a timely manner through appropriate proposal, review and delivery procedures. Nonetheless, the project experienced some delays in procuring the supply and installation of the ITS. The first attempt in January 2015 received poor and insufficient response from potential bidders. After consultations with World Bank ITS experts, modifications to the bidding process, as well as the hiring of an ITS consultant to supervise development and deployment, the second attempt in July 2015 proved successful and the contract was awarded to a consortium of international firms in association with a local firm.

2.5 Post-completion Operation/Next Phase

41. **Appropriate technical, financial, commercial and institutional arrangements have been put in place to ensure BRT's effective operation, although efforts are needed for its broader network integration.** The BRT operator has been successfully operating from the CMS to Ikorodu for more than a year. The BRT operation generates positive cash flows. Nevertheless, the operation's financial sustainability will depend on the success of integrating BRT with the rest of the network, following the State Transport Master Plan and specifically the Bus Network Reform that the state government intends to implement. The first step of network integration was developed under this project. However, the LSG's plan was to implement a broader bus network reform for integration. A potential new World Bank project in Lagos would support this broader network reform.

42. **LAMATA and the LSG have shown interest in the next phase of the project, although no formal request has been sent to the World Bank.** The follow-on assistance would aim to develop a world-class integrated public transport system that would make Lagos State economically competitive and improve the standard of living of its citizens. The new operation would function as a "programmatic" approach in which the LUTP and LUTP2 establish the foundation. The next phase would serve as an instrument to achieve the existing BRT's integration with the network as a whole. The concept of the new operation builds on the lessons learned from the LUTP and LUTP2 (see Section 6). This could involve a number of components, including: (a) support for a broad-based bus reform program focused on rationalizing the informal bus transport sector in an incremental manner; (b) support for service and modal integration; (c) extension of the BRT network and development of an integrated package of investments, including transport and land use; and (d) support for LAMATA's continued efforts to develop and update strategic plans and provide international experience.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design, and Implementation
Rating: High

43. **Relevance of objectives: High**. Project objectives were and remain highly relevant to Nigeria's development priorities. The project contributed directly to the World Bank Group's Nigeria CPS 2010–2013, especially the dimensions of Pillar 1: Achieving Sustainable and Inclusive Non-Oil Growth. The project continues to be aligned with the World Bank Group's Nigeria Country Partnership Framework (CPF) 2014–2017, especially the dimension of improving the quality and efficiency of social service delivery at the state level to promote social inclusion, and strengthening governance and public sector management. The project is also aligned with the development agenda Vision 20:2020, which focuses on two transformational objectives: (i) optimizing the country's human and natural resource potential to achieve rapid economic growth, and (ii) translating that growth into equitable social development for all citizens. The Vision 20:2020 informs the latest Nigeria CPF, which is currently under preparation.

44. **Relevance of design and implementation: Substantial**. Project design and implementation were and remain highly relevant in achieving the PDO. Project components and expected outputs are consistent with the stated objectives, because outputs and outcomes are a direct result of the project's causal chain. The Results Framework was appropriate, enhanced during implementation and supplemented by the already sophisticated M&E framework in LAMATA, which was provided monthly to the World Bank. Despite the project's complexity and technical challenges, project implementation was timely and consistent with ongoing government programs.

3.2 Achievement of Project Development Objectives and Global Environmental Objectives
Rating: Substantial

45. The PDOs are to (a) improve mobility along prioritized corridors, and (b) promote a shift to more environmentally sustainable urban transport modes. The GEO is to promote an incremental shift to more environmentally sustainable urban transport modes among users with a relatively high carbon footprint. The achievement of each of the elements of the PDOs and GEO is discussed in the following paragraphs.

PDO1. Improving mobility along prioritized corridors
Rating: High

46. These were expressed by: (a) improvement of mobility in the corridor from Ikorodu to Mile 12, (b) improvement of mobility through the development of a complementary bus system, and (c) improvement of mobility in rehabilitated strategic road corridors. Table 1 explains the theory of change for PDO1.

Table 1. Theory of change for PDO1. Components, Outputs, and PDO/GEO Indicators

Components	Outputs	PDO/GEO Indicators	PDO/GEO
2B: BRT Infrastructure Construction and Supervision (Mile 12–Ikorodu/BRT–Lite Corridor Extension)	• Mile 12–Ikorodu Road is expanded from a four-lane to six-lane highway with segregated BRT lanes running in the middle.	• Average time spent by individuals on travel along project corridor per trip (minutes). • Average money spent monthly by poor individuals on bus travel along project corridor. • Average number of passengers carried per standard bus per day along the BRT corridor.	To improve mobility along prioritized corridors
2C: Upgrade of BRT Lite (Mile 12–CMS)	• BRT-lite shelters are rehabilitated.		
2E: Development of Complementary Bus Systems	• Bus-route network study is georeferenced and can be viewed in GIS packages with recommendations on three types of services, including mass-transit routes, high-capacity/tributary routes, and standard routes. • 19 additional motor park locations have been identified and would form "Transit Hub" interchanges. • Ikeja bus terminal is constructed.	(No PDO indicator linked to this component)	
3C: Rehabilitation (and PMS)	• Wempco Road in Ogba (1.9 km) and Akin Road in Victoria Island (1.65 km) are upgraded and rehabilitated to be divided highways and provided with covered drainage and necessary road furniture.	• Road rehabilitated, non-rural (kilometers)	

Improvement of mobility in Ikorodu to Mile 12 corridor

47. **The project achieved a significant improvement in mobility along the prioritized corridor with the construction of BRT from Mile 12 to Ikorodu.** The improvement of mobility for BRT users included the enhancement of availability, affordability, accessibility and acceptability of BRT. This improvement is not limited to vehicle movement; it goes further by improving travel experience and removing barriers for mobility. The improvement of mobility and its links with PDO indicators is assessed by considering a multi-criteria framework, as described in Table 2. Activities under Component 2: "Improvement of Public Transport Infrastructure and Enhancement of Traffic Management Systems" contributed to the achievement of results. Component 2 included the reconstruction of Mile 12–Ikorodu Road to expand from a four-lane to a six-lane highway with segregated BRT lanes running in the middle and the upgrade of 44 bus shelters of the BRT-lite (Mile 12–CMS). The original corridor was in poor condition and suffered from persistent road-safety and traffic issues. Some sections experienced submersion during the rainy season due to perennial flooding, which made travel time significantly unreliable during the rainy season.

48. Figure 1 depicts the before and after photos of the corridor.

Table 2. Framework to Assess Improvement in Mobility for BRT Users: Corridor Mile 12 to Ikorodu

Attributes	Criteria Used to Assess
Availability	The BRT operation from Ikorodu to Mile 12 began in November 2015. The operator, Primero Transport Services Limited, started operating from Ikorodu to TBS, which includes the new BRT corridor plus the BRT-lite section (constructed under the LUTP and upgraded under the LUTP2). The operator operates a 24-hour bus service, the first of its kind in Nigeria. BRT provided an alternative mode in the corridor that reduced travel time along the BRT corridor, measured as the reduction of travel time from Ikorodu to TBS by 28%, from 120 minutes to 86 minutes (PDO indicator). The actual value exceeded the target (90 minutes). The average travel speed of the BRT buses is 23 km/h, higher than the target of 18 km/h. The main reasons for mobility efficiency are: (a) other commercial buses spend more time picking up and dropping off passengers, and they make more stops at bus stops that are in-between; (b) off-board ticketing; and (c) BRT's exclusive and dedicated right-of-way. The BRT design allows improvement of efficiency and gains in mobility in the BRT corridor. All the BRT stations were designed to enable the free passage of buses not using the station when the station platforms are occupied. Where appropriate, the necessary cross-section for the platform and lay-by were obtained by reductions in the adjoining service lane width. The project also improved the reliability of transport service between Ikorodu to Mile 12 due to enhanced response to flooding. The works improved resilience to flooding in some sections of the road, which used to experience submersion and flooding during the rainy season, significant delays and unreliable transport service.
Affordability	The average amount spent monthly by individuals on bus travel along the project corridor decreased from NGN 4,120 to NGN 2,141 (in 2012 Naira) (PDO indicator). Tickets are sold in three different categories from Ikorodu to TBS.The current fare structure is set as follows: from Ikorodu to Mile 12, NGN 100.00; from Ikorodu to Fadeyi, NGN 200.00; and from Ikorodu to TBS, NGN 300.00.
Accessibility	All bus-shelter infrastructure has access through ramps. Disabled and elderly passengers are given priority in boarding buses and are provided reserved seats and space for wheelchairs. The BRT system's accessibility for wheelchair users is provided by a dedicated service using low-floor buses and on-board ramps for platform access. All stations have ramps to access the station and mobile ramps to access the bus.
Acceptability	Acceptability has also improved. As per travel surveys, 80% of public transport users rated the BRT service as satisfactory, compared with the initial baseline of 20% (intermediate indicator). The main reasons are: (a) Bus drivers' attitude. Bus drivers are well trained and work in much more favorable conditions than those of informal transport. In Lagos, BRT drivers are known as "pilots," which gives them a higher status. Drivers participate in numerous training programs, including safety, customer service, human relations, and anger management. Drivers work eight-hour shifts. (b) Conditions of bus stops and shelters. Clean, adequate lighting. Apart from the new shelters from Mile 12 to Ikorodu, the upgrade of 44 BRT-lite shelters (from Mile 12 to TBS) improved safety and comfort for BRT users and enhanced mobility, traffic management and safety for the BRT operation in the BRT-lite section. (c) Cleanliness and condition of vehicles. (d) Comfort and capacity. The operator purchased and began operating 434 high-capacity air-conditioned buses. The buses are designed to carry 42 seated passengers, with an additional provision for 20 standing passengers. The average number of passengers carried per standard bus per day along the BRT corridor was 458 (PDO indicator). The value is under the expected target of 800 passengers per bus per day. Nevertheless, for similar distribution of passengers the result indicates buses are less crowded at peak hour and thus provide more comfort for passengers.

Figure 1. Improvement in Mile 12–Ikorodu Corridor

Source: Images on the left: RAP; Images on the right: ICR mission
Note: Left: before; Right: after

49. **The improvement of mobility in the BRT corridor also benefited non-BRT users.** This improvement did not limit benefits to BRT users. The improvement of Mile 12–Ikorodu Road from the existing four-lane (two-lane divided highway) to a six-lane highway with segregated BRT lanes running in the middle (see Figure 1) benefited private users and other public transport users (LAGBUS, *danfos* and *okadas*). Data show that on average it takes non-BRT buses about 49 minutes to go from Ikorodu to Mile 12, compared to the original 120 minutes. Based on vehicle counts and vehicle occupancy estimates, daily ridership among these modes is estimated at 284,000 combined. For the same section, car owners[7] record travel times between 18 and 20 minutes, compared to the original 100 minutes.

[7] It is also understood from cases in many cities that there will be a rebound effect: as the motorization rate and private vehicle use continue to increase, the benefits in travel-time savings for private vehicles will decrease in the longer term.

Improvement of mobility through the development of a complementary bus system

50. **The LUTP2 financed strategic civil works and technical studies to build the foundations of the LSG's plan to implement a broader bus network reform and improve mobility in Lagos.** The project, under Component 2, financed the implementation of the strategic intervention of a holistic program in Lagos: the construction of the Ikeja bus terminal. The project financed the terminal, which serves as a centralized motor park from which all minibus operations in and out of Ikeja will operate. The terminal will reorganize the fragmented parking of buses in Ikeja district. The terminal was completed by the project's closing date, and operation is expected to begin by the end of 2017. Moreover, the project financed a bus-route network study (Component 2D: Development of Complementary Bus System) to improve the operating efficiency of all bus routes in Lagos.

Improvement of mobility in rehabilitated strategic road corridors

51. **Additional improvements in mobility for vehicles and pedestrians were achieved with the improvement of the Lagos State Metropolitan Road Network.** Activities under Component 3: Improvement of Lagos State Metropolitan Road Network resulted in improvement of mobility in prioritized corridors. As a result of these activities, 17.8 km of strategic roads were rehabilitated (PDO indicator). The average travel speed along resurfaced and rehabilitated corridors reached 50 km/h, compared to the original 12 km/h. Improvement of the road enhanced the efficiency of the use of existing road space, reduced vehicle operating costs (VOCs), enhanced the operation of buses, and improved road safety for vehicles and pedestrians. It is important to note that the corridors greatly improved mobility for pedestrians and vulnerable persons. The rehabilitated corridors incorporated a walkway that is raised above the pavement with ramp access and pedestrian crossing facilities. Moreover, prior to the rehabilitation works on the road there was a notable incidence of flooding and ponding on the road, which impeded its serviceability. This defect has been adequately addressed through the rehabilitation works carried out on the road. Field surveys indicated that users attest to the improvement of mobility and reduction of travel time.

PDO2: Promote a shift to more environmentally sustainable urban transport modes. GEO: Promote an incremental shift to more environmentally sustainable urban transport modes among users with a relatively high carbon footprint
Rating: Substantial

Table 3. Theory of change for PDO2 and GEO. Components, Outputs and PDO/GEO Indicators

Components	Outputs	PDO/GEO Indicators	PDO/GEO
2B: BRT Infrastructure Construction and Supervision (Mile 12–Ikorodu/BRT-Lite Corridor Extension)	• Reconstruction of Mile 12–Ikorodu Road, expanding from a four-lane to six-lane highway with segregated BRT lanes running in the middle.	• Number of direct beneficiaries • Number of women direct beneficiaries • Number of indirect beneficiaries	To promote a shift to more environmentally sustainable urban transport modes.

Components	Outputs	PDO/GEO Indicators	PDO/GEO
2C: Upgrade of BRT-Lite (Mile 12–CMS)	• BRT–lite shelters are rehabilitated.	• Percentage of BRT users who report owning a car or two-wheeler • Reduced CO_2 emissions from vehicles along BRT corridor	To promote an incremental shift to more environmentally sustainable urban transport modes among users with a relatively high carbon footprint.

52. **Public transport users benefited from improvements to the Mile 12–Ikorodu corridor.** The improvement of Mile 12–Ikorodu Road from the existing four-lane (two-lane divided highway) to a six-lane highway with segregated BRT lanes running in the middle (see Figure 1) improved travel experience and travel time for BRT, *danfo*, LAGBUS and private vehicle users. Based on vehicle counts and vehicle occupancy estimates, combined daily ridership in *danfos* and LAGBUS is estimated at 284,000. BRT ridership by the project's closing date was 156,000 passengers per day. Consequently, the average daily public transport ridership along the corridor improved under the project to 440,000 (PDO indicator), which is considered the number of direct beneficiaries. Car users also benefited from mobility improvement in the corridor, around 13,000 vehicles per day. The number of women direct beneficiaries using BRT daily is 73,320, or 47 percent of total BRT users (PDO indicator). Indirect beneficiaries are those given access to the Mile 12 market within 45 minutes. This threshold accessibility enhancement has been provided for an additional 283,000 people under the project (PDO indicator).

53. **Competition among BRT, LAGBUS and informal transport limited BRT's full potential ridership.** Public transport provision in the intervened corridor is provided mainly by BRT, LAGBUS and *danfos*. LAGBUS and *danfos* compete with lower-than-anticipated fares than those of BRT: NGN 100 for LAGBUS (formal state bus for long-distance trips, compared to NGN 300 in BRT) and NGN 50 for *danfos*, compared to BRT's NGN 100/200/300 fare. A drop in oil prices enabled *danfo* operators and LAGBUS to charge less than originally anticipated and still be viable. Learning from the LUTP, project preparation and implementation developed proactive and extensive consultation with *danfo* unions and LAGBUS to manage the expectations of different actors, including high-level meetings with union executives and involvement of senior government management. Nevertheless, because of the complexity of this environment, the number of *danfos* and LAGBUS in the corridor exceeded expectations: the number of *danfos* in the corridor decreased only by 11 percent from 2013 to 2016, and LAGBUS increased the service provided in the corridor.

54. **The improvement in the BRT corridor led to a reduction of CO_2 emissions.** The CO_2 emissions from vehicles along the BRT corridor decreased by six percent, from the baseline 371,000 to 349,000 tons by closing date (PDO indicator). Taking into consideration the counterfactual scenario that traffic on the corridor could have grown by nine percent between 2013 and 2016 without BRT, the weighted average reduction of CO_2 emissions is 13 percent when the 2016 scenario is compared with BRT and the equivalent without BRT (see **Error! Reference s ource not found.**). The main emission reductions were in the categories of personal cars and *danfos*, both in absolute and relative terms, while the major increase in emissions came from BRT, LAGBUS, trucks and *okadas*. Annex 7 presents details of the GHG emission analysis.

Table 4. Total CO_2 Comparison for Study Corridor (Ikorodu–Mile 12) for 2016: with BRT scenario vs. without BRT scenario. Source: LUTP II GHG Emission Study.

Type of Vehicle	Total CO_2 Emissions (ton CO_2 eq)		Variation of CO_2 Emission (With vs Without BRT) (ton CO_2 eq)	Variation of CO_2 Emissions (With vs Without BRT) (%)
	Without BRT	With BRT		
Large Bus (BRT, LAGBUS)	879	3,297	2,418	275%
***Danfo* and Coaster Bus**	14,157	9,508	-4,649	-33%
***Okadas* and Tricycles**	420	1,767	1,347	321%
Cars	333,186	272,315	-60,871	-18%
Taxi	10,983	12,102	1,119	10%
Trucks	43,153	49,564	6,411	15%
Total	402,778	348,553	-54,225	13%

55. **The introduction of BRT to the extension corridor (Ikorodu–Mile 12) promoted an incremental shift away from private cars and *danfos*, which are the most carbon-intensive transit modes for passengers.** Comparing the project corridor with a contrafactual corridor ("with" and "without" scenarios[8]), the largest growth in vehicle use is observed in large-capacity buses (hundreds of new BRT buses were added to the corridor) and *okadas* (two-wheelers) and the largest decrease is observed in danfos and cars. This means that, by introducing BRT and rehabilitating the roads, a considerable number of passengers traveled along the corridor, who could have used cars and *danfos,* instead used BRT, LAGBUS or two-wheelers. There is also some increase in the use of other modes, possibly due to the improved road conditions, but in absolute number they are not comparable to the magnitude of reduced use of cars in terms of passenger vehicles. The increased use of two-wheelers may be partly a result of short trips taken to connect the last mile to the BRT bus stations, while buses are taking the market in longer trips. The rise in motorcycle use is commonly seen in the early stage of motorization as an affordable option in many developing countries. In conclusion, the modal shift from cars and *danfos* to more environmentally sustainable urban transport modes is justified.

56. **The project showed meaningful signs of behavioral change among the younger generation and higher-income group who are leading the trend of vehicle modal choice.** The percentage of BRT users owning a car or two-wheeler doubled from 14 percent in 2010 to 30 percent in 2017, and exceeded the target of 21 percent (PDO indicator). This reflected the fact that, for various reasons, the higher share of BRT users who could have used their private vehicles choose to use BRT instead. According to the BRT users' survey and household survey, these private-car or two-wheeler owners have a very good impression of BRT and confirm that they are satisfied with its services. The main motivations for them to choose using BRT rather than other modes are ranked by order: (i) comparative comfort of BRT compared to *danfo*s, (ii) convenience, (iii) safety, (iv) time savings, and (v) accessibility. Moreover, the field survey indicates that vehicle

[8] See Annex 7 for the methodology and results of the GHG emission analysis.

owners who use the BRT are mostly young and have a medium-high income.[9] This can be considered a meaningful sign of behavioral change among the younger generation and higher-income group who are leading the trend of vehicle modal choice, especially in the context of rapid urbanization and the growing middle class**.**

3.3 Efficiency

Rating: Substantial

57. **Ex-post economic analysis.** An ex-post cost-benefit economic analysis was conducted for investments to support the BRT infrastructure component, accounting for 70 percent of the total financing. The ex-post economic analysis indicates that project investments were economically viable, with an overall economic internal rate of return (EIRR) of 36 percent, compared with an estimated EIRR of 15 percent at appraisal. The principal contributors to the improved economic result are (a) the increase in net passenger-related benefits associated with the increased value of time,[10] (b) the consideration of benefits from private car users, which was not included in the calculation at appraisal, and (c) the GHG emission reduction. The distribution of benefits is: 88 percent due to time saving, 9 percent to VOC savings and 3 percent to GHG emissions. Based on the analysis, the net present value (NPV) of the flow of economic benefits generated by the project over 15 years is estimated to be US$486 million (2015 prices discounted at 12 percent). Annex 3 details the methodology, assumptions and results of the ex-post economic analysis.

58. **Cost-effectiveness**. Actual capital costs of the BRT corridor from Mile 12 to Ikorodu were NGN 35.228 billion (US$226 million[11]) compared to appraisal estimates of NGN 11.264 billion (US$88 million[12]), i.e., an increase of 213 percent in Naira terms. The main reason for the cost escalation in the civil works was the high inflation during the life of the project, which is correlated to the increase in construction prices.[13] Construction materials for the project rose to nearly double the price of the Naira to dollar rate during the life of the project. Imports, especially the ITS equipment, were greatly affected by the devaluation of the Naira to the dollar, which moved from NGN 150 to US$1, to NGN315 to US$1 during the life of the project. The unit cost of BRT infrastructure—US$10.4 million per km—is reasonable compared to US$10–US$15 million per km in other parts of the world and taking into account that the project included the rehabilitation of eight bridges.

59. **Administrative efficiency**. The project's administrative efficiency is high because project activities were completed ahead of time in a cost-effective manner. The BRT line was opened in

[9] 60 percent of vehicle owners are between the ages of 20 and 39, of whom 64 percent are employed. The income of 68 percent of private vehicle owners is above NGN 80,000. Source: Field survey.

[10] Value of time considered at appraisal was NGN 84 per hour; in the post-economic analysis the value is NGN 231 per hour in public transport and NGN 299 per hour in private vehicles. LAMATA prepared a technical study to calculate the value of time for the post-economic analysis.

[11] Exchange rate 1 US$=NGN 155.

[12] Exchange rate at appraisal 1 US$ = NGN 128.

[13] Based on research, a significant level of correlation was identified between inflation rate and the price of building materials in Lagos State. Source: An assessment of the impact of the inflation on construction prices in Nigeria. Ogun Oghenekevwe, Ogunsina Olusola and Ugochukwu Stanley Chukwudi, 2014

November 2015. Nevertheless, changes in the FM arrangement delayed the project's implementation. The project was closed in May 2017 with loan funds almost fully disbursed.

3.4 Justification of Overall Outcome Rating

Rating: Satisfactory

60. Based on the ratings for relevance, efficacy and efficiency, the project's overall outcome is rated Satisfactory.

3.5 Overarching Themes, Other Outcomes and Impacts

61. **Institutional strengthening.** One of the project's main achievements, essential for the sustainability of outcomes, is the strengthening of LAMATA's capacity to continue providing an overall vision and a strategic planning basis for transport planning, regulation, monitoring, administration and coordination of sector-wide management. The project also consolidated LAMATA's position as a "knowledge hub" and "center of excellence" for transport planning and management in Africa, which further benefit African counterparts in their capacity building.

62. LAMATA's training culture is one of the organization's best practices. Component 1 of the project was specifically designed to strengthen LAMATA's institutional capacity, coordination with local governments, and the preliminary support activities for Kano State. The project enhanced institutional capacity by providing leadership, management and technical training, as well as study tours for staff; ensuring sustainable funding for operations; and updating the transport-demand model and assumptions for future transport planning. The project also supported improvements in the implementation of a learning management system and efforts to improve more systemized knowledge capturing. Component 2 was also devoted to updating the Strategic Transport Master Plan, identifying and studying 15 additional corridors in the Mass Transit Alternative Analyses, and developing the bus-route networks and motor-park locations ("Transit Hub" interchanges) that can be presented in Geographic Information System (GIS) packages. These activities were intended to strengthen LAMATAs' overall technical capacity in transport planning and management, and were not limited to the scope of the LUTP2. Component 4 also supported the building of capacity in project management and monitoring, including improvements in physical equipment, technical, procurement, and financial audits, as well as social and environmental impact monitoring.

63. **Building capacity in GHG emission analysis.** As part of the institutional strengthening, the project supported the development of a tailored and complete methodology and methodological handbook for GHG emission calculation. These were implemented entirely by local consultants. This methodology has the advantage of being tailored and practical for LAMATA to manage. It is built on what is known as the ASIF identity,[14] and it could be easily replicated in other urban transport projects.

64. **Building capacity at local level.** The creation of Transport Planning Units (TPUs) was an integral aspect of the institutional capacity-building component. The aim was to provide capacity at Lagos Island, Kosofe, and Ikorodu LGA to be responsible for effective traffic management on

[14] ASIF stands for the variables of a generic equation to calculate the GHG emissions of transport that reads:
GHG = Activity x modal Share x energy Intensity x carbon intensity of Fuel

local government roads, define functional road hierarchy, and prepare and implement appropriate traffic management plans for the area. The project supported the creation of six TPUs. Nevertheless, by the closing date the TPUs appeared to have inadequate staffing, funding constraints, and tensions between them and the local government.

65. **The project expanded its geographic reach to influence thinking and accelerate understanding of the mobility and environmental benefits of sustainable transport policies among technicians and policy makers in Kano, Nigeria's second-largest city.** The project facilitated the transfer of capacity and lessons learned from Lagos to Kano, an emerging megacity in its own right. In doing so, the project aimed to reduce the lead time toward the development of an effective BRT in Kano. This comprises three core activities: (i) support to the Kano Urban Transport Project Office (KUTPO), (ii) studies, and (iii) capacity building. Four studies were financed through the GEF grant to support this objective: (i) Consultancy Services for the Viability Study for the Proposed Kano Light Rail Transit; (ii) Conceptual Design of Pilot Scheme for Lowering Carbon Emission in Old Kano; (iii) Consultancy Services for Design of Bus Mass Transit Route System for Kano Metropolitan Area; and (iv) Consultancy Services to Facilitate Coordination and Implementation of all Kano Grant Activities. Through Kano's engagement in the LUTP2, the project also facilitated the establishment of the Kano Area Metropolitan Transportation Authority (KAMATA) in Kano State, following the example and success of LAMATA. By the time of this ICR, a law for the creation of KAMATA had been submitted to the Kano State House of Assembly for approval. If and when approved, KUTPO would transition to KAMATA, which would assume responsibility for the planning and implementation of transport projects in Kano State.

66. **The construction and improvement of BRT have a positive impact on women's inclusion in economic activities, such as access to jobs and services.** As indicated in the beneficiary survey, female passengers were known to have lower incomes than their male counterparts. The increased affordability and inclusion of female passengers are likely to have a long-term impact on reducing the gender gap in income.

67. **The project has supported the mobilization of private-sector financing for BRT operation and maintenance (O&M) of roads, which represents a model to be followed by the rest of the region.** First, the BRT operation was formalized under a franchise agreement between the Primero operator and LAMATA. The private-sector operator funded the acquisition of rolling stock and is in charge of vehicle maintenance. The operator pays a monthly franchise fee to LAMATA. Second, LAMATA has designed and executed maintenance works with the participation of the private sector by awarding contracts to local consultants and contractors.

68. **The project supported the development of a high-standard ITS for BRT for the first time in the country. This improved travel time, mobility quality and monitoring of BRT operation.** The ITS system includes a fare-collection system (FCS), User Information Systems (UIS) and Fleet Management Systems (FMS). The FCS allows travel time to be gained and is designed to be integrated with the next phases of BRT operations. The UIS enhance passengers' transit planning efficacy and mobility quality. The UIS are available for the public—through real-time information in stations and smartphone apps—to obtain real-time data about time-of-arrival of buses, location of closest buses, and travel time between locations in the network. The FMS is in place and allows LAMATA to efficiently monitor operator performance from a control center;

it also allows LAMATA to respond to real-time issues in the network (for instance, in case of accidents or delays to due to intense flooding).

69. **Citizen engagement materialized thanks to strong consultations, communications and media strategy funded by project implementation.** Under the project, BRT consultations, communications and media strategy played a key role in the project's success. Four consultancies addressed and supported the strategy: (i) consulting services for events and stakeholders' management for BRT services; (ii) consulting services for advertising and perception management of the BRT extension (Mile 12–Ikorodu); (iii) consulting services for documentation of the communication strategy and participation efforts to increase familiarity with BRT on the Mile 12–CMS route; and (iv) a consultancy to conduct stakeholder engagements in other LAMATA projects. LAMATA operationalized the strategy with weekly radio and television programs and customer service through phone and social media.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

70. In 2017, LAMATA prepared and conducted several beneficiary assessment surveys along the Mile 12–Ikorodu corridor, Wempco Road, and Akin Adesola Road. The planned sample size for the surveys was 1,720 people and the response rate was 97 percent. Beneficiaries were individually identified and disaggregated by gender, age and income. Results showed that the major drivers of BRT users are commuters who use to go to work daily or with a frequency of three to six times per week. Over 86 percent of the survey respondents expressed their preference for using BRT, mostly because the experience is more enjoyable than on minibuses (38.8 percent), more convenient (22.9 percent), and safer (15.3 percent). Among the survey respondents of BRT passengers on the Mile 12–Ikorodu extension, 60.8 percent are male and 39.2 percent are female. Among BRT users who report owning a car or two-wheeler (22.89 percent), about 89.5 percent have a good impression of BRT. Annex 5 provides further details about the beneficiary survey.

4. Assessment of Risk to Development Outcome

Rating: Moderate

71. **The risk of reduced government ownership, commitment and institutional support is Moderate.** The political commitment to transportation at the highest levels (state and federal) and the creation of LAMATA have been key factors for the success of the LUTP and LUTP2. LAMATA was to consolidate fragmented transport powers into a single, well-trained agency in charge of coordinating and implementing the transport policies, programs and actions of all transport-related agencies in Lagos State. Political changes could reduce government ownership of LAMATA's vision and reduce institutional support. The reduction of transfers from the Transport Fund (see next paragraph on financial sustainability) and the changes in LAMATA's financial management independence could be understood as signs of certain changes in government priorities that need special attention for the sustainability of objectives.

72. **The risk of LAMATA'S financial sustainability is rated Significant.** A Transport Fund[15] was set up in 2006. Since then, LAMATA has received 50 percent of the dedicated fund

[15] The transport fund, created in 2006, receives dedicated funds from: (a) Lagos State budget provision, (b) license fees (taxi permits, road taxes, license plate registration, and vehicle registration), (c) bus concession fees, and (d) other road-user charges (tolls).

each month. This fund represented a stable source of revenue for LAMATA. Nevertheless, transfers from the Transport Fund decreased from US$12.2 million per year in 2014 to US$5.3 million in 2016. LAMATA only received transfers for the first two months of 2017. The risk of the sustainability of funding for LAMATA jeopardizes the authority's sustainable performance of its functions.

73. **The financial risk of the BRT operation is Moderate**. At this stage, the BRT operator covers its O&M costs and pays a franchise fee to LAMATA. Nevertheless, the system's financial sustainability will depend on: (a) the successful implementation of a broad-based bus reform program to integrate BRT with the rest of the network and feed the mass-transport mode; (b) the limitation of cannibalization of demand by other modes in the corridor; and (c) the enforcement of exclusive use of dedicated lanes by BRT.

74. **The technical risk is Low.** Innovative technologies and systems have been put in place to support the operation of BRT. The ITS package was piloted in 2016 and fully installed by May 2017. The risk of maintenance of the ITS infrastructure during the O&M phase is considered low because of the significant capacity of the LAMATA ITS team and the local ITS ecosystem in Lagos. Nevertheless, special attention would need to be paid to facilitate the introduction of smart cards for BRT and integration with other modes of transportation.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Satisfactory

75. The World Bank ensured quality at entry through an adequate alignment of the project objectives with the national and state development strategies and World Bank transport strategies, combined with components designed to achieve the PDO, as well as appropriate implementation arrangements. The World Bank's inputs and processes prior to Board approval were appropriate. The World Bank provided guidance and support to ensure that technical and environmental specifications and feasibility studies were prepared within a short time period to meet high quality standards. Building on the LUTP's achievements, the World Bank team ensured that the experience and lessons learned in the first phase were well considered and incorporated in project preparation. Although the project scope and portfolio were expanded compared to those of the LUTP, the Results Framework remained well focused and straightforward. The economic analysis and risk assessment proved to be valid and robust during the implementation of this complex, large-scale project.

(b) Quality of Supervision

Rating: Satisfactory

76. The World Bank worked closely with the government, implementation agency and co-financiers to support the timely implementation of this complex urban transport project and to provide high quality standards, in compliance with Bank safeguards and fiduciary policies. The Bank supervised the project diligently with the required expertise. Implementation Status and

Results Reports (ISRs) were prepared every six months and the ratings were candid and appropriate.

77. The project was restructured three times and the Bank team was proactive in addressing the needs of restructuring, particularly the challenges associated with macroeconomics and currency depreciation. The Bank has been able to make good use of the funds and reallocate them to ensure the full deployment of the ITS and the delivery of additional and meaningful outputs not envisioned earlier, such as the Ikeja bus terminal (a new component).

78. The Bank team was able to pay attention to the safeguards issues that emerged since the commencement of bus operations along the Ikorodu extension, such as road safety and enforcement of the exclusivity of BRT lanes. The World Bank Safeguards Specialist advised and monitored these issues in each mission to ensure that effective measures were in place for implementation performance.

79. The World Bank drew extensively on lessons learned from the LUTP and LUTP2, and incorporated them for advanced thinking and preparation under the scope of future operations in Lagos's urban transport.

(c) Justification of Rating for Overall Bank Performance
Rating: Satisfactory

80. The overall World Bank performance rating is Satisfactory, based on the ratings for Bank performance in ensuring quality at entry and of supervision.

5.2 Borrower Performance

(a) Government Performance
Rating: Satisfactory

81. The LSG ensured that the project was prepared and implemented in record time with good quality, and complied with loan covenants, including fiduciary and safeguards aspects. The LSG delegated responsibility and continued to provide needed resources to the implementation agency, LAMATA, which was created under the LUTP to ensure timely project implementation in order to support the Lagos transport sector strategy. The LSG also demonstrated strong ownership of the project and was active during its implementation by participating in supervision missions and wrap-up meetings to ensure that the implementation agency executed the project in accordance with the agreements reached with all financial counterparts.

(b) Implementing Agency or Agencies Performance
Rating: Highly Satisfactory

82. The project implementation agency, LAMATA, deserves major credit for successfully implementing this massive project. LAMATA's institutional resilience allowed it to overcome and perform highly during political transitions, Nigeria's complex political economy and macroeconomic changes. LAMATA is considered the hub of excellence in African urban transport to ensure development outcomes. LAMATA responded efficiently on project issues, adhered to project implementation requirements, engaged with World Bank missions, and contributed to the

project's timely completion. LAMATA provided progress and other reports on time, monitored environmental and social aspects, and suggested good practices for environmental methodologies. It managed procurement activities efficiently, monitored resettlement, processed payment of compensation to PAPs, and provided data on performance indicators as soon as the service was operational. After project closing, LAMATA made great efforts, as promised, to ensure that the remaining social issues were resolved by the closing of the ICR.

(c) Justification of Rating for Overall Borrower Performance
Rating: Satisfactory

83. The overall Borrower performance is rated Satisfactory based on the ratings for government performance as well as implementing agency performance.

6. Lessons Learned

84. **A programmatic, long-term approach to the World Bank's engagement is critical for the success of urban transport interventions.** Urban mobility problems in most of the Bank's client countries have resulted from decades of neglect in addressing the problems in a comprehensive manner. The solutions often require a balanced mix of demand and supply instruments, together with the building of institutions and regulatory and legal frameworks. A comprehensive solution to address all issues requires a long-term engagement in the country. Very often, projects are designed as "one-shot" projects, which make it difficult to sustain the immediate benefits. It is critical to build a programmatic approach in order to address urban transport issues.

85. **It is important to develop an incremental phased approach with a focus on early deliverability.** It is also important to develop a BRT network, not just a single corridor, but it is equally critical to develop it under an incremental, phased approach to demonstrate the concept and build popular momentum. In the case of Lagos, the success of BRT-lite (LUTP), implemented within 18 months, created awareness and appreciation of the concept and made it politically and technically possible to embark on a more ambitious agenda as reflected under the LUTP2. During the first phase, the value of "low-hanging fruit" was recognized, in which the probability of success was high and it was relatively easy to demonstrate the value of the "pilot" scheme. Quick implementation and easy deliverability of an operational and visually significant transit-way within an easily obtained right-of-way were critical to achieve local ownership and pave the way for future expansion.

86. **The transition of the urban transport private sector is challenging, and competition for the market and integration of informal transport should be sought.** The LUTP2 evidenced that LAMATA's negotiating capacity may be limited, with the existence of a single operator in Lagos. International experience in urban areas shows that multiple competing operators have generally improved the productivity of public transport systems. The transition from a single operator to a competitive environment in Lagos may allow efficiency gains in the tendering of future BRT corridors. Efforts to eliminate informal transport from the BRT corridor were not effective in Lagos: informal transport remained an important component of overall transport services. Innovative approaches to formalize and integrate informal public transport may allow new operators to flourish and compete for the market, as well to feed the formal transport network

in an integrated manner. Up-front capacity building and discussion between different stakeholders are essential in this process.

87. **In the creation of a unit within an institution, it is important to develop a thorough stakeholder analysis which recognizes and incorporates the system of incentives governing the institution's behavior.** The TPUs created within the LGAs regularly undermined the strategic efforts being made by the broader city administration at a state level. These issues were not simply a question of the TPUs' low capacity; the underlying factors have a substantially structural component. The new unit's sustainability depends on a design that recognizes and tries to incorporate the system of incentives governing the behavior of the institutions where the new unit is hosted.

88. **Experiences from around the world have taught that implementation of BRT is a major challenge and requires considerable up-front preparation and consensus building, with special attention to the *soft* side.** BRT is a "system" and requires extensive project preparation discussions with all interested parties (traffic police, ministries of planning and construction, and so on) on all relevant issues, including transit-way design; service and operations planning; design of stations and terminals; design of ticketing systems, fare levels, and structures; regulation and ownership of BRT vehicles; and traffic and non-motorized transport (NMT) safety measures, traffic management strategies, and enforcement. Special attention needs to be paid to the *soft* side of BRT, because it is critical for the system's sustainability, including political leadership, skillful operation and management, and financial sustainability.

89. **The World Bank's contribution to urban transport should be viewed beyond physical investments.** Urban transport investments provide a platform for guidance, training, technical assistance, and learning throughout the project cycle and the sharing of best practices for demonstration and replication beyond the project's life. It is equally important to document the impacts and share them widely within the city, in the country, and in international forums.

90. **A strong institutional basis for coordinated planning, implementation, and operations/regulation is critical for the success of urban passenger transport.** The long-term engagement in Lagos has allowed LAMATA, the implementing agency, to mature. The key test of an institution is whether it can prove its strength, relevance and longevity beyond the tenure of a single individual or leadership team. It appears that LAMATA has "earned its stripes": the agency, created by law in 2006, has undergone two changes in political leadership (2008 and 2015) and its first large-scale management change in 2016, yet it continues to deliver efficiently and professionally.

91. **BRT planning and design must be very context specific, reflecting market, physical and operational conditions in the corridor and the city in question.** BRT has great potential to revolutionize the image and efficacy of public transport, but it is important to show sensitivity to the city-specific context rather than adopt a "best-technology, one-size-fits-all" solution. The approach should develop a design that is consistent with local circumstances, which may not be global "best practice" or the "gold standard."

92. **The ITS being deployed needed to be planned in such a way that it would be flexible enough to accommodate multiple bus-operator models, to potentially introduce smart cards**

for BRT, and to facilitate integration with other modes of transport in the future. It is important to allow sufficient time for bidders to prepare high-quality proposals, consider instructions to bidders that would encourage international firms to collaborate with local partners through joint ventures, bring ITS expertise on board in the first phases of the project preparation to advise on the design and planning process, plan for a phased deployment with adequate time for testing, and strengthen the ITS capacity within LAMATA to closely monitor deployment and rollout. Furthermore, dedicated resources from the client, consultants and vendor(s) should be in place to fully test the system for trouble-free operations and secure an enforceable service agreement for an extended period of time during the O&M phase.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

No comments provided.

(b) Cofinanciers

93. **Agence Française de Développement (French Development Agency/ AFD).** Despite the absence of a formal mutual reliance framework, the World Bank and AFD teams have displayed a good working arrangement by agreeing onto the same objectives and a same implementation process. Even in the face of the succession of team leaders on the World Bank side and on AFD side the parallel financing has proved effective and very beneficial to LAMATA and Lagos State.

(c) Other partners and stakeholders

No comments provided.

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in SDR and US$, millions equivalent)

Lagos Urban Transport Project - P112956 - IDA-47670 - SDR			
Components	**Appraisal Estimate (SDR millions)**	**Actual/Latest Estimate (SDR millions)**	**Percentage of Appraisal**
1. Institutional Development	13.6	5.5	40.4%
2. Public Transport and Traffic Management	69.8	94	134.7%
3. Improvement of Lagos State Metropolitan Road Network	11.3	15.3	135.4%
4. Project Management & System Monitoring	5.7	4.4	77.2%
5. Unallocated	19.2	-	-
Total Project Costs	119.6	119.2	99.7%
Lagos Urban Transport Project - P112956 - IDA-47670 - Equivalent USD[16]			
Components	**Appraisal Estimate (US$ millions)**	**Actual/Latest Estimate (US$ millions)**	**Percentage of Appraisal**
1. Institutional Development	21.6	8.7	40.4%
2. Public Transport and Traffic Management	111.0	149.5	134.7%
3. Improvement of Lagos State Metropolitan Road Network	18.0	24.3	135.4%
4. Project Management & System Monitoring	9.1	7.0	77.2%
5. Unallocated	30.5	-	-
Total Project Costs	190.2	189.5	99.7%

Lagos Urban Transport Project - (GEF) - P114762 - TF-97347			
Components	**Appraisal Estimate (US$ millions)**	**Actual/Latest Estimate (US$ millions)**	**Percentage of Appraisal**
1. Institutional Development	1.00	1.00	100%
2. Public Transport and Traffic Management	3.50	3.49	99.7%
3. Improvement of Lagos State Metropolitan Road Network	0.00	0.00	-
4. Project Management & System Monitoring	0.00	0.00	-
Total Project Costs	4.50	4.49	99.8%

[16] The exchange rate used is as per the original PAD: US$1 = SDR 0.6289

(b) Financing

Source of Funds	Type of Co-financing	Appraisal Estimate (US$ millions)	Actual/Latest Estimate (US$ millions)	Percentage of Appraisal
Borrower	-	35.00	35.00	100
International Development Association (IDA)	Credit	SDR 119.6 million/ 190.00 US$ million	SDR 119.21 million/ 175.11 US$ million	99.67 (SDR)/ 92.16 (USD)
Global Environment Facility (GEF)	Grant	4.5	4.49	99.78
French Development Agency (AFD)	Credit	100.00	100.00	100
Total Funding	-	329.50	314.60	95.5

Annex 2. Summary of Components, Outputs and Outcomes

Table 2.1. Components, outputs per component, intermediate and PDO/GEO indicators linked with different outputs, if any.

Components	Outputs	Intermediate Results Indicators	PDO/GEO Indicators	PDO/GEO
Component 1: Institutional Development and Capacity Building				
1A: Training, Twinning and Study Tours	383 staff training courses, 50 workshops, 8 study tours, and no twinning provided over the LUTP2 implementation period.	Percentage of activities in annual training plan achieved on target: **Achieved** *(Baseline: 65; Target 85; Actual: 100)*		
1B: LAMATA Corporate Head Office (dropped)	n.a.	n.a.		
1C: Transport Model Update	Three studies/surveys are completed, including (i) extension of strategic-transport master plan and travel-demand model to cover the mega-region, (ii) value of time and transport elasticity study for the mega-city region, and (iii) freight demand study.	Updated travel demand and network models, and databases are available for use: **Achieved** *(Baseline: No model available; Target: Travel demand database systemized; Actual: Model completed and running, being integrated into LAMATA evaluation system)*		
1D: LAMATA Operating Costs	Operating costs covered.	n.a.		
1E: Creation of TPUs	TPUs in Kosofe, Ikorodu and Lagos Island are set up.	Number of Transport Planning Units established and functioning: **Achieved** *(Baseline: 2; Target: 5; Actual: 5)*		
1F: Support to Kano	• Alternative analysis study of interventions to address congestion along Muhammed Murtala Way • Study of the impact of motorcycle and three-wheeler growth in Africa (case study of Kano) • Prefeasibility and conceptual design of transport hub/terminal, bus stops, pedestrian facilities, traffic management, depots and parking facilities in Kano	Concept for hubs and terminals program in Kano developed: **Achieved** *(Baseline: No concept available; Target: Concept developed and actionable; Actual: Target achieved)*		
Component 2: Improvement of Public Transport Infrastructure and Enhancement of Traffic Management Systems				

2A: BRT Infrastructure Construction and Supervision (Oshodi–Mile 2–Oblende) (dropped)	Not implemented because the concession of roads from the FGN to LSG has not been obtained. The scope of work would be moved to the LUTP3, if it eventually comes on stream.			
2B: BRT Infrastructure Construction and Supervision (Mile 12–Ikorodu/BRT-Lite Corridor Extension)	Reconstruction of Mile 12-Ikorodu Road expands from four-lane to six-lane highway with segregated BRT lanes running in the middle. (a) Construction/rehabilitation of roads (7.3 m) to provide BRT lanes, based on median configuration (b) Provision of segregation curbing (two-way), road markings, (c) Traffic management, signal control, stops, ITS (d) BRT Ikorodu interchange, bridges, pedestrian facilities (e) BRT depot (f) Bus shelter and lay-bys (g) Supervision	Physical completion of works; Baseline (percentage): **Achieved** *(Baseline: 0; Target: 100; Actual: 100.)* Average travel speed of public transport services along BRT corridor (kph): **Achieved** *(Baseline: 10; Target: 18; Actual: 23)* Average travel time of formal public transport Mile 12-Ikorodu (minutes): **Achieved** *(Baseline: 120 minutes; Target: 90; Actual: 51.)* Percent of public transport users rating their BRT service as satisfactory: **Achieved** *(Baseline: 20; Target: 60; Actual: 80.)* Percent of two wheelers and car owners who report having a somewhat or highly favorable impression of BRT services: **Achieved** *(Baseline: 42; Target: 65; Actual: 67.)*	Average time spent by individuals on travel along project corridor per trip (minutes): **Achieved** *(Baseline: 120; Target: 90; Actual: 87)* Average amount spent monthly by poor individuals on bus travel along project corridor (Naira): **Achieved** *(Baseline: 4,120; Target: 3,500; Actual: 2,141)* Average number of passengers carried per standard bus per day along the BRT corridor: **Not achieved** *(Baseline: 500; Target: 800; Actual: 458)*	To improve mobility along prioritized corridors
			Number of direct beneficiaries: **Not achieved** *(Baseline:-; Target:300,000; Actual: 156,000)* Number of women direct beneficiaries: **Achieved** *(Baseline: -; Target: 60,000; Actual: 73,320)* Number of indirect beneficiaries: **Achieved** *(Baseline: -; Target: 721,031; Actual: 721,031)*	To promote a shift to more environmentally sustainable urban transport modes
2C: Upgrade BRT Lite (Mile 12–CMS)	BRT-lite shelters upgraded		Percent of BRT users who report owning a car or two-wheeler: **Achieved** *(Baseline: 14; Target: 21; Actual: 30)*	To promote an incremental shift to more environmentally sustainable urban

			CO_2 emissions from vehicles along BRT corridors (metric ton): **Achieved** *(Baseline: 371,000; Target: 359,000; Actual: 349,000)*	transport modes among users with a relatively high carbon footprint
2D: Mass Transit Alternative Analyses Studies	15 corridors are identified and studied in MTAS and are consistent with bu-route network study along with the update of STMP.			
2E: Development of Complementary Bus Systems	Bus-route network study is georeferenced and can be viewed in GIS packages with recommendations on three types of services, including mass-transit routes, high-capacity/tributary routes, and standard routes. 19 additional motor park locations have been identified and would form "Transit Hub" interchanges. Ikeja bus terminal is constructed.			To improve mobility along prioritized corridors
2F: BRT Consultations and Media Strategy	Public awareness strategy for the BRT system as well as framework to incorporate feedback in all elements of design and operations.	Percent of public transport users rating their BRT service as satisfactory: **Achieved** *(Baseline: 20; Target: 60; Actual: 80)*		
2G: Upgrade and Rationalize System Operations	Design and commissioning of ITS on Mile 12–TBS BRT corridor, Mile 12–Ikorodu BRT extension corridor and BFS corridor.			
Component 3: Improvement of Lagos State Metropolitan Road Network				
3A: Routine Maintenance (dropped)	Not financed under LUTP because the funding was to come from LSG.			
3B: Periodic Maintenance and Pavement Management System (dropped)	Not financed under LUTP because the funding was to come from LSG.			

3C: Rehabilitation (and PMS) (renamed)	Wempco Road in Ogba (1.9 km) and Akin Road in Victoria Island (1.65 km) are upgraded and rehabilitated to be divided highways roads and provided with covered drainage and necessary road furniture.	Average travel speed along resurfaced and rehabilitated roads (kph): **Achieved** *(Baseline: 12; Target: 18; Actual: 50)*	Road rehabilitated, non-rural (km): **Achieved** *(Baseline: 0; Target: 17.8; Actual: 17.8)*	To improve mobility along prioritized corridors
Component 4: Project Management and System Monitoring				
4A: Technical Assistance, Equipment, Vehicles, Office Equipment, and Other Operational Support for Implementation	Procurement of office equipment, vehicles, and other operational support facilities in the LAMATA's new corporate head office.			
4B: Institutional, Technical, Procurement, and Financial Audit	Technical Audit Report rated project as Satisfactory.	Financial and technical performance of project based on audits: **Achieved** *(Baseline: Not applicable; Target: Satisfactory; Actual: Satisfactory.)*		
4C: Outcome Monitoring of Transport and Social Impact Indicators, Environmental Impact Indicators and Capacity Development Indicators	Safeguards: Four RAPs were conducted and 2,231 PAPs were provided with identification cards to qualify for compensation and/or assistance.	Traffic accident rate along project corridor (number), with breakdown as follows: **Achieved** *(Fatal: Baseline: 14; Target 11; Actual: 3; Serious: Baseline: 31; Target: 25; Actual: 15; Minor: Baseline: 94; Target: 76; Actual: 48)*		To improve mobility along prioritized corridors
4D: Air Quality Monitoring Along BRT Corridors (dropped)	Three air-quality monitoring stations were developed for effective measuring along the corridor. Study of pollutant emissions was conducted.			

Annex 3. Ex-Post Economic Analysis

Summary
The ICR team conducted an ex-post cost-benefit economic analysis of investments to support the Bus Rapid Transport (BRT) infrastructure component, accounting for 70 percent of total financing. This ex-post economic analysis follows the same basic approach as the ex-ante economic analysis, i.e., estimating road users' surplus, but uses a slightly modified methodology to account for the changes to the project's scope during implementation. Based on the analysis, the net present value (NPV) of the flow of economic benefits generated by the project over 15 years is estimated to be US$486 million at a 12 percent discount rate; its economic internal rate of return (EIRR) is estimated at 36 percent. The results of the economic evaluation are presented in the table below.

Table 1. Economic Evaluation

	Mile 12–Ikorodu Corridor
Discounted Cost (million USD)	235
Discounted Benefits (million USD)	721
Economic Net Present Value (million USD)	486
Benefit/Cost Ratio	3.1
EIRR	36%
VOC Saving (million USD)	66
Time Saving (million USD)	637
GHG Emissions Saving (million USD)	17

Methodology and Economic Analysis Assumptions

Methodology. The evaluation followed the same approach as the ex-ante economic analysis in assessing road-user benefits and the cost of investments. The main benefits stemming from the Mile 12–Ikorodu corridor investments are savings from the reduction of the following transport costs: (a) VOCs, mainly the reduction in fuel consumption and vehicle wear due to smoother road conditions, and (b) reduction in travel time of passengers and freight, which is converted into monetary terms and added as economic benefits. GHG analysis is included in the economic analysis. Additional benefits, which have not been quantified in this analysis, include a reduction in the number of collisions (which will lead to a reduction of economic loss from deaths, injuries and vehicle damage); and improved driving and riding comfort.

Time horizon: A 15-year time period has been chosen, as in the ex-ante economic analysis. This has been adopted because, with the provision of maintenance allowed within the costing, it is considered reasonable to expect that the infrastructure will be serviceable over this time period. The same time horizon was considered in the ex-ante economic analysis.

Discount factor: A discount factor of 12 percent (in real terms) has been used to discount future cost and revenue streams.

Construction and maintenance cost: Construction costs consider the roadway construction cost plus ancillary infrastructure (terminals, shelters, depots, footbridges and street lighting) from Mile 12 to Ikorodu. The infrastructure cost does not include the upgrading from Mile 12 to TBS because the idea is to compare the post-economic analysis with values at appraisal, which only considered the new BRT section. Because the delivery of infrastructure requirements was achieved within the existing highway boundary, no land-purchase costs have been incorporated. For guidance, the requirement for infrastructure maintenance has been included. This has been derived at 10 percent of the subtotal and is based per annum.

Economic benefits: The main economic benefits of the roadwork are: (a) VOC savings, mainly the reduction in fuel consumption; (b) reduction in travel time of passengers and private vehicle users, which is converted into monetary terms and added as economic benefits; and (c) reduction of GHG emissions. These benefits are calculated as the difference in transport costs between a with-project scenario (alternative case) and a without-project scenario (base case).

GHG emissions calculation. The economic analysis considered the benefits from emission reduction in the intervened corridor. The direct GHG emissions avoided over a period of 15 years are 858,368 tons of CO_2eq and the cost effectiveness of the investment is US$161/ton. The calculation is supported by the GHG analysis explained in Annex 7.

Results. The result demonstrates that the Mile 12 to Ikorodu corridor works remain economically viable. The discounted benefits are US$721 million over 15 years. The project's main benefit, time saving, is estimated at US$637 million, 71 percent of which is time saving for BRT users. The distribution of benefits is: 88 percent due to time saving, 9 percent to VOC savings, and percent to GHG emissions. The present values of the flow of net economic benefits (eNPV) generated by the project over 15 years are estimated at US$486 million at a 12 percent discount rate and its EIRR is estimated at 36 percent.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team Members

Names	Title	Unit	Responsibility/Specialty
Lending			
Ajay Kumar	Lead Transport Economist	GTI05	Team Leader
Antoine V. Lema	Social Development Specialist		Social Development Specialist
Roger Gorham	Transport Economist		Environmental Management
Aisha D.A. Kaga	Program Assistant	AFCW2	Assistant
Anne Njuguna	Program Assistant		Assistant
Akinrinmola Oyenuga Akinyele	Sr. Financial Management Specialist	GGO25	Financial Management
Thomas Kwasi Siaw Anang	Procurement Specialist		Procurement
John Kobina Richardson	Sr. Transport Specialist		Team Member
Amos Abu	Sr. Environmental Specialist		Safeguards
Adenike Sherifat Oyeyiola	Sr. Financial Management Specialist	GGO24	Financial Management
Adebayo Adeniyi	Sr. Procurement Specialist	GGO01	Procurement
Belinda Lorraine Asaam	Program Assistant	GWASO	Assistant
Caroline Mary Sage	Sr. Social Development Specialist	GSU06	Team Member
Chita Azuanuka Obinwa	Sr. Program Assistant	GEE07	Assistant
Deborah Adedigba O.		GEN07	Team Member
Manush A. Hristov	Senior Counsel	LEGES	Counsel
Mohammed Aliyu		GSU01	Team Member
Olatunji Ahmed	Transport Specialist	GTI07	Engineering
Shalonda Robinson	Program Assistant	GEEDR	Assistant
Supervision/ICR			
Roger Gorham	Transport Economist	GTI04	Team Leader
Adebayo Adeniyi	Sr. Procurement Specialist	GGO01	Procurement
Anas Abba Kyari	Procurement Specialist	GGO01	Procurement
Bayo Awosemusi	Lead Procurement Specialist	GGO01	Procurement
Daniel Rikichi Kajang	Sr. Procurement Specialist	GGO01	Procurement
Oyewole Oluyemi Afuye	Procurement Specialist	GGO01	Procurement
Sunday Esene Osoba	Procurement Specialist	GGO01	Procurement
Akinrinmola Oyenuga Akinyele	Sr. Financial Management Specialist	GGO25	Financial Management
Amos Abu	Sr. Environmental Specialist	GEN07	Safeguards
Evarist F. Baimu	Senior Counsel	LEGES	Counsel
Joyce Chukwuma-Nwachukwu	Program Assistant	AFCW2	Assistant
Michael Gboyega Ilesanmi	Social Safeguards Specialist	GSU01	Safeguards
Olatunji Ahmed	Sr. Transport Specialist	GTI07	Engineering
Raman V. Krishnan	Sr. ICT Specialist	GTI09	ITS
Sarah Farnuwa Tangalu	Program Assistant	AFCW2	Assistant
Shalonda Robinson	Program Assistant	GEEDR	Assistant
Ugonne Margaret Eze	Program Assistant	AFCW2	Assistant

Names	Title	Unit	Responsibility/Specialty
Fatima Arroyo Arroyo	Urban Transport Specialist	GTI07	ICR Primary Author
Yin Qiu	Consultant	GTI04	ICR Primary Author

(b) Staff Time and Cost

Stage of Project Cycle	Number of Staff Weeks	US$ thousands (Including Travel and Consultant Costs)
Lending		
FY09	4.91	35,441.11
FY10	11.28	83,367.81
Implementation/ICR		
FY11	34.25	137,209.94
FY12	30.84	113,298.25
FY13	30.25	136,145.1
FY14	63.84	166,275.51
FY15	30.78	132,459.45
FY16	25.11	104,053.12
FY17	30.36	157,369.85
FY18	1.73	19,274.63
Total:	**263.35**	**1,084,894.77**

Annex 5. Beneficiary Survey Results

Context and Methodology

1. The LUTP2 is expected to benefit users of the roads, communities and businesses surrounding the roads. The identified beneficiaries of LUTP2 interventions were: (a) households where the projects were implemented; (b) employers/employees of businesses that benefitted economically from the improved roads; and (c) users of the improved roads. Beneficiaries who were individually identifiable were disaggregated by gender, age and income. Multistage proportionate random sampling was used to select beneficiaries in the project areas.

2. The selected beneficiaries were interviewed using structured questionnaires to obtain information relating to changes in travel time (pre- and post-project), changes in transport costs, creation of new business opportunities, employment opportunities, traffic situation, wage information, and so on. The survey was complemented by focus group discussions, key informant interviews, and desk reviews. This approach generated more in-depth responses on how economic activities had changed since the project was implemented. Furthermore, rapid counts of commuters and traffic were also conducted on the Ikorodu–Mile 12 corridor, Wempco Road, Akin Adesola Road, and the TBS bus terminal.

3. The targeted survey population for all the respondents was 1,720. A 97 percent response rate was attained. Twelve survey instruments were adopted to understand the project's impacts on intended beneficiaries, including surveys of households, BRT passengers (Mile 12–Ikorodu), motorists, commuters, vehicle count, terminal inventory, speed, pedestrians, NMT, social impact on gender and vulnerable groups, counterfactual road (Agege/Oshodi), and ongoing construction of the Ikeja Bus Park. Some of the key survey results are presented below.

Profile of Household Survey Respondents

4. The proportions of male and female respondents are 55 percent and 45 percent, respectively. Among the survey population, 41.1 percent are between the ages of 31 and 40, 47 percent are working in business, and 45 percent have graduated from a tertiary institution.

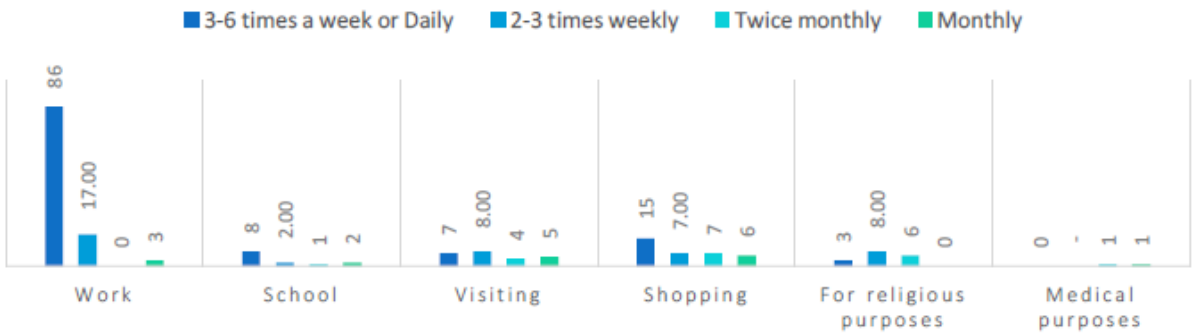
Table 8.1. Profile of Household Survey Respondents

Sex	%	Age	%	Occupation	%	Educational Status	%
Male	55.3	<20 years	2.5	Civil servant	13.1	None	4.5
Females	44.7	21 - 30 years	29.4	Business	46.7	Primary school	2.5
		31 - 40 years	41.1	Military/Paramilitary	8.0	Secondary school	32.7
		41 - 50 years	14.2	Student	8.0	Tertiary	45.2
		51 - 60 years	10.7	Unemployed	9.5	Vocational	15.1
		61 years and above	2.0	Housewife	14.6		

Trip Purpose and Frequency

5. Because a majority of commuters use BRT to get to work daily or between three and six times a week, work is the greatest driver of BRT trips. Many of these trips are made using *okada* as the first mode, while BRT is the main mode, and the egress mode could either be walking or *okada*. The survey findings show that schoolchildren are not well represented as commuters because on the days that children go to school (three to five times per week), school trips account for very low frequency figures. With regard to the travel purpose of BRT users, a sizable percentage of both male (58.15 percent) and female (37.5 percent) respondents use the service to go to work, while others use it to go to school, market, visiting, and religious services. A more direct approach to ascertain BRT's level of benefit to respondents shows that 48.4 percent of male respondents consider the BRT service highly beneficial while another 30.6 percent consider it slightly beneficial. Of female respondents, 50 percent consider BRT highly beneficial and another 30 percent consider it slightly beneficial. In both cases, well over 75 percent of respondents stated that BRT has been favorable to them. Some of the listed benefits include reduced travel cost, better and timely access to places of work/businesses, relative safety for transporting schoolchildren, reduction in travel expenses, and reduction in travel fatigue.

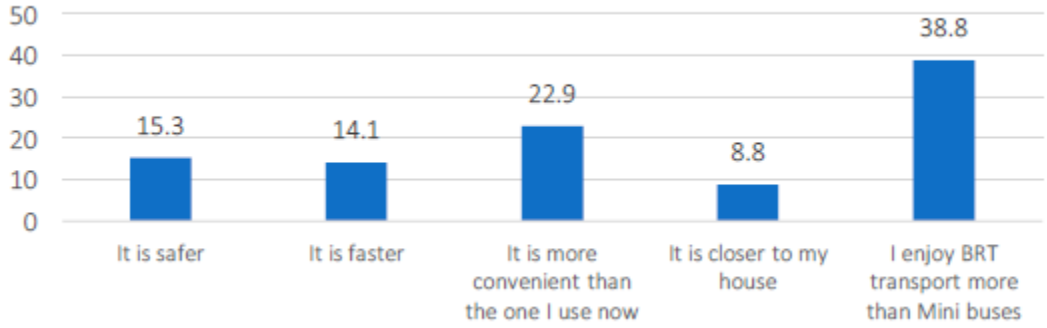
Figure 8.1. Trip Frequency and Purpose on BRT



Preference for BRT

6. The survey shows that over 86 percent of respondents stated that they prefer using the BRT service. Of this absolute percentage, further disaggregation shows the reasons for the preference (see Figure 8.2).

Figure 8.2. Household Members' Perception of BRT Services



Number of Direct Beneficiaries by Gender

7. Analysis of the BRT passenger survey conducted along Mile 12–Ikorodu Road reveals that 60.8 percent of direct beneficiaries are males and a corresponding 39.2 percent are females. Although women make numerous trips, they are mostly short. Most BRT users travel far on it, thus explaining the high incidence of male travelers. Average BRT passenger ridership is 165,000 per day. This figure has been obtained from the franchisee's data and confirmed by the ICR BRT field survey.

Number of Indirect Beneficiaries by Gender

8. To determine the number of indirect beneficiaries by gender and those who are able to traverse the extended corridor in less than 45 minutes, the volumetric traffic count was used as the basis for judgment.

9. The average travel times of non-BRT buses and motor cars were also the basis of the travel times used to derive those vehicles that travel under 45 minutes. The travel times were obtained by the global positioning system (GPS). For two-wheelers, a mystery traveler also recorded times by GPS. The vehicles that fit into the category are:

- Motor vehicles,
- Two-wheelers, and
- Minibuses (these buses had times ranging from 42 to 48 minutes) and thus an average of 45 km/h.

10. Minibuses were accorded an average of 11.52 people, while motor vehicles had an average of 2.63 people and two-wheelers had an average of two people. The traffic count and assignment of averages were complemented by the visual occupancy survey of vehicles. The average total volume of indirect beneficiaries per day came to 121,732 people. In a period of one year this amounts to 44,432,180, of whom 17,417,415 are women, using the 39.2 percent average obtained on the corridor in the household and traffic surveys.

Traffic Data Analysis

- There is strong competition between the BRT buses and other buses going to Ikorodu. The reason why the other buses still compete is the almost bus stop-to-bus stop service they render, as well as their ability to carry wares for the women who trade in Ikorodu.

- The use of cars is still relatively high as a means of travel because at Ikorodu there are no existing park-and-ride facilities. Moreover, most of these car owners live far from the main road and need their cars to move in the morning or evening due to logistics and security considerations.

- The low use of taxis is a function of finance. Taxis are expensive, motorists who can afford them may not be able to use them every day, and therefore there is low patronage and low-income citizens do not usually use taxis.

- During the morning peak period outbound to Ikorodu, minibuses are lesser in volume compared to inbound to Mile12 for the same period. This is because most vehicles move out toward the southeast corridor for work and commercial purposes.

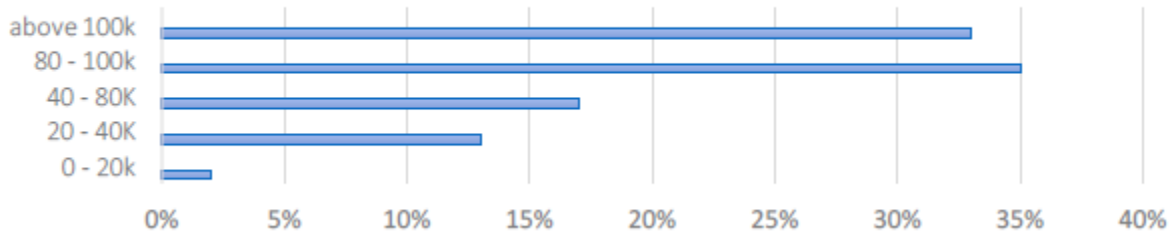
- Minibus figures are high outbound to Ikorodu at interpeak periods due to the longer length of time and to more movement for trading activities for people departing Ketu and Mile 12 market to beat the evening rush hours.

- The use of cars is high for all periods although with changes in volume for the morning period when outward traffic to Ikorodu is quite high, with more than double the number of cars entering Ikorodu from Mile 12. These are work-bound cars and traffic is largely reversed in the evening.

BRT Users who Report Owning a Car or Two-Wheeler

11. In the overall survey of BRT users, the percentage of users who report that they own a car or two-wheeler is 34 percent, of which 38 percent are female and 60 percent are between the ages of 20 and 39. Another 30 percent are between the ages of 40 and 59. Among BRT users, 75 percent are married and 80 percent have post-secondary school education. However, 64 percent are employed in the private sector of the economy. Figure 8.3 shows the income distribution of BRT users reporting ownership of a car or two-wheeler.

Figure 8.3. Income Distribution of BRT Users Owning Vehicles



BRT Users who Report Owning a Car or Two-Wheeler and Having a Favorable Impression of the BRT Service

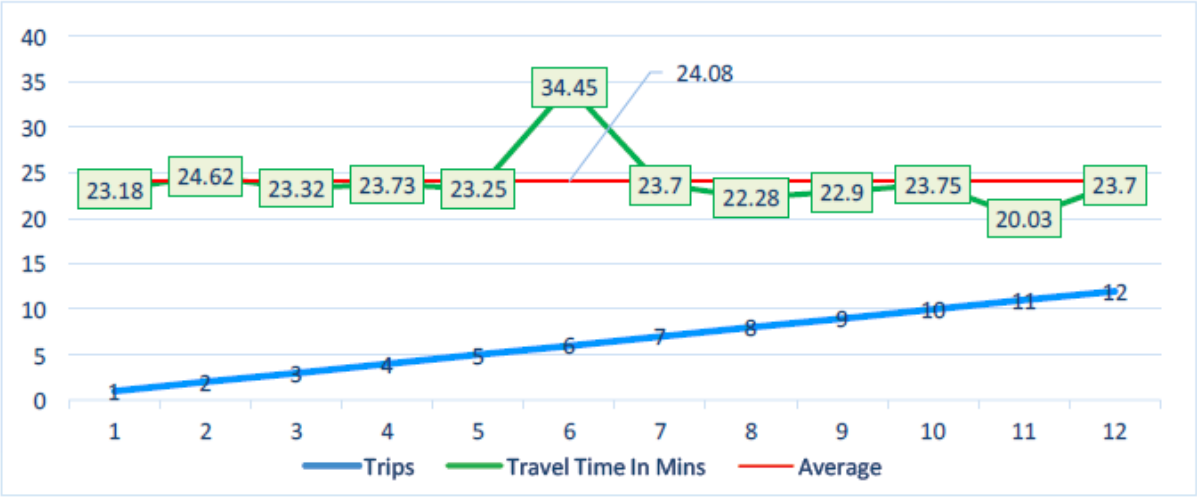
12. In the overall survey of BRT users, the percentage of users reporting that they own a car or two-wheeler is 22.89 percent. About 62 percent of this subset are males and 38 percent are females. About 80 percent of them have post-secondary education, 64 percent are privately employed, and 36 percent are public servants. This subset also has an income peculiarity: the critical mass of 68 percent earns a monthly income above NGN 80,000.

13. The percentage of BRT users reported that they own a car or two-wheeler and have a very good impression of the BRT service (89.4 percent according to the survey), while 91.5 percent confirmed that they are satisfied with the BRT service. The remaining who are dissatisfied report that there is undue delay in adding buses to the fleet at Ikorodu terminal, especially during peak periods.

Average Travel Time on Mile 12–Ikorodu: 24.08 minutes

14. The methodology for obtaining the travel time on the Mile 12–Ikorodu corridor was to have a mystery traveler on board, who took 12 trips (six round trips) on BRT buses. The average travel time on the Mile 12–Ikorodu corridor is 24.08 minutes. Figure 8.4 shows the individual trip times and the average. The data show an outlier result observed on the third inbound trip which recorded 34.45 minutes, compared to other trips that ranged between 20 and 25 minutes, and the delay was a result of some obstruction under the Mile 12 bridge which kept the BRT bus in one spot for about seven minutes. Because this occurs on more than a few occasions, it was reasonable not to discard the result, which is a true reflection of the vagaries of Lagos traffic.

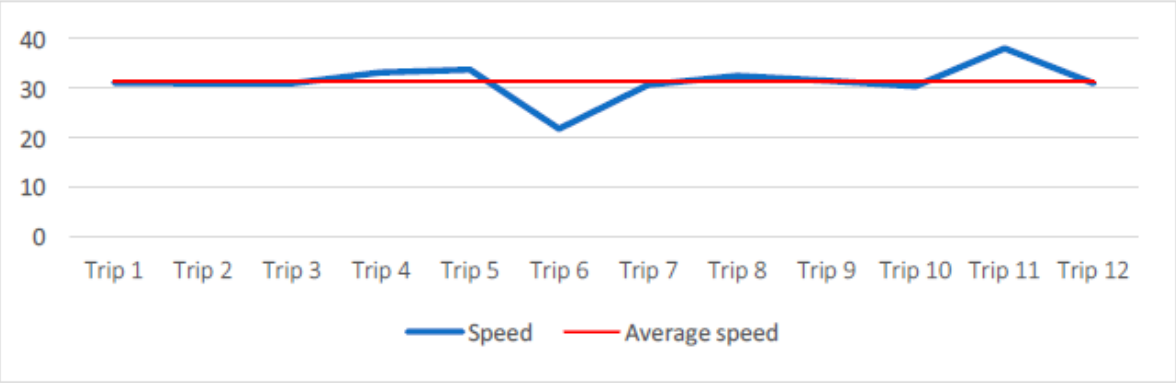
Figure 8.4. Average Time Derived from Average of GPS Recordings of Time on 12 Trips on Mile 12–Ikorodu Corridor



Average Travel Speed on Mile 12–Ikorodu: 31.3 km/h

15. The travel speed recorded by GPS shows a range from 30 to 40 m/h and the average speed was 31.3 km/h.

Figure 2. Journey Speed on 12 Trips on Mile 12–Ikorodu Corridor with Average Speed Depicted



Average Travel Time of Other Commercial Buses on Mile 12–Ikorodu: 49 minutes

16. The methodology was also to have a mystery traveler record travel and stop times on several trips in other commercial buses. This would provide a real-time comparison of travel times of buses that are not on segregated BRT lanes but ply the same route. **Error! Reference source n ot found.** shows that it takes non-BRT buses an average of 49 minutes to make the same journey that BRT makes in 24 minutes.

17. Many reasons could explain the time advantage of about 25 minutes that BRT has over other commercial buses (not including LAGBUS): (a) the other commercial buses spend more time picking up and dropping off passengers, because they make more stops at bus stops that are in-between the BRT stations; (b) the buses are not in as serviceable a condition as that of BRT and as such are not able to move as fast as BRT; and (b) because the buses do not have an exclusive lane such as that of BRT, flowing along with other road users slows down all traffic to some extent. The survey shows that reduced travel times on the corridor are making the commuter experience more pleasant.

Table 8.2. GPS Record of Travel Time and Speed of Other Public Commercial Buses on Mile 12–Ikorodu

Terminal/Bus Stops	Journey Start Time (Mins)	Stop Time (Mins)	Distance Travelled (km)	Running speed in km/hr
Ikorodu Garage – Aruna Bus Stop	0.00	3:59	1.18	17.79
Aruna - Agric	5:42	7:56	1.70	14.51
Agric/Agric Terminus	9:12	10:25	2.07	18.20
Agric Terminus – Majidun Ogolonto	12:11	17:52	3:30	12.97
MajidunOgolonto – Majidun Awori	20:13	24:21	4.51	17.58
Majidun Awori – Irawo Bus Stop	26:12	40:32	9.53	21.02
Irawo - Idera	42:11	44.03	10.27	23.74
Idera – Owode Onirin	45:37	47:38	11.13	25.67
Owode Onirin – Mile 12	48:17	**49:10**	12.02	60.00
Average running Speed				23.498

Average Travel Time and Speed on Mile 12-TBS BRT-Lite Corridor: 45.50 minutes

18. Records of the readings indicate that the average travel time between Mile12 and TBS is 45.50 minutes. The survey found that the average travel time between Ikorodu and Mile 12 is 24.08 minutes, and the total travel time of the corridor is around 70 minutes.

Table 8.3. BRT-Lite Corridor Travel Time and Speed

Terminal/Bus Stop	Journey Start Time In Minutes	Stop Time In Minutes	Distance Travelled In Km	Average Running Speed
Mile12				
Mile12 – Ketu	0:00	-		
Ketu – Ojota	-	-		
Ojota – New Garage	-	-		
New Garage – Maryland	-	11:09	5.41	29.11Km/hr
Maryland – Idi Iroko	11:44	13:36	6.59	37.86 Km/hr
Idi – Iroko – Anthony	13:54	-	-	
Anthony – Obanikoro	-	16:35	8.65	46.12km/hr
Obanikor – Palmgroove	16:57	17:45	9.20	41.25km/hr
Palmgroove – Onipanu	18:10	-		
Onipanu – Fadeyi	-	-		
Fadeyi – Ojuelegba	-	-		
Ojuelagba – Stadium	-	25:52	14.1	40.44km/hr
Stadium - Iponri	26:35	28:25	15.07	31.63km/hr
Iponri - Costain	29:05	30:15	16.2	53.09 km/hr
Costain - Lventis	31:14	36:43	19.9	40.43lm/hr
Leventis – CMS	37:14	40:10	21.3	29.68km/hr
CMS – TBS	40:33	**45:50**	22.9	**18.18km/hr**

Direct and Indirect Impact of Road Project Investments

Time Savings for BRT Users, Non-BRT Bus Users, and Car Owners

19. The socioeconomic survey on the impact of the road project was conducted with commuters. In this survey, commuters confirmed that road construction has resulted in travel time savings.

- About 71 percent of BRT users stated that the trip between Mile 12 and Ikorodu currently takes less than 30 minutes. Before the intervention, 94 percent of users said that the same trip used to take between 50 and 80 minutes. It is therefore clear that there has been a time saving of 20 to 50 minutes for commuters. The commuters' judgment of time savings concurs with the survey findings that the actual travel time is 24.08 minutes compared to 49 minutes in the past; actual time saving is 25 minutes.

- Non-BRT users also confirmed travel-time savings, with 73 percent of respondents stating that it takes about 25 minutes to traverse the corridor compared to the 60 to 80 minutes it used to take. Therefore, the time saving is 35 to 55 minutes.

- However, car owners recorded faster travel times than those of BRT: between 18 and 20 minutes. This is reasonable because cars have few stops and waiting times.

20. In conclusion, there have been time savings of at least 20 minutes for some commuters and as high as 55 minutes for others. Car owners have the most time savings after the road construction, while BRT makes the next largest savings. For commuters who use buses, BRT is the preferred means of travel because of time savings, comfort, and security off and on the bus.

Cost Savings: Willingness-to-pay Extra

21. Passengers' willingness-to-pay (WTP) for improving the quality levels of a transport service was examined. The WTP survey is an important tool in the evaluation of transport investments, because it allows the investor or provider to establish the rate which could be debited to the users. The survey shows that 68.3 percent of household respondents are not willing to pay more for an improved BRT service because most of them stated that the service is owned by the government and as such ought to be subsidized. For about 32.7 percent of the sample who are willing to pay more, about 44 percent are willing to pay only about a five percent increase in fares.

Income Savings

22. Before the BRT extension, commuters from Mile 12 to Ikorodu spent an average of about NGN 4,120 to NGN 4,500 per month. When the extension project was completed, many commuters migrated to the BRT service and the transport cost was reduced to about NGN 4,000 monthly. However, the BRT franchisee recently increased fares on BRT to NGN 200 per round trip, with an average monthly transport expenditure of NGN 5000. The result of this increase is that commuters' transport expenditure has increased by about 20 percent This is a result which may appear unfavorable at project end, but it is a result that must be put into context relative to non-BRT transporters' fares. In context, BRT fares are still relatively lower than all other transport of correlated status. The survey found that National Union of Road Transport Workers (NURTW) buses and the minibuses charge NGN 150 per trip, with a round trip on the corridor costing NGN 300, which means that a commuter who chooses not to travel on the BRT service has a monthly transport expenditure of NGN 7,500. Compared to the non-BRT transport expenditure, the commuter saves 33.3 percent on transportation.

23. The household and passenger surveys show that commuters believe there is an even greater percentage gain on transportation cost through BRT because the other commercial buses competing with BRT on the corridor do not commit to a fixed price and change prices as windows of opportunities present themselves. About 95 percent of the respondents are not opposed to the fare increase, especially because BRT provides a more comfortable and faster ride.

Annex 6. Summary of Borrower's ICR and/or Comments on Draft ICR

1. LAMATA implemented the LUTP2, a transport development project which was financed by the World Bank, AFD and GEF. The project was implemented between May 16, 2011 and May 31, 2017. In compliance with credit terms, LAMATA commissioned the preparation of the ICR to examine and evaluate the implementation performance of the project at its end.

Summary of Lessons Learned

- The RAP should be holistic, sustainable and transparent to PAPs. Security of land tenure enables sustainability. Without it, the objective of the resettlement action will be defeated and another resettlement will have to occur in the future. In the case of the Ayangbunren Market traders, PAPs were displaced from one uncertain future to another equally uncertain future. In the long run, it is doubtful whether money used to secure the resettlement brings any value.

- It is important that terms of agreements are explained properly to PAPs to ensure their acceptance. An illiterate *jurat* (a legal clause that shows that an illiterate person signing understands what he is signing, the same having been translated into his/her local dialect) should always be inserted into agreements in which PAPs are illiterate or appear to be more capable of transacting business or relationships in languages other than English. This will show that the terms that the allottee PAP signs are actually understood.

- Resettlement should not end with a mere allocation of stalls and relocation. Instead there should be an oversight role after relocation for purposes of sorting out all problems that may occur, in order to facilitate seamless and sustainable resettlement. There is a need for some sort of government supervisory role on resettled persons, the area, and the activities of PAPs and to assure their security and tenure. In this regard, the LGA's role should be defined in such a way that supervision of PAPs does not become burdensome.

- LAMATA should seek to obtain long-term leases of land on which PAPs would be resettled. Short-term lease tenure is not ideal. If the land cannot be acquired by the government under the Land Use Act and compensation cannot paid to the owner so that the land may be government (LGA) owned (security of tenure guaranteed), then the lease should be for at least 10 years with a proviso allowing the market associations to negotiate a further lease on any other conditions they may agree with the lessors.

- Lessons learned regarding the TPUs are that, before setting up a special unit in any institution, it is advisable to examine if there is any department that appears to have a semblance of similarity in functions to those of the new special unit being proposed. If such a department exists, then there must be either an abrogation or scrapping of such an existing unit or a merger of the two units. Where parallel units exist, the survival of one is uncertain.

- Although it is uncertain whether the Local Government Service Commission was contacted or consulted before the creation of the TPUs, it is important to stress that stakeholder analysis at the beginning of any initiative must be thorough and include even those whose only function may be decided even remotely. In this regard, the Local Government Service Commission may have been left out and the latter's action has adversely affected a carefully thought-out and laudable project. The commission is responsible for all LGA/LCDA workers throughout the state and the transfer of staff from one LGA/LCDA to another is a normal function. Consultation with this commission will stem the frequent transfer of trained officers to LGAs/LCDAs where the TPU is non-existent.

- For projects to actually endure in the LGA/LCDA, the chairmen of all the 57 LGAs/LCDAs in the state should be sensitized and engaged in a determined manner until they are fully bought into the project. Even if the TPUs have only a 10 percent penetration at the onset, the buy-in of all 57 chairmen will provide institutional acceptance of the project; the first set would feel special to have been selected while the remainder will eagerly await their turn. The LGAs/LCDAs have their special functions, especially regarding feeder roads, and there should be no reason for them to sabotage LAMATA's efforts if they understand the project's overall objective. LAMATA should also keep in mind the politicking that underscores LGAs/LCDAs and help to secure legitimacy for a revenue base that by law accrues to the LGAs/LCDAs. Resistance arises if people fear erosion of their revenue base. Prompt cooperation and support for the TPUs from local government executives should be enjoyed by members of the TPU and should not be seen as competition.

- A sustainable plan requires a dedicated funding line; this line should be from the LGA/LCDA. LAMATA should institutionalize the TPU's funding line within the LGA/LCDA.

- The issue of lack of a concessionary transport fare for children on the BRT corridor needs to be evaluated and a system of subsidies should be considered by LAMATA. Children are grossly under-represented in bus travel, as observed during the field survey. This is because the fares remain largely unaffordable to parents. Perhaps the operator of the franchisee could be persuaded to provide free bus travel for children at peak school resumption and closing times as a corporate social responsibility, or perhaps the LSG/LAMATA could consider subsidizing travel for children. Consideration could also be given to a system that may bring in other multinationals to subsidize such travel, similar to the free transport that Cadbury PLC was providing at one time to children.

Recommendations and Follow-up Actions

- In the near future, the LSG will require further assistance from the World Bank for a third phase of the LUTP. The request is based on the LUTP2's benefits and contributions to the state's development agenda. LAMATA'S vision for the follow-on assistance would involve enhancing the mobility and affordability of bus transport services and increasing the physical resilience of Lagos State's transport network to

extreme economic downturn and weather events. The proposed request could involve a number of components, including the expansion of BRT to additional corridor(s), improving feeder-bus route connectivity, implementing portions of Lagos State's drainage master plan, facilitating bus and passenger movements along identified corridors through enhanced traffic management and ITS measures, and improving the capacity of different agencies in Lagos State to manage the transport system effectively.

- Consolidation of the gains of the establishment of TPUs in the six LGAs/LCDAs by addressing a law or regulations to resolve the issues of legitimacy and sustainability, such as removing parallel staff and institutionalizing only the TPU.

- Empowering the TPU to be sustainable by providing a secure and regular funding line from the LGA/LCDA. In this regard, an annual budget should be prepared in the LGA/LCDA for the TPU, and the TPU should be made a department in the Local Government Commissions with the full rights and privileges of a government agency.

- Staffing of TPUs must be assigned special status, and the Local Government Commissions should be instructed by the LSG, through the appropriate legal channels, that specialized staff must be retained within or transferred only to the LGAs/LCDAs that can use their expertise.

- Foster cooperation and support for TPUs from the local council executives by conducting inter-LGA/LCDA stakeholder workshops for dissemination of TPU activities and feedback so that best practices can be shared.

Conclusion

2. The consultants' overall conclusion is that the LUTP2 has achieved the PDOs and Key Performance Indicators. LAMATA's capacity for project planning and implementation has again been affirmed. With two major projects—LUTP and LUTP2—LAMATA has definitely come of age in Nigeria as a credible institution. It is expected that LAMATA will showcase its capacity by a more visible and perhaps "loud" presence in both hard and soft media. It is expected that more funding will be assigned to the External Relations Unit to achieve this. The website could benefit from greater robustness to make more data accessible. LAMATA can graduate to being an institution of transport planning and perhaps collaborate with various universities. The capacity within LAMATA can be of immense benefit to Nigeria.

Annex 7. GHG Analysis

1. The GHG emission analysis presented in this annex follow a tailored methodology developed for this project and which could be easily replicable for other urban transport projects. The project supported the development of the complete methodology and methodological handbook for GHG emission calculation. This methodology has the advantage of being tailored and practical for LAMATA to manage. It is built on what is known as the ASIF identity[17].

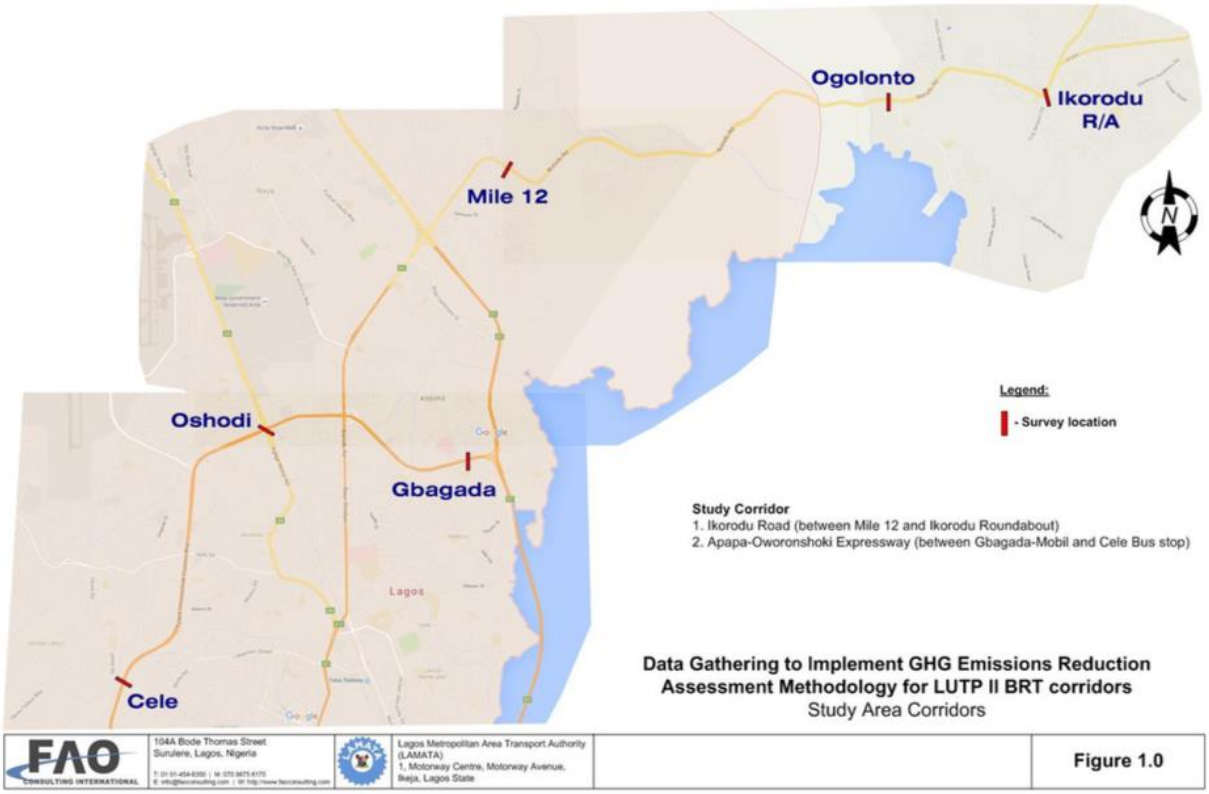
2. In June 2013, LAMATA undertook surveys of two corridors to determine the base case for the implementation of a GHG emissions monitoring methodology for the Lagos metropolitan area, focusing primarily on the new BRT corridor funded under the LUTP2 (Mile 12–Ikorodu). Apapa–Oworonshoki Expressway, which is labeled Corridor 1, was chosen as the control corridor to determine background traffic growth not attributed to BRT. The Ikorodu Road corridor is labeled Corridor 2. The base case was intended to provide LAMATA with sufficient information to be able to estimate the amount of GHG (CO_2) emissions on the Mile 12–Ikorodu corridor prior to the implementation of BRT.

3. The exercise, which conducted by LAMATA in June 2013, was carried out again in 2016. The results are presented in this summary of the report that was submitted by the consultants retained for the GHG emissions study. Furthermore, a careful comparison of the 2013 and 2016 total CO_2 emissions has been conducted to determine the effect of BRT implementation and to ascertain whether there has been an increase or decrease in total CO_2 emissions.

4. For the project, two study corridors were identified, as in the previous studies. The surveys, traffic counts and testing focused on the following roadway corridors:

- Apapa–Oworonshoki Expressway (between Gbagada-Mobil and Cele bus stop), and
- Ikorodu Road (between Mile 12 and Ikorodu Roundabout).

[17] ASIF stands for the variables of a generic equation to calculate the GHG emissions of transport that reads: GHG = Activity x modal Share x energy Intensity x carbon intensity of Fuel.



5. Ikorodu Road is the "study" corridor, while the Apapa–Oworonshoki Expressway serves as the "control" corridor.

6. Data collection for the project primarily involved two types of surveys, including:

(a) Drive Cycle Test, and
(b) Manual Classified and Vehicle Occupancy Counts.

7. The Drive Cycle Test survey was designed to capture average driving conditions across the different vehicle types within the study area, and to monitor how travel conditions evolve over time following the introduction of the BRT scheme. Drive Cycle Tests were conducted within a two-week period from Saturday, May 14 to Saturday, May 28, 2016. The Manual of Classified and Vehicle Occupancy Counts survey started on Saturday, May 14, 2016, and was conducted for a total of seven days between 6 a.m. and 8 p.m., ending on Friday, May 20, 2016.

8. The Drive Cycle Test and Manual of Classified and Vehicle Occupancy Counts were conducted on private cars and public passenger vehicles including *okadas*, tricycles, Danfo-14, Danfo-18, Danfo-22, cars, taxis, coaster buses, large buses (BRT/LAGBUS and so on) and trucks (lorry/trailer).

9. **Analysis and results.** In 2013, the results focused on three key aspects of the analysis that guide the project's objectives, including equivalent CO_2, fuel performance, and inter-city and inter-model comparison.

Comparison of Total Emission Obtained from 2013 and 2016 on Corridor 1

10. Table 11.1 presents a comparison of 2013 total CO_2 emissions with the 2016 total CO_2 emissions in Corridor 1 (Apapa–Oworonshoki Expressway).

Table 11.1. Total CO_2 Comparison 2013 versus 2016 for Corridor 1

Corridor 1: Apapa Oworonshoki Exp. Way	2013 Total CO2 Emissions	2016 Total CO2 Emissions	Difference
	G (kg)	*G (kg)*	*G (% diff.)*
Vehicle Bins			
Okada	2032	3865	90%
Tricycle (Keke NAPEP)	115	131	14%
Cars	287247	441787	54%
Taxi	16929	18287	8%
Danfo - 14	19574	13705	-30%
Danfo – 18	4880	3403	-30%
Danfo – 22	3213	2010	-37%
Coaster	1085	836	-23%
Large Bus (BRT/LAGBUS etc.)	1324	935	-29%
Trucks (Lorry / Trailer)	85838	43129	-50%
Total	422238	528088	25%

From the table above;

- *The total CO2 emission at corridor 1 for the year 2013 is 422 tonnes*
  The total CO2 emission at corridor 1 for the year 2016 is 528 tonnes
- *The percentage difference is 25% (increase in CO2 emission) on corridor 1*

11. Table 11.2 presents a comparison of 2013 total CO_2 emissions with the 2016 total CO_2 emissions in Corridor 2 (Ikorodu Route).

Table 11.2. Total CO_2 Comparison 2013 versus 2016 for Corridor 2

Am	2013	2016	diff.
Corridor 2: Ikorodu Road		Total CO2 Emissions	
	G (kg)	*G (kg)*	*G (% diff.)*
Vehicle Bins			
Okada	380	1704	349%
Tricycle (Keke NAPEP)	25	63	151%
Cars	202098	272315	35%
Taxi	12189	12102	-1%
Danfo - 14	10846	6258	-42%
Danfo – 18	4693	2352	-50%
Danfo – 22	719	498	-31%
Coaster	618	400	-35%
Large Bus (BRT/LAGBUS etc.)	975	3297	238%
Trucks (Lorry / Trailer)	138394	49564	-64%
Total	370937	348553	-6%

From the table above;

- *The total CO2 emission at corridor 2 for the year 2013 is 371 tonnes*
  The total CO2 emission at corridor 2 for the year 2016 is 349 tonnes
- *The percentage difference is -6% (decrease in CO2 emission) on corridor 2*

12. Table 11.1 indicates that there has been a 25 percent increase of total CO_2 emissions from 2013 to 2016 in the Apapa–Oworonshoki corridor. However, Table 11.2 shows that total CO_2

emissions decreased by a margin of six percent between 2013 and 2016 along the Ikorodu Road corridor. This reduction of total CO_2 emissions in the Ikorodu Road corridor could be attributed to the introduction of a new BRT system since November 2015. This also suggests that a switch from other modes to BRT resulted in lower overall emissions.

Impact of BRT on the Study Corridor

13. To determine the true impact of the BRT system on the Ikorodu Road study corridor, the growth exhibited on the control corridor between 2013 and 2016 was applied to the 2013 traffic of the BRT corridor to derive passenger trips for the counterfactual scenario without BRT. The percentage of growth from the control corridor was derived by calculating the increase in the number of vehicles in each vehicle from base year 2013 to current year 2016 and then dividing that number by the 2013 volume.

Table 11.3. Control Corridor Growth Based on Number of Vehicles

Corridor 1: Apapa Oworonshoki Exp. Way (Control)				
Number of vehicles				
Vehicle Bins				
Okada	5967	8440	2473	41%
Tricycle (Keke NAPEP)	1482	1455	-28	-2%
Cars	145989	186266	40277	28%
Taxi	10675	8101	-2574	-24%
Danfo - 14	46303	41977	-4326	-9%
Danfo – 18	12714	12585	-129	-1%
Danfo – 22	12197	8788	-3409	-28%
Coaster	5264	4301	-963	-18%
Large Bus (BRT/LAGBUS etc.)	6649	5862	-787	-12%
Trucks (Lorry / Trailer)	23447	18169	-5278	-23%
	270689	**295944**	**25255**	**9%**

Percentage difference of 9% (increase in traffic) traffic on the road between 2013 and 2016

Source: GHG emissions report

14. Table 11.3 shows the average growth on the control corridor between 2013 and 2016, which has been estimated at nine percent. The growth factors were then applied to the 2013 study corridor traffic to derive the corresponding 2016 study corridor traffic called the counterfactual scenario.

15. Table 11.4 presents the summary of activity and CO_2 emissions per vehicle type for a growth-induced study corridor (counterfactual) scenario without BRT. The calculation indicates that a total of 403 tons of equivalent CO_2 were obtained for the study corridor under the counterfactual scenario. When the 349 tons of equivalent CO_2 for the study corridor are deducted from the counterfactual scenario, the resulting 54 tons of equivalent CO_2 represent the impact of BRT on the study corridor. This also suggests that BRT is responsible for a 13.5 percent reduction of total CO_2 emissions on the Ikorodu Road study corridor, as shown in Table 11.5.

Table 11.4. Total CO_2 Corridor 2 (Without BRT) Source: GHG Emissions Report

	T	D	O	A	B*C	G
Corridor 2: Ikorodu Road	Passenger Trips	Passenger Trip Distance	Per Km Vehicle Occupancy	Vehicle Activity	Emission Factor	Total CO2 Emissions
	pax	*km*		*veh-km*	*g/veh-km*	*kg*
Vehicle Bins						
Okada	4,077	1.6	1.60	4,053	93	377
Tricycle (Keke NAPEP)	119	8.5	2.22	457	93	43
Cars	91,197	22.6	1.82	1,129,443	295	333,186
Taxi	1,422	28.3	1.43	28,018	392	10,983
Danfo - 14	15,287	14.6	10.53	21,277	427	9,085
Danfo – 18	9,131	14.6	13.43	9,964	427	4,255
Danfo – 22	892	14.6	12.98	1,007	427	430
Coaster	1,456	15.4	37.47	597	649	388
Large Bus (BRT/LAGBUS etc.)	3,760	15.4	52.86	1,099	800	879
Trucks (Lorry / Trailer)	5,118	22.3	2.23	51,189	843	43,153
Total	**132,459**			**1,247,105**		**402,778**

Source: GHG emissions report

16. Table 11.5 presents a comparison of total CO_2 emissions for 2016 with BRT and the equivalent for 2016 without BRT.

Table 11.5. Total CO_2 Comparison 2016 versus 2016 for Corridor 2 (Without BRT) Source: GHG Emissions Study

	2016 *(without BRT)*	2016 *(with BRT)*	diff.
Corridor 2: Ikorodu Road	Total CO2 Emissions		
	G (kg)	*G (kg)*	*G (% diff.)*
Vehicle Bins			
Okada	377	1,704	352.0%
Tricycle (Keke NAPEP)	43	63	47.1%
Cars	333,186	272,315	-18.3%
Taxi	10,983	12,102	10.2%
Danfo - 14	9,085	6,258	-31.1%
Danfo – 18	4,255	2,352	-44.7%
Danfo – 22	430	498	15.9%
Coaster	388	400	3.2%
Large Bus (BRT/LAGBUS etc.)	879	3,297	275.2%
Trucks	43,153	49,564	14.9%
Total	**402,778**	**348,553**	**-13.5%**

Percentage difference of -13.5% (decrease in traffic) traffic on the road 2016

Source: GHG emissions report

Conclusion

17. The conclusion, based on the above analysis of the impact of BRT and the comparison of the with-BRT and without-BRT scenarios for 2016, is that BRT has had an overall positive effect on total CO_2 emissions in the Ikorodu Road corridor. This conclusion is further strengthened by the comparison analysis of the 2013 without-BRT scenario and the equivalent 2016 without-BRT scenario, which showed that, had the BRT system not been implemented, total CO_2 emissions would have increased in the Ikorodu Road study corridor by approximately nine percent. The positive effect of BRT is thus demonstrated.

Annex 8. Allocations per component

	Original					2011 Restructuring					2012 Restructuring					2015 Restructuring				
	Total	**LSG**	**IDA**	**AFD**	**GEF**	**Total**	**LSG**	**IDA**	**AFD**	**GEF**	**Total**	**LSG**	**IDA**	**AFD**	**GEF**	**Total**	**LSG**	**IDA**	**AFD**	**GEF**
Component 1: Institutional Development and Capacity Building																				
Total (USD)	**34**	10	23	0	1	**40.8**	16.8	23	0	1	**21**	10	10	0	1	**21**	10	10	0	1
A. Training, Twinning and Study Tours	5.5		5.5			5.5		5.5			5.5		5.5			5.5		5.5		
B. LAMATA Corporate Head Office	13		13			19.8	6.8	13			0					0				
C. Transport Model Update	2		2			2		2			2		2			2		2		
D. LAMATA Operating Costs	10	10				10	10				10	10				10	10			
E. Creation of TPUs	2.5		2.5			2.5		2.5			2.5		2.5			2.5		2.5		
F. Support to Kano	1				1	1				1	1				1	1				1
Component 2: Improvement of Public Transport Infrastructure and Enhancement of Traffic Management Systems																				
Total (USD)	**236.5**	0	133	100	3.5	**236.5**	0	133	100	3.5	**252.9**	3.4	146	100	3.5	**254.34**	3.4	147.44	100	3.5
A. BRT Infrastructure Construction and Supervision (Oshodi–Mile 2–Obalende) (dropped)	120		120			0					0					0				
B. BRT Infrastructure Construction and Supervision (Mile 12–Ikorodu/ BRT-Lite Corridor Extension)	100			100		205.5		105.5	100		133.4	3.4	130			133.4	3.4	130		
C. Upgrade BRT-Lite (Mile 12–CMS)	0					14.5		14.5			14.5		14.5			14.5		14.5		
D. Mass Transit Alternative Analysis Studies	3		3			3		3			1		1			1		1		
E. Development of Complementary Bus System	10		10			10		10			0.5		0.5			0.5		0.5		
F. BRT Consultation and Media Strategy	1.5				1.5	1.5				1.5	1.5				1.5	1.94		0.44		1.5
G. Upgrade and Rationalize System Operation	2				2	2				2	2				2	3		1		2
Component 3 Improvement of Lagos State Metropolitan Road Network																				
Total (USD)	**50**	25	25	0	0	**43.2**	18.2	25	0	0	**46.6**	21.6	25	0	0	**46.6**	21.6	25	0	0
A. Routine Maintenance (dropped)	25	25				18.2	18.2				18.2	18.2				18.2	18.2			
B. Periodic Maintenance and Pavement Management System	14		14			14		14			0		0			0		0		
C. Rehabilitation (and PMS)	11		11			11		11			28.4	3.4	25			28.4	3.4	25		
Component 4: Project Management and System Monitoring																				

Total (USD)	**9**	0	9	0	0	**9**	0	9	0	0	**9**	0	9	0	0	**7.56**	0	7.56	0	0
TOTAL (USD)	**329.5**	**35**	**190**	**100**	**4.5**	**329.5**	**35**	**190**	**100**	**4.5**	**329.5**	**35**	**190**	**100**	**4.5**	**329.5**	**35**	**190**	**100**	**4.5**