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Report No: PAD2002

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A
PROPOSED IDA SCALE-UP FACILITY CREDIT

IN THE AMOUNT OF US$200 MILLION

TO THE

REPUBLIC OF ZAMBIA

FOR A
ZAMBIA: IMPROVED RURAL CONNECTIVITY PROJECT-SUF

April 13, 2017

Transport & ICT Global Practice
Africa Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective March 31, 2017)

Currency Unit = Zambian Kwacha (ZMW)

ZMW 1 = US$0.1060

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AADT	Annual Average Daily Traffic
ADSP	Agriculture Development Support Project
APL	Adaptable Program Lending
BP	Bank Policy
CERC	Crisis Emergency Response Component
CPS	Country Partnership Strategy
CPIA	Country Program and Institutional Assessment
CPs	Cooperating Partners
CRN	Core Road Network
DA	Designated Account
DNPW	Department of National Parks and Wildlife
DSA	Debt Sustainability Analysis
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ERR	Economic Rate of Return
FM	Financial Management
GDP	Gross Domestic Product
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GRZ	Government of the Republic of Zambia
HIV	Human Immunodeficiency Virus
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
IDA	International Development Association
IFMIS	Integrated Financial and Information Management System
IFR	Interim Financial Reports
IPR	Independent Procurement Reviews
IRR	Internal Rates of Return
LRA	Local Road Authority
M&E	Monitoring and Evaluation
MDRI	Multilateral Debt Relief Initiative
MHID	Ministry of Housing and Infrastructure Development
MLG	Ministry of Local Government
MNP	Ministry of National Planning
MOF	Ministry of Finance
MTC	Ministry of Transport and Communication
NCB	National Competitive Bidding
NCC	National Council for Construction
NPV	Net Present Value

NRFA	National Road Fund Agency
OP	Operational Policy
OPRC	Output and Performance Based Road Contracting
PAD	Project Appraisal Document
PDO	Project Development Objective
PIU	Project Implementation Unit
PIMU	Project Implementation Memorandum of Understanding
PLR	Performance and Learning Review
PMU	Project Management Unit
PPR	Procurement Post Review
PR	Prior Review
PRAMS	Procurement Risk Assessment and Management System
QA	Quality Assurance
QCBS	Quality and Cost Based Selection
RAI	Rural Access Index
RAP	Resettlement Action Plan
RDA	Road Development Agency
RED	Roads Economic Decision
RFP	Request for Proposal
ROADSIP	Road Sector Investment Program
RPF	Resettlement Policy Framework
RRMP	Road Rehabilitation and Maintenance Project
RTSA	Road Transport and Safety Agency
SFR	Secondary Feeder Roads
SOE	Statement of Expenses
SPAM	Spatial Production Allocation Model
TA	Technical Assistant
TFR	Tertiary Feeder Roads
TMD	Trunk Main and District
TOR	Terms of Reference
VPD	Vehicles per day
WB	World Bank
WBG	World Bank Group
ZEMA	Zambia Environmental Management Agency
ZMW	Zambian Kwacha

Regional Vice President:	Makhtar Diop
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BASIC INFORMATION

Is this a regionally tagged project?	Country(ies)	Lending Instrument
No		Investment Project Financing

[ ] Situations of Urgent Need of Assistance or Capacity Constraints

[ ] Financial Intermediaries

[ ] Series of Projects

Approval Date	Closing Date	Environmental Assessment Category
04-May-2017	31-Dec-2025	B - Partial Assessment

Bank/IFC Collaboration
No

Proposed Development Objective(s)

The objectives of the Project are to: (i) improve the Recipient's rural road accessibility for communities in selected areas; (ii) strengthen institutional capacity for sustainable management of rural roads; and (iii) respond promptly and effectively to an Eligible Crisis or Emergency.

Components

Component Name	Cost (US$, millions)
Improvement of feeder roads	180.00
Institutional strengthening in the roads sector	20.00

Organizations

Borrower :	Ministry of Finance
Implementing Agency :	National Road Fund Agency

[ ] Counterpart Funding	[ ] IBRD	[✓] IDA Credit [ ] Crisis Response Window [ ] Regional Projects Window	[ ] IDA Grant [ ] Crisis Response Window [ ] Regional Projects Window	[ ] Trust Funds	[ ] Parallel Financing

Total Project Cost:	Total Financing:	Financing Gap:
200.00	200.00	0.00
	Of Which Bank Financing (IBRD/IDA): 200.00	

Financing (in US$, millions)

Financing Source	Amount
International Development Association (IDA)	200.00
Total	**200.00**

Expected Disbursements (in US$, millions)

Fiscal Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual	0.00	10.30	21.67	30.72	36.13	32.04	27.01	21.71	17.09	3.32
Cumulative	0.00	10.30	31.97	62.69	98.82	130.86	157.87	179.59	196.68	200.00

INSTITUTIONAL DATA

Practice Area (Lead)

Transport & ICT

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

Yes

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

Yes

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

Yes

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	High
6. Fiduciary	Moderate
7. Environment and Social	Moderate
8. Stakeholders	Substantial
9. Other	
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Natural Habitats OP/BP 4.04		✓
Forests OP/BP 4.36	✓	
Pest Management OP 4.09		✓
Physical Cultural Resources OP/BP 4.11	✓	
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37		✓
Projects on International Waterways OP/BP 7.50		✓
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Sections and Description

Financing Agreement Schedule 2.Section I.C.1: The Recipient shall, at all times during Project implementation, take all actions necessary or appropriate to enable the Project Implementing Entity and the Participating Agencies to carry out their respective obligations as set forth or referred to in this Agreement, the Project Agreement, the Project Implementation Plan and the Project Implementation Memorandum of Understanding, including, without limitation, the provision of facilities, site access, services and other resources required for that purpose.

Sections and Description

Financing Agreement Schedule 2.Section I.C.2: The Recipient shall ensure that the priority feeder roads within each Participating Province shall be selected by ranking them based on such factors as: (i) the number of beneficiaries, (ii) agricultural production along the road, (iii) social benefits from improved connectivity, (iv)

connectivity to the main network (trunk, district and main roads), and (v) investment efficiency. The selection criteria and process shall be set forth in more detail in the Project Implementation Plan.

Sections and Description

Financing Agreement Schedule 2.Section I.E.5: Without limitation upon its other reporting obligations under this Agreement, the Recipient shall, through RDA (and/or other relevant Participating Agencies), for each of the Safeguards Instruments including the related Supplemental Social and Environmental Safeguards Instrument, regularly collect, compile and furnish to the Association reports in form and substance satisfactory to the Association, on the status of compliance with such Safeguards Instrument including the related Supplemental Social and Environmental Safeguards Instrument, as part of the Project Reports, giving details of:

(a) measures taken in furtherance of the Safeguards Instruments including the Supplemental Social and Environmental Safeguards Instruments;

(b) conditions, if any, which interfere or threaten to interfere with the smooth implementation of the Safeguards Instruments including the Supplemental Social and Environmental Safeguards Instruments; and

(c) remedial measures taken or required to be taken to address such conditions.

Sections and Description

Project Agreement Section IV. (a): The Project Implementing Entity shall: prepare and furnish to the Association, for its review and comments, as soon as available, but in any case no later than November 30 of each year, the proposed annual work plan and budget for the Project for the forthcoming fiscal year of the Recipient, of such scope and detail as the Association shall reasonably request, except for the annual work plan and budget for the Project for the remainder of the fiscal year of the Recipient in the first year of the Project, which shall be furnished no later than one (1) month after the Effective Date.

Conditions

Type	Description
Disbursement	Financing Agreement Schedule 2, Section IV-B1(b): No withdrawal shall be made for Eligible Expenditures under Category 3 of the Project (for works pertaining to Southern and Muchinga Provinces), unless and until the Association is satisfied, and notified the Recipient of its satisfaction, that the Recipient has entered into at least one OPRC for rehabilitation of road(s) in any of the GRZ Priority Provinces under the GRZ's Ten-Year National OPRC Roll-Out Program

Type	Description
Disbursement	Financing Agreement, Section IV.B.1.a: Notwithstanding the provisions of Part A of this Section, no withdrawal shall be made: (a) for payments made prior to the date of this Agreement, except that withdrawals up to an aggregate amount of one million Dollars ($1 ,000,000)

	equivalent may be made for payments made prior to this date but on or after November 1, 2016 for Eligible Expenditures under Category 1.
Type Disbursement	Description Financing Agreement, Section IV.B.1.c: Notwithstanding the provisions of Part A of this Section, no withdrawal shall be made: (c) under Category (6) for Emergency Expenditures under Part 3 of the Project, unless and until the Association is satisfied, and notif ied the Recipient of its satisfaction, that all of the following conditions have been met in respect of said activities: (Reference Section IV.B.1.c)
Type Effectiveness	Description Financing Agreement, Article V, Section 5.01.: The Additional Conditions of Effectiveness consist of the following: (a) The Subsidiary Agreement has been executed on behalf of the Recipient and the Project Implementing Entity. (b) The Project Implementation Memorandum of Understanding has been executed on behalf of the Recipient and the Participating Agencies. (c) The Recipient has adopted the Project Implementation Plan.
Type Effectiveness	Description Financing Agreement, Article V, Section 5.02.: The Additional Legal Matters consist of the following: the Subsidiary Agreement has been duly authorized or ratified by the Recipient and the Project Implementing Entity and is legally binding upon the Recipient and the Project Implementing Entity in accordance with its terms.

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Justin Runji	Team Leader(ADM Responsible)	Engineering	GTI07
Wedex Ilunga	Procurement Specialist(ADM Responsible)	Procurement	GGO01
Srinivas Gurazada	Financial Management Specialist	Financial Management Specilaist	GGO25
Alex Mwanakasale	Team Member	Agriculture	GFA13
Alexandra C. Sperling	Team Member	Legal analyst	LEGAM

Atsushi Iimi	Team Member	Economist	GTI01
Chrissie Kamwendo	Team Member	Community Development	AFMZM
Ekaterine Gureshidze	Counsel	Legal agreements	CLEMG
Lingson Chikoti	Team Member	Financial	GGO26
Margaret Png	Team Member	Legal Agreements	LEGAM
Michelle Sade Kayosa Ajayi	Team Member	Team Support	GTI01
Mwansa Lukwesa	Environmental Specialist	Environmental Safeguards	GEN01
Petrus Benjamin Gericke	Team Member	OPRC	GTI07
Rajesh Rohatgi	Team Member	Engineering	GTI01
Richard Everett	Team Member	Social safeguards	GSU01
Wilhelmus Gerardus Janssen	Team Member	Agriculture	GFA13
Wisdom E. Mulenga	Team Member	Team Assistant	AFMZM

Extended Team

Name	Title	Organization	Location

REPUBLIC OF ZAMBIA
ZAMBIA: IMPROVED RURAL CONNECTIVITY PROJECT-SUF

I. STRATEGIC CONTEXT

A. Country Context

1. **Zambia is a resource rich, low middle-income country that has achieved an impressive average annual growth rate of about 6.4 percent over the last decade. However, the growth has not translated into appreciable improvement in the living standards of majority of the population.** With the decline in the price of copper, Zambia's main export, the economy slowed to an estimated 3.2 percent in 2015 but was expected to improve to 4.2 percent in 2016 as commodity price shocks eased. According to the latest Living Conditions Monitoring Survey of 2015, Zambia had an estimated population of 15.5 million, of which 58 percent resided in rural, and 42 percent in urban areas. Of the population, 54.5 percent lives below the national poverty line while 40.8 percent are considered to be in extreme poverty.

2. **The urban-rural divide in terms of poverty is stark in Zambia.** The national poverty incidence improved marginally from 62.8 percent in 2006 to 60.5 percent in 2010. Still, about 8.4 million people live below the poverty line. Poverty is located overwhelmingly in rural areas where the rate is more than three times that in urban areas. In 2015, rural poverty was estimated at 76.6 percent, a marginal improvement from 77.9 percent in 2010. The urban poverty level stood at 23.4 percent in 2015, a significant drop from 27.5 percent in 2010. Rural areas are clearly lagging behind. At the same time, the Gini coefficient has risen marginally in the last five years, from 0.65 to 0.69, suggesting that income distribution has not improved.

3. **There appears to be a correlation between rural poverty and rural accessibility**. In the two most urbanized provinces, Lusaka and Copperbelt, poverty densities may appear high due to their high population, but poverty headcount is relatively low, at 20.2 percent and 30.8 percent respectively. In the other eight rural provinces, the vast majority of the population live under the poverty line. In Western, Luapula, Northern, and Eastern provinces, which are predominantly rural and rely on subsistence agriculture, 82.2, 81.1, 79.7 and 70.0 percent respectively experience extreme poverty and are not able to satisfy basic food requirements. In these areas, many rural farmers do not have good access to productivity enhancing inputs, resulting in low crop yields. Rural access by road to markets is limited. According to the revised Rural Access Index[1] (RAI), rural accessibility in Zambia is estimated at 17 percent, meaning that 83 percent of the rural population or 7.5 million rural residents do not have access to a good quality road network. In Western and Northwestern Provinces, accessibility is even lower, at 10 percent or less.

4. **To attain sustainable development, economic diversification and pro-poor investments have long been called for in Zambia.** While its economy is traditionally highly dependent on copper, the agriculture sector is by far the highest contributor to employment, currently employing 70 percent of the total population. Moreover, Zambia has significant potential in agriculture and agribusinesses that remain largely underexploited. Since the end of the commodity boom cycle in 2014, falling copper prices, exports, and foreign direct investments continue to weaken the economy. The revised Sixth National Development Plan identifies poor infrastructure as one of the binding constraints. It also recognizes that better infrastructure would accelerate Zambia's gains in the promotion of economic diversification and

[1] World Bank. (2016). "Measuring Rural Access: Using New Technologies."

industrialization, especially in the labor-intensive sectors of agriculture, tourism, manufacturing, and construction. It further states that many rural areas are difficult to access, particularly during the rainy season when vital farming inputs should be delivered.

5. The current suboptimal fiscal circumstances in Zambia have been noted. However, the social economic benefits of large infrastructure investments are to be viewed as counterweights since they are aimed at reducing constraints to economic development. The most recent Debt Sustainability Analysis (DSA), published in June 2015, moved Zambia from low risk of debt distress to moderate risk. This was on account of higher fiscal deficits and borrowing, including two Eurobonds issued in 2012 and 2014 that totaled US$1.75 billion. The public sector debt to GDP ratio at that time was 39.6 percent. The Government has also added to its debt, including a US$1.25 billion Eurobond issue in July 2015, pushing the debt to GDP ratio even higher. The Government is expected to apply a more cautious fiscal strategy going forward. Meanwhile, part of the borrowing has been directed towards infrastructure development including in railways and roads, which, in the medium to long term, could be a significant boost to economic development.

6. Government's long-term efforts on improved agricultural growth and commercialization, would contribute towards reduction of the economy's dependency on copper, better trade balances, and thus reducing its external vulnerability. Zambia currently imports more than US$350 million of agricultural products every year. With necessary production systems supported, there would be opportunities to change it from an importing to an exporting industry. The economic diversification efforts can be balanced with sound macroeconomic management, which is already in motion, and which Zambia has a strong record of.

B. Sectoral and Institutional Context

7. **Geographically, Zambia's 67,671 km of classified road network, covers the country relatively well.** The classified road network comprises 3,116 km of Trunk Roads, 3,701 km of Main Roads, 13,707 km of District Roads, 5,597 km of Urban Roads, 14,333 km of Primary Feeder Roads (PFRs), 14,484 km of Secondary Feeder Roads (SFRs) and Tertiary Feeder Roads (TFRs), 6,607 km of Park Roads, and 5,000 km of Community Roads. An additional 1,126 km of roads are not properly documented. This translates to a road density of 9.1 km per 100 km^2, which, by regional standards, would be categorized as the minimal network for good connectivity. The average total road density in Sub-Saharan Africa is 14.9 km per 100 km^2, and among eastern and southern African countries, classified road density is 28.4 in Kenya, 10.6 in Tanzania, and 10.0 in Zimbabwe[2].

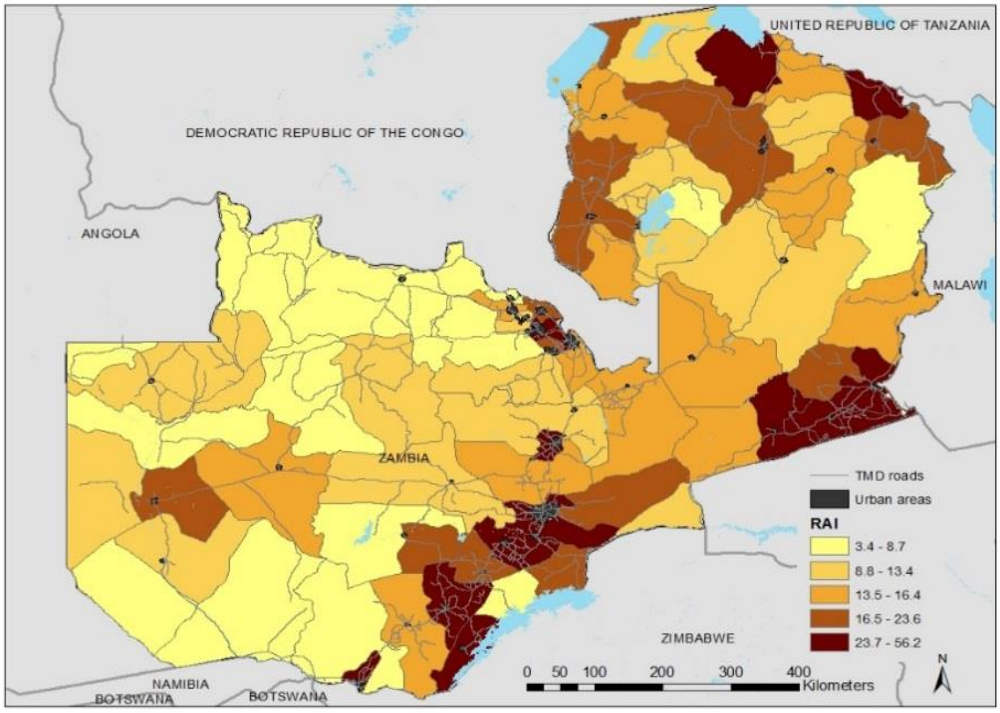
8. Between 1998 and 2013, the Government of the Republic of Zambia (GRZ) made substantial efforts to improve the primary road network under its first (1998 – 2007) and second (2004-2013) Road Sector Investment Programs (ROADSIP I & II), which in effect directed substantial road upkeep resources towards a set of roads referred to as the Core Road Network (CRN). The CRN is a network of roads that is considered critically important in the provision of sub-district accessibility on one hand, and national and international connectivity for the land locked economy, on the other. The combined length of all the Trunk Roads, Main Roads, District Roads, Urban Roads, and PFRs make up the 40,333 km of the CRN.

[2] Gwilliam, Ken. (2011). *Africa's Transport Infrastructure: Mainstreaming Maintenance and Management*.

9. **The country has achieved notable success in maintaining the Trunk, Main, and District (TMD) roads, a large proportion of which is generally in good and fair condition, but the feeder road network remains poor**. The proportion of TMDs in good or fair condition, based on the Road Development Agency's (RDA) 2015 road condition survey, stood at 75 percent. A total of 10,106 km TMDs and Urban Roads, or about 15 percent of the classified road network, are paved and generally well maintained. In 2014, about 88 percent of the paved roads were in good or fair condition. However, in the last few years, the road condition of the feeder road network has been poor and rapidly deteriorating. The proportion of the PFRs in poor condition rose from 76 percent in 2013 to 82 percent in 2015. Less than 50 km of the PFRs is paved, the rest is to earth and gravel wearing course standards.

10. The poor condition of the feeder roads has a negative influence on rural accessibility, which in turn affects agricultural development. In Zambia, RAI ranges from 3.4 to 56.2 percent (Figure 1), with a national average of 17 percent. There is a significant relationship between rural accessibility and agricultural productivity. Where rural access is low, agricultural production remains suboptimal, because farmers and agro-businesses lack good access to markets. Rural accessibility is also correlated to poverty in many parts of the country. Rural accessibility is one of the factors needed to enhance agricultural development and to thereby contribute towards eradication of poverty. These three factors (accessibility, agricultural potential, and poverty) have therefore been identified as important considerations in the prioritization of rural road connectivity interventions.

Figure 1. Zambia: Rural Access Index



Source: World Bank (2016)

11. **Government ministries and agencies have diverse roles in the management of the roads sector.** The RDA is, according to its establishing legislation[3], the custodian on behalf of the Government, of all public roads. The legislation also allows RDA to delegate its functions to other Road Authorities. In this regard, RDA has passed-on its responsibilities on SFRs, TFRs and Urban Roads to local authorities. The local authorities fall under the Ministry of Local Government (MLG). As such, RDA has no direct control over them. Furthermore, the local road authorities in general do not have the requisite technical capacity, and the funding for road development and maintenance from the National Road Fund Agency (NRFA) is low and irregular. RDA has also delegated Park Roads to the Department of National Parks and Wildlife (DNPW), Ministry of Tourism and Arts. The list of the classified road network as well as the institutions that are directly responsible for its management, are as shown in Table 1 below.

Table 1: Road Network Length and Classification in Zambia

Road Type	Responsible Agency	Length Km[1]	Of which, paved
Core Road Network (CRN)			
Trunk (T)	RDA	3,116	3,024
Main (M)	RDA	3,701	2,885
District (D)	RDA	13,707	2,111
Urban	RDA	5,597	2,055
Primary Feeder Roads PFR	RDA/LRAs	14,333	32
Sub-total		**40,454**	**10,106**
Non-CRN (Estimate)			
Secondary Feeder Roads (SFR)	MLG	10,060	
Tertiary Feeder Roads (TFR)	MLG	4,424	
Park Roads	DNPW	6,607	
Community Roads	MLG	5,000	
Not properly documented Roads	MLG	1,126	
Sub-total		27,217	
Total		**67,671**	**10,106**

Source: Road Development Agency, 2014

12. In addition to RDA, MLG, and the Ministry of Tourism and Arts, there are other institutions involved in the management of the roads sector. The Ministry of Transport and Communication (MTC) coordinates road transport policy, planning and development of road transport; Ministry of Housing and Infrastructure Development (MHID) oversees policy implementation in road infrastructure development; National Road Fund Agency (NRFA) administers road funds; Road Transport and Safety Agency (RTSA) is responsible for the implementation of government policy on road safety and traffic management; while the National Council for Construction (NCC) regulates the construction industry.

13. **Funding for road maintenance, particularly for the feeder road network, is irregular and inadequate.** Funding for road development, rehabilitation, and maintenance is channeled from different sources, through the NRFA to the respective agencies. The Government, through its annual budgetary appropriations, allocates funds to NRFA for road development and rehabilitation. Road maintenance is typically funded out of the road user charges managed by the NRFA. However, NRFA's establishing

[3] Zambia Public Roads Act, 2002

legislation does not restrict the use of road user charges to road maintenance only. NRFA therefore uses part of the road user charges to augment government funding. As shown in Table 3 below, the Government spent on average about US$430 million annually, or 2.2 percent of GDP, in the last five years (2011-2015), for road development and maintenance, 20 percent of which was financed out of the road user charges. More than half was spent for road development, construction, and rehabilitation. Furthermore, while this aspect of the expenditure was rising, the relative share of maintenance budget was on the decline.

Table 3: Government Road Revenue and Expenditure

	Road Funding (US$ mil)			Road Expenditure (US$ mil) [1]		Share (%)	
Year	GRZ Budget Allocation	Road User Revenues	Total	Road Const. & Dev. Rehab	Main-tenance	Road Const. & Dev. Rehab	Main-tenance
2011	289	73	363	99	226	30.5	69.5
2012	55	220	275	126	226	35.9	64.1
2013	471	154	625	379	266	58.8	41.2
2014	354	137	491	240	214	52.8	47.2
2015	356	38	394	213	157	57.6	42.4

[1] Expenditure can be more than actual annual receipts due to use of opening cash balances from prior years.

Source: Ministry of Finance; NRFA.

14. **The Government is currently implementing three notable initiatives in the roads sector**. First, to improve inter-urban and urban connectivity and accessibility, the GRZ embarked on the 2012 Road Sector Development Framework, which introduced a number of programs including Link Zambia 8000 (US$5.9 billion program between 2012 and 2020), Pave Zambia 2000 (US$1.6 billion program between 2012 and 2015), and Lusaka 400 (US$340 million over four years from 2012). The framework focuses primarily on the rehabilitation and upgrading to bitumen standards of selected TMDs and Urban Roads and will cost GRZ an estimated US$7.8 billion between 2012 and 2020.

15. Second, GRZ has developed a ten-year (2015 – 2024) National Road Maintenance Strategy which aims to reduce road maintenance backlog and to improve the general condition of the CRN. The maintenance strategy encompasses all aspects of road maintenance i.e., road rehabilitation, periodic and routine maintenance. The estimated cost of implementing the entire strategy over the ten years is US$1.5 billion.

16. Third, GRZ has taken the decision to apply lessons learned and to adopt a relatively novel approach towards road improvement – the Output and Performance-based Road Contracting (OPRC), which aims to underpin sustainability in road maintenance. Specifically, the Government's strategy is to reduce gradually the proportion of PFR in poor condition from the current 82 percent down to below 30 percent over ten years. In principle, the approach obligates the Government to pay not for the quantity of work performed by a contractor, but rather for a road system that meets pre-agreed service level standards, over a contract duration that includes road maintenance. The approach is known to promote

innovation and reduction of costs. Zambia has already implemented two phases of OPRC for feeder roads in the past, with notable success, especially in the most recent World Bank (WB) supported ADSP. Based on RDA plans, the OPRC Roll-out program will improve about 9,372 km of feeder roads mainly to gravel wearing course standards at an estimated cost of US$357 million over ten years.

17. **There is a need for institutional capacity strengthening especially focusing on improving the management of roads.** The road sector reforms of the mid 1990s did reposition the operational responsibilities of road management from direct civil service into the three corporatized entities. RDA was created to manage the road network, NRFA to manage road financing, and RTSA to manage road safety. The positive impacts of the reforms, viewed in terms of post-reform condition of the Zambian road network are apparent in general terms. However, the intended efficiency gains have not been fully realized, mainly due to governance concerns, which in turn have tended to inhibit institutional advancements.

18. **The institutional support would focus on the road sector stakeholder ministries and agencies.** Improving operational effectiveness of RDA is considered critical, and this has to be coupled to corresponding interventions in two other direct stakeholders – the MHID and NRFA. There is a need to strengthen MLG and its Local Road Authorities' (LRAs) capacity to manage rural roads. RTSA's role as the lead road safety agency requires strengthening and the potential for the NCC to positively influence the construction industry requires enhancing.

C. Higher Level Objectives to which the Project Contributes

19. The project complements the objectives of the FY2013-FY2016 Country Partnership Strategy (CPS) for Zambia (Report No. 95986-ZM). The CPS, approved by the World Bank Board of Directors on March 14, 2013, has been updated through the Performance and Learning Review (PLR) of July 30, 2015[4]. It aims to support the Government's development priorities as reflected in the revised Sixth National Development Plan and Vision 2030. One of the two CPS pillars addresses reduction of poverty and vulnerability of the poor, while the other focuses on improving competitiveness and providing infrastructure for growth and employment. The project will contribute towards the achievement of both pillars.

20. The choice of interventions under the proposed operation primarily stems from GRZ's deliberate effort to develop agriculture, the most prominent economic activity in rural Zambia, and its relevance for the rural poor. Indeed a recent study[5] has assessed the relation between access to markets and cultivated land in Sub-Saharan Africa and concluded that a modest but significant positive association exists between increased market accessibility and local cropland expansion. The effects of reduced transport costs on agricultural prices—both input and output prices—which in themselves are a main channel to benefiting farmers, is a primary contributor towards reducing poverty. Additionally, non-road infrastructure in support of community needs such as storage facilities, processing space, and market stalls, is expected to improve rural development opportunities. The combination of improved connectivity and the proposed community amenities is expected to spur parallel developments including new rural businesses, which

[4] The PLR was presented to the Board of Directors on August 26, 2015.
[5] Roads and Rural Development in Sub-Saharan Africa, Claudia N. Berg, Brian Blankespoor, and Harris Selod, World Bank Policy Research Working Paper 7729, June 2016.

can in turn create new jobs in the local communities. Improved accessibility is also expected to contribute towards development of tourism and manufacturing, the other two economic sectors targeted in the diversification agenda.

21. The CPS has also been realigned to address World Bank's twin goals: to end extreme poverty and to promote shared prosperity. Achieving the aspirations of the twin goals in Zambia was a compelling consideration in the choice of the project and its prioritized coverage. Provision of the missing links between rural communities and higher order road network, and the policy dialogue to improve funding for the rural roads are expected to be transformational. Furthermore, the operation targets the rural poor as primary beneficiaries, which is a contribution toward promotion of the shared growth objective.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

22. The objectives of the Project are to: (i) improve the Recipient's rural road accessibility for communities in selected areas; (ii) strengthen institutional capacity for sustainable management of rural roads; and (iii) respond promptly and effectively to an Eligible Crisis or Emergency.

B. Project Beneficiaries

23. **The primary beneficiaries of the Project are road users, estimated at over 460,000, whose travel time and transport cost will be reduced as a result of infrastructure improvements.** Currently, much of the PFR network is poorly maintained and connectivity is hampered by unreliability of transport services, slow vehicle operating speeds, high vehicle maintenance costs, poor road safety, and reduced travel comfort. More specifically, the beneficiaries will be rural farmers who will have improved access to inputs and markets. The rural communities in general will have better access to health, education and other services. Employment in road construction activities, especially during the maintenance part of the OPRC contracts and the expected rural development also have the potential to generate new opportunities for the rural communities. Transport service providers whose vehicle operating cost will be reduced and travel speeds increases will also benefit. In the event that the Crisis Emergency Response Component (CERC) is triggered, the project beneficiaries would include communities benefiting from the related interventions.

24. **Other direct beneficiaries are GRZ's road sector institutions, and the construction industry.** The institutional capacity strengthening initiatives supported by the project will enhance institutional performance and sustainability within the participating ministries and agencies. The ministry responsible for roads (MHID) will be enabled to monitor and assess the performance of the road agency. The ministry responsible for road transport policy (MTC) will operationalize the newly drafted transport policy, which also emphasizes the importance of rural accessibility. MLG and its LRAs will have their capacity to manage rural roads improved. NRFA's road management ability will be improved. RDA will develop a strategy for maintenance of rural roads. NCC will implement its employment creation policy and RTSA will deepen its involvement in road safety on rural roads. The use of output and performance based approach in road contracting will provide the local construction industry with an opportunity to improve their service

delivery skills and competitiveness. The approach will promote innovations and provide ample time (the OPRC contracts will last five years) for them to develop their business.

C. PDO-Level Results Indicators

25. Achievement of the project objectives will be monitored through the proposed PDO-level results indicators, with details in Section VII:

(a) Share of rural population with access to an all-season road (Rural Access Index) (%);
(b) Number of rural people with access to an all-season road (number);
(c) Increased proportion of PFRs (national) in the country in good and fair condition (%);
(d) Improved institutional oversight capacity in the roads sector, assessed by the development and application of an RDA performance framework (yes/no);
(e) Employment created through the implementation of NCC's labor-based policy (number); and
(f) Number of beneficiaries benefiting from emergency response and recovery activities, if the CERC is triggered.

III. PROJECT DESCRIPTION

26. **The project will support improvement of selected Primary Feeder Roads and also contribute towards Government's efforts to address institutional capacity challenges within the roads sector.** The operation is linked to Government's ten-year OPRC Roll-out program. The national program aims to improve about 9,370 km of roads at an estimated cost of US$360 million over ten years. At the end of ten years, each of Zambia's ten provinces would have benefitted from the national program by having approximately 900 km of selected feeder roads improved and maintained. The World Bank supported US$200 million operation would form part of this ten-year program, resulting in the improvement of about 4,300 km of feeder roads, but its implementation would be completely independent of the GRZ funded program[6].

27. **For optimal impact, it is necessary to sequence province participation in the OPRC Roll-out program.** All the ten provinces of Zambia were subjected to a ranking process that weighted and combined their poverty headcount, agricultural production, potential for agribusiness, and rural accessibility - poverty headcount having the highest weighting and rural accessibility the lowest. The result of the ranking was as follows: First ranked - Central Province; Second - Eastern Province; Third - Northern Province; Fourth - Luapula Province; Fifth - Western Province; Sixth - Southern Province; Seventh - North-Western Province; Eighth - Muchinga Province; Ninth - Copperbelt Province; and Tenth ranked - Lusaka Province. Based on this, the national OPRC Roll-out program will be as shown in Table 4 below.

[6] For planning purposes, the national OPRC Roll-out program, starts in calendar year 2017, but GRZ funded part could be delayed due to budgetary procedures. It is expected that GRZ's funding for the program would commence in 2018 and implemented at a pace to be determined by resource availability. The World Bank support has been designed to fit into the national program with regard to the selection of provinces, selection of components, involvement of the various stakeholders, and packaging of works contracts. It is however completely delinked from GRZ's planned operations.

Table 4: RDA's National OPRC Roll-out Program Concept

			GRZ (and other) Funding				Bank Support under the Project				Total program		
		Yr.	Prov. Ranked No.	Km* OPRC	No. Packs	US$ m	Prov. Rank.	Km* OPRC	No. Packs	US $ m	Km*	No. Packs	US$ m
The 10-Year OPRC Roll Out Program	Bank Support Phase	1		0	0	0	1 & 2	1,820	6	69	1820	6	61
		2	5	562	2	21	3 & 4	1,124	4	54	1686	6	69
		3	7	562	2	22	6 & 8	1,370	5	57	1932	7	73
		4	9	562	2	22					562	2	22
		5	10	562	2	22					562	2	22
		6	1 & 2	562	2	22					562	2	22
		7	3 & 4	562	2	22					562	2	22
		8	5 & 6	562	2	22					562	2	22
		9	7 & 8	562	2	22					562	2	22
		10	9&10	562	2	22					562	2	22
			Totals	**5,058**	**18**	**197**		**4,314**	**15**	**180**	**9,37**	**33**	**357**
Km* - Length is made up of both gravel and bitumen surfaced roads and maintenance only roads													
US$180m Cost includes community infrastructure and climate resilience interventions**													

28. **Government's commitment towards improvement of rural connectivity is a cardinal aspect of the entire project, especially from a sustainability viewpoint.** In this regard, the World Bank and GRZ would like to ensure that this collaboration will indeed lead to proper institutionalization of GRZ's ten-year OPRC Roll-out Program. While government contribution towards this program will be outside of the scope of the World Bank supported project, it will be considered a tangible demonstration of GRZ's commitment to its objectives. For this reason, a disbursement condition is proposed. Prior to signing of the OPRC contracts for Works for the last two World Bank supported provinces, and prior to disbursements from the credit funds for the same, the condition that at least one of GRZ's funded OPRC contracts is awarded must be satisfied. The estimated date by when GRZ would have awarded at least one OPRC contract in one of its supported provinces is June 30, 2021. The Government funded contracts in provinces with rural roads previously supported by the World Bank, will include such roads for the purpose of their maintenance.

A. Project Components

29. ***Component 1: Improvement of Feeder Roads (US$180 million).*** The component will support the upgrading, rehabilitation and maintenance of priority feeder road infrastructure in six top ranked provinces i.e. Central, Eastern, Northern, Luapula, Southern and Muchinga Provinces. It will finance about 4,300 km of feeder roads comprising mainly of roads improved to gravel wearing course standards. The Project would also finance road improvement to low cost seal standards where a ten-year projected vehicular traffic would be in excess of 50 to 100 vehicles per day (VPD).

30. For bidding and implementation purposes, each participating province will have two to three OPRC packages; the actual number of packages depending on the total length of candidate roads in each province. A typical package would comprise about 287 km of roads at an estimated average cost of US$12 million. Preliminary indications are that, on account of low vehicular traffic volumes, a few (less than 5 percent) of the feeder roads would require sealing to bitumen standards. A package will therefore include:

(i) a list of roads (forming the bulk of the component) to be rehabilitated to gravel wearing course standards; (ii) roads (albeit few) for upgrading to paved bituminous wearing course standards; (iii) roads to be maintained only; and (iv) a set of community infrastructure in support of agriculture and related activities along some of the roads[7]. The size and cost of the packages comprising (about 287 km at a cost of about US$12 million) would facilitate participation of medium sized firms and thus improve competition. Also to be included in this component are climate resilience adaptation measures identified through the ongoing studies.

31. Priority roads in prioritized districts will be selected based on a multi criteria analysis i.e. considering demography, agricultural potential, social benefits, network connectivity, and cost effectiveness of the investment. While agricultural and social benefits are no doubt important in the rural context, investment efficiency is also important for sustainability purposes. Therefore, high priority is given where agricultural potential exists and social facilities are located, and at the same time, selected roads have to be connected to the major network and many people would benefit from these roads. RDA, with the assistance of its consultants will fine tune the results of the selection process. The provisional list of beneficiary districts in the six provinces, as well as the provisional length of roads in those districts are shown in Table 4. Other guiding principles for road selection are that project roads should not be far spaced, should form a network where possible, and may extend beyond district boundaries.

Table 5: Prioritization of Provinces and Districts

Bank Supported Provinces	Target District
Central	Mkushi, Chibombo
Eastern	Nyimba, Petauke, Sinda, Chadiza, Vubwi, Lundazi, Chipata, Katete
Northern	Mbala, Mungwi, Luwingu,
Luapula	Kawambwa, Samfya, Milenge, Nchelenge, Chiengi, Mwense, Mansa
Southern	Kalomo, Choma, Mazabuka
Muchinga	Chinsali, Shiwangadu, Mpika, Mafinga, Nakonde, Chama

32. In general, OPRC bids will be advertised, awarded and implemented in provincial lots, staggered over three years. Each lot will typically comprise all the packages in a province. Exceptions will be made where packages have a complex mix of packages, e.g. maintenance only packages could be advertised, awarded, and implemented separately to reduce contractual logistics. In the first year, two lots (one lot per province comprising a minimum of two and a maximum of three packages) from the two top ranked provinces i.e. Central and Eastern Provinces, would be awarded. In the second and third years, the next two pairs of lots would be let out in the same manner. Lessons learned from each procurement round will be incorporated into subsequent bidding process. Each contract will last five years, the first two years being dedicated towards road improvement or rehabilitation following which the contractors will be required to maintain the roads to pre-agreed service levels, over the remaining duration of three years. For the purpose of ensuring that road handover conditions are met, an additional year will be necessary at the end of the last two lots, thus making the life of the entire project eight years, noting that OPRC

[7] The unit costs used for planning purposes are: US$40,000 per km of rehabilitated gravel road, US$2,000 per km per year for maintenance of gravel roads, US$486,000 per km of a bitumen sealed road, and US$1,500 per km per year for maintenance of bitumen-sealed roads.

contracts would only commence in FY18 (2017/2018)[8]. The summarized project implementation plan in Annex 3 provides an overview of the timing of the various project activities.

33. The roads requiring maintenance only will be attended to starting from the first year of the OPRC contracts. Such roads will be identified as part of improving overall connectivity. The social infrastructure in support of agriculture and related community level needs, such as storage facilities, processing space, and market stalls will be constructed as part of the OPRC civil work contracts. The identification of such facilities will be led and coordinated by the local authorities. Conceptual designs will be carried out by RDA's consultants, whose teams will include social experts that will ensure that community involvement mechanisms are in place, even after the project has been completed.

34. *Labor influx:* Implementation of the OPRC contracts will require contractors to mobilize skilled and unskilled labor to project sites and to establish labor and resource supply camps, especially in the first two years of the contracts, thus resulting in labor influx into beneficiary communities. The project recognizes the potential negative social impacts associated with labor influx and mitigation measures are spelled out in the contract documents. In addition, contractors will be advised to recruit local communities to carry out some of the road maintenance activities. Management of labor influx related risks is further discussed under Section E (Social Safeguards).

Component 2: Institutional Strengthening in the Roads Sector (US$20 million).

35. Table 6 below summarizes Component 2 activities and costs. Additional detail is provided in Annex 1, Table 1.6 - Summary of Component 2 costs.

Table 6: Summary of Component 2 Activities and Cost

Component 2 Subcomponents	Activities	Responsibility	Est. Cost (US$ '000)
(i) 2.1 Project Coordination and Implementation Support	**GOODS & SERVICES**		
	Overall coordination	MHID	400
	Coordination of LRAs	MLG	300
	Implementation support	All	13,600
		Subtotal	***14,300***
(ii) 2.2 Strategic Institutional Capacity Enhancements	**SERVICES**		
	Agency Perf. Framework, M&E, & employ. policy	MHID	450
	Transport policy & Institutional mandate	MTC	900
	Rural roads maintenance strategy & RMS	RDA	500
	Road sector institutional mandates & PER	NRFA	450
	Road safety audits, awareness, and strategy	RTSA	300
	Implementation of labor based policy	NCC	500
	WORKS, GOODS & SERVICES		
	Equipment for Monitoring and Evaluation	MHID	100
	Equipment for MLG and LRAs	MLG	1,700
	Construction of NCC laboratory	NCC	300
	HR CAPACITY BUILDING		
	Training, workshops, etc.	All	500
		Subtotal	***5,700***

36. ***Sub-component 2.1: Coordination and Implementation Support: (US$14.3 million):*** The subcomponent will reinforce the project coordination function, and support project implementation roles of the entities concerned. The coordination support will enable the ministry responsible for road infrastructure (MHID in this instance) to proactively and effectively coordinate and manage the project implementation in its entirety, ensuring performance of all participating agencies, adherence to the project implementation schedule, monitoring and evaluation, management of the utilization of the pooled human resource development budget, and quality assurance on all outputs. The costs will include establishment and running of a project coordination office. The Government will provide office space and other incidental costs for the project coordination office. Similarly, the MLG will be supported to effectively coordinate the activities of the LRAs as part of the sub-component.

37. *Implementation support* will provide for engineering services, safeguard studies, resettlement actions (excluding land acquisition), other non-strategic technical studies and outputs, and incremental cost of project supervision activities. Engineering services will include: preparation of feasibility studies, engineering designs, bidding documents, road safety audits, road safety awareness creation, and supervision of civil works. Other technical non-strategic studies will include: technical audits, financial audits, procurement audits, and preparation of safeguard documents. Implementation support will also cover incremental costs of supervising the project, including equipment (vehicles, office furniture, computers and software) and operating costs for the entities. Resources will be set aside under the Sub-component for NCC's operational cost of providing oversight on compliance with regards to safeguards.

38. ***Sub-component 2.2: Strategic Institutional Capacity Enhancements (US$5.7 million)*** This Sub-component will include technical services, physical works, goods and materials for the purpose of institutional strategic capacity enhancements within the sector, and human resources development. Strategic institutional capacity enhancements will aim to deliver outputs that are directly linked to the project development objective i.e. outputs that will, in the medium to long term, improve the institutional capacity within the roads sector.

39. **MHID** will develop an Agency Performance Framework to enable the ministry to enter into performance agreements with the RDA. The ministry will also be supported to develop an M&E system to enable it to monitor the performance of its road sector institutions, and guide policy development. The ministry will also manage the adoption by GRZ, of NCC's labor-based employment creation policy. **MTC** will implement the new transport policy. The support will be in the form of a Technical Assistance located within the ministry, over a minimum period of two years. In addition, the ministry will manage the production of a study to review the road sector institutional mandates in terms of road funding, with the objective of improving their efficiency and effectiveness. **MLG** will be assisted to build internal capacity at the head office and within the LRAs. The ministry will recruit technical personnel and procure vehicles to improve its capacity at the head office. It will also procure vehicles mobile laboratory equipment to enhance capacity for quality control at LRA level. In consultation with MTC, especially in view of the new transport policy, MLG will also review areas of possible policy enhancements in support of rural transport services. The objective of the study will be to create an environment for the private sector to provide better rural transport services, if deemed necessary.

40. **NRFA** will upgrade its financial reporting system, including a review of the possibility of linking its Sun System to the Government's Integrated Financial Management Information System (IFMIS), to enable

it better capture and provide strategic information on road funding. In addition, NRFA will manage a study on the Public Expenditure Review (PER) for the roads sector. **RDA** will develop and implement a Rural Roads Maintenance Strategy to augment the national road maintenance strategy. It will work in close collaboration with MLG and LRA's. The study will cover the strategic areas necessary for efficient road asset management including the use of appropriate technology and employment creation. RDA will also upgrade its current road management system.

41. For **NCC,** the project will support the institutionalization of the policy on labor based technology, training, and employment creation. It will support the construction of a materials testing laboratory, which it will design in-house, as part of NCC's Business Plan. This support will enable NCC realize the full benefits of the previous Bank support, which had assisted in the acquisition of laboratory equipment. **RTSA** will be supported to enable it enhance road safety within the project areas but also for improved road safety in the rural Zambia generally. For the project areas, RTSA will carry out a safety audit of selected roads in each province to determine vulnerabilities that could be introduced by the new road improvements. RTSA will also audit all OPRC conceptual designs and assess their compliance with the safety requirements. It will also perform awareness creation campaigns and provide post-construction audit services along the roads. For general road safety in rural Zambia, the project will provide support for a review of the agency's strategy on rural road safety.

42. Human resources development will entail efforts to close the technical skill gaps through training of technical staff in specified areas. These areas were identified as: project management, contract management, Private Public Partnership initiatives; M&E; management of social and environmental safeguards; procurement; appropriate technology; road safety; and climate resilience in the roads sector. The costs will be in the form of training, seminars, conferences, and workshops. NRFA will make available the funding for human resources development and monitor utilization by the beneficiaries.

43. Support towards development of human resources will be through a pooled budget, the use of which will be managed and coordinated by the ministry responsible for roads, in consultation with the sector stakeholders. MHID will coordinate consultations to establish the human development priorities. Persons receiving such support will be expected to submit reports to their direct employers and provide copies to MHID and NRFA for monitoring and reporting purposes. All entities in the sector i.e. MHID, MTC, MLG, NRFA, RDA, RTSA, and NCC, will benefit from the human resources development sub-component.

44. **Component 3: Contingent Emergency Response Component (CERC) (Bank financing: US$0 million)** The contingent emergency response component is included under the project in accordance with OP10.00, paragraphs 12 and 13, for situations of urgent need of assistance within the roads sector. It will allow for rapid reallocation of project proceeds in the event of a natural or man-made disaster or crisis that has caused or is likely to imminently cause a major adverse economic and/or social impact.

45. To trigger this component, the Government needs to declare an emergency or provide a statement of fact justifying the request for the activation of the use of emergency funding. To allocate funds to this component the Government may request the World Bank to re-allocate project funds to support response and reconstruction. If the World Bank agrees with the determination of the disaster, and associated response needs, this component would draw resources from the unallocated expenditure category and/or allow the Government to request the World Bank to re-categorize and reallocate financing from other project components to cover emergency response and recovery costs. This

component could also be used to channel additional funds should they become available as a result of an emergency.

46. The coordination authority and implementation responsibility for the CERC will rest with RDA. With the World Bank's technical advice, RDA will prepare a CERC Annex to the Project Operations Manual (POM). This CERC Annex will lay out the general provisions for activating and implementing the CERC. It will detail the financial management, procurement, safeguards and any other necessary implementation arrangements. Disbursements would be made against a list of goods, works, and services required to support the immediate response and recovery needs.

B. Project Cost and Financing

Table 7: Project Budget

Project Components	Project cost	IBRD or IDA Financing	Trust Funds	Counterpart Funding
Component 1: Improvement of Feeder Roads	**180.0**	**180.0**		
Component 2: Institutional Strengthening	**20.0**	**20.0**		
Sub-Component 2.1 Coordination and Implementation Support	14.3	14.3		
Sub-Component 2.2 Strategic Capacity Enhancement	5.7	5.7		
Component 3: Contingency Emergency Response	**0.0**	**0.0**		
Total Costs	200.0	**200.0**		0
Total Project Cost mms	200.0	200.0		0
Front End Fees[9]	0.5	0.5		0
Total Financing Required	200.0	200.0		0

C. Lessons Learned and Reflected in the Project Design

47. **The World Bank has had a long and successful collaboration with Zambia in the transport sector, but special attention is still required to underpin reforms.** Most recently the World Bank financed an Adaptable Program Lending (APL) through two phases of the Road Rehabilitation and Maintenance Project (RRMP), P071985 and P106596, over the period 2004 to 2016. The APL focused on the rehabilitation of the trunk road network, and overall, the progress was good. However, the last

[9] The Front End Fees will be funded out of the US$ 200 million Credit

Implementation Completion Report (ICR) rated institutional performance as Moderately Unsatisfactory. The main reason was policy level and operational weakness. Furthermore, it has been noted that road investments processes are inadequate often resulting in over commitments. For this reason, the project will provide targeted institutional capacity enhancements, as well as the review of some of the policy reform aspects, including road funding and agency performance.

48. **With a multiplicity of stakeholders, coordination is crucial.** Under RRMP I and II, the coordination role was left to the MTC but the project did not make provision for capacity enhancement for this function. The result was poor follow-ups and long implementation delays. The project does not intend to support the creation of one Project Implementation Unit as each beneficiary ministry and agency will be required to perform and be fully responsible for its assigned activities. However, without one coordinating body, implementation and monitoring would present a special challenge. The project therefore makes provision for institutional capacity strengthening to enable MHID to perform this function. Furthermore, this support is required as the ministry gets established.

49. **Project design needs to be more realistic especially with regard to strategic objectives**. Development and adoption of institutional reforms requires the support of stakeholders, some from outside of the institution or sector concerned. In the case of the roads sector other policy level stakeholders would include government entities responsible for finance and legislative affairs. This presents a special challenge in terms of getting the buy-in of all stakeholders. Often, the policy adoption process experiences inordinate delays. The solutions considered and reflected in the design of the project include choice of less contentious and easily implementable institutional strategies. For instance, the studies to formulate road agency performance framework, to review NRFA's institutional mandate, or to address financing of rural roads, are intended to minimize the rural accessibility challenge in the medium to long term. They resonate well with the institutions concerned.

50. **The World Bank and the implementing agencies are to give special attention to M&E.** A robust but clear M&E framework that is well aligned with the PDO will help to monitor and measure the outcomes and outputs of the project. The previous operations supported the MTC with a sector wide M&E system that could be used to also monitor the projects. However, the system took long to develop and commission and thus did not benefit the project. After the relocation of road infrastructure to the MHID, the new ministry will be responsible for M&E. A simple data collection method will be used initially and efforts made to activate the sector wide system. Additional institutional capacity building work to enhance MHID's ability to effectively monitor the project, including staff training, will be carried out.

51. **In the selection of OPRC roads, their contiguity is critical.** During the implementation of ADSP, it was observed, that contractors whose roads were far apart had logistical difficulties especially during the maintenance phase. Furthermore, single corridor roads had limited impact to the communities primarily due to limited road user catchment areas, and the missing linkages to the rest of the network due to poorly maintained adjoin roads. For this reason, while districts have been prioritized, the roads in these districts will be assessed for contiguity and connectivity. In addition, existing roads that are in poor state of maintenance, and which would reduce the effectiveness of the new roads, will also be included as part of maintenance aspect of the OPRC packages.

52. **OPRC contracts tend to attract medium sized firms, depending on the package sizes.** Large construction firms prefer once-off contracts i.e. the classical road construction or rehabilitation contracts

which do not include road maintenance. The small scale firms, although prepared to carry out maintenance, are often ill-equipped for the upfront construction and rehabilitation work. They also lack the needed engineering capacity for OPRC contracts. Absence of these two categories of firms leaves a limited choice of medium sized contractors which can limit competition. To overcome the challenge, the project has been designed so that the package sizes, in terms of cost and road length, are convenient for the medium sized firms in Zambia. The appropriateness of this approach has also been confirmed by RDA following the outcome of a study on the local construction industry. Furthermore, to avoid chocking the market and the possibility of cartels, the lots will be spread out over three years. Lessons learned in the initial rounds of bidding will be used to improve subsequent rounds. Further support will be provided to the contractors through a series of pre-bid workshops, where technical and procedural details would be explained. Through these workshops, engineering firms and financial institutions would be alerted of the potential areas of collaboration between them and the contractors.

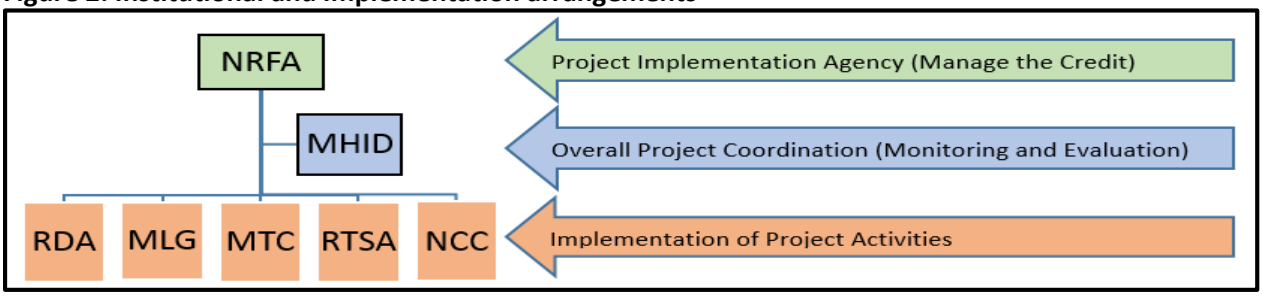
IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

53. The roles and responsibilities of the various institutions have been defined. The credit will be to GRZ, through the Ministry of Finance, which will, by a subsidiary agreement, pass it on to the NRFA. The NRFA will manage the credit on behalf of GRZ and in this regard it will account for the deposits and withdrawals and perform the audits and provide financial reports in accordance with the World Bank rules and guidelines. NRFA will monitor the utilization of the project resources by each beneficiary including itself and provide expenditure projections. It will provide progress reports, including the Mid-Term Review Report, and the ICR. It will also coordinate procurement function, and prepare and revise Procurement Plans. For the purpose of the credit agreement, it will be the Implementing Agency It will liaise closely with all the other ministries to provide procurement guidance where necessary and to ensure adherence to the procurement guidelines. A project agreement between NRFA and IDA will capture these obligations and responsibilities.

54. Figure 2 below presents the overall institutional and implementation arrangements. The institutional relationships and coordination for the delivery of the actual project outputs is provided in Annex 2, Figure 2.

Figure 2: Institutional and Implementation arrangements



55. The NRFA will manage the credit on behalf of GRZ. It is a corporate body established under the National Road Act No. 13 of 2002. Its core function is to manage and administer the road fund in Zambia. NRFA has significant experience in managing Bank funded projects, having successfully managed the IDA credits for the Road Rehabilitation and Maintenance Projects (P071985, and P106596). Project component activities will be performed by the respective government ministries and agencies under the primary coordination of the MHID. The MHID was created in September 2016, with roads (previously under the Ministry of Works and Supply) becoming part of its "Infrastructure" functions. A decision was taken to hub project coordination in this ministry, being the government policy body on road infrastructure, provided that the necessary institutional capacity support was availed through the project. Its role will include monitoring of the performance of all actors, enforcing the adherence to the project implementation schedule, performing project M&E function, administering the utilization of the pooled human resource development budget, and quality assurance on Component 2 outputs. The ministry officials responsible for roads would typically be transferred from the former Ministry of Works and Supply, but it is recognized that the new ministry could face initial organizational challenges. For this reason, the ministry will be required and supported to create a project coordination office. The MHID has already formed the office and assigned individuals to perform the project coordinator function.

56. RDA will lead Component 1 (Improvement of feeder roads) activities through a dedicated Project Management Unit (PMU). It will take full responsibility for the preparation of the component, procurement of services related to the component, implementation, quality control, road contracts cost, reporting and timely completion of the component activities. According to the Public Roads Act No. 12 of 2002, RDA is the legal custodial of all classified roads in Zambia. It will therefore take the overall responsibility for planning, design, procurement, contract management, construction and maintenance, monitoring and quality assurance, and day to day management of civil works contracts. To strengthen their capacity, private sector consulting firms will be assigned engineering and other specialized roles such as feasibility studies, technical designs and supervision of road contracts. The legislation also empowers RDA to delegate some road functions to the LRAs. For the purpose of implementing the project and also as part of developing their internal capacities, RDA will involve LRAs in the planning and project implementation process.

57. MLG will coordinate the work of the LRAs where the project is active and also perform Component 2 functions. Several LRAs (to be determined by the number of participating districts) will be actively involved in the project implementation. The LRAs will keep themselves and MLG well informed of the road improvement and maintenance works in their districts, will attend site meetings and have full access to the contract documents. LRAs will prepare separate reports to MLG on the progress of the work in their districts and also certify the adherence of the contractor to the agreed road service levels. MLG will also manage the implementation of strategic institutional strengthening activities under Component 2. In this regard, they will be responsible for the procurement of equipment and materials for the participating LRA's as well as in building the capacity of the ministry to manage rural roads.

58. MTC will manage the adoption and implementation of the recently formulated transport sector policy. RTSA will enhance road safety aspects within the project areas and endeavor to improve road safety in rural Zambia in general. For the project areas, RTSA will carry out a safety audit of selected roads in each province. It will also audit all OPRC conceptual designs and assess their compliance with the safety requirements. Furthermore, RTSA will perform awareness creation campaigns and provide post-

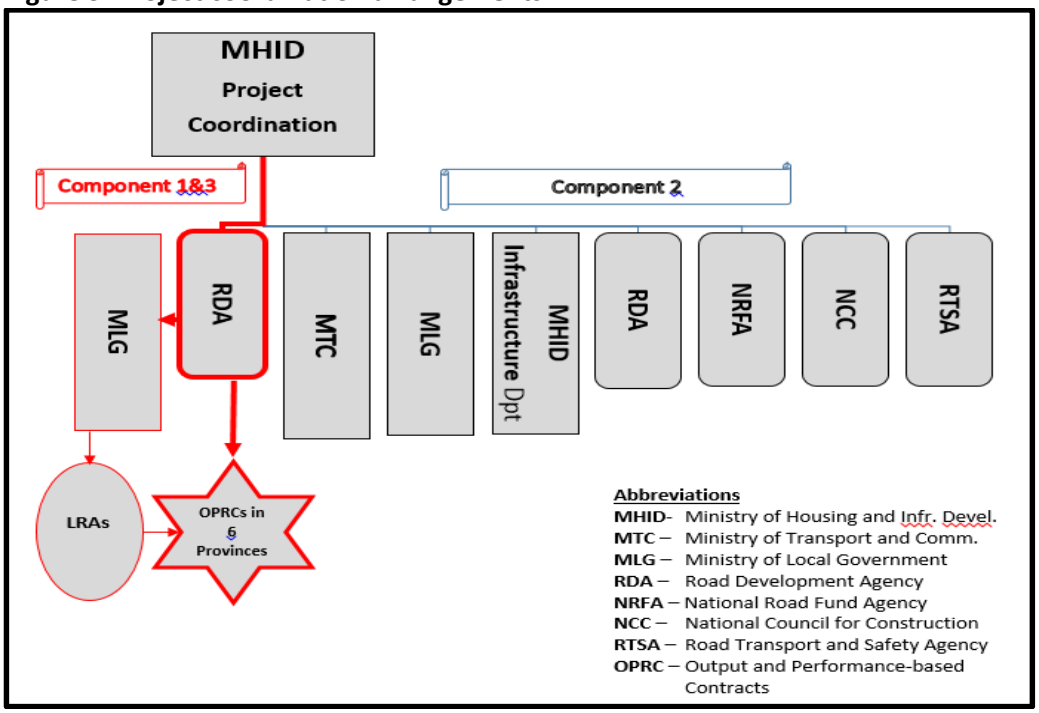
construction audit services along the roads. For general road safety in rural Zambia, the project will provide support for a review of the agency's strategy on rural road safety.

59. The NCC will manage activities leading to better institutionalization of government employment creation through implementation of the labor-based policy. It will also oversee activities leading to the improvement of the NCC's training school. NCC will also perform a special function of overseeing the implementation of social and environmental safeguards, including contractor's adherence to the conditions of contract with regard to social and environmental compliance. In particular, NCC will review the process used by RDA's contractors to manage any potential risks of adverse impacts due to temporary project induced labor influx.

60. To further strengthen the institutional structures for the purpose of project implementation, a Project Implementation Memorandum of Understanding (PIMU) will be prepared and signed by all the key stakeholders before project effectiveness. The PIMU will spell out the roles and responsibilities of each beneficiary and it will be used by GRZ and the World Bank as a tool to assess and manage this collaboration among the stakeholders. MHID will administer the PIMU as part of its coordination function.

61. Clarity on the coordination and implementation roles is critical. With this multiplicity of stakeholders, it will be important to ensure that their individual contributions are continuously coordinated and monitored. This will be particularly so in terms of delivering the project outputs. In a hierarchical public sector set-up like Zambia's, effective coordination is deemed a ministerial function and for this reason, the ministry responsible for road infrastructure, the MHID, would perform overall coordination. Figure 3 below summarizes the coordination set up.

Figure 3: Project coordination arrangements



B. Results Monitoring and Evaluation

62. The responsibility for monitoring and evaluation of the achievement of the project development objectives will primarily rest with the MHID. The MHID will collect the required data from the implementing agencies and prepare a comprehensive report to the World Bank reflecting methods used to collect data, its credibility, and status on each of the indicators identified in the project's Results Framework and Monitoring. At the implementing agency level, RDA Project Management Unit will provide data for Component 1 activities. MLG and the LRA will also provide information specific to the districts.

63. *Development objective indicators.* A series of indicators are used to gauge the achievement of the project development objectives relating to both the physical and institutional aspects. These include monitoring connectivity in terms of: Increased accessibility index within the target areas; Improved mobility measured by traffic growth; Improved transportation efficiency measured in terms of road condition; and Development and use of an agency performance framework in the ministry responsible for roads. Baselines for these four indicators are readily available. Accessibility index data for Zambia is available, traffic volumes form part of ongoing feasibility studies, road condition is available from RDA reports and an agency framework does not exist. Progress on each of these four indicators would be relatively easy to monitor through the life of the project.

64. *Intermediate results indicators.* Progress on the selected intermediate results indicators is relatively easy to track over the life of the project. Except for the proportion of PFRs in good and fair condition, which is well known from existing RDA road condition surveys, baselines for the other five indicators will be "zero" quantities or "no" work done yet.

65. *Gender and citizen engagement indicators* – The following indicators have been selected to monitor development in the area of gender and citizenship engagement: Direct project beneficiaries, disaggregated into gender; Proportion of women employed in the road maintenance aspects of the road contracts; RDA develops and implements a citizen engagement tool that includes social and environmental safeguards in general, and labor influx in particular, as areas of citizen consultations; and Proportion of complains addressed and resolved under the Grievance Redress Mechanism (GRM).

66. *Third Party Monitoring* – The project would have provisions to ensure that third party monitoring of works through 'social audit' by engaging citizens. Active groups would be identified from the community, who would be trained on major quality issues which need to be observed during construction. They would report any issues to the contractor first and if not resolved, then to the project implementation unit.

67. *Road Satisfaction Surveys* – within the first six months of project effectiveness, a consultant would be engaged to measure road user satisfaction along the roads being improved under the project. This would involve identifying indicators to assess the satisfaction of users, conduction the base line surveys and end of project surveys.

68. *Impact assessment.* As part of lessons learned and the effort to strengthen the Government's capacity of monitoring and evaluation, a rigorous evaluation of the socio-economic impact of the project will be carried out at the end of the project, as part of Government's project completion report, to draw

evidence in the Zambian context. The results are intended to be used not only as an input to the evaluation of the project but also to improve the overall feeder road program further and maximize the benefits from the program.

C. Sustainability

69. The project will address sustainability in a four-pronged approach through: (i) the application of the OPRC approach in the delivery of the feeder roads component; (ii) linking government commitment to disbursement; (iii) strategic institutional capacity enhancements; and (iii) instituting a post-project completion strategy. The use of OPRC approach by RDA will ultimately address not just the needs of the feeder roads part of the network but the entire CRN. The skills transfer under the project will include OPRC planning, designing, procurement, budgeting, and implementation. The approach encourages long term planning, locks resources to a given set of roads thus eliminating the effects of annual budget fluctuations, and promotes innovation on the part of the private sector. It has the potential to reduce the cost of maintaining roads, which in turn would reduce the fiscal burden on the sector.

70. The project is part of GRZ's ten-year national OPRC Roll-out program and it will be critically necessary to have its commitment towards the program. Overall, although the project will finance only a portion of the road network – about 30 percent of the PFRs is in poor condition - it is the leveraging of government resources towards the feeder roads network that will have a long-term sustainability effect in the sector. The program itself will instill discipline and commitment within RDA's annual planning and budgeting process and thereby ensure continuation of funding beyond the World Bank support. The project duration of eight years, will enable sectoral dialogue between the World Bank and GRZ, well into GRZ's ten-year OPRC Roll out program. Furthermore a disbursement condition is included as part of the Credit Financing Agreement. Under the arrangement, GRZ will be required to commence the funding of actual OPRC contracts before works in the last two World Bank supported provinces can start.

71. The planned institutional capacity enhancements will have an even more lasting impact than the feeder roads aspects of the project. The initiatives have the potential to impact positively on the roads sector over the long term. Strategic studies focused on improving the effectiveness of NFRA, for example, will directly support sustainability of the road funding by ensuring its regularity, predictability and amount of flows to the sector. For the MLG, the planned institutional support will be transformational. The ministry will be better prepared to manage the rural road network, through beefed-up capacity of the participating LRAs, with expected benefits well beyond the project.

72. Finally, although limited to the project roads, is the requirement that RDA and MLG have a system in place to assume responsibility over the completed project roads immediately after the end of the OPRC contracts. In this regard, RDA will be expected to have a maintenance contract or an equivalent arrangement in place at the end of the first two five year OPRC contracts. This will be around the sixth year of the Project. An intermediate results indicator has been introduced to this effect.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

73. **The overall risk rating for the proposed operation is Substantial.** Political, governance and macroeconomic risks are rated ***moderate***. Also rated ***moderate*** are fiduciary, and environmental and social safeguards. Sector strategies and policies, technical design of the project, and stakeholders are considered ***substantial*** risks. Institutional capacity for implementation and sustainability risk is rated ***high.***

74. Road **sector strategies and policies**, especially with regard to road investment priorities, are overly dependent on political considerations rather than sound economic management principles. As a result, feeder roads and road maintenance have been underfunded. Although GRZ has expressed the desire to improve rural accessibility, the decision has not necessarily been institutionalized at the sector level. Second, with the recent creation of the MHID, road transport policy matters are in essence split between the new ministry and the MTC. It is unclear how this will play out in terms of division of roles and responsibilities. Finally, policy formulation and oversight functions are still weak, as noted during the last two (RRMP I and II) operations. Three mitigation measures are proposed for this risk: (i) the project will support the adoption and operationalization of the transport sector policy developed which was created with support from the WorldB under RRMP II; (ii) a review of NRFA's institutional mandate will refine some of the institutional gaps that may have arisen post-reform; and (iii) MHID will be assisted to create and operationalize an agency performance framework for RDA.

75. The proposed OPRC approach has distinct advantages but it requires sound pre-planning and special attention to the **technical project and program design** on the part of the cCient. While the approach allows service providers to take and implement operational technical decisions, the client has to be well prepared at all stages especially in terms of conceptual designs, choice of the applicable levels of service, the proposed terms and the bidding documentation. RDA is in the process of designing the OPRC and these outputs have not yet been submitted to the World Bank for clearance. Fortunately, RDA has implemented OPRC activities in the past[10] and understands these challenges. Furthermore, RDA has hired experienced consultants to assist in the project designs.

76. **The high risk associated with weak institutional capacity for implementation and sustainability stems from three main challenges**:

(i) **Sustainability - the lack of certainty that GRZ will indeed systematically fund its program as well as the maintenance of roads delivered under the project:** The GRZ contribution towards the OPRC Roll-out program to completion and the maintenance of roads delivered by the project is not guaranteed. This is due to budgeting, policy and strategy weaknesses. However, at project preparation, GRZ has shown its willingness to finance its part of the program. As a mitigation measure, the project will make provision for delayed commencement of GRZ's funded part of OPRC to the second year. A disbursement condition requiring government to commence its part of the program, before the work in the last two World Bank funded provinces can start has been proposed. Government will also be expected to finance the maintenance of

[10] Under ADSP, which supported roads similar to the feeder roads currently being proposed.

the World Bank supported roads after the end of the contracts. An indicator to monitor the existence of these contracts has been proposed and included in the results framework. In the longer term, the implementation of the transport policy, the review of road sector institutional mandates, the development of a rural roads maintenance strategy, and the use of an agency performance framework are all intended to address this risk.

(ii) **RDA's workload vis-à-vis it's staff establishment:** Regarding RDA's capacity, part of the effects of short term sector strategies is that RDA's technical staff often get inundated by other work related demands. As a mitigation measure, the project will support the strengthening of the already existing Project Management Unit, however, the main risk is that the unit is likely to be still saddled with other responsibilities.

(iii) **Involvement of other stakeholders with limited experience in Bank operations and OPRC approach.** The involvement of the MLG and its LRA's presents a challenge, albeit minor, in that besides their general lack of technical capacity, they have not been involved in World Bank operations or the implementation of OPRC work in the past. This will be mitigated through the recruitment of consulting firms, who will supervise OPRC activities and report directly to RDA. The coordination role of MHID is critical, but the fact that it will take time for the new ministry to fully define and establish its structure, remains a challenge. The responsibilities for the implementation of the institutional strengthening activities lie with several institutions some of which have demonstrated implementation capacity weaknesses. There is therefore a need for MHID to track progress in this regard and also offer sector guidance where necessary. While the ministry has demonstrated its commitment and capacity during the project preparation phase, these could be eroded by future staff changes. To mitigate the challenge, the project has made provision to support a dedicated coordination office.

77. **Stakeholder related risks** pertain to the existence of private sector (contractors and consultants) capacity to bid competitively and to successfully implement the OPRC activities. Some of the contributing factors to the risk will include lack of clarity on the expectations of the client, allocation of risks, poor communication, and lack of upfront involvement of the private sector prior to the bidding process. Furthermore the private firms are established either as purely contracting or civil engineering enterprises and getting the required combination of contracting and engineering competencies will present a challenge. Fortunately the private sector in Zambia has been exposed to OPRC processes in the past. In addition, the project will promote and support upfront consultations with the private sector. RDA will be required to hold regular workshops and awareness creation session for contractors, with a special focus on the medium scale locals, well before the bidding process commences. Another mitigation measure is the staggered awarding of contracts, thus using lessons learned to improve in subsequent bidding rounds. The World Bank will support RDA's effort through experienced technical assistance and will have to ensure that it has on board the necessary expertise.

78. **Environmental and Social risks are moderate.** The selected feeder roads will traverse already existing corridors that may require minor realignments for technical reasons. Fortunately, these roads are located in low population density rural Zambia where recognized forests areas are well demarcated. Local communities and stakeholders will be consulted on the potential labor influx related risks and mitigation measures, as part of preparation of Environmental and Social Impact Assessments (ESIAs) and Environmental and Social Management Plans (ESMPs), including contractors' ESMPs. To ensure that environmental and social safeguards are properly managed, the project will have two oversight layers.

The primary oversight function will be carried out by RDA's supervision consultants, whose duty it will be to ensure that contractors observe the contractual obligations on the matter, including implementation of actions identified in the project ESIAs and Resettlement Action Plans (RAPs). The second oversight function will be carried out by the NCC, which will be empowered to review road construction sites and consult beneficiary communities to assess compliance by contractors and consultants. NCC will provide advice on the road construction sites, where necessary, and prepare regular reports for the World Bank project supervision teams.

VI. APPRAISAL SUMMARY

A. Economic Analysis

79. **The economic importance and viability of the operation has been established.** In total, the project could support more than 32 PFRs in the six provinces. The total road length could amount to about 4,300 km of gravel, bitumen sealed, and maintenance-only roads. The feeder roads component is estimated to cost US$180 million. The average Annual Average Daily Traffic (AADT) is about 36.7 vehicles, and the average benefit-cost ratio is 2.0. Some roads are highly cost-effective, with a benefit-cost ratio of more than 10. In general, however, the benefit-cost ratios are likely to be below 1.0 for many selected feeder roads. This is basically because of the low traffic nature of feeder roads in rural Zambia. Since detailed data on PFRs are not available, the net present values (NPV) and internal rates of returns (IRR) are calculated using available data on similar rural roads that exist in the same project areas. For demonstration purposes, economic efficiency is examined for six comparable District Roads. The results indicate that expected economic benefits, such as reduction of vehicle operating costs, are small, but investments are found economically viable. While the IRR are estimated at 7.4 percent to 13.2 percent, the NPVs for the investments at a discount rate of 6 percent are all positive and estimated to vary from US$0.12 million to US$0.52 million (see also Annex 4).

80. In addition, significant social benefits and other induced effects in the agricultural sector are expected. The project's prioritization framework will be focused on not only investment efficiency but also accessibility to social facilities. With 32 PFR that are tentatively considered as most likely candidates under the Project, 75 basic schools would be connected, and more than 400,000 people are expected to benefit directly from improved road connectivity, with associated significant social benefits.

81. Finally, the Project is expected to contribute to green house gas emission reduction, though the impact will be small in magnitude. The total volume of carbon emissions that can be reduced by the project is estimated at about 60.5 tons of CO_2, of which the social value is about US$1,800 if the World Bank's recommended social value of carbon, i.e., US$30 per ton, is used.

82. **Value Added of World Bank's Support**. The World Bank has significant experience in the promotion of innovative approaches to road infrastructure development including in OPRC. It has supported and continues to support performance based road contracting in developing countries, and is therefore well placed to provide guidance in the project design and implementation, based on lessons learned. In this regard, Zambia has benefitted in the past from the World Bank financed OPRC work under ADSP and it was on the basis of this past collaboration and experience gained in the process, that a

decision was taken by GRZ to roll-out a national OPRC program. While Zambia has implemented notable road sector reforms, the World Bank, with its expertise, will support the review, identification, rationalization, and choice of solutions to some challenges facing the sector. Especially, it has been observed that one of the reasons for the poor condition of feeder roads network is the lack of resources for road maintenance. Since Zambia has implemented a road user charging system, which inter alia is intended to fund road maintenance, a review of the current processes could inform strategic decisions in support of improved funding for rural roads.

B. Technical

83. **Most of the fundamental technical aspects of the project have been addressed and work is ongoing to finalize the remaining areas that are critical to readiness.** Regarding the process leading to the selection of roads, as described under Section III, a comprehensive ranking analysis to identify beneficiary provinces has been concluded. The selection of participating districts and roads is partially complete because its needs further rationalization to ensure road network and connectivity effectiveness. RDA has three consultants whose main tasks are to produce the conceptual designs and bidding documents for project roads. For the purpose of the national OPRC Roll-out program, all PFRs in the country have been assessed and prioritized on basis of their technical and social-economic viability. This is an important input in the identification of the project roads. Bidding documents for civil works in the initial two provinces are expected by May 30, 2017.

84. *Scope of Works* - The civil works envisaged under the project primarily involve rehabilitation of existing mainly single lane, poorly maintained earthen tracks to gravel standards, as well as continuing routine maintenance. The project will allow for low cost sealed roads, where justified. It was also agreed that GRZ, through RDA, would monitor traffic growth along the improved roads and provide its own funding to upgrade roads with unexpected traffic levels to bitumen sealed standards. The scope of works shall include but not be limited to improving geometry, strengthening the pavement and improving drainage works. Roads requiring maintenance only will be included as a contribution towards improved connectivity. The unit cost that have been used to estimate the scope of work have been reviewed and found acceptable. The unit cost is derived from recent government bids for similar work with a reconfirmation using first principals. As the scope gets fine-tuned, a decision on how to shield the project from undue price fluctuations will be taken. One such approach is to work with conservative rates and to make provision for un-allocated funds. Another approach would be to include price contingencies.

85. *Contracting Approach* - The civil work contracts, which would include a network of roads rather than single road stretches would be procured on OPRC contracting approach. The contract duration would be five years, including two years of rehabilitation works and three years of maintenance. The OPRC contracting approach rather than input based contracting was selected based on its inherent advantage of reduced variation of works risks, better asset management, and reducing dependence on irregular maintenance budget provision. The contracting entity in this approach is paid on the basis of meeting required service levels, which include adherence to quality standards and maintenance aspects among others. For the road maintenance part of the contracts, contractors will be advised to consider the use of communities as sub-contractors and thus creating employment and minimizing the effects of migrant labor.

86. *Preparation of conceptual designs, Project Costing and Bidding Documents* - The OPRC contracting approach requires the contracting entity to undertake detailed designs and associated risks. Conceptual designs, project costing, proposed payment structure and bidding document preparation for civil work contracts are being undertaken through an engineering consultants already engaged by RDA. Consultants, supervised by RDA would ensure that proposed conceptual designs are robust; safe; adhering to local specification/standards; and encourage use of local available materials, while at the same time are adaptive of international good practices.

87. *Road Safety* – Due to low traffic volumes, low vehicle operating speeds, and relatively low population densities in rural areas, feeder roads tend to be generally safer than the inter-urban and urban roads. This notwithstanding the conceptual designs will specify technical interventions to ensure that project roads have the necessary features to improve road safety. These will include road geometry, signage, sight distances and speed controls. Special attention will be given to built-up areas where road signage and other measures will be used to control speeds. Other non- infrastructure interventions will include RTSA's road safety awareness campaigns and audit of the conceptual designs as well as the project roads, during and after construction.

88. *Climate Resilience* - The key climatic hazards being faced by Zambia are floods, droughts and extreme temperatures, which also affect agriculture sector adversely. To address such climate risks, civil works contract would include intervention to make the road network more resilient to such risks. This would be achieved by undertaking a Climate Vulnerability Assessment of the road network, identifying network redundancies (criticality of the road links in the network in the event of natural disaster), undertaking hazard spot mapping and proposing appropriate engineering interventions to reduce impact of climate risks. Furthermore, as part of the project preparation and implementation, the sector wishes to incorporate tangible climate resilience interventions. In particular, the sector would like to: (i) develop a strategy on climate resilience for roads; and (ii) identify specific climate resilience and adaptation activities that would be implemented in this and other projects. In this regard, a US$200,000 grant financing has been made available from the Global Facility for Disaster Reduction and Recovery (GFDRR). The two outputs (climate resilience strategy for roads and a list of activities) are expected by June 30, 2017. Funds to implement some of the recommendations of the second output will be availed though the feeder roads component (Component 1) and will form an integral part of the OPRC activities.

89. *Gender Assessment* – An individual consultant will be engaged to – (i) assess the gender aspects in provinces, particularly in the labor employment trends by the contractors; (ii) identification of women beneficiaries; (iii) specific needs of the women as regards to the social infrastructure; and (iv) identifying gender access and safety issue in rural transport services to influence it is pro-gender and what can be done under the project to improve it. Such assessment would be provided to the engineering consultants to incorporate these aspects in conceptual designs/bidding documents.

90. *Local Employment Generation* – Through the "Special Condition of Contracts", bidders would be encouraged to use local labor including women for construction. For maintenance persons, contractors would be encouraged to use "length-person[11]" approach for routine maintenance works i.e. clearing of bushes/vegetarians, drain and culvert clearing, minor pothole repairs etc. Under this system, labors living

[11] A "length-person" approach entails the allocation of an appropriate length of road for maintenance to one individual, and payment to the individual is linked to the condition of the specific length of the road.

by the side of a particular segment of the road (generally 2 to 3 km) would be employed and made responsible for routine maintenance of that particular segment. The procurement and management of such services would be the responsibility a the main contractors i.e. other than ensuring that the right procedures are followed, RDA will not be required to initiate or manage these contracts.

91. *Social Infrastructure* – The social infrastructure in support of agriculture and related community level needs, such as storage facilities, processing space, and market stalls will be constructed as part of the OPRC civil work contracts. The identification of types and precise location of such facilities will be facilitated by the local authorities and led by communities in the project areas. Conceptual designs will be carried out by RDA's consultants, whose teams will include social experts that will ensure that community involvement mechanisms are in place before, during, and after the project. *Community ownership* and *sustainability arrangements* will be the two cardinal considerations in the decision to fund the amenities. Agriculture sector and community development experts in the World Bank and in the Government are to be consulted and will be required to participate where necessary. These interventions are intended to spur parallel developments including new rural businesses, which would in turn create new jobs in the local communities.

92. *Quality Assurance (QA) and Project Reporting* - During the construction phase, a supervision consultant would be engaged by RDA to supervise the works as employer's representative and to ensure that the contractor is meeting the required quality and service levels. QA requirements during construction would be included in the Technical Specifications of the bidding document. The contracting entity would be required to submit regular progress reports as well as service level monitoring reports.

C. Financial Management

93. A Financial Management assessment (FM) for NRFA was carried out by the World Bank to determine whether NRFA has adequate FM arrangements systems to meet the minimum requirements of the World Bank, and to effectively handle project finances. Details of this assessment are included in Annex 2, including an action plan to improve the financial management arrangements. The format of the Interim Financial Reports was agreed upon at negotiation. The assessment concludes that the financial management arrangements in place meet the World Bank's minimum requirements under OP/BP10.00 and therefore are adequate to provide, with reasonable assurance, accurate and timely information on the status of the project. The overall FM residual risk rating of the project is Moderate.

94. NRFA's financial transactions will be managed by the Fund Management Directorate which will use the existing financial management arrangements at NRFA including staff members that are appropriately qualified, experienced, and trained in handling IDA funds, financial regulations, and procedures (NRFA has in the recent past successfully implemented IDA financed projects, RRMP I and II). NRFA has a Financial Manual, last revised in 2016, that will be used for this project. The accounting system is computerized through the use of Sun System 5 accounting software. The possibility of linking NRFA's Sun System to the Government's Integrated Financial Management Information System (IFMIS) could become relevant in the course of project implementation. NRFA's Director – Fund Management, who will be assisted by the Manager Finance (Cooperating Partners) and the Assistant Accountant, will have overall responsibility for the project's financial management.

D. Procurement

95. The World Bank has carried out the Procurement – Risk Assessment and Management System (PRAMS) review of the various implementing agencies to establish the procurement risks and risk mitigation issues which would be addressed over the life of the project. The PRAMS was carried out based on the World Bank's PRAMS online system. The PRAMS assessment determined the Procurement Risk assessment for the project and the frequency and type of procurement implementation support that the World Bank will need to provide to the implementing agencies and the percentage of the sample contracts to be subject to Procurement Post Review (PPR) by the World Bank. Based on the PRAMS assessment, the procurement risk for this project is deemed "Moderate", largely because most of the implementing agencies are reasonably familiar with project implementation under World Bank funded projects and the applicable World Bank procurement policies. In terms of PPRs, High risk projects focus on a sample size of 20 percent; Substantial risk projects, a sample size of 15 percent, Moderate risk 10 percent, and Low Risk 5 percent. Changes in risk levels will be communicated to the Ministry of Finance, (MOF) and Ministry of National Planning and Development as outcomes of the PPR or Independent Procurement Reviews (IPR) exercises that will be carried out each year over the life of the project. The outcomes of the PPR / IPR also result in the revisions of the Prior Review (PR) and thresholds for when International Competitive Bidding (ICB) and National Competitive Bidding (NCB) will apply.

96. The PRAMS assessment concluded that procurement management arrangements in place are reasonable given that the participating implementing agencies have in the past implemented World Bank funded projects. Some of them have had at least two series of funding going back almost 20 years. However, based on the previous World Bank experience in working with these institutions, it is critical that the respective implementing agencies identify and assign procurement specialists. These may be staff sourced in-house or may be externally hired individual consultants to carry out procurement during project implementation. The identified risks and risk mitigation measures are provided in Annex 2.

97. The NRFA, which will be the procurement coordinating institution, has worked with the other implementing ministries and agencies as they prepared their procurement plans, based on which a consolidated procurement plan was prepared for the project, negotiated and agreed upon. As needed, and based on the identified risk mitigation areas, the World Bank will arrange for procurement training of selected relevant management, technical, procurement, accounting staff contractors and consultants to familiarize them with their role in carrying out procurement during project implementation and in particular on the specific requirements for OPRC contracts.

98. Bidding documents and contract management procedures will make provisions for mitigation of social and other impacts that could arise from labor influx and Occupational Health and Safety (OHS). The bidding documents, supervision consultancy agreements, and site management procedures will include appropriate clauses, regulations, and instruction to guide all stakeholders (contractors, consultants, and RDA, MLG and LRAs personnel) of their specific obligations in managing these concerns. With regard to RAPs, bidding documents will clearly spell out the requirement that no works shall commence in road segments where possible resettlement, land acquisition, or land compensation was considered necessary, until the relevant actions including compensations are completed.

E. Social (including Safeguards)

99. Rehabilitation, upgrading, and maintenance of feeder roads in the sparsely populated rural Zambia is not expected to have significant adverse social impacts. The occasional realignment of roads through existing settlements, to improve safety or to reduce construction costs, will be accompanied by appropriate mitigation measures as identified in the Resettlement Policy Framework (RPF) and the specific RAPs. The RPF and the Environmental and Social Management Framework (ESMF) for the project have been drafted and reviewed by the World Bank. After the final clearance by the World Bank, the two documents were disclosed in-country and through the World Bank's InfoShop on February 8, 2017. These two frameworks and all other safeguard instruments and measures focus specifically to activities supported by this operation, and exclude other initiatives, such as GRZ's funding towards the national OPRC Roll-out Program. Operational Policy (OP)/Bank Policy (BP) 4.12 Involuntary Resettlement was triggered, as the rehabilitation of feeder roads and possible encroachment on the road reserves may require some relocation and resettlement. The additional non-road infrastructure (storage facilities, processing space and market stalls), to be included after consultation with communities, may also require some small but additional portions of land. OP/BP 4.11 Physical Cultural Resources was also triggered as a cautionary measure in case of chance finds.

100. Once specific project sites have been fully identified, Environmental and Social Impact Assessments (ESIAs) and Resettlement Action Plans (RAPs) for the various packages will be developed, approved, and disclosed by the World Bank and GRZ. One composite ESIA will cover all the provinces, but three RAPs (one per pair of provinces each year) will be prepared in sequence, starting with that of the first two participating provinces. Construction works will not commence before the disclosure of the one composite ESIA and the specific RAPs as well as the completion of safeguard actions.

101. *Labor influx:* Preparation of ESIAs will include screening for potential social and environmental risks of adverse impacts due to labor influx, including the establishment of work camps. Road rehabilitation and maintenance contracts will result in the establishment of temporary construction camp sites by private contractors, thus introducing migrant labor within beneficiary communities. Typically, there would be one main project camp over the five year duration of the contract per participating province. It would be used to service other more temporary satellite camps located at the actual road construction sites. These camps will mainly house skilled and semi-skilled labor.

102. The project will result in labor influx and a robust system to manage the potential concerns will be put in place. Measures to mitigate negative impacts of the labor influx will be explicitly articulated as instructions and conditions of contracts. These instructions will be enforced by RDA and its contract supervision consultants. Mitigation and monitoring of any labor influx related risks that are identified will be addressed in the ESIAs, ESMPs, Contractor ESMPs and Codes of Conduct, and related monitoring and supervision plans. Contractor oversight by the project's Supervising Engineer and the project-level Grievance Redress Mechanism will be the major vehicles by which potential labor influx issues are identified and addressed during implementation.

103. In addition, the project has made provision to finance the NCC and thus enable them oversee the application and adherence to these requirements. NCC will report to the World Bank directly.

Furthermore, consultations with beneficiary communities and their leadership would take place prior to and during the execution of the works. Where necessary relevant NGOs will be required to make the necessary inputs, for example in awareness creation efforts within the communities. Management of labor influx has also been included as a specific area of focus as part of the citizen engagement process, to be monitored continually.

104. Contract documentation for civil works will obligate service providers to ensure that they comply with the requirements of the Zambian Occupational Health and Safety Act, 2010 [No. 36 of 2010]. RDA and its supervision consultants will be responsible for administering this requirement as part of their project implementation obligation. NCC will therefore be expected to assess the extent to which the legislation is applied.

F. Environment (including Safeguards)

105. The Environmental Assessment is Category B – Partial Assessment and therefore triggers OP)/BP 4.01. The categorization and all the environmental safeguard assessments and mitigations will be limited specifically to activities supported by this operation, and will exclude other initiatives, such as GRZ's funding towards the national OPRC Roll-out Program.

106. Provisionally, OP/BP 4.46 on Forests has been highlighted as a possibility, to be confirmed when actual road alignments are determined. Also triggered as a cautionary measure is the Physical Cultural Resources OP/BP 4.11. The project will entail road improvement works, mainly rehabilitation to gravel standards and upgrading to bitumen sealed standards, and maintenance of feeder roads in rural parts of Zambia. Also to be included is the construction of road drainage structures. Although the precise location of the road links is not yet known, they will be rural access roads and tracks that are currently in poor condition but whose alignment is generally defined. The road improvement works will involve bush clearing to demarcate the road works corridor and to improve on road safety, earthworks to achieve engineered road profiles, and excavation of material for road layers. Drainage structures will include channels, culverts, drifts and small bridges. Necessary mitigation measures in relation to all activities, are to be included as part of road building contract documentation. An ESMF has been prepared, was cleared by the World Bank, and was disclosed in-country and at the Info-shop in line with World Bank procedures.

H. World Bank Grievance Redress

107. Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms (GRM) or to the World Bank's Grievance Redress Service (GRS). The intent of a robust and transparent project-level GRM is to resolve grievances quickly, simply, and at the local level within the community that is most impacted by the issue and its effects. Such issues could include resettlement-related complaints, poor contractor environmental health and safety performance, or improper or unsafe worker interactions with local community members.

108. World Bank processes such as the GRS and independent Inspection Panel provide additional grievance redress mechanisms for when escalation of an issue may be desired by the grievant, but should not be seen as the best first step to resolving community-level issues. But if needed, the GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and

individuals also may submit their complaints to the World Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit *http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service*. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework
COUNTRY : Zambia
Zambia: Improved Rural Connectivity Project

Project Development Objectives

The objectives of the Project are to: (i) improve the Recipient's rural road accessibility for communities in selected areas; (ii) strengthen institutional capacity for sustainable management of rural roads; and (iii) respond promptly and effectively to an Eligible Crisis or Emergency.

Project Development Objective Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Share of rural population with access to an all-season road	✓	Percentage	18.70	25.00	Annual	Rural Access Index as a measure of improved rural connectivity within the target area (target area is defined as all the participating provinces); Method of determining RAI is as per WB method. Refer to http://documents.worldbank.org/curated/en/367391472117815229/Measuring-rural-access-using-new-	RDA

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
						technologies RDA project progress reports are used to update.	
Number of rural people with access to an all-season road	✓	Number	1147000.00	1587000.00	Annually	Rural Access Index as a measure of improved rural connectivity within the target area (target area is defined as all the participating provinces); Method of determining RAI is as per WB method. Refer to http://documents.worldbank.org/curated/en/367391472117815229/Measuring-rural-access-using-new-technologies RDA project progress reports are used to update.	RDA

Description: Percentage of rural people in the project area who live within 2 kilometers (typically equivalent to a 20-minute walk) of an all-season road. This indicator is also known as Rural Access Index (RAI).
An all-season road is motorable all year by the prevailing means of rural transport (often a pick-up or a truck which does not have four-wheel-drive). Predictable interruptions of short duration during inclement weather (e.g. heavy rainfall) are acceptable, particularly on low volume roads. Please note that this indicator requires supplemental information Supplemental Value: Number of rural people with access to an all-season road The Supplemental Value is the total number of rural people with access to an all-season road. An all-season road is a road that is motorable all year by the prevailing means of rural transport (often a pick-up or a truck which does not have four-wheel-drive).

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Increased proportion of Primary Feeder Roads in the country, that is in good and fair condition		Percentage	0.00	30.00	Annual	Road Condition Surveys	RDA
Description: The national average of the roads in good/fair condition as per 2015 Road Condition Survey was 18% (Good 3% and fair 15%). The total number of km of PFRs is 14,333km in the country. The Project will rehabilitate and maintain a total about 4,314 km of roads, which account for 30%, which would be added to the baseline, holding the condition of other PFRs that are not covered by the Project constant.							
Name: Improved institutional oversight capacity in the roads sector, assessed by the development and application of an RDA performance framework		Yes/No	N	Y	Annually	MHID annual reports	MHID
Description: The MHID will develop an agency performance framework that includes a performance agreement, performance KPI's, and methods of assessing the RDA performance. The indicator measures whether the framework is prepared and effectively adopted.							
Name: Employment created through the implementation of NCC's labor-based policy		Number	0.00	25000.00	Annually	National Council for Construction's annual reports	NCC
Description: Description: NCC will establish the key areas in the implementation of the labor-based policy that would result in employment creation. These will include							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
RDA's road development, rehabilitation and maintenance programs as well as activities funded under the Project. The number of jobs created is counted in both Project and other road activities. The target is set based on the past experience by NCC. According to NCC Inspector reports, 3,000-4,000 jobs were annually created in the road and other construction sectors, such as health and building. The policy is expected to facilitate the adoption of labor based employment, which aims at 5,000 jobs per year. During the next 5 years, 25,000 jobs are expected to be created in the OPRC and other maintenance works by RDA and MLG. The projections are based on two activities namely: grass cutting; and cleaning of drains.							
Name: Number of beneficiaries benefiting from emergency response and recovery activities, if the CERC is triggered		Number	0.00	0.00	Annually	RDA's annual reports	RDA
Description: Reporting on this indicator will be subject to CERC being triggered.							

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Proportion of PFRs in the project provinces, that is in good and fair condition		Percentage	18.00	63.00	Annually	Road Condition Survey	RDA
Description: The national average of the roads in good/fair condition, which was 18% (Good 3% and fair 15%) as per 2015 Road Condition Survey, is applied for baseline. The total number of km of PFRs is 14,333 km in the country. The Project will rehabilitate and maintain a total of 4,314 km of roads, which account for 30%, which would be added to the baseline, holding the condition of other PFRs that are not covered by the Project constant.							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Total length of rural roads improved through OPRC approach under the project		Kilometers	0.00	4300.00	Quarterly	RDA's quarterly reports	RDA
Description: Under the Project, the total of about 4,300 km of roads will be rehabilitated and maintained in the 15 packages.							
Name: Existence of government funded road maintenance contracts for continued upkeep of roads after Bank supported OPRC contracts end		Yes/No	N	Y	Annually	RDA Road Sector Annual Plans	RDA
Description: The Government is committed to continue maintaining the PFRs funded by the Project after the 5-year OPRC contracts. The indicator measures whether or not those additional maintenance contracts are included in the RDA annual plan.							
Name: Completion and implementation of a rural roads maintenance strategy by RDA and MLGH		Yes/No	N	Y	Annually	RDA's annual reports	RDA
Description: This is a measurement to ensure the sustained management of rural road management, for which the Project will support the preparation and implementation of the rural roads maintenance strategy by the RDA and MLG.							
Name: Share of the road		Percentage	26.00	35.00	Annually	RDA Road Sector Annual	RDA; NRFA

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
fund revenues allocated by NRFA towards road maintenance						Plans (Road Sector Agencies)	
Description: The baseline of 26% is based on the 2017 Road Sector Annual Work Plan as well as the Road Maintenance Strategy 2015 - 2024 project Road sector cash flows. The target is based on the projected local resource revenues as outlined in the Road Maintenance Strategy. It is assumed that the projected revenues for the Road Fund will all go towards maintenance. While 10% of the total collections of the Road Fund are spent on operating costs in the road sector, the remaining 90% would be spent on road maintenance on the assumption that GRZ will fund the costs attributed to other upgrading and rehabilitation works. "							
Name: Performance of road safety audit by RTSA on all OPRC packages		Number	0.00	15.00	Quarterly	RTSA's quarterly reports	RTSA
Description: The target is the number of packages. The Audit shall be done before and after the design, and after the implementation of the projects.							
Name: Direct project beneficiaries	✓	Number	0.00	464128.00	Annually	Project Progress Reports; NCC Annual Report	RDA; NCC
Female beneficiaries	✓	Percentage	0.00	228955.00	Annually	Project Progress Reports; NCC Annual Report	RDA; NCC
Description: Direct beneficiaries are people or groups who directly derive benefits from an intervention (i.e., children who benefit from an immunization program; families that have a new piped water connection). Please note that this indicator requires supplemental information. Supplemental Value: Female beneficiaries							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
(percentage). Based on the assessment and definition of direct project beneficiaries, specify what proportion of the direct project beneficiaries are female. This indicator is calculated as a percentage.							
Name: Proportion of women employed in the road maintenance aspects of the road contracts		Percentage	0.00	20.00	Monthly	Project Progress Reports	RDA
Description: In Zambia, road project progress reports normally report how many women are employed in the activities, which will be used to calculate this indicator. It is assumed that 20% are female.							
Name: Development and implementation of a citizen engagement tool for social and environmental safeguards and labor influx		Yes/No	N	Y	Annually	RDA Annual Reports	RDA
Description: RDA develops and implements a citizen engagement tool that includes social and environmental safeguards in general, and labor influx in particular, as areas of citizen consultations							
Name: Proportion of complaints addressed and resolved through Grievance Redress Mechanism		Percentage	0.00	75.00	Quarterly	Quarterly Reports	RDA
Description: These are complaints received from the stakeholders and the general public, at project level. The complaints are expected to be recorded, addressed and							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
resolved timely.							

Target Values

Project Development Objective Indicators

Indicator Name	Baseline	End Target
Share of rural population with access to an all-season road	18.70	25.00
Number of rural people with access to an all-season road	1147000.00	1587000.00
Increased proportion of Primary Feeder Roads in the country, that is in good and fair condition	0.00	30.00
Improved institutional oversight capacity in the roads sector, assessed by the development and application of an RDA performance framework	N	Y
Employment created through the implementation of NCC's labor-based policy	0.00	25000.00
Number of beneficiaries benefiting from emergency response and recovery activities, if the CERC is triggered	0.00	0.00

Intermediate Results Indicators

Indicator Name	Baseline	End Target
Proportion of PFRs in the project provinces, that is in good and fair condition	18.00	63.00
Total length of rural roads improved through OPRC approach under the project	0.00	4300.00
Existence of government funded road maintenance contracts for continued upkeep of roads	N	Y

Indicator Name	Baseline	End Target
after Bank supported OPRC contracts end		
Completion and implementation of a rural roads maintenance strategy by RDA and MLGH	N	Y
Share of the road fund revenues allocated by NRFA towards road maintenance	26.00	35.00
Performance of road safety audit by RTSA on all OPRC packages	0.00	15.00
Direct project beneficiaries	0.00	464128.00
Female beneficiaries	0.00	228955.00
Proportion of women employed in the road maintenance aspects of the road contracts	0.00	20.00
Development and implementation of a citizen engagement tool for social and environmental safeguards and labor influx	N	Y
Proportion of complaints addressed and resolved through Grievance Redress Mechanism	0.00	75.00

Note to Task Teams: End of system generated content, document is editable from here.

ANNEX 1: DETAILED PROJECT DESCRIPTION

REPULIC OF ZAMBIA
Zambia: Improved Rural Connectivity Project-SUF

Introduction

1. **Zambia, a resource rich, low middle-income country aims to attain sustainable development through, *inter alia,* economic diversification and pro-poor investments.** While its economy is traditionally highly dependent on copper, the agriculture sector is by far the highest contributor to employment, currently employing 70 percent of the total population. Moreover, Zambia has significant potential in agriculture and agribusinesses that remain largely underexploited. Since the end of the commodity boom cycle in 2014, falling copper prices, exports, and foreign direct investments continue to weaken the economy. The revised Sixth National Development Plan identifies poor infrastructure as one of the binding constraints. It also recognizes that better infrastructure would accelerate Zambia's gains in the promotion of economic diversification and industrialization, especially in the labor-intensive sectors, such as agriculture, tourism and construction.

2. There is a significant correlation between rural accessibility and agricultural productivity. According to Berg et al 2016[12], improved market access from road investments in Sub-Saharan Africa contributed towards increased cropland. The study also found that cropland expansion, in turn, was associated with a small but significant increase in local gross domestic product, suggesting that agricultural activities developed at the extensive margin — mostly to serve local demand — but not as commercial agriculture serving external markets.

3. The development objective of the proposed project is to improve rural accessibility for communities in selected areas in Zambia by providing better road infrastructure and strengthening institutions for effective and sustainable management of rural roads. The objective was used in establishing the number and content of the project's components. The two components are: Component 1- Improvement of feeder roads; and Component 2 - Institutional strengthening in the roads sector. Component 2 has two subcomponents i.e. Project coordination and implementation; and Strategic institutional enhancements. The objective of the project focuses on improved rural road connectivity to improve rural transport services on sustainable basis through developing logistically networked infrastructure and capacity through sustainable institutions.

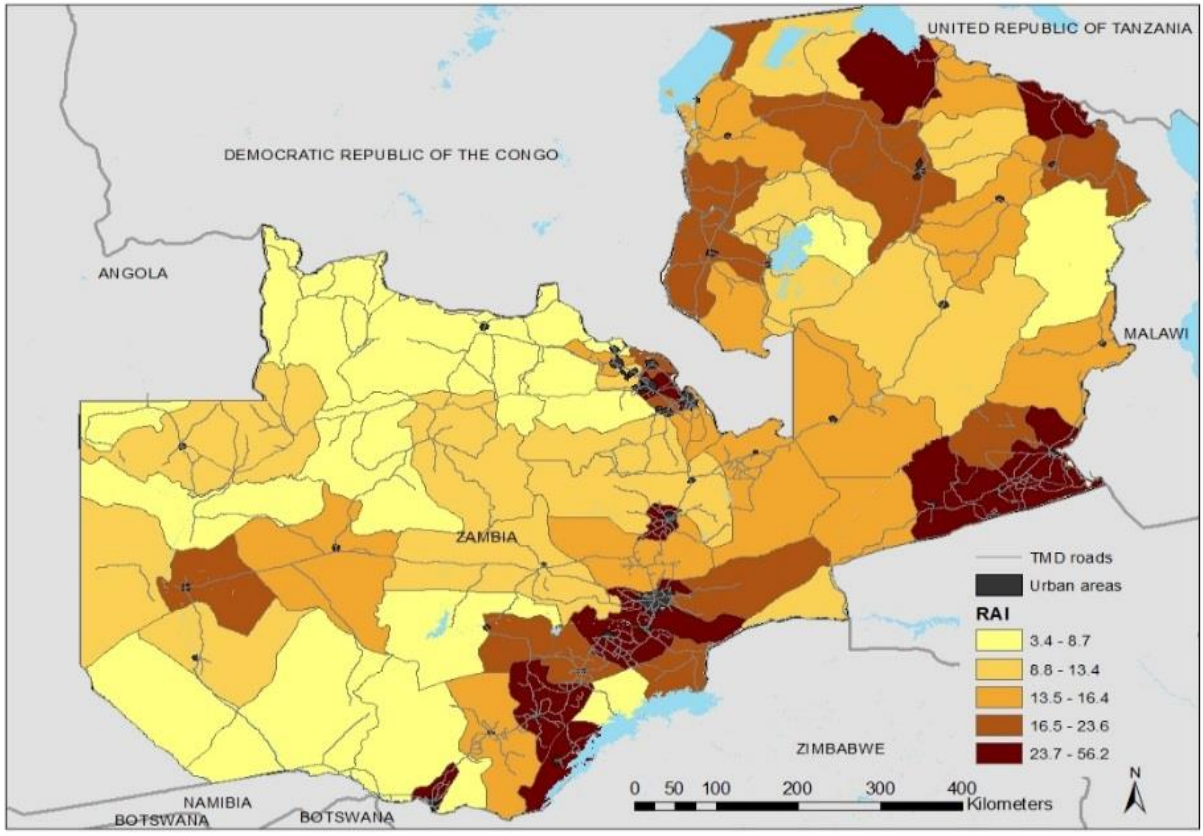
The Feeder Roads Challenge

[12] Roads and Rural Development in Sub-Saharan Africa, Claudia N. Berg, Brian Blankespoor, and Harris Selod, World Bank Policy Research Working Paper 7729, June 2016.

4. In recent years, Zambia has achieved notable success in maintaining the Trunk, Main, and District (TMD) roads, a large proportion of which is generally in good and fair condition but the feeder road network remains significantly poor. The proportion of TMDs in good or fair condition, based on RDA's 2015 road condition survey, stood at 75 percent. A total of 10,106 km (mostly Trunk, Main, District and Urban Roads) or about 15 percent of the classified road network are paved and well maintained. In 2014, about 88 percent of the paved roads were in good or fair condition. However, the road condition of the feeder road network has been poor and rapidly deteriorating in the last few years. The proportion of the Primary Feeder Roads in poor condition rose from 76 percent in 2013 to 82 percent in 2015. Less than 50 km of the PFRs is paved, the rest is to earth and gravel wearing course standards.

5. This poor condition of the feeder road network has significant influence on rural connectivity. As discussed, the rural accessibility of Zambia is estimated at only 17 percent (see Figure 1). There is a significant correlation between rural accessibility and agricultural productivity. Where rural access is low, agricultural production remains suboptimal, because farmers and agro-businesses do not have good access to market. Rural accessibility is also correlated with poverty in many parts of the country. Poverty is generally high when rural access is limited. Rural access is clearly one of the necessary factors to enhance agricultural development and eradicate poverty in Zambia, and these three indicators are used together to identify the current rural accessibility gap and priority areas in the Project.

Figure 1.1 Zambia: Rural Access Index



Source: World Bank (2016).

6. Sustainability is key in rural road network management. These feeder roads, which provide last-mile connectivity to rural residents and businesses, are generally low-volume roads, carrying an average daily traffic of 20 to 50 vehicles. Essentially, these roads tend to be neglected in the current government system in the transport sector. Responsibilities are fragmented and not well coordinated among transport ministries and agencies. Allocated financial resources are insufficient regardless of the fact that these feeder roads are unpaved and therefore highly sensitive to the lack of routine maintenance. The sustainability of road maintenance is also becoming increasingly important because of climate changes. GRZ has been working on climate change risks in various areas, such as agricultural production, but the unpaved rural road network is also faced with a risk of climate change especially during the heavy rainy season.

7. One of the important instruments to ensure sustainability of road maintenance is output and performance based road contracting (OPRC), in which contractors are responsible for not only initial rehabilitation but also follow-on maintenance. Contractors are motivated to integrate and optimize all design, work and maintenance works at the lowest possible cost. OPRC is generally found cost-

effective.[13] In addition, a recent study shows that the probability of the roads being intervened was increased by introducing OPRC, which eventually resulted in increasing agricultural production in Zambia.[14]

Feeder Roads Component

8. ***Component 1 - Improvement of Feeder Roads (US$180.00 million).*** The objective of the feeder roads component is to ensure that areas identified as having the best potential for economic growth are provided with more efficient rural transport infrastructure. The existing critical access barriers are to be removed for optimum rural road connectivity. This is to be done within the context of the Government's own program to improve rural accessibility. *Component 1* will therefore support the first phase of GRZ's ten-year national OPRC Roll-out program that aims to improve the condition of the feeder roads network from the current 18 percent in good and fair condition to above 50 percent. The table below **(Table 1.1)** summarizes the entire program, and provides an indication of the expected inputs and outputs.

Table 1.1: National OPRC Roll-Out Program

			GRZ (and other) Funding				Bank Support under the				Total program		
		Yr.	Prov. Ranked No.	Km* OPRC	No. Packs	US$m	Prov. Rank.	Km* OPRC	No. Packs	US$m	Km*	No. Packs	US$m
The 10-Year OPRC Roll Out Program	Bank Support Phase	1		0	0	0	1 & 2	1,820	6	69	1820	6	61
		2	5	562	2	21	3 & 4	1,124	4	54	1686	6	69
		3	7	562	2	22	6 & 8	1,370	5	57	1932	7	73
		4	9	562	2	22					562	2	22
		5	10	562	2	22					562	2	22
		6	1 & 2	562	2	22					562	2	22
		7	3 & 4	562	2	22					562	2	22
		8	5 & 6	562	2	22					562	2	22
		9	7 & 8	562	2	22					562	2	22
		1	9&10	562	2	22					562	2	22
			Totals	**5,058**	**18**	**197**		**4,314**	**15**	**180***	**9,372**	**33**	**357**
Km* - Length is made up of both gravel and bitumen surfaced roads and maintenance													
US$180m Cost includes community infrastructure and climate resilience interventions**													

[13] Lancelot, Eric. (2010). Performance based contracts in the road sector: Towards improved efficiency in the management of maintenance and rehabilitation. Transport Papers TP-31, The World Bank Group.

[14] Iimi and Gericke. (2016). "Output- and Performance-Based Road Contracts and Agricultural Production: Evidence from Zambia."

9. GRZ's OPRC Roll-out program aims to construct and rehabilitating about 9,370 km (or 58%) of the feeder roads network at an estimated cost of US$360 million. In the initial part of the program, World Bank's support of US$180 million (US$160 million and an unallocated amount of US$20 million) will improve about 4,300 km of the road network or 30 percent of the PFRs, while the government will contribute about US$200.00 million to improve an estimated 4,800 km.

10. Rural transportation infrastructure in Zambia is poorly developed and yet there is demand for it, particularly at district level where the population density is relatively high. Zambia's state structure is unitary, with 10 provinces, 103 councils (84 districts, 15 municipalities and 4 cities) and 1,422 wards. Population densities at each administrative level significantly vary as do rural roads in accessible condition. The results of the Moving Observer Count surveys carried out by RDA between February and April 2016, show that a significant number of road links have extremely low motorized traffic counts – many have well below of 50 vehicles per day (VPD) expressed as Annual Average Daily Traffic (AADT). These comprise motorcycles, cars, vans, buses, and trucks. At the same time, non-motorized traffic (e.g. bicycles, pedestrians, and animal drawn carts) is often ten times more than the motorized traffic. Most rural communities, therefore, rely on the use of non-motorized means of transport. The trend suggests the existence of a latent demand for efficient rural transportation. One of the reasons for the unmet demand is the poor condition of the rural road infrastructure.

11. *Identification of interventions areas and roads networks* – The overarching principle guiding the identification of project candidate feeder roads was that such roads are to be located in provinces and districts with high economic development potential. In line with Government's 10-year OPRC Roll-out program (Table 1.1, above), the phasing in of the investments under Component 1 was based on rigorous criteria which entailed prioritization and ranking of provinces and districts, as elaborated in Table 1.2 below. The ranking of the provinces provided the basis for determining the order in which they would be part of the roll-out plan. This notwithstanding, a network approach was considered more advantageous than simplistic linear improvement of feeder roads. Road density in a district as well as contiguity of districts were significant considerations from the perspective of improved transport service provision.

Selection of Provinces

12. Of the ten provinces in Zambia, Lusaka and Copperbelt provinces are most populated, while agricultural production is generally more concentrated in Central, Eastern, and Southern provinces. Poverty is high in Eastern, Western and Luapula provinces. Given the Project objectives, four variables: (i) poverty headcount[15]; (ii) total value of major crops produced in each province[16]; (iii) agribusiness per population; and (iv) Rural Access Index[17], were used to prioritize the provinces. The value of current agricultural production is used as a proxy to general agricultural potential. The Government

[15] Central Statistics Office, Zambia. (2016). Zambia 2015 Living Conditions Monitoring Survey: Key Finding.
[16] Maize, tobacco, groundnuts, wheat, cotton seeds, soybeans and sweet potatoes are considered, of which data come from Agricultural Statistics by the Central Statistics Office, Zambia. To aggregate different crops, producer prices from FAOSTAT are used.
[17] World Bank. (2016). "Measuring Rural Access: Using new technologies."

also aims at diversification and modernization of agricultural production. To incorporate this aspect, the number of agribusinesses (which are more associated with market-oriented crops than locally consumed food crops) was used[18]. The significance and importance of the four variables in the analysis, i.e. poverty, agricultural potential, agribusiness, and accessibility, was weighted as 40, 30, 20 and 10 percent respectively. The results are summarized in Table 1.2 below.

Table 1.2. Prioritization of Provinces

		Weight:	**0.4**	**0.3**	**0.2**	**0.1**		
Province	**Land area**	**Population**	**Poverty head-count (%)**	**Agriculture production value ($ mil)**	**No. of agro-businesses**	**RAI (%)**	**Weighted score**	**Ranking**
Central	94,330	1,274,227	56.2	92.5	141	12.4	0.718	1
Eastern	50,432	1,611,435	70	42.3	235	23.8	0.653	2
Northern	75,465	1,121,506	79.7	37.0	86	17.5	0.598	3
Luapula	44,675	962,187	81.1	15.2	87	16.7	0.540	4
Western	127,074	884,403	82.2	2.9	71	10.6	0.530	5
Southern	82,971	1,612,081	57.6	35.5	175	20.6	0.514	6
North-Muchinga	124,171	708,735	66.4	18.3	91	8.5	0.513	7
Copperbelt	85,889	745,462	69.3	23.9	25	15.8	0.440	8
Lusaka	31,345	1,964,982	30.8	40.1	175	14.8	0.395	9
	22,002	2,203,779	20.2	21.8	230	22.4	0.267	10

Source: Detail Economic analysis of the Project (project file)

Selection of Districts

13. Within each of the high priority provinces, priority districts are selected based on three criteria: (i) poverty headcount;[19] (ii) total value of major crops produced in each district; and (iii) Rural Access Index.[20] The three variables are weighted at 50, 30 and 20 percent, respectively. Given the constraints of available resources, the project will support two to eight districts in each selected province, with clustering of roads and existing or past road projects taken into account. Scattered road works are considered less effective in the effort to realize the expected impacts. The results of the analysis in the six priority provinces of the project are the districts summarized in **Table 1.3** below.

[18] Ministry of Commerce, Trade and Industry. (2014). Manufacturing Sector Survey Report: 2011-12.
[19] Since the 2015 poverty figures have not been available at the district level, the 2010 data are used, which are available in World Bank. (2015). "Mapping Subnational Poverty in Zambia."
[20] World Bank. (2016). "Measuring Rural Access: Using new technologies."

Table 1.3. Selection of Districts

			Weight:	0.5	0.3	0.2		
Province	District	Land area	Population	Poverty headcount	Agriculture production value ($ mil)	RAI (%)	Weighted score	District Ranking in the province
Central	Mkushi	17,579	152,285	0.71	36.78	15.2	0.892	1
Eastern	Petauke/	10,932	338,885	0.82	9.19	14.3	0.825	2
Northern	Mbala	7,451	213,875	0.82	12.15	14.1	0.897	1
Northern	Mungwi	9,946	144,992	0.86	6.79	11.5	0.833	2
Luapula	Kawambwa	9,068	131,114	0.82	4.86	13.9	0.784	2
Southern	Kalomo	12,071	255,089	0.75	11.01	13.7	0.909	1
Southern	Choma	7,013	244,963	0.72	9.22	29.7	0.763	2
Muchinga	Chinsali/	15,438	148,329	0.85	5.68	15.4	0.690	2
Muchinga	Mpika	39,305	212,072	0.74	7.39	8.8	0.541	3

Source: Detail Economic analysis of the Project (for detail see Annex 4)

Selection of feeder roads

14. To select priority feeder roads within each target district, *multi-criteria analysis* is to be applied. All Primary Feeder Roads will be ranked, taking the following aspects into account: (i) the number of beneficiaries; (ii) agricultural production along the road; (iii) social benefits from improved connectivity; (iv) improved connectivity to the main network (Trunk, District and Main Roads), and (v) investment efficiency.

15. More work is ongoing to establish the acceptability of the roads based on network configuration, appropriateness of each road link, alignment, and the choice of technical interventions. Each of the World Bank supported provinces will have two to three OPRC packages, the actual number of packages depending on the total length of candidate roads in each province. A typical package would comprise about 287 km of roads at an estimated average cost of US$12 million. Preliminary indications are that, on account of low vehicular traffic volumes, a few (less than 5 percent) of the feeder roads would require sealing to bitumen standards. A package will therefore include: (i) a list of roads (forming the bulk of the component) to be rehabilitated to gravel wearing course standards; (ii) roads (albeit few) for upgrading to paved bituminous wearing course standards; (iii) roads to be maintained only; and (iv) a set of community infrastructure in support of agriculture and related activities along some of the roads[21]. The size and cost of the packages comprising (about 287 km at a cost of about US$12 million) would facilitate participation of medium sized firms and thus improve competition. Also to be included in this component are climate resilience adaptation measures

[21] The unit costs used for planning purposes are: US$40,000 per km of rehabilitated gravel road, US$2,000 per km per year for maintenance of gravel roads, US$486,000 per km of a bitumen sealed road, and US$1,500 per km per year for maintenance of bitumen-sealed roads.

identified through the ongoing studies. e approach has the potential to push the unit prices down, besides easing road construction and maintenance logistics.

16. The use of additional non-road infrastructure where appropriate in support of community level agricultural and related amenities such as post-harvest storage facilities, processing space, and market stalls is a key aspect of enhancing benefits of the Project. These interventions are expected to spur parallel developments including new rural businesses, which can in turn create new jobs in the local communities. The specifics interventions are to be identified and their design decided upon after stakeholder consultations. This aspect of the investments will be incorporated as part of the contract documentation for feeder roads.

The Institutional Capacity Challenge

17. The current institutional structure for road maintenance is fragmented and weak. By law, RDA is responsible to manage and maintain the national road network, including primary feeder roads (PFRs). The lower level of feeder and community roads are managed by the Local Road Authorities under the coordination by the MLG. At the national level, the Maintenance Department of RDA, which is comprised of one director, two senior managers and nine engineers and technicians, is responsible for supervising maintenance works in collaboration with the RDA Regional Offices. The Regional Offices directly report to the Maintenance Department. Human resources are limited at both headquarter and regional offices. Each province has one Regional Office, in which only six persons (one regional engineer, two civil engineers and three technicians) are normally working to implement road maintenance works in the province.

18. The internal process in RDA may need to be improved further for more integrated planning and strategic budgeting. Every year, the Planning and Design Department prepares an annual maintenance work plan in consultation with the Maintenance Department. However, available resources are normally below the budget requested, and there is no systematic decision process about how to allocate approved resources. NRFA does not have any influence on the Government's decision, and neither does the Maintenance Department. To ensure sustainability of road maintenance financing, a clearer allocation mechanism may need to be established at the policy level.

19. There is no clear budget mechanism for road maintenance at the local level, either. RDA is collaborating with the LRAs for road maintenance under the coordination by MLG. District Council normally have an infrastructure department composed of a few engineers and technicians for water supply and local roads. Again, the implementation capacity is limited. LRAs prepare their annual work plans and submit them to RDA. RDA simply compiles them and submit to the MHID as part of a single transport sector annual plan. Again, available financial resources for local road maintenance chronically run short. A systematic resource allocation mechanism needs to be established.

20. MHID was recently established, to *inter alia* take up the road infrastructure function at policy level. The function was previously performed by the MoWs. It is possible that during the project

implementation, some reorganization might still be taking place. Policy formulation and implementation weaknesses exhibited by the predecessor ministry will still be a concern. On roads infrastructure specifically, MHID does not have a sound oversight mechanism to enable it guide or monitor the effectiveness of RDA.

21. RTSA's role as the lead road safety agency requires strengthening. Although Zambia's rate of road accidents and fatalities per 100,000 population and per 10,000 vehicles shows stability, road accidents in absolute figures show an increase. Zambia still requires support to also stabilise road accidents in absolute figures. Most of the crashes occur along the urban and inter-urban roads. According to the **Table 1.4.,** below, annual road accident related deaths were 2,206 in 2016, reflecting an annual average increase of about 6.4 percent since 2011 when the recorded road accident deaths were 1,670.

Table 1.4. Road Safety in Zambia between 2011 and 2016

Year	No. of Registered Motor Vehicles	Zambia Population	No. of Accidents	No. of Fatalities	No. of Accidents per 10,000 Vehicles	No. of accidents per 100,000 population	No. of fatalities per 10,000 vehicles	No. of fatalities per 100,000 population
2011	381,948	13,800,000	22,570	1,670	591	164	44	12
2012	452,574	14,300,000	28,247	2,360	624	198	52	17
2013	534,532	14,800,000	29,118	1,851	545	197	35	13
2014	605,635	15,200,000	32,392	1,858	535	213	31	12
2015	663,529	15,500,000	33,672	2,113	507	217	32	14
2016	696,474	16,040,000	32,350	2,206	464	202	31.7	13.8

Source: Road data records 2017, RTSA

22. The institutional responsibilities in the roads sector, and the key challenges of the stakeholder institutions are summarized in Table 1.5 below.

Table 1.5. Key Transport Sector Ministries and Agencies

Institution	Road Related Responsibilities	Challenges and weaknesses
MTC	Transport sector policy, planning and coordination in the roads sector	Policy, planning, coordination and monitoring capacity
MHID	Formulation and implementation of road development policies and to administer RDA	Relatively new (created in 2016). Coordination and monitoring capacity
MLG	Carries out RDA's delegated functions through Local Road Authorities (LRAs)	Coordination and implementation capacity
RDA	Manage and maintain the classified road network, and implement road works	Strategic planning, road management systems. Weak institutional capacity for road maintenance
NRFA	Manage road revenues and expenditures	Strategic planning, road funding impact and efficiency monitoring.
RTSA	Implement road safety policies	Policy and strategic approach to road safety and inadequate human resources at mid management level. Inadequate capacity in traffic management
NCC	Technical and institutional regulator to the construction industry	Inadequate funding

The Institutional Capacity Component

23. ***Component 2: Institutional Strengthening in the Roads Sector (US$20.00 million)*** will focus on capacitating the sector institutions in two thematic areas: Subcomponent 2.1 will support coordination and implementation of the project, while Subcomponent 2.2 will aim at strategic institutional enhancements in the roads sector. The support under Component 2 will benefit the following government ministries and agencies. The three ministries are: MHID; MTC; and MLG, and the four agencies are: RDA; NRFA; NCC; and RTSA. Table 1.6 below, summarized the financing for Component 2 and its subcomponents.

Table 1.6: Summary of Component 2 costs

		Beneficiaries							
SUB-COMPONENT	Activity	**MHID**	**MTC**	**MLG**	**NRFA**	**RDA**	**RTSA**	**NCC**	**Totals**
2.1: Project Coordination and Implement.	**A. Project Coordination**	**400**	**0**	**300**	**0**	**0**	**0**	**0**	**700**
	1. Equipment and materials (MHID, MLG)	200		100					300
	2. Operational cost (MHID, MLG)	200		200					400
	B. Implementation	**0**	**0**	**500**	**400**	**12,200**	**200**	**300**	**13,600**
	1. OPRC Feasibility, design and docs (RDA)					2,700			2,700
	2. ESMF and RPF (RDA)					200			200
	3. ESIA and RAPs (RDA)					300			300
	4. Resettlement actions (RDA)					3,000			3,000
	5. Supervision services for roads (RDA)					5,000			5,000
	6. Road safety audit (RTSA)						200		200
	7. Procurement audit (NRFA)				100				100
	8. Technical and financial audits (NRFA)				300				300
	9. Equipment and materials (MLG, NCC)			500				100	600
	10. Operational cost (RDA, NCC)					1,000		200	1,200
2.2 Strategic Instituional enhancements	**A. Strategic Technical Services**	**450**	**900**	**0**	**450**	**500**	**300**	**500**	**3,100**
	1. Agency Perfromance Framework (MHID)	300							300
	2. M&E system (MHID)	100							100
	3. Adoption of Labour Based Policy	50							50
	4. Implement transport policy (MTC)		600						600
	5. Institutional mandates study (MTC)		300						300
	6. Public Expend. Review (PER) (NRFA)				300				300
	7. Update Fin. Manag. System (NRFA)				150				150
	8. Rural Roads Maintenance Strategy (RDA)					300			300
	9. Highway Manag. System upgrade (RDA)					200			200
	10. Road safety awareness creation (RTSA)						300		300
	11. Labor-based pol. implement by NCC							500	500
	B. Startegic Physical Support	**100**	**0**	**1,700**	**0**	**0**	**0**	**300**	**2,100**
	1. Moble Laboratory (MLG)			200					200
	2. M&E equipment (MHID)	100							100
	3. Equipment for roads units (MLG)			1,500					1,500
	4. Matials testing lab (NCC)							300	300
	C. HR Development	**500**	**0**	**0**	**0**	**0**	**0**	**0**	**500**
		1,450	**900**	**2,500**	**850**	**12,700**	**500**	**1,100**	**20,000**

24. ***Sub-component 2.1: Project Coordination and Implementation: (US$14.3 million):*** This subcomponent will reinforce the project coordination function, and support project implementation roles of the entities concerned. *The coordination support (US$0.7 million)* will enable the ministry responsible for road infrastructure (MHID in this instance) to proactively and effectively coordinate and manage the project implementation in its entirety, including performance of all role players, adherence to the project implementation schedule, monitoring and evaluation, management of the utilization of the pooled human resource development budget, and quality assurance on all outputs. The costs will include establishment and running of a project coordination office. Similarly, the MLG will be supported to effectively coordinate the activities of the LRAs as part of the sub-component.

25. *Implementation support* (US$13.6 million). This will provide for engineering services, environmental and resettlement actions, other non-strategic technical studies and outputs, and incremental cost of supervising activities. Engineering services will include: preparation of feasibility studies, engineering designs, bidding documents, and supervision of civil works and are to be

executed by RDA. Other technical studies related to compliance will include: road safety audit, technical audits, financial audits, procurement audits and safeguard documents which will be the responsibility of NRFA. *Implementation support* will cover incremental costs of supervising the project, including equipment (vehicles, office furniture, computers and software) and operating costs for entities. *Implementation support* will also cover investment costs for equipment and materials for MLG and NCC. Support to NCC will include enabling it to conduct inspections and to prepare reports to the World Bank supervision teams, on Safeguards, with particular emphasis on Social Safeguards and the application of the GRM.

26. ***Sub-component 2.2: Strategic Institutional Capacity Enhancements (US$5.7 million).*** This Sub-component will include technical services, physical works, goods and materials for the purpose of institutional strategic capacity enhancements within the sector, including human resources development. The *strategic technical services* will be linked to the PDO i.e. their impact on the institutional road sector capacity will have to be significant and long term.

27. The list of strategic activities to be delivered through technical services under the sub-component are:

(a) **Development of an Agency Performance Framework and an M&E system** (US$0.2 million). The MHID, created in September 2016, is responsible not only for road infrastructure coordination but also for entering into performance agreements with the road sector institutions and monitoring their respective performance. The costs associated with developing an agency performance framework will enable the Ministry to enter performance agreements with its road sector institutions; while the development of an M&E system will enable the Ministry to better monitor the performance of its road sector institutions, and guide policy development.

(b) **Implementation of Transport Policy** (US$0.6 million). The MTC will manage the adoption and implementation of the transport policy. The Project cost will support the recruitment of a Technical Assistant to assist the ministry to focus on the realization of the pre-identified aspects of the transport policy. In particular, from the sustainable point of view, the assignment will entail Technical Assistance located within the MTC and would focus on funding of rural roads.

(c) **Review of NRFA's institutional mandate** (US$0.5 million). The NRFA's core function is to manage and administer the road fund in Zambia. Under the Project, because of its past performance, NRFA is assigned to handle compliance reporting of financial audits, procurement audits, technical audits and other reporting. Related to its core function however, there is a need to reassess its mandate with the objective of improving its efficiency and effectiveness in road funding. The associated cost will clarify and improve NRFA's institutional mandate.

(d) **Rural Roads Maintenance Strategy to augment the National Road Maintenance Strategy** (US$0.3 million)**.** In principle, the importance of road maintenance is well understood in Zambia. RDA, the road agency legally responsible for the entire Zambian road network has adopted a National Road

Maintenance Strategy covering routine, periodic and emergency maintenances for the national roads for a period 2015 to 2024. As the Government of Zambia is embarking on construction and rehabilitation of primary feeder roads there is a need to augment the National Maintenance Strategy. The cost is to cover the development of Rural Road Maintenance Strategy to augment the National Road Maintenance Strategy.

(e) **Institutionalization of the Policy on Labor-based Technology and Training** (US$0.5 million). National Construction Council is established to promote and build the capacity of the construction industry in Zambia. The Project will support NCC to manage activities leading to better institutionalize the labor based policy as well as improve aspects of the skill development of its training school.

28. Physical institutional capacity enhancements will include:

(a) **Mobile Laboratory Equipment to Enhance Capacity for Quality Control** (US$0.2 million). MLG as part of its core function of coordinating the work of Local Road Authorities is critical in selected priority project areas. The Project will support MLG to procure equipment and materials for the participating LRAs.

(b) **Hardware and Software for M&E System** (US$0.3 million). MHID/MLG is assigned a core role in the Project implementation and monitoring. More specifically, its role will include monitoring of the performance of stakeholder institutions in project. It will also include ensuring that the parties adhere to the project implementation schedule, project M&E, and management of the human resource development budget. To these ends, the Project will support the procurement of hardware and software for M&E systems to enable monitor the project and also for the roads sector.

(c) **Materials Testing Laboratory** (US$1.5 million). NCC, besides institutionalizing the policy on labor based technology and training, also has the Business Plan to achieve its mandate. The business plan includes the establishment of a materials testing laboratory. The project will support the procurement of the material testing laboratory.

29. ***Human Resources Development*** (US$0.7 million). This activity will entail efforts to close the technical skill gaps through training of technical staff in specified areas. These areas were identified as: project management, contract management, PPP initiatives; M&E; management of social and environmental safeguards; procurement; appropriate technology, road safety and climate resilience in the roads sector. The costs will be in form of training.

30. ***Component 3. Contingent Emergency Response (Total cost US$0.0 million).*** This is a zero budget component which is included to facilitate the use of IDA funds in the event of a disaster and the Government's request to reallocate some funding from existing World Bank projects to provide emergency relief.

31. The summary of project costs is as shown below:

Table 1.7: Project Cost Summary

Project Budget	Amount	Percentage of Total
Total Project Amount	**200.00**	**100.0**
Component 1: Improvement of Feeder Roads	**180.00**	**90.0**
Rehabilitation and maintenance of gravel roads	*125.00*	*62.5*
Upgrading and maintenance of bitumen sealed roads	*20.00*	*10.0*
Community infrastructure	*5.00*	*2.5*
Climate resilience	*10.00*	*5.0*
Unallocated	*20.00*	*10.0*
Component 2: Institutional Strengthening	**20.00**	**10.0**
Sub-Component 2.1 Coordination and Implementation Support	14.30	7.1
Project coordination	*0.70*	*0.4*
Implementation Support	*13.60*	*6.8*
Sub-Component 2.2 Strategic Capacity Enhancement	5.70	2.9
Technical Services	*2.90*	*1.3*
Physical institutional support	*2.10*	*1.2*
Human resources development	*0.70*	*0.5*
Component 3: Contingency Emergency Response	**0.00**	**0.0**

ANNEX 2: IMPLEMENTATION ARRANGEMENTS

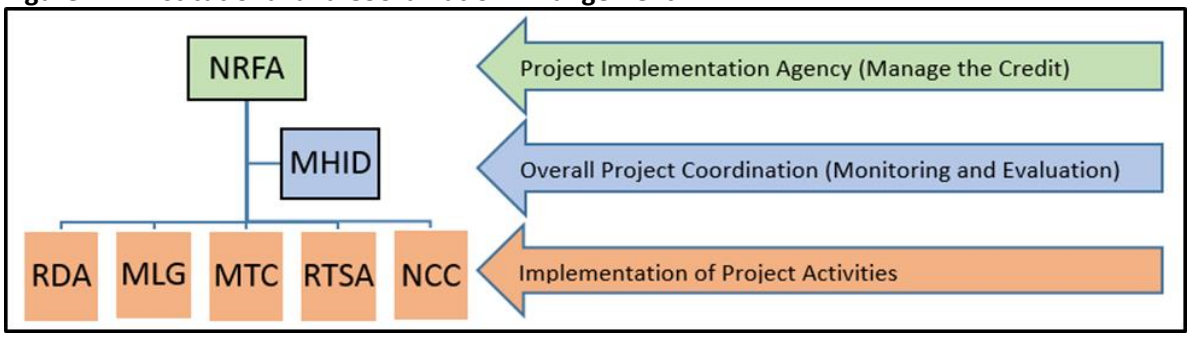
REPUBLIC OF ZAMBIA
Zambia: Improved Rural Connectivity Project-SUF

Project Institutional and Implementation Arrangements

1. NRFA will be the primary implementing entity for this project. It will manage the credit on behalf of GRZ. NRFA has good experience in handling the financial aspects of World Bank funded projects. Its function will include oversight, monitoring, and reporting on the utilization of the entire credit. It will also coordinate the procurement function. However, the nature of project outputs requires the inputs of a multiplicity of stakeholders in the implementation. Hence, the involvement of a number of stakeholders. These include: MHID, NRFA, RDA, MLG, LRA, MTC, RTSA and the NCC. Since there are no plans to create PIUs under each entity, every beneficiary ministry and agency will perform activities that pertain to its specialization.

2. **Figure 2.1** below shows the summarized version of the institutional and coordination arrangements.

Figure 2.1: Institutional and Coordination Arrangement



3. The MHID will be responsible for entire project coordination. It will create a project coordination unit to facilitate efficient and effective delivery of its function.

4. RDA will lead the project implementation process for component 1 and will create a Project Management Unit (PMU). RDA will be responsible for planning, technical soundness of the interventions, procurement of works contracts, and oversight of all the road related operations. The functions of the PMU will include: (a) support to project preparation and the development of detailed project design; (b) budgeting and costing of road packages; (c) monitoring and reporting on project progress in line with specified designs; (d) procurement tasks; and (e) procurement and supervision of consultants and contractors, to be engaged for implementation of activities initiated by LRAs.

5. MLG will be responsible for the coordination of LRAs and will also undertake some procurement functions because the Government Gazette No. 547 of 2004 mandated MLG to oversee the implementation of delegated functions and responsibilities by the local authorities by managing the social, economic and political spheres of governance to ensure delivery of quality services.

6. The LRAs will participate in the preparation of project packages and implementation of activities as part of keeping abreast on the road improvement and maintenance works in their districts. They will prepare separate reports to MLG on the progress of the work in their districts and also certify the adherence of the contractor to the agreed road service level. They will also have relatively minor procurement functions due to the limitations already prescribed by government procedures.

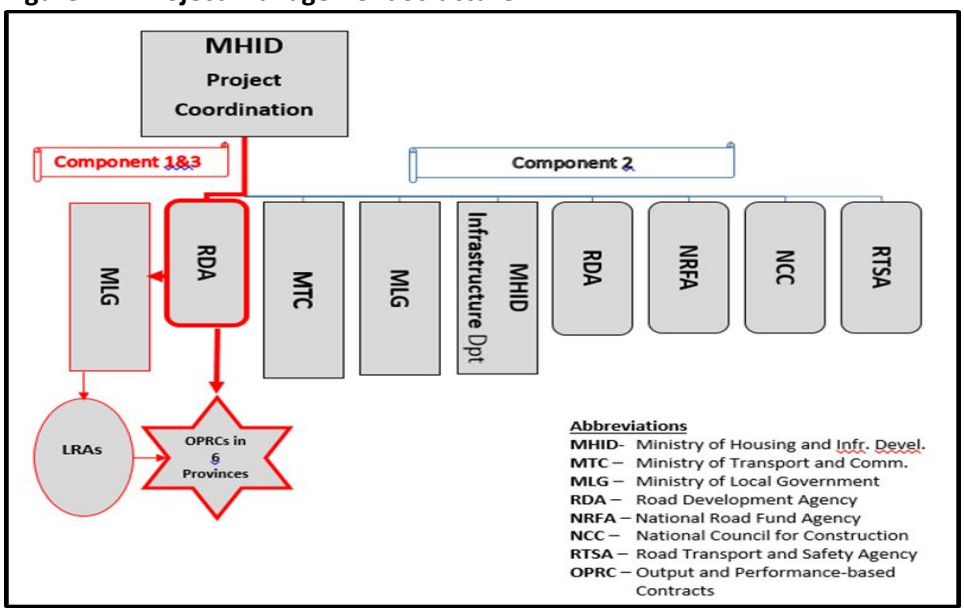
7. MTC will be responsible for the adoption and implementation of the transport policy in line with its mandate to formulate and administer policies in the ICTs, ground and air transportation, and the meteorological sectors in order to enhance sustainable socio-economic development.

8. The NCC will be responsible for labor policy implementation and skills development in line with its main function of promoting the development, training and regulation of the construction industry in Zambia. NCC is also charged with the responsibility of registering of contractors, affiliation of professional bodies or organizations whose members are engaged in activities related to the construction industry.

9. The RTSA will be responsible for the implementation of road safety activities that include awareness and audits. RTSA was established through an Act of Parliament, the Road Traffic Act No. 11 of 2002. RTSA's mission is to promote road transport and safety through education, regulation and law enforcement. The purpose of the RTSA is to contribute to national economic development through the implementation of government policy on road transport, traffic management and road safety.

10. Figure 2.2 below depicts the coordination arrangement that is considered appropriate for the implementation of the project.

Figure 2.2: Project Management Structure



11. **Table 2.1** below summarizes the responsibilities of each stakeholder.

Table 2.1. Project Stakeholder Responsibilities

Organization	Responsibilities
NRFA	1. Manage the project credit on behalf of government including preparation of financial audits procurement plans, financial, and progress reports. 2. Upgrade its financial reporting system, including a review of the possibility of linking its Sun System to governments Integrated Financial Management Information System (IFMIS) 3. Manage the Public Expenditure Review (PER) study for the roads sector.
MHID	1. Overall project coordination. 2. Perform the M&E function. 3. Administer the utilization of the human resource development budget 4. Manage the preparation and application of an agency performance framework. 5. Manage the adoption and implementation of NCC's labor-based employment creation policy.
RDA	1. Lead in the implementation of Component 1 (and Component 3 if triggered) including the planning, design, procurement, contract management, construction and maintenance, monitoring and quality assurance, and day to day management of civil works contracts. 2. Manage the preparation of a rural roads maintenance strategy. 3. Manage and review its road management system.

MTC	1. Manage the adoption and implementation of the transport sector policy. 2. Manage the preparation of a study to review the institutional mandates of the road sector institutions.
MLG and LRAs	MLG 1. Coordinate the work of the LRA where the project is active. 2. Manage the procurement of equipment and materials for LRA's. 3. Mange the procurement of equipment and materials for capacity building within roads directorate in the ministry. LRAs 4. Assist RDA's contract supervision teams in the districts. 5. Prepare separate reports to MLG on the progress of the work. 6. Certify certain areas of the maintenance phase of OPRC.
RTSA	1. Carry out safety audit of selected roads in each province. 2. Audit OPRC conceptual designs. 3. Perform awareness creation campaigns. 4. Review of the agency's strategy on rural road safety.
NCC	1. Manage the construction of NCC's materials testing laboratory for the training school. 2. Oversee implementation of social and environmental safeguards with particular focus on labor influx, without usurping RDA's roles. 3. Implement the labor-based employment creation policy.

Financial Management

12. The World Bank FM team conducted FM assessment of National Roads Funds Agency (NRFA) which will be implementing the Improving Rural Connectivity Project by updating the assessment that was carried out in January 2012. The objective of the FM assessments was to determine whether the FM arrangements: (i) are capable of correctly and completely recording all transactions and balances relating to the project; (ii) will facilitate the preparation of regular, accurate, reliable and timely financial statements; (iii) will safeguard the project's entity assets; and (iv) will be subjected to auditing arrangements acceptable to the World Bank. The assessment complied with the Financial Management Manual for World Bank-Financed Investment Operations that became effective on March 1, 2010, as well as with the Financial Management Assessment and Risk Rating Principles.

13. The main strengths are that: (i) NRFA has been running two World Bank-funded projects that were successfully completed and no major capacity weaknesses were identified; (ii) NRFA has qualified accounting personnel with wide experience in implementing World Bank-funded projects; and (iii) NRFA is an autonomous organization.

14. The conclusion of the assessment is that the FM arrangements in place meet the World Bank's minimum requirements under OP/BP10.00, and therefore are adequate to provide, with reasonable

assurance, accurate and timely information on the status of the project required by the World Bank. The overall FM residual risk rating of the project is Moderate. FM supervision will be conducted based on the risk rating of NRFA. Two on-site supervisions per year will be carried out. Other forms of supervision will include desks reviews of IFRs and audit reports.

Budgeting

15. Budget preparation and monitoring will follow NRFA procedures. NRFA will prepare Annual Work Plans, which will be the basis for budget preparation. The Government's current budget preparation process will be followed.

Accounting

16. NRFA uses Sun system 5 and the project will use this package as it is adequate.

Internal Controls and Internal Audit

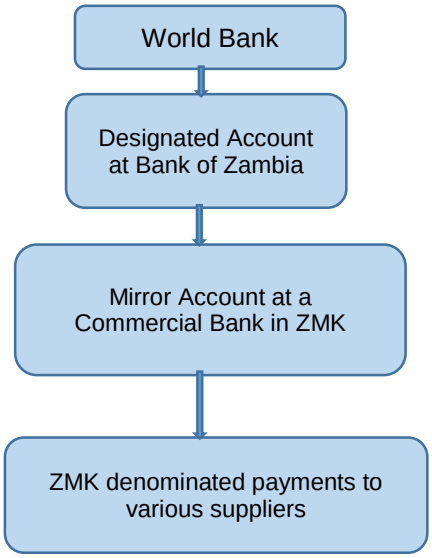
17. ***Staffing.*** NRFA has a Finance Directorate called Fund Management headed by a Director – Fund Management and deputized by three (3) Managers Finance in charge of Cooperating Partners, Roads Fund and Administration respectively. These Managers Finance are also assisted by three (3) Assistant accountants who are also deputized by three (3) Accounts Assistants. Therefore, these staffing levels are adequate, and therefore, NRFA will use this structure and will not recruit any staff. An Assistant Accountant, reporting to the Manager Finance (Cooperating Partners), and assisted by an Accounts Assistant, will be responsible for the Projects' financial management. The Assistant Accountant has experience in managing donor and IDA projects and is therefore familiar with the fiduciary requirements required by the World Bank and its Cooperating Partners.

18. ***Internal Controls.*** NRFA is serviced by the Internal Audit Unit with positions filled and all staff have experience in World Bank-financed projects. NRFA will also apply the procedures as stipulated in their financial manuals, updated in 2016 and these manuals are adequate.

Funds flow and reporting arrangements

19. ***Funds flow:*** The Project will use a system under which funds will flow from the World Bank to a Designated Account (DA) or a Holding Account, denominated in United States Dollars at Bank of Zambia (BOZ), to be operated by the project. The flow of funds is depicted below.

Figure 2.3: Flow of Funds



20. ***Financial reporting arrangements:*** The Project will submit quarterly IFRs, in a format agreed with the World Bank, within 45 days of the end of each calendar quarter reported on. These quarterly reports will include: (i) statement of sources and uses of funds, and (ii) detailed statement of uses of funds by project activity/component. The Project will also prepare annual accounts within three months after the end of the financial year in accordance with accounting standards acceptable to the World Bank. The Project will be responsible for ensuring the reports are audited and submitted to the World Bank within six months after the end of the financial year.

21. ***Auditing arrangements:*** The project audits will be audited by the Office of the Auditor General (OAG), who is the Supreme Audit Institution in Zambia, who may contract acceptable private audit firms to the World Bank to conduct the project audits on their behalf. All audits should be carried out in accordance with International Standards on Auditing. All Terms of References for audits of the implementing entities were agreed upon at negotiations. The audit report together with the management letter should be submitted to the World Bank within six months after effectiveness. The audit report will be publically disclosed by the World Bank in accordance with the World Bank disclosure policy.

Implementation Support Plan

22. Financial Management implementation support missions will be carried out twice a year based on the substantial FM residual risk rating. Implementation Support will also include desk reviews such as the review of the IFRs and audit reports. In-depth reviews and forensic reviews may be done where deemed necessary. The FM implementation support will be an integrated part of the project's implementation reviews.

Conclusion

23. The conclusion of the assessment is that the financial management arrangements in place meet the World Bank's minimum requirements under OP/BP10.00, and therefore are adequate to provide, with reasonable assurance, accurate and timely information on the status of the Project required by World Bank. The overall Financial Management residual risk rating is low.

Disbursements

Table 2.2 :Disbursement Table

Category	Amount of the Credit Allocated expressed in Dollars	Percentage of Expenditures to be Financed (inclusive Taxes)
(1) Goods, non-consulting services, consulting services, Operating Costs and Training for the Project	34,400,000	100%
(2) Works for Participating Provinces (i), (ii), (iii) and (iv)	113,640,000	100%
(3) Works for Participating Provinces (v) and (vi)	48,460,000	100%
(4) Refund of Preparation Advance	3,000,000	Amount payable pursuant to Section 2.07 (a) of the General Conditions
(5) Front-end Fee	500,000	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 3.01 (a) of the General Conditions
(6) Emergency Expenditure under Part 3 of the Project	0	
TOTAL AMOUNT	**200,000,000**	

24. The project will use the report-based disbursement method. This procedure is flexible and allows the project to move away from time-consuming transaction-based method to quarterly advances to the Designated Account (DA) on IFRs. The initial advance to the DA will be made based on a 6-month cash flow forecast. Subsequent Withdrawal Applications (WAs) will be completed by NRFA for further advances to the DA on a quarterly basis based on six months cash forecasts reduced by the actual cash in the DA at that particular time. The following documentation should accompany the IFRs to justify expenditures for each quarter: (i) DA activity statement supported by copy/copies

of bank statements; (ii) Summary statement of expenditure for contracts above the prior review threshold; (iii) Summary statement of expenditure for contracts below the prior review threshold. Other methods of disbursing to the project will include reimbursements, direct payment, and use of special commitments (e.g., letters of credit); and (iv) Further disbursement details are provided in the disbursement letter. The possibility of retroactive financing disbursements will be considered for project activities so long as the appropriate World Bank procurement and financial processes and documentation are adhered to.

Procurement

25. The applicable World Bank Procurement Procedures and Guidelines[22] (including updates and revisions) will apply. A Procurement Risk Assessment System (PRAMS) of the Implementing agencies was undertaken in January 2017 in accordance with the World Bank's Procurement Risk Management System. Generally the Procurement Risk for the various Implementation Agencies was assessed as Moderate. As the implementation agencies continue to address the identified risk mitigation actions, the procurement risk would be reduced to Low Risk.

26. **Procurement Manual and Procurement Plan.** The procurement arrangements to be used under the project, including packaging of procurement, maintaining clarity of accountability over procurement, record keeping, and frequency and scope of prior and post review will be elaborated in the procurement module of the PIMs ("the procurement manual") for the various implementing agencies or one collective manual prepared by the NRFA. This may be an independent standalone document or part of the Project Implementation Manual (PIM). Further information will be provided in the procurement plans. The Procurement Manual will address the needs of the various implementation agencies including the RDA, NRFA, NCC, MLG, MTC, MHID, and RTSA. The Manual will outline the identified risks and provide risk mitigation actions. The manual may take the form of existing PIM under NRFA or any of the specific implementing agencies that have been used in the past, but will be updated to suit the new project and its implementation arrangements. The Manual should as a minimum, cover the project implementation arrangements and coordination, reporting arrangements, legal and regulatory framework, roles and responsibilities of the institutions and staff involved in procurement, internal and external controls and quality assurance checks or systems, approval systems and accountability, and contracts register. It will also spell out the roles and responsibilities of various players in contract management, based on both government regulations and as required for prior review of IDA contracts.

[22] World Bank's Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants, and World Bank's Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers. The Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", dated October 15, 2006 and revised in January 2011 and as of July 1, 2016 will apply.

27. **Procurement decentralization.** Procurement decentralization affects since January 1, 2013, all procuring entities. This means that the Zambia Public Procurement Agency (ZPPA) has not been involved in reviewing bidding documents and bid evaluation and review and approval or not, of contract award recommendations. All procurement activities will be carried out internally by the implementing ministries and agencies using their own institutional arrangements, controls and quality checks. Since January 2013, the ZPPA has been transformed into a regulatory and oversight body for public procurement in Zambia.

28. **Procurement risk mitigation measures.** Based on the PRAMS, the main risks and proposed risk mitigation measures are shown in table below.

Table 2.3: Summary of Procurement Assessment of Capacity, Risk, and Mitigation - Action Plan for implementing ministries and agencies.

Risks	Mitigation Measures	Action by	By When
Procurement manual: Existing manuals will require to be updated to be useful for guidance under the project. NRFA will coordinate the effort of the updates, and will do so on a regular basis as required based on the provisions of the Financing Agreement and the applicable procurement and consultants guidelines.	Ensure the procurement decision making is fully covered in the Manual of the Agency(cies) and is widely disseminated .	NRFA and all implementing agencies.	July 2017
Evaluations and awards of contracts: Reports do not always contain all essential information necessary for approvals, including adequate justification for decisions taken during evaluation such as rejection of bids. Wrong award decision may be made because of inadequate information, and due diligence is not routinely carried out.	Quality of evaluations and awards of contracts requires enhancing. Staff to be trained in good evaluation practices which base decisions on pre-disclosed criteria and includes due diligence verifications of bidders recommended for award of contract.	NRFA and all implementing agencies.	Starting from project effective ness.
Inadequate participation by technical experts in bid preparation and evaluation leading to potential / inadequate bidding process, contract awards and implementation delays	Improve procurement implementation capacity by acquiring and assigning the necessary procurement expertise. Involve technical staff and users in preparation of specifications or agree to	NRFA and all implementing agencies	Starting from project effective ness

Risks	Mitigation Measures	Action by	By When
	hire competent consultants to draft technical specifications and terms of reference and during evaluation of bids and proposals.		
Procurement staff capacity may be inadequate due to increased work load that will result from the implementation of, and inadequate capacity in use of OPRC procurement and contracting.	Improve procurement implementation capacity by acquiring the necessary procurement expertise Assign or recruit procurement officer in the implementing agencies. Get minimum exposure to procurement requirements under World Bank funded projects; conduct training for contractors, consultants and relevant client staff on OPRC contracts.	RDA and all implementing agencies.	Within the first six (6) months of project implementation and throughout the life of the project.

29. **Procurement Post Reviews (PPRs) and Independent Post Reviews (IPRs) by the World Bank.** Based on the assessed agency implementation risk for procurement, which is Moderate, the World Bank will carry out PPRs or IPRs for all contracts that will be based on the procurement plan not having been subject of prior review by the World Bank using a sample of 10 percent. Based on continuing assessment of risk and the success of risk mitigation measures implemented, the sample size will be reduced as risk mitigation measures are successfully implemented.23 The review thresholds are shown in the table below.

[23] High Risk projects focus on a sample size of 20 percent; Substantial risk, a sample size of 15 percent, Moderate risk 10 percent, and Low risk 5 percent. Changes in risk levels will be communicated to the MOF, MNDP and all implementing agencies as outcomes of the PPR / IPR exercise, which also result in the revisions of the prior review and National Competitive Bidding thresholds.

Table 2.4: Prior Review and Procurement Method Thresholds[24]

Expenditure Category	Procurement Method	Contract Value Threshold for Use of Method (US$)	Contracts Subject to Prior Review (US$)
Works	ICB(Works/Supply and Installation)	>= 15,000,000	All contracts
	NCB	>= 300,000 - < 15,000,000	None
	Force Account	All values	All contracts
	Shopping	< 300,000	None
	Direct Contracting	All values	All contracts
Goods	ICB	>= 2,000,000	All contracts
	NCB	>= 100,000 < 2,000,000	None
	Shopping	< 300,000 (motor vehicles only)	None
	Shopping	< 100,000 000 (rest not motor vehicles)	None
	Direct Contracting	All values	All contracts
	Procurement from UN agencies	All values	None

30. **Procurement Plan.** The NRFA, MHID, RDA, MTC, MLG / LRAs, RTSA and NCC with the support of the World Bank, have developed a procurement plan for the first 18 months of Project implementation. The World Bank reviewed and approved this plan on March 28, 2017. The procurement plan includes all the procurement packages identified for the first 18 months of Project implementation. The Procurement Plan will be updated as required at least once a year throughout the life of the Project.

31. **Procurement methods**. Particular methods of procurement of goods and works are as follows:

International Competitive Bidding. Except as otherwise provided, goods and works shall be procured under contracts awarded on the basis of International Competitive Bidding (ICB).

(a) Other methods of procurement of goods and works. The following list specifies the methods of procurement, other than International Competitive Bidding which may be used for goods and works. The Procurement Plan shall specify the circumstances under which such methods may be used:

(i) National Competitive Bidding

(ii) Force Account

[24] Contracts with a cost estimate below US$300,000 for motor vehicles only may be procured on basis of shopping procurement method.

(iii) Procurement from UN agencies
(iv) Shopping
(v) Direct Contracting
(vi) In addition to procedures set forth in Section III "Other Procurement Methods" Clause

"Force Account", procurement of Emergency Expenditures under the Immediate Reponse Mechanism (IRM) part of the project shall be procured in accordance with the provisions and procedures set forth in the IRM Operations manual.

32. Additional Provisions for National Competitive Bidding: The following provisions shall apply to the procurement of goods and works under National Competitive Bidding procedures: The procurement procedure to be followed for National Competitive Bidding ("NCB") shall be the open bidding procedure set forth in the Public Procurement Act, 2008, Act. No.12 of 2008, as amended by the Public Procurement (Amendment) Act 2011, Act No. 15 of 2011 (the "PPA"), and the Public Procurement Regulations, 2011, Statutory Instrument No. 63 of 2011 (the "Regulations"); provided, however, that such procedure shall be subject to the provisions of Section I and Paragraphs 3.3 and 3.4 of Section III, and Appendix 1 of the "Guidelines for Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" (January 2011) (the "Procurement Guidelines"), and the additional provisions in the following paragraphs:

(a) Eligibility: Eligibility to participate in a procurement process and to be awarded an Association-financed contract shall be as defined under Section I of the Procurement Guidelines; accordingly, no bidder or potential bidder shall be declared ineligible for contracts financed by the Association for reasons other than those provided in Section I of the Procurement Guidelines. No restriction based on nationality of bidders and/or origin of goods shall apply, and foreign bidders shall be allowed to participate in NCB without application of restrictive conditions, such as, but not limited to, mandatory partnering or subcontracting with national entities.

(b) Domestic Preference: No margins of preference of any sort shall be applied in the bid evaluation.

(c) Bidding Documents: Procuring entities shall use bidding documents acceptable to the Association.

(d) Bid validity: An extension of bid validity, if justified by exceptional circumstances, may be requested in accordance with Appendix 1 of the Procurement Guidelines. A corresponding extension of any bid guarantee shall be required in all cases of extension of bid validity. A bidder may refuse a request for extension of bid validity without forfeiting its bid guarantee.

(e) Qualification: Qualification criteria shall be clearly specified in the bidding documents. All criteria so specified, and only such specified criteria, shall be used to determine whether a bidder is qualified. Qualification shall be assessed on a "pass or fail" basis, and merit points shall not be used. Such assessment shall be based entirely upon the bidder's or prospective bidder's capability and

resources to effectively perform the contract, taking into account objective and measurable factors, including: (i) relevant general and specific experience, and satisfactory past performance and successful completion of similar contracts over a given period; (ii) financial position; and where relevant (ii) capability of construction and/or manufacturing facilities.

(f) Prequalification procedures and documents acceptable to the IDA shall be used for large, complex and/or specialized works. Verification of the information upon which a bidder was prequalified, including current commitments, shall be carried out at the time of contract award, along with the bidder's capability with respect to personnel and equipment. Where pre-qualification is not used, the qualification of the bidder who is recommended for award of contract shall be assessed by post-qualification, applying the qualification criteria stated in the bidding documents.

(g) Special Condition of Contract: bidders would be encouraged to use local labor including women for construction.

(h) Bid Evaluation: All bid evaluation criteria other than price shall be quantifiable in monetary terms. Merit points shall not be used, and no minimum point or percentage value shall be assigned to the evaluation criteria or significance of price in bid evaluation. No negotiations shall be permitted.

(i) Guarantees: Guarantees shall be in the format, shall have the period of validity and shall be submitted when and as specified in the bidding documents.

(j) Cost Estimates: Detailed cost estimates shall be confidential and shall not be disclosed to prospective bidders. No bids shall be rejected on the basis of comparison with the cost estimates without the Association's prior written concurrence.

(k) Rejection of bids and re-bidding: No bid shall be rejected solely because it falls outside of a predetermined price range or exceeds the estimated cost. All bids (or the sole bid if only one bid is received) shall not be rejected, the procurement process shall not be cancelled, and new bids shall not be solicited without the IDA's prior written concurrence.

(l) Fraud and corruption: In accordance with the Procurement Guidelines, each bidding document and contract shall include provisions stating the IDA's policy to sanction firms or individuals found to have engaged in fraud and corruption as set forth in the Procurement Guidelines.

(m) Inspection and audit rights: In accordance with the Procurement Guidelines, each bidding document and contract shall include provisions stating the World Bank's policy with respect to inspection and audit of accounts, records and other documents relating to the submission of bids and contract performance.

Particular methods of procurement for consulting services are:

33. Quality and Cost-Based Selection (QCBS). Except as otherwise provided in the paragraph below, consultants services shall be procured under contracts awarded on the basis of Quality and Cost-Based Selection.

34. Other methods of procurement of consultants' services.

(a) Advance procurement will be used for procurement of the Technical Services and Supervision Consultant, the Environmental and Social Service Provider and the Panel of Experts.

(b) Retro-active financing provisions will be included for the Technical Services and Supervision Consultant, the Environmental and Social Service Provider and the Panel of Experts.

35. The following list specifies selection methods, other than Quality and Cost-Based Selection, which may be used for consultants' services. The Procurement Plan shall specify the circumstances under which such methods may be used:

(i) Quality-Based Selection (QBS)
(ii) Selection based on the Consultant's Qualifications (CQS)
(iii) Least-Cost Selection (LCS)
(iv) Single-Source Selection for firms (SSS)
(v) Individual Consultants (IC)
(vi) Single-Source Selection for IC (SSS).

Table 2.5: Prior Review Threshold: Consultants

	Selection Method	Prior Review Threshold	Comments
1.	QCBS and QBS	>=$300,000	All Contracts (*Advertising will be international in UNDB magazine and in addition in national newspaper of wide circulation and in Government gazette)*
2.	FBS, QBS, LCS and CQS	<$300,000	None
3.	Single Source (Firms)	All values	All
4.	Individual Consultants	> =$100,000	All
5.	Individual Consultants Competitive selection	<$100,000	None
6.	Single Source (Individual Consultants)	All values	All
Notes: QCBS = Quality- and Cost-Based Selection (Section II of the Consultants' Guidelines) LCS = Least Cost Selection (Para 3.6, of the Guidelines) CQS = Selection based on Consultants' Qualifications (Para 3.7 of the Guidelines) FBS= Fixed Budget Selection (Para 3.5 of the Guidelines) QBS = Quality Based Selection (Para 3.2 of the Guidelines)			

36. **Selection of Consulting Services:** Selection of consulting services under the project will be carried out based on the provisions of the "Guidelines Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers dated January 2011 revised July 2014". The consulting services that are likely to be needed under the project include those for design, supervision, dispute resolution, the environmental assessments and safeguard study, and the financial, procurement, and technical audits. These contracting needs will be identified and included in the procurement plan, and contractors will be selected on the basis of methods that have been included in the approved procurement plan. These methods and their corresponding prior review limits are provided above.

37. **Short List Comprising Entirely of National Consultants**. Shortlists of consultants for services that are estimated to cost less than US$300,000 equivalent per contract may be comprised entirely of national consultants in accordance with the provisions of paragraph 2.7 of the World Bank Consultant Guidelines. Engineering and Contract Management contracts with cost estimates of less than US$300,000 may be comprised entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. The procurement plan will indicate which contracts using CQS may not have shortlists comprising entirely of national firms.

38. **Review of Terms of Reference (TOR) by the World Bank.** All consultancy contracts as well as all single source selections, irrespective of the contract value, will be subject to prior review by the World Bank.

39. **Consultant Procurement Packages**. The procurement packages for consulting services that will be subject to Bank prior and post review will be provided in the project procurement plan that was reviewed and approved during negotiations.

40. **Training**. This category will cover all costs related to the carrying out of study tours, training courses and workshops, i.e., hiring of venues and related expenses, stationery, and resources required to deliver the workshops as well as costs associated with financing the participation of community organization in short courses, seminars, and conferences, including associated per diem and travel costs. Training projects will be part of the Annual Work Plan and Budget and will be included in the procurement plan. Prior review of training plans, including proposed budget, agenda, participants, location of training, and other relevant details, will be required only on an annual basis.

41. **Operating Costs.** Operating costs relate to the project implementation services to be provided to the project. These will be procured using the Borrower's administrative procedures, acceptable to the World Bank. Lists of eligible expenditures applicable are spelt out in the Financing Agreement and PIM. The PIM will elaborate the applicable administrative procedures that will be followed and which will have been reviewed and found to be acceptable to the Bank.

Environmental and Social (including safeguards)

42. The Environmental Assessment is Category B – Partial Assessment and therefore triggers OP)/BP 4.01. The categorization and all the environmental safeguard assessments and mitigations will be limited specifically to activities supported by this operation, and will exclude other initiatives, such as GRZ's funding towards the national OPRC Roll-out Program.

43. Provisionally, OP/BP 4.46 on Forests has been highlighted as a possibility, to be confirmed when actual road alignments are determined. Also triggered as a cautionary measure is the Physical Cultural Resources OP/BP 4.11. The project will entail road improvement works, mainly rehabilitation to gravel standards and upgrading to bitumen sealed standards, and maintenance of feeder roads in rural parts of Zambia. Also to be included is the construction of road drainage structures. Although the precise location of the road links is not yet known, they will be rural access roads and tracks that are currently in poor condition but whose alignment is generally defined. The road improvement works will involve bush clearing to demarcate the road works corridor and to improve on road safety, earthworks to achieve engineered road profiles, and excavation of material for road layers. Drainage structures will include channels, culverts, drifts and small bridges. Necessary mitigation measures in relation to all activities, are to be included as part of road building contract documentation. An ESMF

has been prepared, was cleared by the World Bank, and was disclosed in-country and at the Info-shop in line with World Bank procedures.

44. Rehabilitation, upgrading, and maintenance of feeder roads in the sparsely populated rural Zambia is not expected to have significant adverse social impacts. The occasional realignment of roads through existing settlements, to improve safety or to reduce construction costs, will be accompanied by appropriate mitigation measures as identified in the Resettlement Policy Framework (RPF) and the specific RAPs. The RPF and the Environmental and Social Management Framework (ESMF) for the project have been drafted and reviewed by the World Bank. After the final clearance by the World Bank, the two documents were disclosed in-country and through the World Bank's InfoShop on February 8, 2017. These two frameworks and all other safeguard instruments and measures focus specifically to activities supported by this operation, and exclude other initiatives, such as GRZ's funding towards the national OPRC Roll-out Program. Operational Policy (OP)/Bank Policy (BP) 4.12 Involuntary Resettlement was triggered, as the rehabilitation of feeder roads and possible encroachment on the road reserves may require some relocation and resettlement. The additional non-road infrastructure (storage facilities, processing space and market stalls), to be included after consultation with communities, may also require some small but additional portions of land. OP/BP 4.11 Physical Cultural Resources was also triggered as a cautionary measure in case of chance finds.

45. Once specific project sites have been fully identified, Environmental and Social Impact Assessments (ESIAs) and Resettlement Action Plans (RAPs) for the various packages will be developed, approved, and disclosed by the World Bank and GRZ. One composite ESIA will cover all the provinces, but three RAPs (one per pair of provinces each year) will be prepared in sequence, starting with that of the first two participating provinces. Construction works will not commence before the disclosure of the one composite ESIA and the specific RAPs as well as the completion of safeguard actions.

46. Labor influx: Preparation of ESIAs will include screening for potential social and environmental risks of adverse impacts due to labor influx, including the establishment of work camps. Road rehabilitation and maintenance contracts will result in the establishment of temporary construction camp sites by private contractors, thus introducing migrant labor within beneficiary communities. Typically, there would be one main project camp over the five year duration of the contract per participating province. It would be used to service other more temporary satellite camps located at the actual road construction sites. These camps will mainly house skilled and semi-skilled labor.

47. The project will result in labor influx and a robust system to manage the potential concerns will be put in place. Measures to mitigate negative impacts of the labor influx will be explicitly articulated as instructions and conditions of contracts. These instructions will be enforced by RDA and its contract supervision consultants. Mitigation and monitoring of any labor influx related risks that are identified will be addressed in the ESIAs, ESMPs, Contractor ESMPs and Codes of Conduct, and related monitoring and supervision plans. Contractor oversight by the project's Supervising Engineer and the project-level Grievance Redress Mechanism will be the major vehicles by which potential labor influx issues are identified and addressed during implementation.

48. In addition, the project has made provision to finance the NCC and thus enable them oversee the application and adherence to these requirements. NCC will report to the World Bank directly. Furthermore, consultations with beneficiary communities and their leadership would take place prior to and during the execution of the works. Where necessary relevant NGOs will be required to make the necessary inputs, for example in awareness creation efforts within the communities. Management of labor influx has also been included as a specific area of focus as part of the citizen engagement process, to be monitored continually.

49. Contract documentation for civil works will obligate service providers to ensure that they comply with the requirements of the Zambian Occupational Health and Safety Act, 2010 [No. 36 of 2010]. RDA and its supervision consultants will be responsible for administering this requirement as part of their project implementation obligation. NCC will therefore be expected to assess the extent to which the legislation is applied.

Monitoring and Evaluation

50. The responsibility for monitoring and evaluation of the achievements of the project will primarily rest with the MHID. The Ministry will collect the required data from the implementing agencies and prepare regular comprehensive reports to the World Bank reflecting methods used to collect data, its credibility, and status on each of the indicators identified in the project's Results Framework and Monitoring. At the implementing agency level, RDA's Project Management Unit will provide data for Component 1 activities. MLG and the LRA will also provide information specific to the districts.

51. The Results Framework and Monitoring (Section VII) lists PDO Indicators as well as the Intermediate Results Indicators. It further defines each indicator, its baseline and end target values, frequency of data collection, data sources and methodology, and data collection responsibilities. The selected PDO indicators are intended to track progress towards the final project outcomes, while the intermediate indicators assess the progress towards the delivery of outputs that have the potential to yield the project outcomes. The relevance and ease of measurement of the indicators has been discussed with the client, the final list of indicators were confirmed during negotiations.

52. *Development objective indicators.* Five indicators will be used to continuously assess the progress of the project towards the attainment of the project development objectives both in terms of physical and institutional outcomes. These include connectivity in terms of changes in the Rural Access Index[25] (RAI) within the target areas. The target area is defined as the participating provinces. RAI is a core indicator, which is supplemented by a sub-indicator that provides the absolute number of people in question. Another indicator is the increase in the proportion of PFRs in good and fair condition at national level. The indicator will measure the impact of the project on physical road infrastructure as well as on the institutional capacity aspects. Three additional indicators, namely:

[25] Proportion of rural people living within two kilometers of an all season road.

improved institutional oversight; employment creation; and beneficiaries from the emergency response, will assess the impact of the project on the institutional capacity.

53. The baselines, targets and future values of the PDO indicators will be relatively easy to obtain. The baseline value of the RAI is available from previous existing studies. The target has been calculated on the basis of provincial population densities and the expected lengths of roads to be improved in each participating province. Future values of RAI will be calculated by the RDA based on the same method used to obtain the existing values. The baseline values of the proportion of the PFRs in good and fair condition have been obtained from RDA's road condition survey[26], while the target value is based on roads to be improved. Future values will be obtained from RDA's subsequent road condition surveys. The indicator relating to the development and use of an RDA performance framework will be easy to report on – it will either be "yes" or "no".

54. The employment creation arising from the implementation of NCC's labor-based policy will require a customized monitoring process. First, NCC will establish the steps leading to the implementation of the policy and then identify the implementation areas that will result in actual employment creation. The target is based on the assumption that most of the employment will occur within the road development, rehabilitation and maintenance programs implemented through RDA, including the activities under this project. The number of beneficiaries benefiting from the emergency response and recovery activities will be monitored only if the CERC is triggered.

55. *Intermediate results indicators.* The selected intermediate results indicators are: Proportion of PFRs in the project provinces, that is in good and fair condition; Total length of rural roads improved and maintained through OPRC approach under the project; Existence of government-funded road maintenance contracts for continued upkeep of roads after the World Bank supported contracts come to an end; Completion and implementation of a rural roads maintenance strategy by RDA and MLGH; Share of the road fund revenues allocated by NRFA towards road maintenance; and Performance of road safety audit by RTSA on all OPRC packages.

56. The baselines for the above intermediate results indicators have been established from existing reports or on the basis that there are no initial values. The baseline for the proportion of PFRs in good and fair condition is known from existing RDA road condition surveys. The baseline for the share of road funds allocated by NRFA towards maintenance is available from NRFA reports. The other four indictors will have no initial values since the activities have not started. Tracking the progress of each of these indicators over the life of the project will be carried out by the respective activity implementation agencies.

57. *Gender and citizen engagement indicators.* The operation, through the planned improvement in rural connectivity is expected to contribute towards closing the opportunity and outcome gaps between genders. Improved rural roads will enhance accessibility to schools, health facilities and

[26] RDA's Road Condition Survey Report of 2015

markets. The Project has not specifically benefited from pre-investment analytical work on gender gaps. However, its implementation will include deliberate efforts to mainstream specific gender actions. In particular, implementing agencies will identify project implementation activities that would be designed with gender empowerment in mind e.g. provision of employment opportunities in road maintenance. Results monitoring will also aim to capture gender impact in some detail, including gender-disaggregated data where applicable.

58. Citizen engagement will also be an integral part of the project implementation. The renewed focus on results and inclusion through the two goals of ending extreme poverty and boosting shared prosperity means working in partnership with public, private sector, civil society and citizens to improve development outcomes. Emerging evidence shows that citizen engagement, including beneficiary feedback, can lead to improved development results under the right conditions. In this regard, the operation includes indicators in the results framework to monitor outcomes from citizen engagement actions being taken.

59. The following indicators have therefore been selected to monitor development in the area of gender and citizenship engagement: Direct project beneficiaries disaggregated into gender; Proportion of women employed in the road maintenance aspects of the road contracts; RDA develops and implements a citizen engagement tool that includes social and environmental safeguards in general and labor influx in particular, as areas of citizen consultations; and Proportion of complains addressed and resolved under the GRM. The baselines do not have initial values since activities have not yet commenced. The indictors will be tracked by the respective agencies.

60. *Impact assessment.* As part of lessons learned and the effort to strengthen the Government's capacity of monitoring and evaluation, a rigorous evaluation of the socio-economic impact of the project will be carried out to draw evidence in the Zambian context. In addition, Third party monitoring will be conducted to provide a greater pool of evidence. The results are intended to be used not only as an input to the evaluation of the project but also to improve the overall feeder road program and maximize the benefits from the program.

61. *Data collection and verification methods.* The institutional responsibilities for data collection is as detailed in Section VII, Results Framework and Monitoring. Beneficiary institutions will collect data on the respective aspects of their activities through Beneficiary surveys, and will submit them to the MHID who will in turn verify their reliability. The MHID will carry out regular inspections on site and review technical audits and reports for this purpose. The ministry will have the right to request for additional supporting information from the implementing institutions if necessary.

62. RDA will be responsible for providing eleven out of the fifteen data sets and it already has a monitoring and evaluation unit. In addition, RDA has recruited experts to carry out feasibility studies which include collection of baseline data. During project implementation the works supervision consultants will be required to monitor various aspects of the physical components. The MHID will originate only one data item, that on the agency framework. NRFA will provide information on the

share of road funds towards road maintenance, NCC will provide information on employment creation while RTSA will report on road safety audits.

ANNEX 3: IMPLEMENTATION SUPPORT PLAN

COUNTRY : Zambia
Zambia: Improved Rural Connectivity Project-SUF

Strategy and Approach for Implementation Support

1. To ensure successful implementation and sustainability of outcomes under the Rural Connectivity project, the team will ensure that all institutions entrusted with implementation of activities have the required capacity through training or utilization of consultants to bridge the capacity gaps. An institutional assessment during project appraisal facilitated the identification of capacity gaps. In addition, risk management will be at the core of implementation support.

Implementation Support Plan and Resource Requirements

2. The Project will monitor implementation progress through a management information system that will facilitate tracking of progress towards achieving the PDO and overall implementation progress, and identification of implementation bottlenecks; and to effectively respond to issues and challenges as they arise. In addition, there will be reviews which include: (i) Implementation Support missions to be conducted semi-annually or as required. The mission will establish if other development partners (DPs) are active in the road sector and consult with them; (ii) a mid-term review (MTR) that will include a comprehensive assessment of the progress achieved at the mid-point of project implementation; and will serve as a platform for revisiting project design issues and identifying where adjustments may be needed; (iii) project impact assessment; and (iv) implementation completion, where an independent assessment of the project will be undertaken and lessons drawn to inform future or similar operations.

3. At the technical level, the World Bank team will assemble the appropriate technical skills mix and experience needed to support implementation of this operation and to reflect incorporation of corporate requirements in project implementation.

4. The World Bank's financial management (FM) and procurement specialists will carry out periodic reviews to ensure that fiduciary systems and capacities remain adequate during the course of project implementation in accordance with the World Bank's fiduciary requirements. They will also conduct capacity building activities tailored to address identified skills gap.

5. The World Bank will require that quarterly Interim Financial Reports (IFRs) be submitted to the World Bank as well as the annual external audit report for review. The World Bank will review other project-related information as well, such as the internal control, oversight and reporting systems. Annual and unannounced project-site visits will be carried out by the World Bank to review the FM systems, including internal controls. Monitoring of actions taken on issues highlighted in the audit review of Rural Connectivity project, external audit reports, auditors' management letters, internal audits, and other reports will be reviewed by the World Bank, including Statements of Expense (SoE) transaction reviews. FM capacity training for project implementation units will be carried out once the PIM (which will include a section FM) is approved. Additional FM training will be conducted during

project implementation as needed.

6. An independent agency will be contracted to conduct regular procurement audits for activities implemented at the Local Authority and community levels.

7. The World Bank's safeguards team will consist of social and environmental specialists who will guide the project team in applying the agreed safeguard instruments as well as reviewing compliance during missions.

Implementation Support Plan and Resource Requirements

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	• Completion of feasibility studies • Procurement of OPRC for the 1st 2 provinces • Initiate procurement studies for Component 2 • Initiate procurement of OPRC for the 2nd 2 provinces	• Design Engineers • Highways Engineer • Transport Economist • Safeguard Specialist • Financial Analyst • M & E Specialist • Road Safety Specialist • Procurement Specialist • FM Specialist • Community Dev. Specialist • Auditors		
12-60 months	• Implementation of OPRC for the 1st 2 provinces. • Finalize procurement of OPRC for the 2nd 2 Provinces. • Finalize procurement of component 2 studies. • Commence implementation of OPRC for 2nd 2 provinces • Mid Term Review • Procurement and implantation of OPRC for 3rd 2 provinces	Same as above		

	• Procurement of last 2 studies
61-120 months	• Completion of implementation of OPRC in all provinces • Completion assessments & reporting
Other	

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
	At least 2 weeks	At least 2 weeks	

Table 3.1 PROJECT IMPLEMENTATION PLAN										
Bank Financial Year	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**
Activity	Jul. 16-Jun. 17	Jul. 17-Jun. 18	Jul. 18-Jun. 19	Jul. 19-Jun. 20	Jul. 20-Jun. 21	Jul. 21-Jun. 22	Jul. 22-Jun. 23	Jul. 23-Jun. 24	Jul. 24-Jun. 25	Jul 25-Dec. 25
1. Plan, feasibility, design, & bidding										
2. Board Approval	*									
3. Procurer OPRC for 1st 2 Provinces										
4. Project Effectiveness		*								
5. Implement OPRC in 1st 2 Provinces			Bank funded Rehabilitation and Maintenance					Govt. funded maintenance..		
6. Procure Comp. 2 initial studies										
7. Procurer OPRC for 2nd 2 Provinces										
8. Implement OPRC in 2nd 2 Provinces				Bank funded Rehabilitation and Maintenance					Govt. funded..	
9. Procure Component 2 Studies										
10. Mid Term review (Dec. 31, 2020)					*					
11. Procure OPRC in 3rd 2 Provinces										
12. Implement OPRC in 3rd 2 Provinces					Bank funded Rehabilitation and Maintenance					
13. Procure last Component 2 Studies										
14. Completion date (Dec. 31, 2025)										

ANNEX 4: DETAILED ECONOMIC ANALYSIS

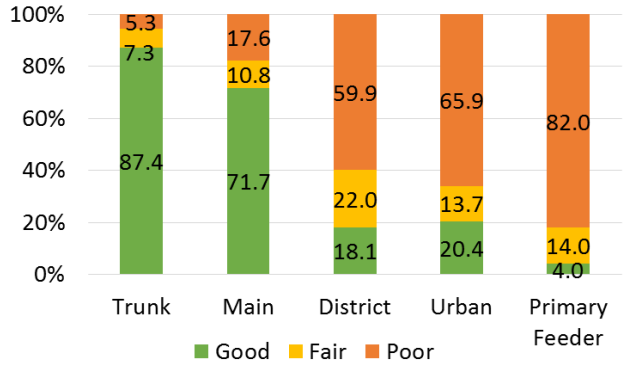
REPUBLIC OF ZAMBIA
Zambia: Improved Rural Connectivity Project-SUF

Background

1. The project aims at supporting the provision of efficient and reliable road infrastructure in selected rural areas of Zambia. Since the vast majority of the rural population depends on subsistence farming for their livelihoods, the Project is focused on improving farmers' accessibility and therefore facilitating agricultural development in the country. Based on a new method developed in the context of the Sustainable Development Goals, the Rural Access Index, which measure a proportion of the rural population who live within 2km of a good road, was re-estimated at 17 percent, leaving about 7.5 million rural residents unconnected to the road network..

2. While the primary road network is well maintained, most of the feeder roads are in poor condition. Given the Government's efforts in the last decade, Trunk Roads (3,116 km), Main Roads (3,701 km) and District Roads (13,707 km), which provide international and major domestic connectivity, are mostly in good condition. However, these roads account for only a fraction of the total network. In recent years, the quality of the feeder road network composed of Primary Feeder Roads (PFD) (14,333 km) and secondary and tertiary feeder roads (about 27,000 km) has been deteriorating. The proportion of PFRs in poor condition increased from 77 percent in 2011 to 82 percent in 2014 (**Figure 4.1.**).

Figure 4.1. Zambia: Road condition by road class



Source: RDA Road Condition Report 2014.

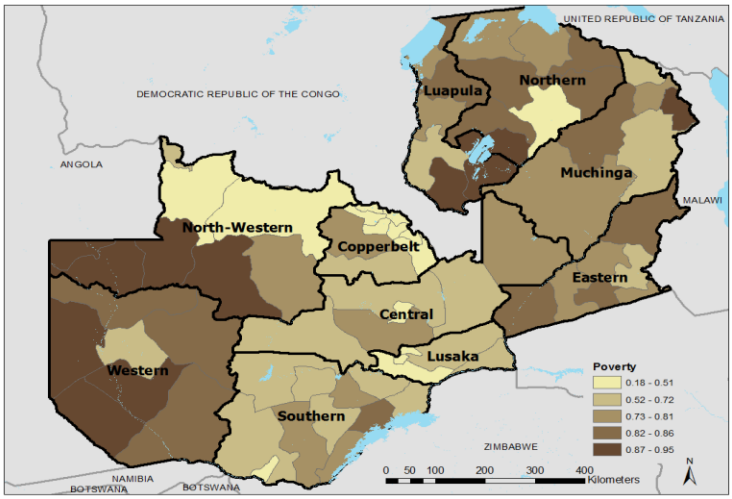
3. A significant amount of resources would be required to rehabilitate the feeder road network and meet the existing gap in rural accessibility in the country. Thus, prioritization is a must from the strategic and sustainability points of view. Under the standard cost of road rehabilitation in Zambia,[27] about US$1

[27] The unit cost of rehabilitating an unpaved road is assumed to be US$125,000 per km.

billion would be required to rehabilitate all District Roads in poor condition, and another US$1.3 billion for Primary Feeder Roads. These account for nearly 10 percent of GDP of Zambia.

4. The project is particularly focused on improving farmers' connectivity and agricultural productivity in rural areas, where majority of the poor live (**Figure 4.2**). Where poverty is high, rural accessibility, measured by the Rural Access Index, tends to be low. If rural access is low, other types of accessibility, for instance, to markets, schools and health centers, are also low.[28] From the road sector point of view, it is also important to ensure connectivity of the road network as a whole. No doubt, Secondary and Tertiary Feeder Roads are in poor condition, though there is no official statistics. However, it is equally or even more important to improve PFR first, because fragmented improvements in feeder roads would not allow to exploit full benefits. Roads must be connected organically. Following the Government's 10-year PFR rehabilitation program, the project aims at improving rural accessibility through providing better PFRs in selected areas.

Figure 4.2. Poverty Map at the District Level



Prioritization framework

5. Against these backgrounds, prioritization takes place in three steps: First, provinces are prioritized based on (i) poverty incidence; (ii) agricultural production and agro-business potential; and (iii) rural accessibility. Other aspects, such as social benefits and cost effectiveness, are also important to identify key feeder roads.

6. Second, within each priority province, the similar framework is applied to identify priority districts, with (i) poverty; (ii) agricultural production; and (iii) rural accessibility taken into account. This aims at concentrating the project on the areas where critical needs exist in each province, while certain

[28] See more detailed discussion in World Bank (2016) "Measuring Rural Access: Using new technologies."

geographic concentration is necessary to make the project implementation and contract management practical and efficient. There will also be cost implication when project areas are clustered.

7. Third, priority feeder roads are selected based on multiple socioeconomic criteria, including (i) demographics; (ii) agricultural production along the road; (iii) social benefits from improved access; (iv) connectivity to the main road network; and (v) economic efficiency of investment. The connectivity to the primary road network is of particular importance because roads need to form an integrated network. While social benefits cannot be overemphasized in the rural context, it is also important to ensure certain economic viability of investment. Traditionally used indicators are net present value, internal rate of return and benefit-cost ratio. In the following analysis, the benefit-cost ratio is used, which is calculated by the Roads Economic Decision (RED) model.

Selection of Provinces

8. There are 10 provinces in Zambia. While Lusaka and Copperbelt Provinces are most populated, agricultural production is more concentrated on Central, Eastern, and Southern Province to a certain extent. Poverty is high in Eastern, Western and Luapula Provinces. Given the Project objectives, four variables, (i) poverty headcount[29]; (ii) total value of major crops produced in each province[30]; (iii) agribusiness per population; and (iv) Rural Access Index[31] were used to prioritize provinces.

9. As discussed above, poverty reduction is one of the most important development objective of the Project. While the value of current agricultural production is used as a proxy of general agricultural potential, the Government also aims at diversification and modernization of agricultural production. To incorporate this aspect, the number of agribusinesses is used,[32] which are more associated with market-oriented crops than locally consumed food crops. The four indicators are weighted 40, 30, 20 and 10 percent, respectively. Each variable is normalized to zero (low priority) to one (high priority).

10. Central Province is identified as the highest priority, primarily because of its large agricultural production and relatively high poverty. It is followed by Eastern, Northern and Luapula Provinces (**Table 4.1**). These provinces are generally major agricultural production areas in Zambia and have high poverty rates (**Figure 1.1**). Southern Province is also one of the major agricultural areas in the country. Western Province has less agricultural potential, however, poverty is among the highest and RAI is among the lowest. The result is broadly robust regardless of some changes in weights.

11. Given available resources, the World Bank project is focused on six provinces over the first three years of the program: Central, Eastern, Northern, Luapula, Southern, and Muchinga. In parallel, the

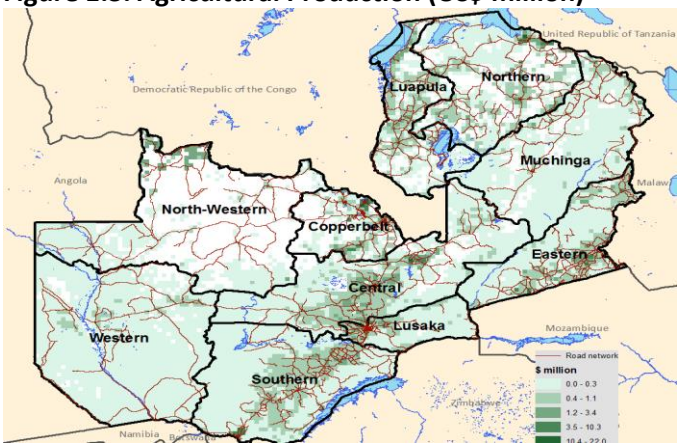
[29] Central Statistics Office, Zambia. (2016). Zambia 2015 Living Conditions Monitoring Survey: Key Finding.
[30] Maize, tobacco, groundnuts, wheat, cotton seeds, soybeans and sweet potatoes are considered, of which data come from Agricultural Statistics by the Central Statistics Office, Zambia. To aggregate different crops, producer prices from FAOSTAT are used.
[31] World Bank. (2016). "Measuring Rural Access: Using new technologies."
[32] Ministry of Commerce, Trade and Industry. (2014). Manufacturing Sector Survey Report: 2011-12.

Government will support Western Province in Year 2, and North-Western in Year 3. In later years, priority feeder roads in the rest of the provinces are also planned to be rehabilitated by the Government.

Table 4.1. Selection of Provinces

		Weight:	0.4	0.3	0.2	0.1		
Province	Land area	Population	Poverty head-count (%)	Agriculture production value ($ mil)	No. of agro-businesses	RAI (%)	Weighted score	Ranking
Central	94,330	1,274,227	56.2	92.5	141	12.4	0.718	1
Eastern	50,432	1,611,435	70	42.3	235	23.8	0.653	2
Northern	75,465	1,121,506	79.7	37.0	86	17.5	0.598	3
Luapula	44,675	962,187	81.1	15.2	87	16.7	0.540	4
Western	127,074	884,403	82.2	2.9	71	10.6	0.530	5
Southern	82,971	1,612,081	57.6	35.5	175	20.6	0.514	6
North-Western	124,171	708,735	66.4	18.3	91	8.5	0.513	7
Muchinga	85,889	745,462	69.3	23.9	25	15.8	0.440	8
Copperbelt	31,345	1,964,982	30.8	40.1	175	14.8	0.395	9
Lusaka	22,002	2,203,779	20.2	21.8	230	22.4	0.267	10

Figure 1.3. Agricultural Production (US$ million)



Source: Spatial Production Allocation Model (SPAM) by IFPRI

Selection of Districts

12. Within each of the high priority provinces, priority districts are selected based on three criteria: (i) poverty headcount[33]; (ii) total value of major crops produced in each district; and (iii) Rural Access Index[34]. The three variables are weighted at 50, 30 and 20 percent, respectively.

13. Given available resources, the project will support two to eight districts in each selected province, with clustering of roads and exiting or past road projects taken into account (**Table 4.2**). Too much scattered road works is considered less effective to realize the expected impacts. In Central Province, priority is given to Mkushi District.

14. Lundazi is ranked first in Eastern Province, however, key feeder roads in this district have already been rehabilitated under the recent project, Agricultural Development Support Project (ADSP). Thus, the Project will focus on Petauke District, from which Sinda has recently been divided.

15. In Northern Province, Mbala and Mungwi are ranked first and second, respectively, both of which will be supported. The two districts adjoin each other.

16. In Luapula Province, Samfya is ranked first, however, given environmental sensitivity of the district, priority is given to the second ranked district, Kawambwa. Many feeder roads in Samfya District are located close to Lake Bangweulu, Lake Walilupe, and Lake Kampolombo, which will require a different level of environmental management.

17. In Southern Province, two adjacent districts, Kalomo and Choma are selected.

18. Finally, in Muchinga Province, Chinsali and Mpika Districts, which are located next to one another, will be supported. Mafinga District, which has recently been divided from Isoka District, is ranked first in the province. However, it is located at the eastern end of the province, isolated from the other districts, and considered to be difficult to be packaged under one contract. Chinsali District was divided into two: Chinsali and Shiwang'andu. Both districts are considered as priority.

Table 4.2. Selection of Districts

			Weight:	0.5	0.3	0.2		
Province	District	Land area	Population	Poverty headcount	Agriculture production value ($ mil)	RAI (%)	Weighted score	Ranking
Central	**Mkushi**	**17,579**	**152,285**	**0.71**	**36.78**	**15.2**	**0.892**	**1**
Central	Chibombo	13,028	296,934	0.73	22.72	15.4	0.786	2
Central	Serenje	23,450	160,694	0.78	5.98	14.1	0.697	3

[33] Since the 2015 poverty figures have not been available at the district level, the 2010 data are used, which are available in World Bank. (2015). "Mapping Subnational Poverty in Zambia."
[34] World Bank. (2016). "Measuring Rural Access: Using new technologies."

			Weight:	0.5	0.3	0.2		
Province	District	Land area	Population	Poverty headcount	Agriculture production value ($ mil)	RAI (%)	Weighted score	Ranking
Central	Kapiri Mposhi	17,301	241,624	0.68	15.32	9.2	0.695	4
Central	Mumbwa	21,423	219,034	0.64	3.58	9.2	0.544	5
Central	Kabwe	1,550	203,656	0.33	8.13	49.1	0.041	6
Eastern	Lundazi	13,847	315,223	0.84	13.10	14.5	0.999	1
Eastern	**Petauke/ Sinda**	**10,932**	**338,885**	**0.82**	**9.19**	**14.3**	**0.825**	**2**
Eastern	Katete	3,808	241,585	0.82	3.23	27.7	0.562	3
Eastern	Mambwe	6,115	71,335	0.81	0.28	18.5	0.536	4
Eastern	Chadiza	2,593	104,527	0.81	4.55	36.0	0.475	5
Eastern	Nyimba	7,479	86,007	0.78	1.22	25.5	0.369	6
Eastern	Chipata	5,658	453,874	0.72	10.78	34.3	0.262	7
Northern	**Mbala**	**7,451**	**213,875**	**0.82**	**12.15**	**14.1**	**0.897**	**1**
Northern	**Mungwi**	**9,946**	**144,992**	**0.86**	**6.79**	**11.5**	**0.833**	**2**
Northern	Luwingu	8,851	134,816	0.86	3.20	13.4	0.730	3
Northern	Chilubi	4,654	77,170	0.87	0.32	8.7	0.700	4
Northern	Mporokoso	12,523	101,267	0.82	3.56	23.6	0.621	5
Northern	Kaputa	11,706	113,830	0.79	0.92	11.7	0.585	6
Northern	Mpulungu	9,420	96,706	0.81	2.70	41.2	0.477	7
Northern	Kasama	10,915	238,851	0.51	7.35	21.1	0.302	8
Luapula	Samfya	8,048	192,573	0.91	2.30	11.7	0.828	1
Luapula	**Kawambwa**	**9,068**	**131,114**	**0.82**	**4.86**	**13.9**	**0.784**	**2**
Luapula	Milenge	7,000	43,822	0.88	0.40	14.2	0.594	3
Luapula	Nchelenge	2,506	148,424	0.77	2.31	16.0	0.474	4
Luapula	Chiengi	2,157	109,498	0.82	1.36	21.6	0.397	5
Luapula	Mwense	6,757	118,424	0.79	1.35	19.5	0.379	6
Luapula	Mansa	9,139	218,332	0.65	2.65	21.9	0.151	7
Southern	**Kalomo**	**12,071**	**255,089**	**0.75**	**11.01**	**13.7**	**0.909**	**1**
Southern	**Choma**	**7,013**	**244,963**	**0.72**	**9.22**	**29.7**	**0.763**	**2**
Southern	Gwembe	3,998	52,847	0.82	0.19	7.8	0.699	3
Southern	Mazabuka	5,268	262,122	0.63	8.28	30.7	0.649	4
Southern	Namwala	15,052	101,965	0.72	1.66	7.8	0.647	5
Southern	Monze	4,289	196,623	0.75	2.75	21.7	0.646	6
Southern	Sinazongwe	4,175	102,498	0.77	0.22	23.8	0.585	7
Southern	Kazungula	19,973	98,645	0.68	0.70	7.6	0.585	8
Southern	Itezhi-Tezhi	5,234	64,789	0.70	0.83	17.2	0.566	9
Southern	Siavonga	4,509	90,048	0.72	0.27	21.8	0.548	10
Southern	Livingstone	1,389	142,492	0.28	0.40	54.3	0.006	11
Muchinga	Mafinga	3,912	80,140	0.91	2.99	17.4	0.711	1
Muchinga	**Chinsali/ Shiwang'andu**	**15,438**	**148,329**	**0.85**	**5.68**	**15.4**	**0.690**	**2**

Province	District	Land area	Weight: Population	0.5 Poverty headcount	0.3 Agriculture production value ($ mil)	0.2 RAI (%)	Weighted score	Ranking
Muchinga	**Mpika**	**39,305**	**212,072**	**0.74**	**7.39**	**8.8**	**0.541**	**3**
Muchinga	Isoka	4,197	84,762	0.81	3.20	26.0	0.398	4
Muchinga	Nakonde	4,564	118,377	0.72	4.49	28.7	0.204	5
Muchinga	Chama	18,474	101,782	0.71	0.17	4.8	0.200	6

Selection of roads

19. To select priority feeder roads within each target district, multi-criteria analysis is applied. All PFRs are ranked with the following aspects considered: (i) the number of beneficiaries; (ii) agricultural production along the road; (iii) social benefits from improved connectivity; (iv) connectivity to the main network (Trunk and Main Roads); and (v) investment efficiency. The overall prioritization score is calculated with equal weights put on these five criteria.

20. **Demographics.** Priority roads need to serve as many local residents as possible. The number of expected beneficiaries from each road segment is calculated based on district-level population density. Along each road, a 2-km buffer is considered as a beneficiary area.

21. **Agriculture production.** As applied at the provincial and district levels, agricultural potential is among the most important priority given the project objective. However, few data are available at the road segment level. The analysis uses one of the most disaggregated agricultural production estimates, i.e., Spatial Production Allocation Model (SPAM) by IFPRI, which covers all crops produced and is available with an approximately 10x10 km resolution. Along each road, the production estimates are added up and evaluated at the producer prices from FAOSTAT).[35]

22. **Social benefits.** To measure at least one of the social benefits from improved connectivity, the number of basic schools connected along the road is taken into account.

23. **Connectivity to the main road network.** Roads must form an integrated road network. In Zambia, the most reliable road network is composed of Trunk and Main Roads, of which most are paved and well maintained. To ensure full benefits from road connectivity, the connectivity indicator is set to 1 if both ends of the road are connected to Trunk and/or Main Roads, 0.5 if one of the ends is connected to Trunk or Main Road, and 0 otherwise.

24. **Efficiency of investment.** Rural roads generally cannot expect high rates of returns to investment, because the level of traffic is low. On PFRs in Zambia, most traffic is non-motorized. On average, about 400-500 peoples and bicycles use a PFR daily. Given the currently poor quality of the roads, motorized

[35] See You, L., S. Wood, U. Wood-Sichra. (2009). Generating plausible crop distribution and performance maps for Sub-Saharan Africa using a spatially disaggregated data fusion and optimization approach. Agricultural System, Vol. 99(2-3), pp. 126-140.

traffic ranges mostly from nearly zero (though significant non-motorized traffic often exist) to 100 vehicles per day. On some roads, over 300 AADT is observed. To take investment efficiency into account, the Roads Economic Decision (RED) model is used to estimate the benefit-cost ratio, i.e., the reduction of road user costs divided by the investment costs, when detailed data are available.[36] For other provinces where field surveys remain to be completed, preliminary engineering estimates are used. Road user cost benefits are calculated under the assumption that a road would be well maintained to keep International Roughness Index (IRI) below eight after the rehabilitation of the road.

Tentative ranking of roads

25. Based on the calculated weighted score, all feeder roads will be ranked. However, a final set of feeder roads that would be supported will be determined once all relevant data are updated. Currently, detailed field surveys are ongoing, and the road condition and traffic on some of the roads could be changed. Other roads may already have been rehabilitated by other donors or the local governments. Therefore, the number of selected roads will be determined based on these updated data as well as available resources. In total, the project aims at supporting rehabilitation and maintenance of about 4,300 km of feeder roads in the selected districts.

Investment and maintenance costs

26. The estimated unit rates of rehabilitation, maintenance and emergency works vary across provinces, mainly because of availability of materials required. In Western Province, for instance, project costs are relatively high (**Table 4.3.**). For project preparation purposes, it is assumed to be US$40,000 per km across the provinces.

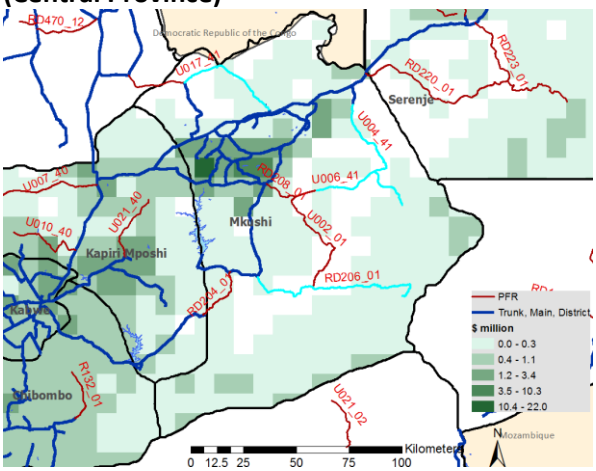
Table 4.3. Unit Rates for Rehabilitation, Maintenance and Emergency Works for Gravel Roads

	Investment costs ($/km)			Maintenance costs			Emergency work costs ($/km)
	Full construction	Light rehab	Spot improve-ment	Heavy grading ($/km)	Spot gravelling ($/m3)	Re-gravelling ($/m3)	
Central	143,605	107,704	43,082	3,982	16	37	3,367
Southern	145,577	109,182	43,673	6,401	19	70	4,657
Western	152,000	114,000	45,600	8,414	28	95	4,316

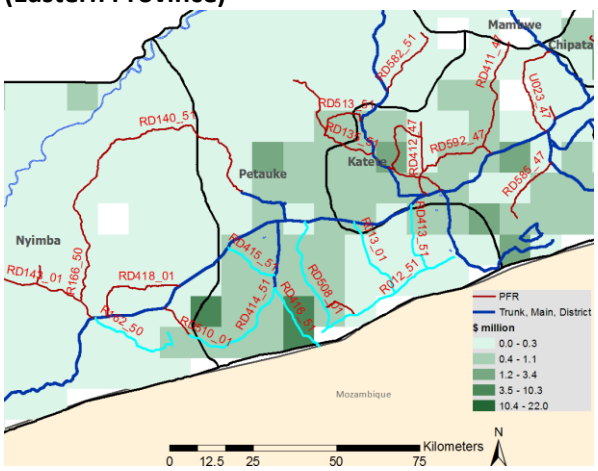
[36] Detailed data are available in Central, Eastern and Northern Provinces.

Figure 4.4. Illustration of Some of the Candidate Feeder Roads that Could be Supported

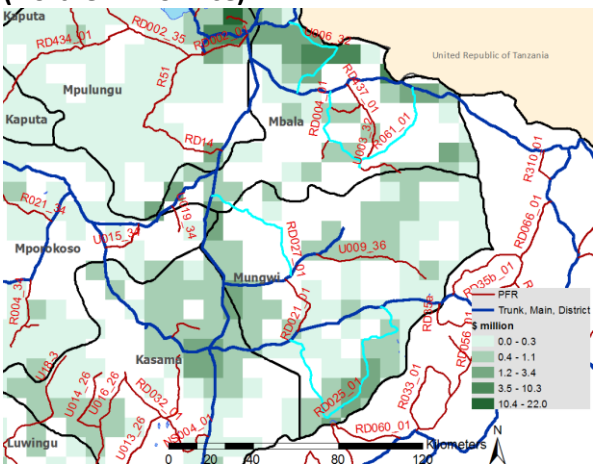
(Central Province)



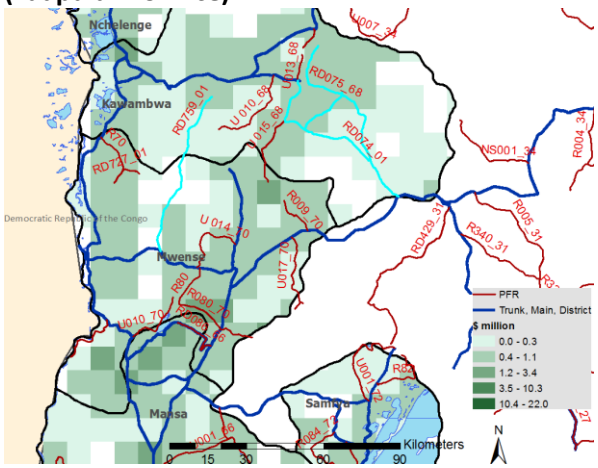
(Eastern Province)



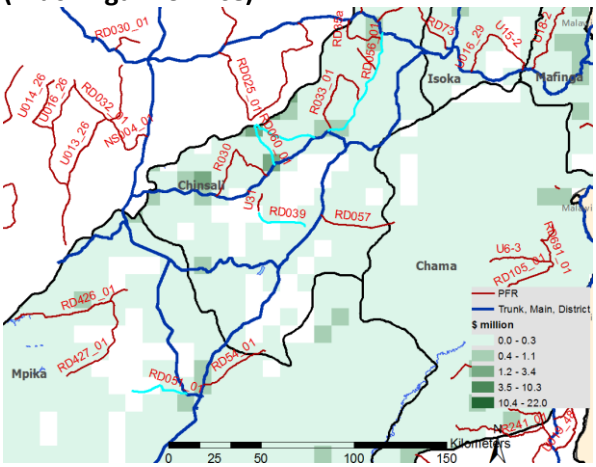
(Northern Province)



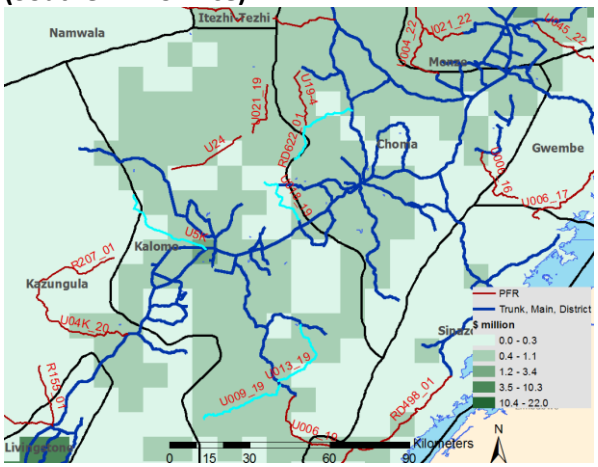
(Luapula Province)



(Muchinga Province)



(Southern Province)



Economic efficiency of comparable rural road investment

27. At the appraisal stage, detailed data to perform a traditional economic analysis on individual feeder roads are not fully available. However, there are District Roads that exist close to the possible project feeder roads and share similar characteristics, such as road condition and average daily traffic, for which detailed data are available. To confirm economic efficiency of individual investments, the following analysis takes a traditional consumer supply approach, focusing on vehicle operating cost savings, using highway engineering software, Highway Development and Management (HDM) Model 4.

28. For demonstration purposes, the following four District Roads are examined for the PFR that would be likely to be supported under the project in the same areas (**Table 4.4**).

Table 4.4. Selected Roads for Individual Economic Efficiency Analysis

		Primary Feeder Road			Comparable Road		District	
		Name	KM	ADT	Name	KM	ADT (2008)	(2016) [1]
Southern	Kalomo	U013_19	32.3	8	D348_01	27.9	18	22
Southern	Choma	U018_19	38.6	11	D351_01	29.6	18	22
Eastern	Sinda	RD413_51	21.9	23	D136_01	19.7	19	23
Eastern	Petauke	RD508_01	42.4	22	D414_01	20.4	18	22

[1] Estimates.

29. The latest underlying data necessary for HDM4 calibration, such as vehicle operating costs by type, were collected by the Road Development Agency in 2008. There are updated data for 2013, which were adjusted using national price indices (**Table 4.5**). These are used as a baseline data for the current analysis. There is no significant change between 2013 and 2016.

Table 4.5. Underlying Economic Vehicle Operating Costs, 2013

Vehicle Description	New Vehicle ($/vehicle)	New Tire ($/tire)	Fuel ($/liter)	Lubricating Oil ($/liter)	Maintenance Labor ($/hour)	Crew Wages ($/hour)	Annual Overhead ($/year)	Annual Interest (%)	Passenger Working Time ($/hour)	Passenger Non-Working Time ($/hour)	Cargo Time ($/hour)
Light vehicle	21,414	57.00	0.55	2.07	36.67	1.29	0	9.52	0.91	0.32	0.00
Truck Heavy	93,267	829.09	0.61	2.07	36.67	3.14	2,073	9.52	0.91	0.32	0.11

Truck Articulated	115,018	584.13	0.61	2.07	36.67	3.14	6,633	9.52	0.91	0.32	0.11
Bus	182,186	604.54	0.61	2.07	36.67	3.14	10,364	9.52	0.91	0.32	0.00

30. In rural Zambia, the current motorized traffic is generally low. Without any improvement, the normal traffic growth is likely to continue low. However, because of the project, significant additional traffic is expected to be generated, though the level of traffic remains low in absolute terms. It is assumed that the traffic would be doubled in the first year. Then, the traffic would grow at a moderate annual normal growth rate. In Zambia, recent rural population growth was 2.3 to 2.5 percent. The latest GDP growth rate was 3.2 percent in 2015, much lower than the average growth rate of 6.4 percent in the last 10 years. The economy will recover over the medium to long term, but the growth forecasts are relatively weak in the short run. Thus, the current analysis assumes a traffic growth rate of 5 percent over the next 20 years.

31. The assumed project life is 20 years. As usual, the do-minimum scenario assumes only routine maintenance for an unpaved road. The project scenario includes grading and graveling, though detailed design remains to be developed for each of the project roads. While grading is assumed every six months, spot regravelling will be implemented whenever necessary. Routine maintenance is also assumed. Assumed financial costs of gravelling and grading are US$45 per m3 and US$1,000 per km, respectively. Routine maintenance costs are assumed to be US$1,000 per km. These are converted to economic costs at a factor of 0.8.

32. For a set of selected District Roads that are comparable to the project feeder roads, the net present values (NPV) are estimated, which vary from US$0.12 million to US$0.52 million (**Table 4.6**). The expected NPV are found to be positive, though relatively small, because of the nature of rural road interventions. The NPV are calculated using a Bank recommended discount rate of 6 percent. The internal rates of return (IRR) are estimated at 7.4 percent to 13.2 percent. Expected economic benefits, such as reduction of vehicle operating costs, are small because of the low volume of traffic, but investment requirements are also small, resulting in relatively high IRR. The efficiency is sensitive to initial rehabilitation costs, which would vary depending on the current road condition.

33. Although these roads are not the same as the feeder roads that the project will support, the result indicates that the project investments are likely to be economically viable. It is also suggested that the economic viability is crucially depending on expected traffic growth as well as the assumption that the roads will be maintained over time. If the roads are not maintained, the economic benefits will be reduced, resulting in IRR below the threshold.

Table 4.1. Summary of Economic Efficiency of Investment: Comparable District Roads

Province	District	Road	KM	ADT 2016 [1]	ADT 2036 [2]	Rehab cost ($/km)	NPV ($ mil) [4]	IRR (%)
Southern	Kalomo	D348	27.9	22	111	43,218	0.29	9.2
Southern	Choma	D351	29.6	22	111	43,380	0.35	9.2
Eastern	Sinda	D136	19.7	23	114	37,812	0.52	13.2
Eastern	Petauke	D414	20.4	22	111	45,885	0.12	7.4

[1] Estimated.

[2] Projected.

[3] Estimated based on required works with the current road condition taken into account.

[4] Estimated at a discount rate of 6 percent.

Emission reduction calculation

34. Theoretically, improved road condition can help to improve fuel efficiency of vehicles and thus reduce carbon emissions. The magnitude of reduction primarily depends on vehicle type, road condition and traffic forecasts. In general, CO_2 emissions from vehicles differ depending on type of vehicle. According to the standard model, such as HDM for RUC for Africa, rural road improvement can typically reduce emissions by about 30 percent (**Table 4.7.**). In the rural Zambian context, the current traffic volume is relatively low and mostly comprises light vehicles. Thus, for calculation purposes, the emission estimate for passenger car is used as a proxy.

35. The future traffic on feeder roads in Zambia is not expected to increase dramatically, even though the project would bring a certain amount of motorized traffic shifted from non-motorized traffic. Thus, the traffic is assumed to grow by 2.5 percent per year, which is the current rural population growth rate in Zambia.

36. The volume of carbon emissions that can be reduced by the project is calculated for each of the selected priority roads under the 15 year project life assumption. The total reduction is about 60.5 tons of CO_2 (**Table 4.1**), of which the social value is about US$1,800 if the World Bank's recommended social value of carbon, i.e., US$30 per ton, is used.[37]

Table 4.2. Carbon Dioxide per km by Vehicle Type

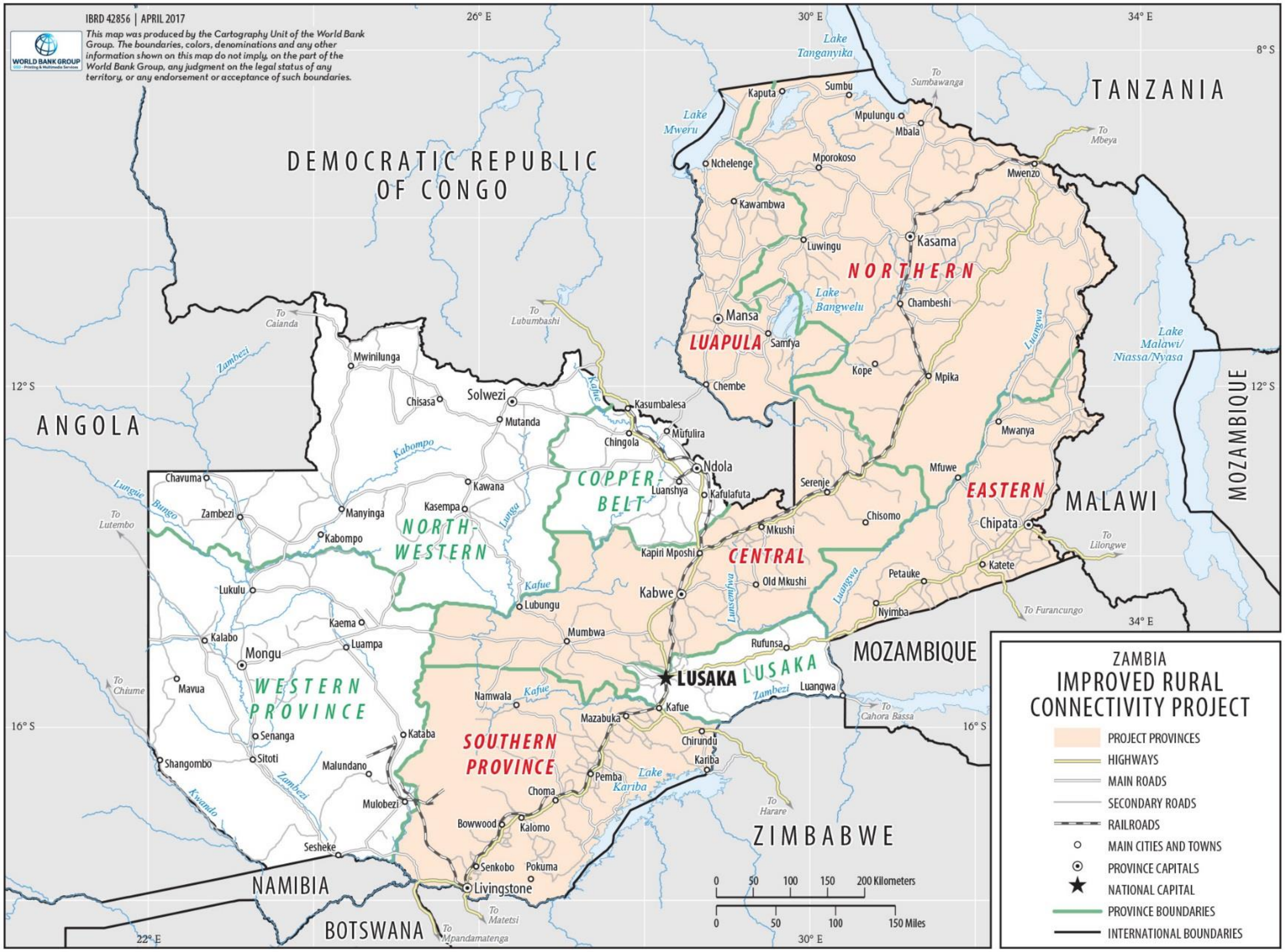
	Carbon Dioxide - CO2 (g/km)			
	Motor cycle	Passenger car	Delivery vehicle	Articulated truck
Without project	60.9	283.5	284.5	1,800.8
With project	61.2	214.0	220.1	1,395.0

[37] World Bank. (2014). Social Value of Carbon in project appraisal: Guidance note to the World Bank Group staff.

Change (%)	0.6	-32.5	-29.2	-29.1

Table 4.3. Expected Carbon Dioxide Reduction

Total length (km)	1,497
Avg. ADT	36.7
Annual traffic growth rate	2.5%
Project life (years)	15
CO2 reduction (tons)	60.5
Value (US$)	1,816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ZAMBIA
IMPROVED RURAL CONNECTIVITY PROJECT
PROJECT PROVINCES
HIGHWAYS
MAIN ROADS
SECONDARY ROADS
RAILROADS
MAIN CITIES AND TOWNS
PROVINCE CAPITALS
NATIONAL CAPITAL
PROVINCE BOUNDARIES
INTERNATIONAL BOUNDARIES
DEMOCRATIC REPUBLIC OF CONGO
TANZANIA
ANGOLA
MALAWI
MOZAMBIQUE
ZIMBABWE
NAMIBIA
BOTSWANA
NORTHERN
LUAPULA
COPPER-BELT
NORTH-WESTERN
CENTRAL
EASTERN
LUSAKA
WESTERN PROVINCE
SOUTHERN PROVINCE
LUSAKA
Lake Tanganyika
Lake Mweru
Lake Bangweulu
Lake Malawi/ Niassa/Nyasa
Lake Kariba
Kaputa
Sumbu
Mpulungu
Mbala
Nchelenge
Mporokoso
Mwenzo
Kawambwa
Kasama
Luwingu
Chambeshi
Mansa
Samfya
Kope
Mpika
Chembe
Mwinilunga
Solwezi
Chisasa
Mutanda
Kasumbalesa
Chingola
Mufulira
Ndola
Luanshya
Kafulafuta
Mwanya
Mfuwe
Serenje
Chisomo
Chipata
Katete
Mkushi
Kapiri Mposhi
Old Mkushi
Kabwe
Petauke
Nyimba
Chavuma
Zambezi
Kawana
Kasempa
Manyinga
Kabompo
Lukulu
Lubungu
Kaema
Kalabo
Mongu
Luampa
Mumbwa
Rufunsa
Mavua
Namwala
Kafue
Luangwa
Mazabuka
Chirundu
Senanga
Kataba
Sitoti
Shangombo
Malundano
Kariba
Pemba
Choma
Mulobezi
Bowwood
Kalomo
Sesheke
Senkobo
Pokuma
Livingstone
To Sumbawanga
To Mbeya
To Caianda
To Lubumbashi
To Lutembo
To Chiume
To Lilongwe
To Furancungo
To Cahora Bassa
To Harare
To Matetsi
To Mpandamatenga
Zambezi
Kabompo
Kafue
Lunga
Lungue Bungo
Luangwa
Lunsemfwa
Kwando
0 50 100 150 200 Kilometers
0 50 100 150 Miles
26° E
30° E
34° E
22° E
8° S
12° S
16° S