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Report No: PAD2228

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON

PROPOSED CREDITS

IN THE AMOUNT OF US\$96.8 MILLION

TO THE

REPUBLIC OF NICARAGUA

FOR A

RURAL AND URBAN ACCESS IMPROVEMENT PROJECT

February 10, 2017

Transport & ICT
LATIN AMERICA AND CARIBBEAN

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CURRENCY EQUIVALENTS
(Exchange Rate Effective December 31, 2016)}

Currency Unit = US\$

SDR 0.74386 = US\$1

US\$1.34455 = SDR 1

FISCAL YEAR
January 1 - December 31

Regional Vice President: Jorge Familiar
Country Director: J. Humberto Lopez
Senior Global Practice Director: Jose Luis Irigoyen
Acting Practice Manager: Gylfi Palsson
Task Team Leader: Sevara Melibaeva

ABBREVIATIONS AND ACRONYMS

ARAP	Abbreviated Resettlement Action Plan
CO ₂	Carbon Dioxide
CONASEV	National Council for Safety and Road Education
EIRR	Economic Internal Rate of Return
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plans
FM	Financial Management
FOMAV	Road Maintenance Fund (<i>Fondo de Mantenimiento Vial</i>)
GDP	Gross Domestic Product
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
HDM-4	Highway Design and Management Model
IDA	International Development Association
IDB	Inter-American Development Bank
IFR	Interim Financial Reports
INIDE	National Institute of Development Information (<i>Instituto Nacional de Información de Desarrollo</i>)
JICA	Japanese International Cooperation Agency
MCA	Community Modules for Adoquines (<i>Módulos Comunitarios de Adoquinado</i>)
MTI	Ministry of Transport and Infrastructure (<i>Ministerio de Transporte e Infraestructura</i>)
NDF	Nordic Development Fund
NPV	Net Present Value
PDO	Project Development Objective
RED	Road Economic Decision Model
SIGFA	Integrated Financial Management and Audit System (<i>Sistema Integrado de Gestión Financiera Administrativa y de Auditoría</i>)
SIGFAPRO	Integrated Financial Management and Audit System for Projects (<i>Sistema Integrado de Gestión Financiera Administrativa y de Auditoría para Proyectos</i>)
SUF	Scale Up Facility
UCR	Project Coordinating Unit for World Bank Resources (<i>Unidad Coordinadora de Recursos-Banco Mundial UCR MTI-BM</i>)
WB	World Bank



BASIC INFORMATION

Is this a regionally tagged project? No	Country(ies)	Lending Instrument Investment Project Financing
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- Situations of Urgent Need of Assistance or Capacity Constraints
- Financial Intermediaries
- Series of Projects

Approval Date 06-Mar-2017	Closing Date 30-Jun-2022	Environmental Assessment Category B - Partial Assessment
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Bank/IFC Collaboration No

Proposed Development Objective(s)

The objectives of the Project are to: (a) improve safe and sustainable access to markets and services in targeted rural and urban areas of the Recipient; and (b) in the event of an Eligible Emergency, provide immediate and effective response to said Eligible Emergency.

Components

Component Name	Cost (US\$, millions)
Component 1: Road Infrastructure Improvement	85.20
Component 2: Road Safety	8.10
Component 3: Institutional Strengthening and Implementation Support	3.37
Component 4: Immediate Response Mechanism	0.00



Organizations

Borrower : Republic of Nicaragua

Implementing Agency : Ministerio de Transporte e Infraestructura (Ministry of Transport and Infrastructure)
Road Maintenance Fund (FOMAV)

<input type="checkbox"/> Counterpart Funding	<input type="checkbox"/> IBRD	<input checked="" type="checkbox"/> IDA Credit	<input type="checkbox"/> IDA Grant	<input type="checkbox"/> Trust Funds	<input type="checkbox"/> Parallel Financing
		<input type="checkbox"/> Crisis Response Window	<input type="checkbox"/> Crisis Response Window		
		<input type="checkbox"/> Regional Projects Window	<input type="checkbox"/> Regional Projects Window		

Total Project Cost:

96.80

Total Financing:

96.80

Financing Gap:

0.00

Of Which Bank Financing (IBRD/IDA):

96.80

Financing (in US\$, millions)

Financing Source	Amount
IDA-59640	96.80
Total	96.80

Expected Disbursements (in US\$, millions)

Fiscal Year	2017	2018	2019	2020	2021	2022
Annual	0.00	8.71	17.56	35.99	23.62	10.92
Cumulative	0.00	8.71	26.27	62.26	85.88	96.80



INSTITUTIONAL DATA

Practice Area (Lead)

Transport & ICT

Contributing Practice Areas

Gender

Jobs

Social, Urban, Rural and Resilience Global Practice

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

● Low

4. Technical Design of Project or Program

● Moderate

5. Institutional Capacity for Implementation and Sustainability

● Substantial

6. Fiduciary

● Moderate

7. Environment and Social

● Substantial



8. Stakeholders	● Moderate
9. Other	
10. Overall	● Moderate

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

The Recipient, through MTI, shall maintain a Project coordination unit within MTI (the UCR-BM) with functions and responsibilities satisfactory to the WB and with personnel in numbers and with experience and qualifications, all satisfactory to the WB and carry out the proposed Project activities in accordance with Operational Manual (Section I.A.1 of Schedule 2 of the Financing Agreements).



Sections and Description

The Recipient shall make a portion of the proceeds of the Financing allocated from time to time to Part 1.3 (Maintaining Road Assets) and activities under Part 3.6 (b) (Strengthening of the institutional capacity of FOMAV) available to FOMAV under a Subsidiary Agreement between the Recipient and the FOMAV, under terms and conditions approved by the Association (Section I.B.1 of Schedule 2 of the Financing Agreements).

Sections and Description

The Recipient shall (i) carry out the implementation of the proposed Project, except Part 1.3 (Maintaining Road Assets) and activities under Part 3.6 (b) (Strengthening of the institutional capacity of FOMAV); and (ii) cause FOMAV to carry out Part 1.3 and activities under Part 3.6 (b), in accordance with the terms of the Operational Manual, acceptable to the Association (Section I.C.1 (a)-(n) and Section I.C.2 of Schedule 2 of the Financing Agreements).

Sections and Description

In order to ensure the proper implementation of Component 4 (Immediate Response Mechanism), if it is activated, the Recipient shall take the following measures: (i) prepare and furnish to the Association for its review and approval, an operations manual (“Immediate Response Mechanism Operations Manual”) which shall set forth detailed implementation arrangements for Component 4; (ii) afford the Association a reasonable opportunity to review the proposed Immediate Response Mechanism Operations Manual; (iii) promptly adopt this Manual for Component 4; (iv) ensure that the Coordinating Authority carries out Component 4 in accordance with this Manual (in the event of any inconsistency between the Manual and the Financing Agreements, the provisions of the Financing Agreements shall prevail); and (v) not amend, suspend, abrogate, repeal or waive any provision of the Manual without prior approval by the Association. The Recipient shall, throughout the implementation of Component 4, maintain the Coordinating Authority, with adequate staff and resources satisfactory to the Association (Section I.D.1(a)-(e) and Section I.D.2 of Schedule 2 of the Financing Agreements).

Sections and Description

The Recipient and FOMAV shall carry out the implementation of the proposed Project in accordance with the relevant safeguards instruments as set forth in Section I.F of Schedule 2 of the Financing Agreements.

Sections and Description

The Recipient, through MTI, shall cause FOMAV to be staffed at all times during implementation of the proposed Project with personnel in numbers and with experience and qualifications, all acceptable to the Association (Section I.A.2(b) of Schedule 2 of the Financing Agreements).

Conditions

Type	Description
Effectiveness	The Subsidiary Agreement has been duly authorized or ratified and executed on



	behalf of the Recipient and FOMAV, and is legally binding upon the Recipient and FOMAV in accordance with its terms (Section 5.01(a) and Section 5.02 of the Financing Agreements).
Type Effectiveness	<p>Description</p> <p>The Operational Manual has been adopted by the Recipient and FOMAV (Section 5.01(c) of the Financing Agreements).</p>
Type Effectiveness	<p>Description</p> <p>The IDA or the IDA SUF Financing Agreement, respectively, has been executed and delivered and all conditions precedent to its effectiveness or to the right of the Recipient to make withdrawals under it (other than the effectiveness of IDA or IDA SUF Agreement respectively) have been fulfilled (Section 5.01(b) of the Financing Agreements).</p>
Type Disbursement	<p>Description</p> <p>The Recipient shall undertake no activities under Component 4 (Immediate Response Mechanism) of the proposed Project (and no activities shall be included in Component 4) unless and until the following conditions have been met in respect of said activities:</p> <ul style="list-style-type: none">(i) the Recipient has determined that an Eligible Emergency has occurred, has furnished to the Association a request to include said activities in Component 4 in order to respond to said Eligible Emergency, and the Association has agreed with such determination, accepted said request, and notified the Recipient thereof;(ii) the Recipient has prepared and disclosed all safeguards instruments required for said activities, in accordance with the Immediate Response Mechanism Operations Manual, the Association has approved all such instruments, and the Recipient has implemented any actions which are required to be taken under said instruments;(iii) the Recipient’s project coordinating unit has adequate staff and resources, in accordance with the provisions of Section I.D.2 of Schedule 2 of the Financing Agreements for the purposes of said activities; and(iv) the Recipient has adopted the Immediate Response Mechanism Operations Manual in form, substance and manner acceptable to the Association and the provisions of the Manual remain or have been updated in accordance with the provisions of Section I.D.1(c) of Schedule 2 of the Financing Agreements so as to be appropriate for the inclusion and implementation of said activities under Component 4 of the proposed Project. <p>(Section IV.B.1 of Schedule 2 of the Financing Agreements)</p>

**PROJECT TEAM****Bank Staff**

Name	Role	Specialization	Unit
Sevara Melibaeva	Team Leader(ADM Responsible)	TTL	GTI01
Carlos Lago Bouza	Procurement Specialist(ADM Responsible)	Procurement Specialist	GGO04
Luz A. Zeron	Financial Management Specialist	Financial Management	GGO22
Anna Maria Ferrer Gimenez	Team Member	Road Safety Specialist	GTI04
Esteban Fernando Travaglianti	Team Member	Road Engineer	GTI04
Karla Dominguez Gonzalez	Team Member	Gender Specialist	GTI04
Licette M. Moncayo	Team Member	Program Assistant	GTI04
Linda Castillo	Team Member	Program Assistant	LCCNI
Marco Antonio Zambrano Chavez	Environmental Specialist	Environmental Safeguards	GEN04
Maria Virginia Hormazabal	Team Member	Finance Officer	WFALA
Mariela Mena	Safeguards Specialist	Social Safeguards Specialist	GSU04
Pilar Elisa Gonzalez Rodriguez	Counsel	Lawyer	LEGLE
Virginia Maria Henriquez Fernandez	Team Member	Transport Specialist	GTI04

Extended Team

Name	Title	Organization	Location
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NICARAGUA
RURAL AND URBAN ACCESS IMPROVEMENT PROJECT

TABLE OF CONTENTS

I. STRATEGIC CONTEXT	10
A. Country Context	10
B. Sectoral and Institutional Context	11
C. Higher Level Objectives to which the Project Contributes	13
II. PROJECT DEVELOPMENT OBJECTIVES	15
A. PDO	15
B. Project Beneficiaries	15
C. PDO-Level Results Indicators	16
III. PROJECT DESCRIPTION	16
A. Project Components	16
B. Project Cost and Financing	19
C. Lessons Learned and Reflected in the Project Design	19
IV. IMPLEMENTATION	20
A. Institutional and Implementation Arrangements	20
B. Results Monitoring and Evaluation	21
C. Sustainability	22
D. Role of Partners	22
V. KEY RISKS	23
A. Overall Risk Rating and Explanation of Key Risks	23
VI. APPRAISAL SUMMARY	24
A. Economic and Financial (if applicable) Analysis	24
B. Technical	26
C. Financial Management	28
D. Procurement	30
E. Social (including Safeguards)	31
F. Environment (including Safeguards)	33
G. World Bank Grievance Redress	35



VII. RESULTS FRAMEWORK AND MONITORING..... 37

MAP IBRD 42686



I. STRATEGIC CONTEXT

A. Country Context

- Nicaragua remains one of the Latin American and the Caribbean region's poorest countries, but has recently experienced strong economic growth.** With per capita gross national income of US\$1,800, Nicaragua's annual economic growth has averaged 4.8 percent in the last six years. A key engine of this growth has been the manufacturing industry (mainly food products and textiles), although construction, mining, fisheries, and general commerce have all been expanding since 2010. Agricultural production experienced a slight decrease stemming from adverse weather conditions causing drought over the last decades, which contributed to poor export performance. Looking forward, agriculture is expected to be bolstered by increased production of coffee as output recovers from disease and drought, and private consumption is expected to recover, driving a sustained expansion in agricultural exports. Economic growth is expected to average 4 percent between 2016 and 2019.¹
- While poverty levels have declined, significant challenges remain with respect to boosting shared prosperity.** The 2006-2010 period brought a notable reduction in poverty and inequality, in contrast to the 2001-2005 period, in which poverty essentially stayed constant at 48 percent. Nicaragua saw a significant reduction in overall poverty dropping to 42.5 percent by 2009 and 26.9 percent by 2014² and extreme poverty³ dropping from 14.6 percent to 8.3 percent in the same period.⁴ Despite progress made, about 1.7 million Nicaraguans (a third of the population) remained below the official poverty line in 2014,⁵ with the majority concentrated in rural areas and remote communities, with constrained access to basic services due to limited infrastructure, including rural roads, notwithstanding their economic potential.
- Nicaragua's socio-economic development has been negatively affected by natural disasters, climatic conditions and epidemics.** The country's geographic location makes it vulnerable to climate-related phenomena such as droughts, hurricanes, El Niño-Southern Oscillation and related events, including floods and landslides, along with geological events (e.g., earthquakes and volcanic eruptions). In the last six years alone, Nicaragua witnessed the effects of five highly destructive tropical storms and hurricanes, causing significant social suffering and devastating economic and financial losses. Basic infrastructure has been the most affected, including the transport system. The 2001 droughts caused a loss of 2.15 percent to gross domestic product (GDP); the 2007 Hurricane Felix was responsible for 14.4 percent GDP loss; and heavy rains in 2007 in the northwestern region and the 2011 Tropical Depression 12E wiped out 3 and 6.8 percent of GDP respectively. While GDP losses for the 2009 Hurricane Ida are not available, they were likely to be the most significant. These events have been contributing to large fiscal deficits (e.g., in 2007 Nicaragua had to restructure its public debt in the aftermath of Hurricane Felix). Severe budget constraints have also limited Nicaragua's ability to finance adaptation and mitigation activities. Efforts to address this challenge are being made at the national level through the National System for Prevention, Mitigation and Attention to Disasters Executive Secretariat, and with the integration of these activities into policy and administrative actions using data from the Secretariat to enhance planning and increase coordination at regional levels.

¹ World Bank Group (2017) *Global Economic Prospects*, Flagship Report, January.

² National Development Information Institute (2014) *Standards of Living Survey*.

³ People living below US\$1.90 a day (World Bank).

⁴ World Bank Data for Nicaragua (2016).

⁵ World Bank estimates based on the 2014 Living Standards Measurement surveys.



B. Sectoral and Institutional Context

4. **Poor road quality and lack of connectivity is a threat to the affordable and reliable delivery of goods.**

As there is no paved road connection linking the Pacific and Atlantic coasts, Nicaragua ships most of its agricultural exports through seaports on the Atlantic coast in Honduras and Costa Rica at a significant cost. The Pan-American Highway crossing Nicaragua from north to south is the main road link to access these seaports. In the Pacific and Central regions, the poor quality of the roads rather than their availability is the main constraint. The World Bank's (WB) Logistics Performance Index scored Nicaragua at 2.53, on a scale of 1 to 5, placing it 103rd out of 160 countries worldwide in 2016. The main logistics challenges stem from high transportation costs, limited capacity of ports, reliance on ports in neighboring countries, and long customs clearance waiting times.

5. **Road infrastructure quality has improved in recent years, but there remain deficiencies limiting mobility and hindering potential productive and economic activities, especially for those in the most remote and poorest parts of the country.**

The country's classified road network totals 24,335 km. Since 2010, the size of the paved network increased from 2,814 to 4,121 km and the share of population with access to a paved road increased from 28 to 39 percent. However, paved roads as a share of the whole road network remains low at only 17 percent, of which 35 percent is in fair or poor condition.⁶ Thus, Nicaragua ranks 86th in the world in terms of its road infrastructure quality.⁷ Moreover, 30 percent of rural roads become unusable during the six-month rainy season (May to October), resulting in high costs and loss of income for rural producers and restricting their access to local and regional markets due to longer travel times, spoilage and losses of perishable goods, harm to live animals during travel, and increased vehicle operating costs. Ensuring reliable access to current and potential production zones would lead to higher agricultural production, lower transport costs and hence lower final prices of products to consumers, which would stimulate new economic and employment opportunities for the poor. The Ministry of Transport and Infrastructure (MTI) plays an oversight and managerial role in the rehabilitation, upgrading, and construction of roads in Nicaragua. Recognizing access and connectivity constraints, the MTI has developed a Comprehensive Productive Roads Program for optimizing the country's limited resources and prioritizing road infrastructure investments in productive zones based on strategic, social, economic, technical and environmental criteria, including poverty and agricultural production potential. The MTI's Planning Department is responsible for monitoring and assessing the contribution of road investments to governmental objectives of poverty reduction and economic growth. However, the Department requires strengthening of its capacity to improve the quality of the data collection, analysis and reporting.

6. **The road sector is challenged by an increasing maintenance backlog in the face of a static and inadequate cost recovery base.**

The Road Maintenance Fund (FOMAV) established in 2000 has a key role in ensuring the long-term sustainability of the road sector as a whole. The creation, strengthening and supervision of a mechanism to finance periodic and routine road maintenance using private contractors has had a major impact in promoting long-term sustainability of the road sector and preserving road investments in Nicaragua. However, the resources required to meet the maintenance needs of the country's growing road network remain insufficient, as was identified by the *Financial Sustainability Study of FOMAV* (2014), conducted under the ongoing WB-financed project.⁸ FOMAV is financed by levies on fuels (petrol and diesel)

⁶ 2015 surface condition surveys.

⁷ Rankings for Central American countries: Panama (45th), El Salvador (57th), Honduras (72nd), Guatemala (87th), and Costa Rica (115th). World Economic Forum, 2015.

⁸ Rural Roads Infrastructure and Improvement Project (P123447), IDA Credits 5028 and 5533, IDA Grants H7440 and H9830.



of 16 cents per dollar, licenses, spares and import duties on vehicles. FOMAV is responsible for the core road network (paved national and secondary roads), while municipalities have to invest and maintain local tertiary roads. FOMAV transfers approximately 20 percent of its revenue to Nicaragua's Association of Municipalities for the maintenance of the municipal road network. The supplier role is undertaken by a variety of actors, including private contractors, private micro-enterprises for routine maintenance of the main road network, community-based cooperatives for minor routine maintenance of the rural *adoquines* roads, Community Modules for Adoquines (MCAs), and force account operations by the Corporation of Regional Highway Construction Agencies (*Corporación de Empresas Regionales de la Construcción*). Box 1 provides details on the role of MCAs and cooperatives.

Box 1: The MCA Model and Cooperatives for Minor Routine Maintenance

Community Modules for Adoquines (Módulos Comunitarios de Adoquinado, MCA) represent a community development approach for the construction of the *adoquines* roads under a collaborative arrangement between a MTI, local mayors, and selected local participants living in the vicinity of those roads. *Adoquines*, or cobblestones, are concrete-like paving blocks made of cement, fine aggregates, coarse aggregates, filler, and water. MCAs are legally constituted and accredited by municipal authorities, which are co-responsible for work execution. Each MCA is responsible for paving up to 3 km of a rural road section and hires its own local labor for construction of works. MTI engineers provide the necessary training and carry out supervision throughout the process. MCAs join together to contract an earthworks contractor and an *adoquines* supplier. The works are declared completed when the MTI supervisor emits the Defects Liability Certificate.

The Nicaraguan Government with support of a WB-financed Third Road Rehabilitation and Maintenance Project (P068673) first introduced this approach in 2004 by piloting the use of 32 MCAs to pave 28 km of rural roads with *adoquines*. To date, MCAs have paved a total of 428 km of rural roads with financing from the WB, and another 180 km with financing from the Central American Bank for Economic Integration. This labor intensive method has proven to be technically feasible and generally produced the same quality of product as alternative methods. Moreover, MCAs have generated important social benefits, such as: (i) short-term employment opportunities with over 280 MCAs formed and over 9,500 jobs created to date; (ii) technology transfer and technical skills building; and (iii) empowerment and creation of a sense of ownership for the roads within communities. The MTI has also actively promoted the recruitment of females in MCAs with support of the last two WB-financed projects. Since 2007, the proportion of women employees in MCAs increased from 10 percent to 46 percent.

Cooperatives for minor routine maintenance are small micro-enterprises created by converting former MCAs to carry out performance-based routine maintenance of rural roads paved with *adoquines*. The first cooperatives for minor routine maintenance were piloted in 2015 under the WB-financed Rural Roads Infrastructure and Improvement Project (P123447), targeting a total of 75 km of the *adoquines* roads. These cooperatives were aimed at making the MCA model more sustainable and providing longer term job opportunities for former MCA employees upon completion of

7. **The increased frequency of floods due to El Niño phenomena has caused serious damage to the country's road infrastructure.** For more than a decade, Nicaragua's road infrastructure has been severely impacted by heavy rains during the rainy season, causing the inaccessibility of many areas. Considering that climate projections indicate a steady increase in extreme weather events in the future, the Government recognizes the need to improve the monitoring of road network for natural disasters, as well as developing and implementing climate resilient measures on those roads most vulnerable to climate related impacts. In 2003, the MTI with support from Japanese International Cooperation Agency (JICA) completed a



comprehensive climate change vulnerability assessment of the main road network,⁹ which identified 291 vulnerable spots and proposed measures to tackle them. The MTI is currently carrying out a study on Development of Adaptive Capacity to Climate Change in the Transport Sector,¹⁰ with financing from the Nordic Development Fund (NDF). The study aims to: (i) improve the climate change scenarios in Nicaragua, by improving understanding of local and regional meteorology and climatology; (ii) develop and operationalize a prioritization tool for climate change adaptation investments in roads and bridges; and (iii) based on these tools, recommend 30 critical points of highest priority out of the identified 291 vulnerable spots, and prepare the necessary design and feasibility studies to improve their resilience. The implementation of adaptation works on the top three priority points will be financed by the NDF.

8. **Nicaragua also faces a number of challenges in road safety, especially with increasing levels of motorization.** Over the 2007-2012 period, the number of road accidents and related fatalities in Nicaragua increased by almost 27 percent and 30 percent respectively, with 3,500 deaths and over 30,000 injuries. In 2015, there were 675 fatalities on Nicaraguan roads,¹¹ a rate of 13 deaths per 10,000 motor vehicles, which is about 25 times greater than the rate in Sweden and the United Kingdom. Per population of 100,000, this is an annual rate of about 11 fatalities, which is more than three times the death rate in Sweden and the United Kingdom.¹² Motorcycles account for the largest share of road accident fatalities (30 percent) and injuries (45 percent). Considering that the motorization level increased during the same period by 32 percent, the situation is expected to deteriorate further if critical traffic safety measures are not taken. The Government has launched several initiatives defined in the National Road Safety Strategy 2013-2018 to achieve road safety objectives and reduce road traffic fatalities by 20 percent. The MTI also completed a Road Safety Assessment of the paved road network 2013 financed by the Inter-American Development Bank (IDB). Monitoring the implementation of the Strategy and promoting road safety education and prevention measures is the responsibility of the National Council for Safety and Road Education (CONASEV), created under the Ministry of Interior, and its Technical Committee, which is made up of representatives of the National Police, MTI, FOMAV, the Municipality of Managua and transport companies.

C. Higher Level Objectives to which the Project Contributes

9. **The proposed Project contributes to the goals of both the National Human Development Plan and the National Transport Plan of Nicaragua, aimed at developing productive zones and improving the quality of life of the population living in the targeted areas.** MTI is committed to supporting economic growth and poverty reduction by improving road infrastructure in productive zones to benefit the agricultural and trade sectors, reducing costs of crop and livestock production, and improving access and mobility to areas of high productivity. The proposed improvement of key urban access routes to Managua through La Garita – Tipitapa and Ciudad Sandino – Mateare will facilitate the movement of people and goods, thus enabling access to jobs and markets in Managua and reducing transportation costs and travel time, as well as alleviating physical barriers to trade at both local and national levels. This in turn is expected to have positive effects on the cost

⁹ Oriental Consultants Company Limited and Japan Engineering Consultants Company Limited (2003). *Study on Vulnerability Reduction on Main Roads in Nicaragua*.

¹⁰ NGG, METEO-SIM, CONDISA (ongoing). *Desarrollo de Capacidad Adaptativa para el Cambio Climático en el Sector Transporte*. Nicaragua.

¹¹ This data from the traffic police includes deaths that occurred on site, and does not capture the deaths that may have occurred in post-crash hospital care.

¹² World Health Organization (2015) *Global Status Report on Road Safety*, retrieved from <http://www.who.int/en/>



of imports and exports, thus increasing Nicaragua’s competitiveness and improving people’s purchasing power.

10. **Moreover, use of MCA in upgrading rural roads will be essential for reducing poverty and enhancing shared prosperity in areas with high levels of poverty.** Around 46 percent of population in the targeted municipalities (Table 1) live in conditions of extreme poverty, with La Libertad and Macuelizo municipalities having the highest poverty levels of 56.6 percent and 54 percent respectively.¹³ Investments in rural road infrastructure have proven to generate direct jobs as part of the construction contracts and indirect jobs through expanded employment opportunities due to quicker and more reliable access to markets all year round. Recent research suggests an employment generation effect of between 200 to 500 annualized direct jobs for every US\$1 million spent on infrastructure.¹⁴ An evaluation of the impacts generated through the investments in the rural road improvements using the labor intensive MCA model in Nicaragua shows an increase in the monthly average income for employees in benefitting municipalities by around 26.5 percent, while for women, the impact was even greater increasing their monthly average income by about 77 percent.¹⁵ The proposed Project will also facilitate the development of human capital in the long run through improving access to vital services, such as education and health. The impact evaluation of the rural road program in Nicaragua also suggests that improvement of rural roads was associated with an 8.5 percent decline in respiratory illnesses among men and 7.3 percent increase in school registration among girls.¹⁶

Table 1: Extreme Poverty Levels in the Proposed Project Intervention Areas by Municipality

Road Section	Road Type	Department	Beneficiary Municipalities	Extreme Poverty Index (%)
La Garita - Tipitapa	Core trunk road	Managua	Managua	20.2
			Tipitapa	33.8
Ciudad Sandino - Mateare	Core trunk road	Managua	Ciudad Sandino	27.6
			Mateare	38.5
Granada - Malacatoya	Rural road	Granada	Granada	32.2
Macuelizo - Santa María	Rural road	Nueva Segovia	Macuelizo	54
			Santa María	51.1
Cárdenas - Colón	Rural road	Rivas	Cardenas	48.6
La Libertad - San Pedro de Lóvago	Rural road	Chontales	San Pedro de Lóvago	36.7
			La Libertad	56.6
Corn Island	Rural road	RACS	Corn Island	44.8

Source: Projections reported by National Institute of Development Information (*Instituto Nacional de Información de Desarrollo, INIDE*) for 2016 (based on 2005 Census)

11. **The proposed Project is fully aligned with the World Bank’s Country Partnership Strategy for the period of FY2013-2017 for Nicaragua.**¹⁷ It contributes to both key strategic areas of the Strategy: (i) raising welfare by improving access to quality basic services; and (ii) raising incomes by enhancing productivity,

¹³ Projections reported by INIDE for 2016 (based on 2005 Census).

¹⁴ Tuck, Laura; Schwartz, Jordan & Andres, Luis (2009) *Crisis in LAC: Infrastructure Investment and the Potential for Employment Generation*.

¹⁵ Jiménez, Bexi Francina Mota (2013) *Impact Evaluation of Rural Roads Project in Nicaragua. Impacts on Welfare and Education*, September.

¹⁶ Garz, Seth and Perova, Elizaveta (2014) *Evidence on the Impacts of Short-term Employment Generation Projects to Improve Road Infrastructure in Rural Nicaragua*, World Bank Paper.

¹⁷ *Country Partnership Strategy for the Republic of Nicaragua (FY2013-2017)*, discussed by the Board of Executive Directors of the World Bank on November 13, 2012, Report No: 69231-NI.



competitiveness and diversification. The proposed Project seeks to improve road infrastructure to facilitate access to basic services for the rural poor, especially during the rainy season. It will also build on the success of the MCA model for rural road construction – which has been an effective job creation instrument for vulnerable communities, including women, generating over 9,000 short-term jobs to date – and convert MCAs for road construction into cooperatives for maintenance to provide longer-term employment opportunities. Moreover, the proposed Project seeks to address the Strategy’s transversal themes of climate change and gender. The designs of road sections incorporate climate-informed standards to ensure proper drainage and resilience to heavy rainfall, flooding, and landslides as well as other climate-related hazards. The proposed Project also seeks to develop adaptation capacity within the MTI and FOMAV to mitigate climate change impacts in the road sector, in line with the goals of the Government’s Strategic Framework for Developing the Dry Corridor in Nicaragua. Lastly, the proposed Project is expected to have an impact on net reduction in greenhouse gas emissions. To that end, based on preliminary findings, overall adaptation and mitigation climate co-benefits are estimated at 80 percent of the proposed Project amount. In terms of gender equality, Nicaragua has made major progress, including the adoption of a legislation that prohibits any form of discrimination. However, some gender gaps remain in labor force participation, with 47.4 percent of women 15 years and older compared to 80.3 percent of men employed in 2013. Moreover, women’s participation in civil works in rural areas was reported at 8.2 percent compared to men at 15.2 percent in 2005.¹⁸ The proposed Project will continue supporting women’s empowerment and employment opportunities in rural road construction works under the MCA model and building on the findings of the *Roads to Agency* study¹⁹ funded under the WB’s Gender Umbrella Trust Fund. The study’s recommendations have been shared with the MTI and the Ministry of Family, and accepted by the Government for inclusion in the proposed Project.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

The objectives of the Project are to: (a) improve safe and sustainable access to markets and services in targeted rural and urban areas of the Recipient; and (b) in the event of an Eligible Emergency, provide immediate and effective response to said Eligible Emergency.

B. Project Beneficiaries

12. **Total beneficiaries are estimated at 550,000 people, of which about 370,000 are direct beneficiaries²⁰ including about 50 percent of people living in rural areas and 51 percent women.** The direct beneficiaries of the proposed Project are those people living within five km of the roads to be improved. These include farmers, livestock producers, small business owners, and freight and passenger transport companies. Benefits to them will accrue as a result of the expected increase in access to social services and markets, as well as the decongestion in roads that would consequently reduce travel costs and times and improve safety. Also, the commuters residing outside of Managua who travel daily on the roads La Garita – Tipitapa and Ciudad Sandino – Mateare to access jobs and services in the capital will benefit from the economic agglomeration opportunities generated by the proposed Project through the reduced congestion and travel/commuting

¹⁸ Based on 2005 Census.

¹⁹ Casabonne, Ursula; Jiménez, Bexi and Müller, Miriam (2015) *Roads to Agency. Effects of Enhancing Women’s Participation in Rural Roads Projects on Agency a Comparative Assessment of Rural Transport Projects in Argentina, Nicaragua and Peru.*

²⁰ The beneficiaries for the rural road sections were estimated using a buffer of 5 km and for the urban access roads it was estimated that the section would benefit 50 percent of the population in the affected urban areas.



times. The upgrading of these sections will benefit about 93,000²¹ daily public transport commuters who do not own vehicles and rely on the 650 collective transport units.

C. PDO-Level Results Indicators

13. **The following PDO level results indicators will be used to measure achievement of the PDO:**
- (a) Total travel time to access markets and services in targeted urban and rural Project areas (% reduction);
 - (b) Share of rural population with access to an all-season road;
 - (c) Road traffic fatalities on selected non-rural road sections (% reduction); and
 - (d) Adoption of measures as recommended by the FOMAV Sustainability Study and as agreed with the WB.

III. PROJECT DESCRIPTION

A. Project Components

14. **The proposed Project will build on the lessons and results from the previous WB-financed transport projects²² while expanding to new areas of engagement addressing road safety and climate change challenges.** It will finance four Components:

15. **Component 1: Road Infrastructure Improvement (US\$85.2 million including contingencies).** The first Component will finance physical works for road rehabilitation and maintenance to improve road connections of the population to social services and markets and ensure sustainability of road assets. It will do this through four sub-components:

- (a) **Sub-component 1.1: Improving Urban Access to Managua (US\$32.6 million including contingencies).** This sub-component will contribute to improving safe access of urban and rural population to markets and basic services located in the urban areas of Managua, Tipitapa, Ciudad Sandino, and Mateare municipalities, by increasing road capacity and reducing congestion of the key urban access to Managua. It will do so through upgrading of the La Garita – Tipitapa (about 8 km) and Ciudad Sandino – Mateare (about 11.8 km) road sections from two to four lanes to improve access to the city of Managua for commuters and reduce transport costs for the transit traffic, including the incorporation of road safety and climate resilience building measures in the design and the supervision of the works. The design will incorporate physical measures to ensure safety of pedestrians and non-motorized traffic, and climate resilience building measures, such as drainage structures, culverts, and slope management. The road designs will be subjected to the road safety audits financed under sub-component 2.2. Consulting services for supervision of works on these road sections will also be financed by this sub-component;
- (b) **Sub-component 1.2: Rehabilitating and Improving Rural Roads (US\$32 million including contingencies).** This sub-component will contribute to: (i) improving all-weather access to

²¹ The total number of direct beneficiaries includes the 93,000 commuters residing outside of Managua.

²² Second Road Rehabilitation and Maintenance Project (P053705, closed on June 24, 2005); Third Road Rehabilitation and Maintenance Project (P068673, closed on June 30, 2007); Fourth Roads Rehabilitation and Maintenance Project (P083950, closed on September 30, 2014); Rural Roads Infrastructure and Improvement Project (P123447, under implementation).



essential markets and services for the targeted rural population; (ii) building resilience of rural roads to climate events and flooding; and (iii) reducing poverty through generation of short-term employment opportunities and skills building, in particular for women. It will do so by carrying out of rehabilitation and improvement works (such as *adoquines* or cobblestone surfacing or any other viable surface replacement option acceptable to the WB), and the construction of drainage facilities and structures on selected rural roads, all within the existing right of way. As such, it will finance priority road improvement works on approximately 46.2 km of selected rural roads in key productive regions using the MCA approach for the labor-intensive works of laying *adoquines*, including construction of major drainage works (drain boxes and bridges) to build climate resilience;

(c) **Sub-component 1.3: Maintaining Road Assets (US\$12 million including contingencies).** This sub-component seeks to improve sustainable access to markets and services through alleviating the transport logistics burden on the core road network, reducing transport costs, and increasing productivity. It will be implemented by FOMAV through the following interventions:

- (i) *Periodic maintenance of San Lorenzo – Múhan trunk road section.* Carrying out of periodic maintenance works (such as asphalt resurfacing) on approximately 30 km of the San Lorenzo – Múhan priority section of the core road network, all within the existing right of way; and
- (ii) *Performance-based routine maintenance of rural adoquines roads.* Carrying out of routine maintenance of selected rural roads paved with *adoquines* (cobblestone), all within the existing right of way. This sub-component will extend performance-based minor routine maintenance to about 200 km of the *adoquines* rural roads. Routine maintenance works will be carried out by small cooperatives to be created on the basis of the former MCAs, which will provide continuity of employment opportunities for former MCA workers in the longer term, and women will be specifically encouraged to participate.

(d) **Sub-component 1.4: Building Resilience to Climate Change in the Road Sector (US\$8.6 million including contingencies).** This sub-component seeks to increase the resilience of roads to climate change, thus contribute to improving sustainable access to markets and services. To do so, it will support the carrying out of works to improve the resilience of vulnerable points of the road network to climate change impacts, selected in accordance with the criteria set forth in the Operational Manual. The ongoing vulnerability study financed by the NDF developed climate change models for Nicaragua, assessed climate vulnerability of the roads, and identified 30 sites of the road network most vulnerable to climate change impacts based on these climate models. Of these 30 vulnerable sites, seven will be selected for improvement under this sub-component to build their resilience to climate related variations.

16. **Component 2: Road Safety (total estimated cost US\$8.1 million including contingencies).** This Component will support activities to strengthen the institutional capacity for managing road safety and physical works to improve road safety measures of the road network. To do so, this Component will finance two sub-components:

(a) **Sub-component 2.1: Reducing Selected Road Accident Hazardous Spots (US\$6.5 million including contingencies).** This sub-component will contribute towards improving road safety in targeted spots with high rates of fatalities. This sub-component will build on the IDB-financed Road Safety Assessment of Nicaragua's Paved Road Network completed in 2013, which identified 50 spots of the



road network with the highest road fatality risks, and will support carrying out of civil works to implement road safety measures in road accident hazardous spots, selected in accordance with the criteria set forth in the Operational Manual. The Government has already implemented road safety improvements on 25 of these 50 spots. This sub-component will finance the implementation of physical road safety measures on 12 of the remaining 25 road accident hazardous spots. The design of these spots will take into account public consultations to ensure that the voices of women, children and vulnerable groups are considered; and

- (b) **Sub-component 2.2: Strengthening Road Safety Management Capacity (US\$1.6 million).** This sub-component will strengthen the road safety management capacity of various actors. To do so, it will finance the provision of support for the implementation of Nicaragua's Road Safety Strategy for the period of 2013-2018, and carrying out of capacity building activities for managing road safety, including, *inter alia*: (a) road safety audits of the La Garita – Tipitapa and Ciudad Sandino – Mateare road sections upgraded under sub-component 1.1 of the proposed Project; (b) technical studies related to the works under sub-component 2.1; (c) training of members of CONASEV; (d) provision of speed radars and breathalyzers to improve enforcement of road safety; and (e) institutional strengthening of MTI road safety professionals. All equipment and activities to be supported under sub-component 2.2 are directly related to road safety, do not include any activities related to the criminal sector or weapons, lethal equipment or any other police or military equipment of such nature, and are unlikely to be politicized or abused.²³ The WB has assessed the risks and has confirmed that this intervention is critical to the proposed Project and economic development in Nicaragua and falls within the WB's development mandate.

17. Component 3: Institutional Strengthening and Implementation Support (US\$3.375 million). This Component seeks to continue building the MTI's and FOMAV's capacity, through the following activities:

- (a) Strengthening of the capacity of MTI's planning unit for (i) monitoring and evaluation; (ii) collection of road sector statistical data; and (iii) administration and management of information collected through its statistical software program (US\$300,000);
- (b) Carrying out of a forward-looking impact evaluation of the activities implemented under the proposed Project with a focus on poverty (US\$500,000);
- (c) Carrying out of the financial audits of the proposed Project (US\$300,000);
- (d) Strengthening of the environmental and social safeguards capacity of the environmental unit of the MTI (US\$200,000);
- (e) Strengthening of the procurement capacity of the MTI (US\$170,000);
- (f) Strengthening of the institutional capacity of (i) MTI (US\$500,000), and (ii) FOMAV (US\$500,000);
- (g) Provision of support for the enhancement of women's participation in the road works (US\$100,000). This will aim at removing barriers for women to participate in the MCAs through (i) expanding means of communication and dissemination of information on employment opportunities (e.g., fliers and communitarian radio), (ii) piloting a model to provide childcare services for female employees with children, and (iii) carrying out gender sensitization trainings to boost women's preparedness and diversify tasks performed by women;

²³ World Bank (2012) *Staff Guidance Note: World Bank Support for Criminal Justice Activities*, A note prepared by the Legal Vice Presidency, February.



- (h) Provision of support for technical studies related to works under the proposed Project or to other potential investments in the transport sector (US\$705,000); and
- (i) Carrying out of a beneficiary satisfaction survey to promote citizen engagement (US\$100,000).

18. **Component 4: Immediate Response Mechanism (with an initial zero dollar allocation. In the event this Component is activated, it will be financed with IDA funds). This Component allows the Government to access resources for eligible expenditures in event of an Eligible Crisis or Emergency, to provide immediate and effective response to said Eligible Crisis or Emergency.** Given that Nicaragua is a country highly vulnerable to natural disasters and climate change phenomena, this Component will enable the Government to respond quickly to such events. Initially, the Component will have a zero dollar allocation, however, in the event of an eligible crisis or emergency, a reallocation of funds will be undertaken.

B. Project Cost and Financing

19. **The lending instrument for the proposed Project will be an IDA credit of US\$46.8 million and IDA Scale Up Facility (SUF) credit of US\$50 million.** The proposed Project will also cover retroactive expenditures for costs incurred up to a 12-month period before the date of signature of the Financing Agreements in the amount of up to US\$9.36 million under the IDA Credit and up to US\$10 million under the IDA SUF Credit.

Project Components	Project cost	IDA Financing
Component 1: Road Infrastructure Improvement	85.20	85.20
Component 2: Road Safety	8.10	8.10
Component 3: Institutional Strengthening and Implementation Support	3.375	3.375
Component 4: Immediate Response Mechanism	0	0
Total Costs	96.675	96.675
Front End Fees	0.125	0.125
Total Financing Required	96.80	96.80

C. Lessons Learned and Reflected in the Project Design

20. **Application of the innovative *adoquines* and MCA model is highly appropriate for rural road improvements with emphasis on the poor regions that also provides a number of employment and skills building benefits.** The MCA model application has proven to be cost-effective, generate social benefits, support bicycle traffic, and has a very low environmental impact. Labor-intensive methods under the MCA model are technically feasible for a wide range of activities in the improvement works for *adoquines* roads, and generally produce the same quality of product as other road rehabilitation methods. The model is a very effective instrument to generate productive short-term employment for skilled and unskilled workers locally and empower beneficiary communities through the mobilization of local resources (material, labor, and



technology). It also enhances local community engagement in planning and decision-making of municipalities in addressing local needs. Most of the *adoquines* roads built with previous WB-financed projects are still in use and in fairly good condition, serving as the main roads to the beneficiary municipalities.

21. **Having in place a prudent project control mechanism, while respecting quality specifications, ensures that a project remains within budget, and achieves its development objective.** The Fourth Roads Rehabilitation and Maintenance Project (P083950) encountered cost overrun issues related to worldwide increases in commodity prices that precipitated the need for additional financing. Therefore, a project control mechanism was established, which included a rigorous qualitative and quantitative review of proposed designs and implementation of works. Moreover, a reasonable margin for quantity and price contingencies have been built into the cost estimates of the civil works.

22. **Building on the Government's current pilot to provide rural road routine maintenance through the implementation of results-based contracts with microenterprises may ensure the sustainability of the MCA model.** One of the main concerns related to the use of MCAs is the sustainability of the model once construction works are completed. While the MCA workers have gained new skills transferrable to other jobs, these can also be applied in the maintenance of rehabilitated rural roads. FOMAV has launched, with WB support under the ongoing Rural Roads Infrastructure and Improvement Project (P123447), pilot results-based routine maintenance contracts to be carried out on rural roads by microenterprises (or cooperatives), which have been legally converted from MCAs. The proposed Project builds on this experience and will continue to provide support as well as guidance, for the expansion of the pilots to the wider network, consequently bolstering the sustainability of both MCAs and the rural road network.

23. **Continuous provision of capacity building to MTI staff on WB's social and environmental safeguards should ensure smooth supervision and compliance with WB Safeguard policies.** The ongoing Rural Roads Infrastructure and Improvement Project (P123447) required the preparation of a Resettlement Action Plan, a first for MTI. Due to MTI's lack of prior experience with WB's social safeguards, there were slight delays in the preparation and updating process of the Resettlement Action Plan, revealing MTI's weaker capacity in managing social safeguards. Fortunately, these delays were resolved in a manner that the timeline for the works was not affected. Although the MTI has more experience with the environmental safeguards, periodic training on compliance with the WB's Safeguard policies will be carried out to improve MTI's capacity in both environmental and social management.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

24. **MTI will be the main institution responsible for the implementation of the proposed Project, except for periodic and routine maintenance under sub-component 1.3, and activities under Component 3 on strengthening of the institutional capacity of FOMAV, which will be implemented by FOMAV.** The Immediate Response Mechanism Coordinating Authority will be responsible for implementing Component 4 of the proposed Project, if it is activated. As under the ongoing Rural Roads Infrastructure and Improvement Project (P123447), MTI will assign many of the day-to-day operations to the project coordination unit (*Unidad Coordinadora de Recursos MTI – Banco Mundial*, UCR MTI-BM), which is experienced, having implemented over five IDA operations in the transport sector. The Director of the UCR reports directly to the Minister and Vice-Minister. The UCR unit is well integrated within the MTI structure, and has staff that are already familiar

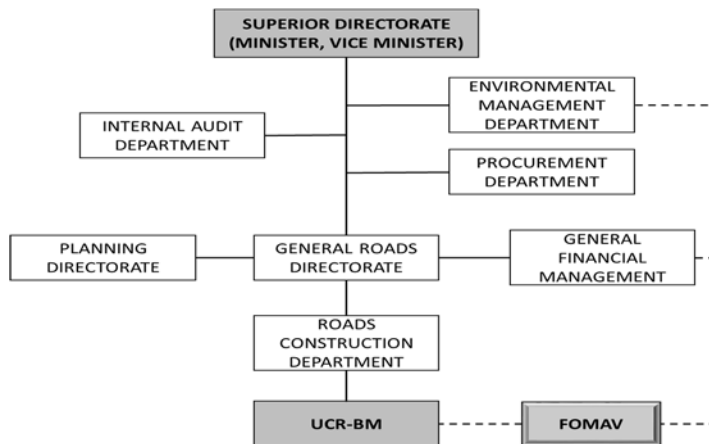


with WB procedures and policies. The unit has demonstrated effective implementation and management of previous WB-financed projects achieving high levels of disbursement and satisfactory performance ratings.

25. **The fiduciary and environmental and social safeguards capacity of MTI has been found adequate and the respective staff are familiar with the WB’s policies, processes, systems, safeguards, and procedures.** However, additional capacity building and training will be required to enable the smooth implementation of the WB’s procurement regulations that will be applied to the proposed Project. Additional capacity building will also be provided to MTI with regard to the appropriate implementation of OP/BP 4.12, Involuntary Resettlement, and environmental safeguards. The UCR will be responsible for all Project-related queries and transaction processing, including procurement and contracting, financial management (FM), reporting on monitoring and evaluation of the results indicators, submission of quarterly implementation progress reports, timely submission of FM reports and audits, management of disbursement requests, supervision of technical works, management and compliance with fiduciary and safeguards requirements, as well as all institutional development activities.

26. **MTI will sign a Subsidiary Agreement with FOMAV, outlining the terms and use of funds by FOMAV.** Under this agreement, FOMAV will implement the periodic and routine maintenance sub-component 1.3 of the proposed Project, and the activities under Component 3 on strengthening of the institutional capacity of FOMAV. The UCR will coordinate all the required inputs from the other departments and units within MTI, as well as coordinate with FOMAV on the implementation of maintenance sub-component 1.3 and with the MCAs in the respective municipalities on execution of *adoquines* sub-component 1.2. Figure 1 shows the main MTI departments and directorates responsible for the proposed Project (the solid line represents internal arrangements within MTI and the dotted line represents project coordination arrangements).

Figure 1: Implementation Arrangements Flowchart



B. Results Monitoring and Evaluation

27. **The monitoring and evaluation system is designed to assess whether implementation of the proposed Project is on track to achieve its objectives and expected results.** Measurement of the progress in the carrying out of the proposed Project activities will be documented in project progress reports. The responsibility for the preparation of these reports lies with the UCR unit in MTI. In order to collect all relevant information, and data, this unit will coordinate with departments within the MTI (including but not limited to



Planning, Financial Management, Environmental & Social, and Procurement) and FOMAV. The reports will be prepared on a semi-annual basis and submitted to the WB for review. In addition to reporting on the proposed Project results indicators and intermediate outcome indicators, the reports will include information on disbursements, FM, procurement, and social and environmental policies and guidelines, as well as an updated annual plan of works and activities. The reports will also include an assessment of the impact that women have had on proposed Project design, and implementation and success (quality, cost, time) of completed or ongoing activities.

C. Sustainability

28. **Design of the proposed Project includes suitable, appropriate, and relevant sustainability provisions.** These include: (i) continued provision of support to the implementation and expansion of rural road maintenance with microenterprises, which are former MCAs; and (ii) promoting the adoption of FOMAV's Financial Sustainability Study's key recommendations to ensure the sustainability of the road improvements carried out under WB-financed projects and on the road network as a whole. The ongoing project²⁴ is supporting FOMAV in the implementation of pilots for minor routine maintenance of rural *adoquines* roads through performance-based contracts with the cooperatives. These cooperatives are composed of trained staff formerly employed in the MCAs. The proposed Project will build on the lessons of these pilots and support their application on rural roads paved under previous WB projects and throughout the country. This will ensure the preservation of the *adoquines* rural road network and the sustainability of the MCA model after the construction is over. In addition, the study on Financial Sustainability of FOMAV, completed in August 2014, recommended measures for improving the revenue stream of the FOMAV, in order to reduce its resource gap and meet the growing maintenance needs of the road network. Given the importance of this proposed increase in FOMAV's revenue stream to ensure long-term preservation of the road network and sustainability of large investments being made in road improvements, the WB will continue the dialogue with the Government. The Government has expressed its intention to make its best efforts with consideration of economic and political conditions to ensure allocation of greater resources for maintenance. The implementation of these measures will be monitored under the proposed Project through a PDO level indicator on "Adoption of measures as recommended by the FOMAV Sustainability Study and as agreed with IDA" to be achieved by proposed Project's closure.

D. Role of Partners

29. **The WB is coordinating with other multilateral and bilateral organizations in Nicaragua to build on their work and scale up support for improving rural roads using the MCA model.** The proposed Project builds on the results and findings of the following studies undertaken with support of these partners: (i) the Road Safety Strategy (2013-2018) financed by the IDB; (ii) the Study on Vulnerability Reduction on Main Roads (2003), financed by JICA; and (iii) the Study on the Adaptation Capacity of the Transport Sector to Climate Change (2016), financed by the NDF. Over the last four years, the MCA model for paving rural roads with *adoquines* has also been scaled up with support from the Central American Bank for Economic Integration that has financed improvement of an additional 181 km for a total of US\$102.5 million.

²⁴ Rural Roads Infrastructure and Improvement Project (P123447), IDA Credits 5028 and 5533, IDA Grants H7440 and H9830.



V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

30. **The overall risk to the proposed Project is rated Moderate.** Risks related to the institutional capacity for implementation and sustainability, and environmental and social categories are substantial, due to sustainability of financing for road maintenance, and the frequent occurrence of natural disasters and severe climate change events. All other risks are moderate, with the exception of the sector strategies and policy risk, which is identified as low.

31. **Institutional Capacity for Implementation and Sustainability: There is a substantial sustainability risk for proposed Project-financed roads, as road maintenance expenditures in Nicaragua have tended to be lower than needed.** The WB will continue supporting FOMAV to achieve its funding needs as a road fund and continue the dialogue with the Government on adopting the recommendations of the recently completed study on FOMAV's Financial Sustainability. The adoption of appropriate measures to achieve sustainability will be monitored through the PDO indicator ("Adoption of measures as recommended by the FOMAV Sustainability Study and as agreed with the WB"), to achieve which the Government will propose the specific measures from the study or other alternative measures to be agreed with the WB and implement them before proposed Project's closure.

32. **Environmental and Social (Climate Change and Disaster Risks): Considering substantial environmental risk and moderate social risk, the combined environmental and social risk category is rated substantial.** The environmental risk is rated substantial due to the vulnerability of the country to extreme climate change events, given that Nicaragua is one of the world's most disaster prone countries. Every year extreme weather and climate change impacts in the form of floods and droughts lead to serious damages to infrastructure, including roads, and impose high economic costs on the country. The WB is working closely with the Government to help reduce the high levels of vulnerability, promote mainstreaming of disaster risk reduction in relevant sectors and improve local capacity for disaster risk reduction and management. At the proposed Project level, this will be mitigated through careful understanding of potential climate and disaster impacts on road sections financed by the proposed Project, incorporation of climate resilient designs, and strengthening institutional capacity to address climate adaptation in the road sector. This will partially be informed by the climate scenarios study for the road network currently being conducted by the MTI with support from the NDF.

33. **The social risk is moderate, and is associated with potential increase in traffic accidents during and after road construction and resettlement induced by some of the proposed Project-financed road improvements.** Considering that drivers may increase speed and engage in riskier behavior on improved smoother (paved) and less congested (upgraded) roads, proper mitigation measures will be incorporated in construction contracts and in the road designs, including (a) traffic management during construction period enforced by the supervision consultant; (b) appropriate vertical and horizontal road signing and signaling; (c) traffic calming measures in trading centers and densely populated areas; and (d) widening of the road shoulders to provide appropriate space for pedestrians and non-motorized traffic in trading or city centers. Moreover, Component 2 includes more general road safety actions for strengthening road safety management capacity and treating road accident hazardous spots. There are also social risks related to resettlement on urban access roads in Managua (La Garita – Tipitapa and Ciudad Sandino – Mateare) due to the nature of works associated with the widening of these road sections, as well as one of the rural roads (Granada – Malacatoya) due to the presence of encroachers within the existing right of way. To mitigate these risks, site-



specific Abbreviated Resettlement Action Plans (ARAPs) have been prepared for these three road sections and will be implemented prior to the award of contract. The contracts for road works and supervision consultants on these roads will also include the Environmental and Social Management Plan (ESMP), prepared by the Borrower and approved by the WB, as well as clauses requiring the presence of social and environmental specialists on site during implementation, and other required resources to implement the ARAPs (such as construction of small structural improvements for the encroachers and small vendors). The risk of labor influx during construction works has been found low (section E on Social Safeguards provides more detail). Nevertheless, the construction contracts will incorporate special clauses requiring application of workers’ code of conduct, mitigation measures against child labor, and labor influx guidelines.

VI. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

34. **MTI applied a comprehensive multi-criteria approach to prioritizing the roads in most need of intervention, based on their contribution to developing the productive areas of the beneficiary municipalities, improving quality of life of the population living in proposed Project areas, and ensuring the permanent transitivity of the intervened roads.** Within approximately 6,448 km of prioritized rural roads and 297 km of prioritized urban roads of the main road network with higher traffic, the following roads were identified and proposed for financing: i) five sections for the improvement of unpaved rural roads (totaling 46.2 km) by *adoquines* pavement; ii) one section of periodic maintenance of paved roads (with 30.0 km); and iii) two sections to improve the capacity to four lanes for decongesting roads providing urban access to Managua (totaling 19.81 km). The prioritization was carried out applying the Multi-criteria Matrix, developed with support of the ongoing WB-financed Rural Roads Infrastructure and Improvement Project (P123447). This Multi-criteria Matrix measures the following variables with respective assigned weights: (i) population; (ii) agricultural production; (iii) poverty level; (iv) connectivity; (v) transitivity; (vi) average daily traffic; (vii) vulnerability; (viii) environmental impacts; and (ix) net present value.

Table 2: Summary of Economic Analysis Results

Road Section	Length (Km)	Total Cost (US\$ M)	NPV (US\$ M)	EIRR (%)
La Garita - Tipitapa	8.0	10.96	27.07	20.1
Ciudad Sandino - Mateare	11.81	16.53	77.16	30.0
Sub-total Sub-Component 1.1	19.81	27.49	104.23	25.6
Granada - Malacatoya	10.0	6.00	6.33	14.7
Corn Island	1.0	0.60	1.74	24.1
Macuelizo - Santa María	10.0	6.00	4.57	11.3
Cárdenas - Colón	10.0	6.00	3.35	11.0
La Libertad - San Pedro de Lóvago	15.2	9.12	23.72	19.3
Sub-total Sub-Component 1.2	46.2	27.72	39.71	15.4
San Lorenzo - Múhan	30.0	8.35	21.60	47.8
Sub-total Sub-Component 1.3	30.0	8.35	21.60	47.8
TOTAL	96.01	63.56	165.54	22.7

35. **The economic analysis of the rural road investments was analyzed and quantified using the Road Economic Decision (RED) Model by simulating lifecycle conditions and costs to provide economic decision criteria for road design construction and maintenance alternatives.** A discount rate of 6 percent was utilized,



and the roads were modeled and reported on their Net Present Value (NPV) and Economic Internal Rate of Return (EIRR). For the upgrading of the urban access roads of La Garita – Tipitapa and Ciudad Sandino – Mateare and for the periodic maintenance of a 30 km San Lorenzo – Múhan trunk road section, net benefits were estimated using the Highway Design and Management Model (HDM-4). A discount rate of six percent was utilized in these cases, and proposed roads were modeled to determine their NPV and EIRR. Benefits in the analysis included travel time savings, increased access to markets and public services, vehicle operating cost savings, and maintenance cost savings. Costs included construction, maintenance, and environment related costs.

36. **For urban access roads, the cost-benefit analysis indicates a sound economic justification with an aggregate discounted NPV of US\$104.23 million, and an EIRR of 25.6 percent at a six percent discount rate.** For the rural roads, the cost-benefit analysis indicates a sound economic justification with an aggregate discounted NPV of US\$39.71 million, and an EIRR of 15.4 percent at a six percent discount rate. For periodic maintenance, the results also yielded economically viable results, with a NPV of US\$21.60 million and an EIRR of 47.8 percent.

37. **The economic analysis also considered economic benefits stemming from the reduction in economic losses associated with road accidents due to road safety countermeasures on the selected road sections of the roads that will receive capacity upgrading and periodic maintenance.** The unit values of economic loss for death and injury are estimated at US\$10,000. The proposed Project’s physical and institutional interventions are assumed to reduce the number of annual deaths and injuries by 45 percent. The benefits are calculated as a savings in costs compared to the reference case. Table 2 presents the detailed results of the economic evaluation.

Table 3: Results of the Sensitivity Analysis

Road Section	20% Increase in Capital Costs		20% Decrease in Benefits		Combined Scenario	
	NPV (US\$ M)	EIRR (%)	NPV (US\$ M)	EIRR (%)	NPV (US\$ M)	EIRR (%)
La Garita - Tipitapa	24.93	17.3	19.52	16.8	17.38	14.4
Ciudad Sandino - Mateare	73.73	26.0	58.29	25.2	54.86	21.8
Sub-total Sub-Component 1.1	98.66	22.1	77.81	21.3	72.24	18.2
Granada - Malacatoya (Cont.)	5.17	12.2	3.91	11.7	2.75	9.5
Corn Island	1.62	20.6	1.27	19.9	1.14	16.9
Macualizo - Santa María	3.35	9.4	2.44	9.0	1.22	7.3
Cárdenas - Colón (Cont.)	2.20	8.9	1.53	8.4	0.38	6.5
La Libertad - San Pedro de Lóvago	21.88	16.9	17.13	16.4	15.28	14.3
Sub-total Sub-Component 1.2	34.22	13.2	26.28	12.7	20.78	10.7
San Lorenzo - Múhan	25.14	46.5	20.82	46.3	24.36	45.3
Sub-total Sub-Component 1.3	25.14	46.5	20.82	46.3	24.36	45.3
TOTAL	150.02	19.7	124.91	19.1	117.4	16.7

38. **Appropriate sensitivity analysis was undertaken predicated defined changes in key parameters of interest (Table 3).** The sensitivity analysis has tested the impact of a 20 percent increase/decrease in certain key parameters in the economic appraisal, such as the capital costs and the benefits of the proposed Project. A 20 percent increase in construction costs and a 20 percent reduction in benefits resulted in a positive NPV of



US\$117.4 million and an IRR of 16.7 percent. The results suggest that the economic viability of the proposed Project is robust, with the defined changes in the key parameters having little impact on overall viability.

39. **An assessment of the proposed Project’s impact in terms of Carbon Dioxide (CO₂) emissions (as a proxy for greenhouse gases) was undertaken, focusing on Component 1.** The proposed Project’s impact was defined as the difference in emissions between a reference scenario “Without-Project” and the “With-Project” scenario. The assessment estimated gross greenhouse gas emissions over the period of 20 years of the proposed Project of 1,280,510 tCO₂e, resulting in a total net reduction in greenhouse gas emissions over the life of the Project of 62,667 tCO₂e (about 5 percent), or an annual average net reduction of about 3,100 tCO₂e (or 5 percent) as compared to the reference scenario on the 96.01 km of roads under Component 1 of the proposed Project. This will be achieved through lower vehicle emissions as a result of increased fuel efficiency on improved rural road sections, and reduced congestion and traffic idling time on upgraded urban access roads.

B. Technical

40. **Design of the proposed Project takes into account experience in the execution of past projects, as well as best practices and adaptation of solutions to the country context.** Technical considerations include: (i) use of *adoquines* as the main surfacing solution for rural road improvements, and asphalt overlays for periodic maintenance; (ii) inclusion of local communities in the construction delivery process using MCAs; (iii) subcontracting of earthworks and *adoquines* supply to the private sector; (iv) adaptation with the integration of differentiated design approaches to include more hazard resilient measures for more climate vulnerable roads; (v) employing existing right of way design approaches with minimal changes to vertical and horizontal alignments; and (vi) integrating road safety measures in the design, with special attention to non-motorized traffic. Road designs are in line with country geometric and pavement design norms, while asphalt resurfacing conforms to standard country technical specifications which are in line with international standards. Special considerations are integrated for road safety and drainage provisions.

41. **Urban Access Roads of La Garita – Tipitapa (8 km) and Ciudad Sandino – Mateare (11.8 km). These two lane paved road sections will be upgraded to four lanes through doubling of the existing asphalt concrete roadway.** Interventions include construction of two seven meter wide walkways, 3.5 meter wide lanes on each side, and 1.2 meter shoulders. The structural solutions were calculated using the AASHTO 1993²⁵ method, obtaining structural packages of bearing layer in concrete asphalt, granular base stabilized with cement and granular subbase, according to the load conditions of past and projected traffic. To address the congestion issue, the design will include upgrading of intersections and roundabouts at single points to improve the flow at critical congested points, extension of approach lanes, and construction of bicycle paths in urban areas. Road safety measures have also been incorporated in the designs, such as construction of a central separator with New Jersey wall²⁶ with a security width of 50 centimeters from the edge of the roadway, allowing for pedestrian crossings at specific critical points, horizontal and vertical signaling and speed calming measures, and 1.5 meter wide pedestrian sidewalks. The works will include drainage improvements as mitigation measures against adverse climatic events, as deemed necessary. These design

²⁵ American Association of State and Highway Transportation Officials (AASHTO) (1993) *Guide for Design of Pavement Structures*, Washington, DC, USA.

²⁶ A concrete barrier used in narrow highway medians to prevent vehicle crossovers into oncoming traffic.

options were selected based on geometric design and traffic studies, with consideration of volumetric traffic counts, origin-destination census, speed measurements and travel times.

42. **Pavement of Rural Roads (46.2 km). The *adoquines* pavement structure was calculated based on the transit levels and loading conditions of each section.** It includes the stabilization of the granular base materials with cement to form a strong support structure, the use of select granular materials for the subbase and suitable fill materials as the lowermost layer or sub-grade. The design also includes the use of quality sand materials to form the road mat for the *adoquines*, and using a custom sand cement mortar mix for the joints. Special drainage, bio-engineering and support features (e.g. cheap cement-sand bags, use of gabion boxes, masonry lining of side drains, construction of catch-water drains, use of concrete cordons, and re-vegetation) will be incorporated in final designs as mitigation measures against adverse climatic events, as deemed necessary. Road safety elements have also been built into the designs (road signs, road marking, safety barriers, etc.). The cost per km was increased to improve the design of drains and sewers considering the effects of climate change.

Table 4: Proposed Interventions by Road Section

Road Section	Current Surface	Type of Intervention	Longitude (km)	Current condition (IRI)	Current Traffic (AADT)	Traffic Growth (%)	Total Cost (mln US\$)
La Garita - Tipitapa	Paved	Upgrade to four lanes	8.0	3.50	9,213	4.9%	10.96
Ciudad Sandino - Mateare	Paved	Upgrade to four lanes	11.81	2.60	8,167	4.7%	16.53
Granada - Malacatoya	Earth	Surfacing with Adoquin	10.0	18.0	737	8.5%	6.00
Corn Island	Earth	Adoquin	1.0	17.0	351	2.1%	0.60
Macuelizo - Santa María	Earth	Surfacing with Adoquin	10.0	25.6	203	9.8%	6.00
Cardenas - Colon	Earth	Surfacing with Adoquin	10.0	18.0	377	8.7%	6.00
La Libertad - San Pedro de Lovago	Earth	Surfacing with Adoquin	15.2	18.0	201	7.9%	9.12
San Lorenzo - Múhan	Paved	Periodic Maintenance	30.0	4.0	1,513	6.7%	8.35
TOTAL			96.01		2,423		63.56

43. **Periodic Maintenance of San Lorenzo – Múhan (30 km). Eight alternative reinforcement techniques were evaluated with the HDM-4 model in the With-Project scenario compared to the alternative base in the Without-Project scenario for a period of 20 years, including periodic maintenance.** The alternative with the highest net present value was selected, consisting of two types of sections: (i) reinforcements of 6 cm of asphalt concrete; and (ii) 20 cm of recycled base and reinforcement of 6 cm of asphalt concrete. The width of 7 meters of existing roadway and one meter of paved shoulder were maintained. The proposed asphalt resurfacing will be in line with standard technical specifications in the country and internationally.

44. **The proposed Project has climate adaptation benefits.** More specifically, sub-component 1.4: Building resilience to climate change in the road sector, has 100 percent adaptation benefits through improving



resilience of the selected vulnerable points of the road network to climate change impacts. In addition, resilience was a central feature of design solutions identified for roads under sub-components 1.1: Improving urban access to Managua, and 1.2: Rehabilitating and improving rural roads, and 1.3: Maintaining the road assets. About 23, 16, and 5 percent of the costs of these sub-components respectively are associated with resilience building measures, such as slope management, major drainage works (drain boxes and bridges), and minor drainage works (ditches, culverts, sub-drainage, pipes). The adaptation co-benefit is the ratio of the resilience associated commitment for these sub-components per the total amount of IDA financing for these sub-components. Thus, the overall adaptation co-benefit that can be attributed to the proposed Project activities is 26 percent.

Table 5: Adaption Co-benefits

Sub-components	Total Financing for Sub-component (US\$ million)	Resilience Associated Commitment (US\$ million)	Resilience Associated Commitment (% of cost)
Sub-component 1.1	32.6	7.5	23%
Sub-component 1.2	32.0	5.1	16%
Sub-component 1.3	12.0	0.6	5%
Sub-component 1.4	8.6	8.6	100%
TOTAL	74.7	21.8	26%

C. Financial Management

45. **FM will be carried out by MTI, which is experienced with WB-financed projects.** MTI is a solid and experienced entity, and has in place adequate controls and monitoring mechanisms over the funds executed by FOMAV, and both MTI and FOMAV have experience implementing WB-financed projects. Key risks are related to: (i) the implementation of the *adoquines* contracts by MCAs and the maintenance contracts between FOMAV and cooperatives; and (ii) the presence of two implementing agencies, MTI and FOMAV, which requires consolidation of financial information, and timely transfer of funds and documentation. FOMAV will need to strengthen its capacity to properly monitor the execution of the activities performed by cooperatives and will require additional support for the creation of cooperatives for routine rural maintenance as well as payments to these cooperatives, which will be made based on performance. The Operational Manual includes detailed procedures and guidelines on the requirements for the organization, monitoring of, and payment to the cooperatives, and will be adopted prior to effectiveness. Furthermore, a Subsidiary Agreement between MTI and FOMAV will be signed prior to effectiveness of the Credits.

46. **MTI will be responsible for preparing and monitoring the annual operating plan and budget, which will include FOMAV's budget.** The budget will then be integrated into MTI's annual budget and monitored through the Integrated Financial Management and Audit System (*Sistema Integrado de Gestión Financiera Administrativa y de Auditoría, SIGFA*).

47. **Project accounting and budget will be managed through SIGFA, including FOMAV's sub-component expenditures.** As for all WB-financed projects, the transactions will be recorded in a separate accounting and reporting module (SIGFAPRO), which provides financial information according to project needs and monitors contract payments. Since SIGFAPRO is not interfaced with SIGFA, reconciling procedures are required between these two systems. Accounting for the proposed Project will be cash-based, in accordance with the Government accounting policies. FOMAV's accounting systems are not capable of generating reports for the



proposed Project's needs, thus additional financial information and conciliation of advances will be provided to MTI on monthly basis, in the agreed formats as documented in the Operational Manual, with reports serving as the basis for monitoring, expenditure recording, and consolidation. MTI will ensure that FOMAV's financial reports are supported by adequate records and documentation in accordance with WB requirements. Performance-based payments to cooperatives will be made upon FOMAV's technical certification of the level of service agreed in the contract. MTI payments to MCAs are based on the periodic physical progress billed by the MCAs and certified by a MTI supervisor.

48. MTI will submit semi-annual Interim Financial Reports (IFRs) (June 30 and December 31), within 45 days of the semester. The format and content of the IFRs will be enhanced to provide information by sub-component on the outstanding balance of the funds transferred to FOMAV, information on contracts, and notes to the IFRs. MTI and FOMAV should retain all records (contracts, orders, invoices, bills, receipts and other documents) evidencing expenditures under their respective parts of the proposed Project until at least the later of: (i) one year after the WB has received the audited Financial Statements covering the period during which the last withdrawal from the Credit Account was made; and (ii) two years after the Closing Date. MTI and FOMAV will provide access to the WB to examine such records.

49. MTI has well established internal control and procedures. Nevertheless, MTI and FOMAV need to strengthen their monitoring capacity of the rehabilitation and minor routine maintenance works on the selected rural roads carried out by the MCAs and cooperatives respectively, and provide the necessary technical assistance to the MCAs and cooperatives on the organization and implementation of internal controls. The Operational Manual includes: (a) roles and responsibilities of MTI and FOMAV; (b) criteria for the organization of the MCAs and cooperatives; (c) monitoring procedures for the activities carried out by the MCAs and cooperatives; (d) content and formats of the IFRs and FOMAV's financial reports; and (e) monitoring processes for signed contracts. In addition, the MTI/External Resources Unit accounting manual will be updated.

50. The MTI will open two separate Designated Accounts in United States Dollars at the Central Bank of Nicaragua, one for each financing source, IDA SUF credit and IDA credit. On a quarterly basis, MTI will transfer funds to FOMAV from the Designated Account(s), into a separate account in Cordobas, as an advance supported by quarterly cash forecasts. FOMAV will be required to document advances on a monthly basis. Expenditure justifications will be reported through Statement of Expenditures. Advances to the Designated Accounts will be made on a variable ceiling up to forecast of cash flow for one semester, or another period if necessary, forecast computed on signed contracts and committed procurements in process, for both MTI and FOMAV. These and other additional disbursement procedures are outlined in the Disbursement Letter.

51. The proposed Project's annual financial statements will be audited by a private firm under the terms of reference and list of audit firms acceptable to the WB. The auditors will conduct interim reviews of the activities implemented by the MCAs and cooperatives for routine maintenance, and the results of the review will be communicated to the MTI and FOMAV in a management letter within 90 days after the review is conducted. The proposed Project's annual audit reports will be submitted to the WB not later than six months after the end of each audited period. Audit costs will be financed by the proposed Project. Audited financial statements will be disclosed on the MTI's website and the WB will make them available to the public in accordance with the WB Policy on Access to Information.

52. In order to monitor the proposed Project's FM arrangements, the WB will conduct at least two full FM implementation support missions per year and carry out desk reviews of interim unaudited financial reports



and annual audit reports. These missions will look into the operation of the internal controls and the acceptability on continuity of the agreed FM arrangements.

D. Procurement

53. **Procurement for the proposed Project will be carried out by: (i) MTI, (ii) FOMAV, and (iii) MCAs.** The Project will be executed in accordance with the WB's Procurement Regulations for Borrowers under Investment Policy Financing (July 2016) ("Procurement Regulations"), and the provisions stipulated in the Procurement Plan and the Operational Manual. A procurement capacity assessment was carried out in November 2016 and both MTI and FOMAV were found to have the necessary capacity. The UCR will be responsible for all procurement and contracting related queries and processing, including management and compliance with fiduciary requirements.

54. **A Project Procurement Strategy for Development was carried out and identified the appropriate selection methods, market approach and type of review by the WB.** Most activities under the proposed Project will be carried out through National or International Competition. An acceptable Procurement Plan was also prepared and included in the new Systematic Tracking of Exchanges in Procurement system. Procurement arrangements for the Immediate Response Mechanism Component are described in the Immediate Response Mechanism Operational Manual. For International Competition, in addition to WB Standard and Sample Bidding Documents, MTI and FOMAV will use standard bidding documents agreed with the Nicaraguan Procurement Directorate.

55. **MCAs will be responsible for rural road improvement.** Road sections will be divided into sub-sections and one MCA will be created and act as contractor for each sub-section. Municipalities will jointly and severally implement works with the MCAs of their jurisdiction, in order to ensure enhanced fiduciary oversight. Criteria for determining the length of subsections is based on the expected managerial capacity of MCAs and is outlined in the Operational Manual as well as support and supervision arrangements by municipalities and MTI respectively. In principle, the aggregate amount of the works, including materials, for each sub-section is estimated at US\$600,000. The Operational Manual outlines the procedures for hiring laborers by MCAs and procurement of minor construction materials by MCAs. MCAs working along the same road section will jointly procure a contractor to carry out earth works and a supplier of *adoquines* in order to benefit from economies of scale in terms of contract prices and administrative effort. These procurements will follow National Competition to ensure transparency. The bidding documents used by MCAs have been agreed upon with the WB.

56. **A series of mitigation measures will be implemented to ensure the satisfactory performance of procurement functions within MTI and FOMAV.** These include: (a) prior review by MTI of all National Competition conducted by MCAs; (b) supervision of procurement/selection transactions carried out by MCAs by auditors acceptable to the WB and according to terms of reference acceptable to the WB; (c) agreement of MTI/FOMAV and WB on the required qualifications of existing procurement staff who will be appointed to support the proposed Project, with the commitment of MTI/FOMAV to replace them only with staff of equivalent qualifications acceptable to the WB; and (d) inclusion of Special Procurement Provisions in the Procurement Plan. All procurement procedures are described in the Operational Manual, and published on the MTI web page.

57. **To maintain sound procurement processes, MTI will carry out procurement audits.** To this end, it will:
i) ensure all procurement records and documentation for each fiscal year of the proposed Project, are audited



by independent auditors acceptable to the WB in accordance with appropriate procurement audit principles; ii) furnish to the WB the procurement audit report; and iii) furnish to the WB other information concerning the procurement records, documentation and reviews. The scope of this Audit will also include the procurement/selection transactions carried out by MCAs.

E. Social (including Safeguards)

58. **The Indigenous Peoples Policy OP/BP 4.10 is triggered because one of the proposed sub-projects is located in the Municipality of Corn Island, which is part of the South Atlantic Autonomous Region and where people of a Creole (Kriol) ethnicity are found.** The assessments have determined that on the other seven road sections where locations are known, Indigenous Peoples were not present. Thus, an Indigenous Peoples Plan was prepared by the Borrower and approved by the WB only for the road section in Corn Island and disclosed in-country and on the WB's external website on December 23, and 28, 2016, respectively. The grievance-handling procedures and processes established for the Indigenous Peoples Plan will be based on the Grievance Redress Mechanism (GRM) put in place by MTI for the proposed Project. Its implementation will be monitored by MTI's Environmental and Social Management Division in coordination with the Corn Island Municipal Office. The Indigenous Peoples will be able to submit complaints and other grievances verbally or in writing to the MCA representatives in the sub-project works area, the Corn Island Municipal Office, or on the MTI's website. Each complaint received will be recorded in a unified format, of which the complainant and all the other pertinent parties will receive a copy, and results of complaint resolutions will be announced in the periodic consultation meetings with the communities and Indigenous Population in the area. If a site visit is required, it will take place within three days of the date in which the claim is made, in coordination with all the parties involved. In case of nonconformity with the response, the complainant may appeal to the MTI, within a period of five days. Once the case has been evaluated, the MTI will instruct the Mayor also to request the MCA to comply with the request. Given that the precise location of activities under the resilience and road safety Components (1.4 and 2.1) are not known yet, an Indigenous Peoples Planning Framework was prepared by the Borrower and approved by the WB for these interventions and disclosed on December 23, 2016 in-country, and on December 28, 2016, on the WB's external website. The Indigenous Peoples Plan and Indigenous Peoples Planning Framework were consulted upon locally on November 17, 2016, with the Creole (African descent) and Miskito communities. The Framework was also consulted at national level on December 16, 2016, in a multi-stakeholder workshop in Managua with participation of representatives from Development Secretariat of the Caribbean Coast, and Executive Directorate of Autonomous Regional Government of the Southern Caribbean Coast.

59. **The Involuntary Resettlement Policy OP/BP 4.12 is triggered because limited acquisition of land in the form of strips of land on the right of way and farmland will result in involuntary resettlement of informal encroachers and traders on three road sections with known locations under Component 1.** Around 32 families (or 160 people) have been identified to be affected, of which 24 families (or 138 people) will be affected by economic displacement: (i) for the Ciudad Sandino – Mateare sub-project, 15 families with homes, businesses or both will be affected; (ii) for the La Garita – Tipitapa sub-project, 11 families are affected; (iii) for the Granada – Malacatoya sub-project, six families living in poverty are affected. For the four roads (Corn Island, Cárdenas – Colón, La Libertad – San Pedro de Lóvago, and San Lorenzo – Múhan) with known locations and detailed designs, no involuntary resettlement was identified. Therefore, site-specific ARAPs were prepared by the Borrower and approved by the WB for only these three road sections, consulted upon (ARAPs for Granada – Malacatoya and La Garita – Tipitapa on December 15, 2016, and ARAP for Granada – Malacatoya on December 16, 2016) and disclosed in-country (ARAP for Granada – Malacatoya on December



24, 2016, and ARAPs for La Garita – Tipitapa and Ciudad Sandino – Mateare on December 27, 2016). All three instruments were disclosed on the WB’s external website on December 28, 2016. For one of the eight sections with known locations (Macuelizo – Santa María), the precise siting alignments cannot be determined at this time. If as a result of the definition of the siting alignments, it is determined by the WB that resettlement will be carried out, a Resettlement Action Plan will be prepared by the Borrower, in accordance with a Resettlement Policy Framework, acceptable to the WB. The Resettlement Policy Framework was prepared by the Borrower and approved by the WB consistent with OP/BP 4.12 policy, and disclosed in-country and on the WB’s external website on December 23 and 28, 2016, respectively. The contracts on the three road sections with expected resettlement will include the required resources to implement the ARAPs (such as construction of small improvements for the encroachers and small vendors).

60. **The public consultations for the ARAPs were carried during December 15-16, 2017, with the participation of between 10 to 20 community members, Municipality officials, residents in the area of influence for each sub-project.** These also included male and female representatives of families whose properties would be affected by the execution of the works. During the consultations, the main concerns raised were regarding operation of their businesses, protection and safety of their houses once the road is completed, and the inclusion of road safety measures in the road designs such as crossings for children as well as speed reducers. The measures to ensure the safety of pedestrians, road-side businesses and houses, and of the non-motorized traffic have been incorporated in the respective designs of the road sub-projects. For each ARAP consultation, the MTI also clarified that it was the first of many future consultations that would take place prior to commencement of works at each road section to continue discussing and addressing public concerns and to ensure the joint decision-making process and the communities’ approval of the proposed measures.

61. **The potential risks to the communities derived from contracting labor from outside for the road construction works is low.** For works under sub-component 1.2, there are local people with the skills to carry out the tasks demanded by the MCAs and by the cooperatives for routine maintenance of rural roads. Each MCA will employ on average around 50 people within the communities. Moreover, the preliminary gender analysis and experience of previous projects did not highlight any cases of gender-based violence, social conflict, child labor, or increased communicable diseases. For the works on La Garita – Tipitapa and Ciudad Sandino – Mateare under sub-component 1.1, absorption capacity will be high around the target urban areas as most of the labor is expected to be local and only a few high skill/technical labor will be required from outside. Preventive and response measures will be put in place, such as inclusion of training on healthy relationships, non-violent conflict resolution, gender relations, and awareness of human immunodeficiency virus and sexually transmitted infections within the training curricula of courses provided by MTI to the MCAs. Similar training will be provided for the contractors and included in the respective contracts for the urban access roads. The contracts for road works and supervision consultants on these roads will also include the ESMPs prepared by the Borrower and approved by Bank, as well as clauses requiring the presence of social and environmental specialists on site during implementation. Mechanisms for reporting complaints on cases of potential gender-based violence and child abuse will be put in place in MCAs offices and in the proposed Project’s GRM system. MCAs will collaborate with the nearest police stations that can respond and provide orientation regarding these issues.

62. **The proposed Project will build on the successful experiences of previous transport projects in supporting women’s inclusion in the community-run *adoquines* paving tasks through MCAs.** The MTI has made significant efforts to recruit women to the MCAs over the past nine years, with share of female employees increasing from 10 to 46 percent currently. Women have been involved mainly in leadership,



technical and administrative positions, which have contributed to increased income, skills building, and improvement of agency of women enabling them to make effective choices and transform these choices into desired outcomes. Apart from employment, the WB-financed *Roads to Agency* study (2015) found that these experiences had profound psychological and human development effects in addressing gender gaps, such as increase in women's self-esteem and autonomy, change in the intra-household bargaining and social norms, exposure to wider social networks, and opportunities to develop leadership skills. However, according to the study, women in Nicaragua still face some barriers and challenges to participation in the MCAs, such as unpreparedness, childcare constraints, and lack of information, among others. To address and remove these barriers, the following gender-targeted activities are being supported under Component 3: (i) proper technical and gender-sensitization training to diversify tasks for women's agency leaving option of tasks open to their choice; (ii) application of gender sensitive recruitment strategy to provide women with better access to information through diverse massive communication mechanisms, such as communitarian radio and distribution of fliers; and (iii) introduction of childcare provision to women employed by the MCAs in coordination between MTI, the Ministry of Family and participating Municipalities. Women from the former MCAs will also be encouraged to participate in the cooperatives for minor routine maintenance of *adoquines* roads supported under sub-component 1.3, which will provide additional employment opportunities in the longer term.

63. **Community involvement through citizen engagement activities is being sought as a means to empower beneficiary communities to take control of their road networks and become involved with local-level planning and decision-making.** The MTI will be responsible for the execution and monitoring of citizen engagement activities under the proposed Project, including, inter alia: (a) carrying out of gender-representative consultations in all beneficiary communities before and during implementation of works to inform them of planned works in their communities or other proposed Project-related activities that will affect them; and (b) selection of representatives from each beneficiary community as part of the public consultation meetings who will serve as community monitors during the construction period and provide monthly updates on the status of rehabilitation works or other activities to affected community members. This community monitoring system will be complemented by a GRM system established for the beneficiaries of the proposed Project that will be operated by MTI and allow for submission of questions, complaints, or suggestions via MTI website, email, phone, or regular mail. In this regard, it was agreed that: (i) supervision contracts will include the responsibility for reporting of complaints in progress reports; (ii) beneficiaries of the proposed Project in rural areas may submit their complaints by telephone and / or the MCA office; (iii) beneficiaries in the non-rural works area may submit their complaints directly to the MTI (given their proximity to the MTI offices), by telephone or through the MTI website. The MTI will then report any issues or problems associated with the implementation of the proposed Project on the ground and ensure that each complaint is documented and reported. The MTI will also carry out beneficiary satisfaction surveys, financed under Component 3, at the initiation, during implementation and upon completion of the road works to ensure citizen participation in decision-making activities and measure their satisfaction with proposed Project activities and progress.

F. Environment (including Safeguards)

64. **Based on Environmental Assessment OP/BP 4.01, the proposed Project is classified as Category B, since Project environmental impacts are expected to be site-specific and primarily during construction, and thus are moderate to low.** The urban access roads, rural pavement (*adoquines*), and periodic maintenance sub-projects will be undertaken on existing roads only. There will be no activities in critical or sensitive natural habitats. The proposed Project is expected to have a positive impact on health and quality of life, including



improvement in air quality, reduction of total suspended solids from unpaved roads, noise nuisance reduction, travel time savings, and improved and reliable all-season access. The road maintenance sub-component will also improve road surface conditions and drainage, and reduce road erosion. The road safety physical interventions will improve safety for the pedestrians and non-motorized transport and contribute to reduction of fatalities on roads.

65. **Upgrade of the urban access road in Ciudad Sandino – Mateare will require the cutting of some trees along the current roadside.** In line with the national law, the National Forest Institute requires the preparation of a Reforestation Plan, which is included in the ESMPs of the proposed sub-projects prepared by the Borrower and approved by the WB. These trees have not been found to have any known societal or cultural significance that could lead to opposition from the community. Given the presence of pedestrians, carriages, bicycles, and carts, a safe thoroughfare for non-motorized transport and pedestrians will be established during the construction phase. The civil works on rural roads under the MCA model will take place along existing unpaved roads within the existing right of way and are not complex in nature (works will be community executed and consist of laying of a sand-cement base with *adoquines* placed on top). The potential environmental impacts are limited as these unpaved roads are already in use by vehicles. The works will be of the same magnitude as under the ongoing project, for which the screening process is already in place, and this same screening process will be used to ensure that any sections that might have a negative impact on protected areas or sensitive ecological habitats are not approved. The proposed periodic maintenance works on the San Lorenzo – Múhan section will involve minor activities such as surface cleaning, repairing of drainage structures, patching of potholes, and resurfacing of asphalt, none of which are expected to have any significant impact.

66. **The ESMPs were prepared by the Borrower and approved by the WB for eight specific road sections with known locations and detailed designs.** These include: i) upgrade of La Garita – Tipitapa, consulted upon on December 15, 2016, disclosed in-country on December 23, 2016, and on the WB's external website on December 28, 2016; ii) upgrade of Ciudad Sandino – Mateare, consulted upon on September 6, 2016, disclosed in-country on December 23, 2016, and on the WB's external website on December 28, 2016; iii) pavement of Cárdenas – Colón, consulted upon on October 13, 2011, disclosed in-country on December 23, 2016, and on the WB's external website on December 28, 2016; iv) pavement of La Libertad – San Pedro de Lóvago, consulted upon on November 23, 2016, disclosed in-country on December 23, 2016, and on the WB's external website on December 29, 2016; v) pavement of Corn Island, consulted upon on November 17, 2016, disclosed in-country on December 23, 2016, and on the WB's external website on December 28, 2016; (vi) pavement of Granada – Malacatoya, consulted upon on December 17, 2016, disclosed in-country on December 23, 2016, and on the WB's external website on December 28, 2016; (vii) pavement of Macuelizo – Santa María, consulted upon on January 19, 2017, and disclosed both in-country and on the WB's external website on January 23, 2017; and (viii) periodic maintenance of San Lorenzo – Múhan, consulted upon on December 19, 2016. Public meetings and consultations for ESMPs were carried out on each site with key project stakeholders and project beneficiaries during September 6, 2016 – January 19, 2017, with participation of between 30 and 70 people at each sub-project (totaling about 300 people), and duly reported and annexed to each ESMP. Consultation participants included rural and urban population living in the participating municipalities and communities and the project affected people that live and/or are engaged in economic activities in the project areas. During the consultation workshops, the topics discussed were related to the impacts of the project on environment, land, livelihood, and gender, which have been taken into account in designing the most environmentally and socially feasible options for improving the proposed urban and rural roads.



67. **In addition, the Environmental and Social Management Framework (ESMF) was updated for the resilience and routine maintenance of rural roads, as well as the road safety sub-components (1.4, 1.3-ii, and 2.1), where the precise locations of civil works are not yet known.** The ESMF was prepared by the Borrower, approved by the WB, and disclosed in Nicaragua and on the WB's external website on December 27, and December 29, 2016 respectively. The ESMF includes appropriate management tools to assure the adequate environmental and social management during implementation of sub-projects, and screening provisions and management measures in case any critical areas are identified during sub-project preparation and implementation, and in the event of potential affectation of the physical and cultural properties (chance finds procedures). The ESMF consultation workshop was held in Managua on December 5, 2017, with participation of 33 people from MTI, FOMAV, Ministry of Environment and Natural Resources, and other stakeholders. No major issues were raised during the consultation. Minor comments and recommendations were recorded in the final version of the ESMF. The evidence of the workshop is included in the Annex 1 of the respective document.

68. **The Environmental and Social Management Division of MTI will be responsible for the oversight and management of safeguards for proposed Project activities implemented by MTI, and has experience under previous WB-financed projects.** FOMAV will rely on this Division for assistance with safeguards requirements for implementation of sub-component 1.3, specifically, in the case of periodic maintenance of San Lorenzo – Múhan. Given the scope and nature of all potential adverse impacts essentially restricted to the construction phase, both MTI's and FOMAV's institutional capacity to manage safeguard risks has been found adequate, with the respective staff familiar with the WB's safeguard policies. Nonetheless, the Division's capacity on social safeguards compliance could be further strengthened, and this will be supported under Component 3 of the proposed Project, specifically, through implementation of an Environmental and Social Strengthening Plan developed by the MTI and approved by the WB. This will entail hiring of a full time social safeguards specialist and additional capacity building and training activities to the Division's staff to enable effective implementation of the safeguards instruments, including the requirements under OP/BP 4.12 Involuntary Resettlement, and strengthening of the environmental and social management capacity at the institutional level in general.

69. **Natural Habitat OP/BP 4.04 is triggered on a precautionary basis.** None of the proposed road sections traverse critical ecological habitats. The ESMF, prepared by the Borrower and approved by Bank, includes appropriate screening criteria to identify potential negative impacts on critical or sensitive areas, and measures to prevent, mitigate, and/or compensate potential negative impacts on critical or sensitive areas.

70. **Physical Cultural Resources OP/BP 4.11 is also triggered on a precautionary basis.** All civil works will take place within the right of way of existing roads, and thus no impact to any physical or cultural resource is expected, nor will access to places of worship or shrines be restricted during construction. However, there will be land movements and material banks usage, and chance findings may occur. The ESMPs for the road works and the ESMF, all prepared by the Borrower and approved by the WB, include specific guidelines to address change finds and corresponding protocols of action.

G. World Bank Grievance Redress

72. **Communities and individuals who believe that they are adversely affected by a WB-supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS).** The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's



independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the WB's attention, and WB Management has been given an opportunity to respond. For information on how to submit complaints to the WB's corporate 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 WB Inspection Panel, please visit www.inspectionpanel.org.



VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY : Nicaragua

Rural and Urban Access Improvement Project

Project Development Objectives

The objectives of the Project are to: (a) improve safe and sustainable access to markets and services in targeted rural and urban areas of the Recipient; and (b) in the event of an Eligible Emergency, provide immediate and effective response to said Eligible Emergency.

Project Development Objective Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Total travel time to access markets and services in targeted urban and rural Project areas (% reduction)		Percentage	0.00	30.00	Annual	Project progress reports by implementing agency UCR-MTI	UCR-BM, MTI
Total travel time to access markets and services in targeted rural Project areas during rainy season (% reduction)		Percentage	0.00	44.00	Annual	Project progress reports by implementing agency UCR-MTI	UCR-BM, MTI

Description: Measurement of the access to markets and services portion of the PDO. Percentage of travel time saved by the users to reach markets as well as education and health services, in line with progress in improving non-rural and rural roads (components 1.1, 1.2 and 1.3 [i]). Travel time is determined through the average travel speeds obtained from HDM-4 (non-rural roads) and RED (rural roads), for both the with and without project scenarios. In the case of the rural roads, a 50% speed reduction is considered to represent the impact of heavy rains during the rainy season. Time savings is the difference between the travel time in the without-project



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
scenario and the travel time in the with-project scenario, measured in percentage. Please note that this indicator requires supplemental information.							
Name: Share of rural population with access to an all-season road	✓	Percentage	40.00	45.00	Annual	Commissioned Surveys, Reports of INIDE (based on CENSUS 2005), GIS maps	UCR-BM, Planning Department of MTI
Number of rural people with access to an all-season road	✓	Number	1077108.0 0	1561806.0 0	Annual	Commissioned Surveys, Reports of INIDE (based on CENSUS 2005), GIS maps	UCR-BM, Planning Department of MTI
<p>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).</p> <p>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).</p>							
Name: Road traffic fatalities on selected non-rural road sections (% reduction)		Percentage	0.00	45.00	Annually from 3rd year of the proposed Project	Reports from Road Safety Department of MTI	UCR-BM, Road Safety Department, MTI
<p>Description: Measurement of the safety portion of the PDO. Percentage of reduction in the total number of annual fatalities on the three (3) selected non-rural roads: La Garita-Tipitapa; Ciudad Sandino-Mateare; and San Lorenzo – Muhan. The baseline for the reduction has been calculated based on the average number of fatalities from 2010 to 2014 on each non-rural road section: La Garita-Tipitapa: 23 fatalities; Ciudad Sandino-Mateare: 21 fatalities; and San Lorenzo – Muhan: 9 fatalities.</p>							



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Adoption of measures as recommended by the FOMAV Sustainability Study and as agreed with the WB		Yes/No	N	Y	Yearly from 3rd year of the proposed Project	Reports from FOMAV, project progress reports	UCR-BM, MTI, FOMAV
<p>Description: Measurement of the "sustainability" portion of the PDO. Progress in the adoption of the key recommendations proposed in the FOMAV Financial Sustainability Study, which aims to reduce resource deficits and meet maintenance needs of the road network (component 1.3). To achieve the goal of this indicator, the specific measures to be adopted will be proposed by the Government of Nicaragua and agreed with the WB before the end of the third year, and will be implemented before the proposed Project's closure.</p>							

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Roads constructed, Rural	✓	Kilometers	0.00	46.20	Annual	Project progress reports by implementing agency UCR-MTI	UCR-BM, MTI
<p>Description: Kilometers of rural roads constructed under the project. Rural roads are roads functionally classified in various countries below Trunk or Primary, Secondary or Link roads, or sometimes Tertiary roads. Such roads are often described as rural access, feeder, market, agricultural, irrigation, forestry or community roads. Typically, rural roads connect small urban centers/towns/settlements of less than 2,000 to 5,000 inhabitants to each other or to higher classes of road, market towns and urban centers.</p>							



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Roads rehabilitated, Non-rural	✓	Kilometers	0.00	49.81	Annual	Project progress reports by implementing agency UCR-MTI	UCR-BM, MTI
<p>Description: Kilometers of all non-rural roads reopened to motorized traffic, rehabilitated, or upgraded under the project. Non-rural roads are roads functionally classified in various countries as Trunk or Primary, Secondary or Link roads, or sometimes Tertiary roads. Typically, non-rural roads connect urban centers/towns/settlements of more than 5,000 inhabitants to each other or to higher classes of road, market towns and urban centers. Urban roads are included in non-rural roads.</p>							
Name: Rural roads paved with adoquines under performace based routine maintenance		Kilometers	0.00	200.00	Annual	Reports from FOMAV, project progress reports	UCR-BM, FOMAV
<p>Description: Measurement of progress towards provision of routine maintenance on 100 km of rural roads paved with adoquines, carried out by small cooperatives, created based on the former MCAs in an effort to provide sustainability of the MCA model and consequently, of the rural road network.</p>							
Name: Short-term employment through participation in rural road construction works, disaggregated by gender		Number	0.00	600.00	Annual	Reports from MTI supervisors	UCR-BM, MTI
Share of women employed in short-term MCA rural road construction works		Percentage	0.00	30.00	Annual	Reports from MTI supervisors	UCR-BM, MTI



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
<p>Description: Short term employment monitoring by participating in MCAs, and women empowerment monitoring. Cumulative number of short-term jobs created through MCAs, of which percentage filled by women.</p>							
Name: Medium and long-term employment through participation in cooperatives for performance-based maintenance, disaggregated by gender		Number	0.00	50.00	Annual	Reports from FOMAV supervisors	UCR-BM, FOMAV
Share of women employed in long-term cooperatives for performance-based maintenance.		Percentage	0.00	30.00	Annual	Reports from FOMAV supervisors	UCR-BM, FOMAV
<p>Description: Medium and long-term term employment monitoring through the participation in performance-based cooperatives for minor routine maintenance of adoquines rural roads, and women empowerment monitoring. Cumulative number of medium and long-term jobs created through performance-based cooperatives for minor routine maintenance, of which percentage filled by women.</p>							
Name: Direct project beneficiaries	✓	Number	0.00	370000.00	Annually from 3rd year of the proposed Project	Projections made by INIDE (based on CENSUS 2005)	UCR-BM, MTI
Female beneficiaries	✓	Percentage	0.00	51.00	Annually from 3rd year of the proposed Project	Project progress reports by implementing agency UCR-MTI	UCR-BM, MTI
<p>Description: Direct beneficiaries are people or groups who directly derive benefits from an intervention (i.e., children who benefit from an immunization program;</p>							



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
<p>families that have a new piped water connection). Please note that this indicator requires supplemental information. Supplemental Value: Female beneficiaries (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.</p>							
Name: Number of vulnerable spots on the road network with implemented countermeasures for climate resilience		Number	0.00	7.00	Once	Project progress reports by implementing agency UCR-MTI	UCR-BM, MTI
<p>Description: Measurement of the progress of the works carried out to improve the resilience of highly vulnerable points of the road network to climate change impacts. These points have been identified through the ongoing climate vulnerability assessment of the road network, financed by the NDF.</p>							
Name: Carbon emissions avoided annually		Metric ton	0.00	3133.00	Annually from 3rd year of the proposed Project	Reports from MTI-PMS unit	UCR-BM, Planning Department, MTI
<p>Description: Measurement of the avoidance of CO2 vehicle emissions per year on the improved roads due to reduced traffic idling time and increased fuel efficiency. Vehicle emissions are assessed by using the HDM-4 simulations.</p>							
Name: Accident black spots removed on most vulnerable sections of the road network		Number	0.00	12.00	Yearly and at works completion	Reports from Road Safety Department of MTI	UCR-BM, Road Safety Department, MTI
<p>Description: The proposed Project will execute physical road safety measures on top critical spots with highest road fatality risks identified by the Road Safety Assessment of Nicaragua's Paved Road Network financed by IDB in 2013.</p>							



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Number of road safety professionals members of CONASEV trained		Number	0.00	20.00	Annual	Reports from Road Safety Department of MTI	UCR-BM, Road Safety Department, MTI
<p>Description: Progress on the provision of training to staff working on road safety activities in governmental institution that are members of the Technical Committee of the National Road Safety Council (Consejo Nacional de Seguridad Vial – CONASEV), charged with implementation of the National Road Safety Strategy.</p>							
Name: Number of MTI and FOMAV staff receiving training under the capacity building initiatives		Number	0.00	25.00	Annual	Project progress reports by implementing agency UCR-MTI	UCR-BM, FOMAV, MTI
Number of MTI and FOMAV staff trained, which are female		Number	0.00	10.00	Annual	Project progress reports by implementing agency UCR-MTI	UCR-BM, MTI, FOMAV
<p>Description: Progress on human resource capacity building within MTI and FOMAV.</p>							
Name: Share of project beneficiaries surveyed and satisfied		Percentage	0.00	75.00	Once	Project progress reports by implementing agency UCR-MTI	UCR-BM, MTI



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
<p>Description: Measurement of citizen's participation in decision-making activities and their satisfaction with project activities and progress. The survey will be carried out at the initiation, during implementation and upon completion of the road works to measure the improvement of accessibility for the beneficiary population, their needs and whether their needs have been taken into account during implementation, their perceptions and expectations with respect to the quality of roads, and, indirectly, the benefit that the interventions in these roads provide in terms of access to health, education, and markets disaggregated by gender perspective, with emphasis on issues of road safety, personal safety, affordability, and accessibility.</p>							
<p>Name: Time taken to disburse funds requested by the Government for an eligible emergency</p>		Weeks	0.00	4.00	Once	Operational Manual	UCR-BM, MTI
<p>Description: Measurement of implementation progress if activated.</p>							



Target Values

Project Development Objective Indicators

Indicator Name	Baseline	End Target
Total travel time to access markets and services in targeted urban and rural Project areas (% reduction)	0.00	30.00
Share of rural population with access to an all-season road	40.00	45.00
Road traffic fatalities on selected non-rural road sections (% reduction)	0.00	45.00
Adoption of measures as recommended by the FOMAV Sustainability Study and as agreed with the WB	N	Y
Total travel time to access markets and services in targeted rural Project areas during rainy season (% reduction)	0.00	44.00
Number of rural people with access to an all-season road	1077108.00	1561806.00

Intermediate Results Indicators

Indicator Name	End Target
Roads constructed, Rural	46.20
Roads rehabilitated, Non-rural	49.81
Rural roads paved with adoquines under performace based routine maintenance	200.00



Indicator Name	End Target
Short-term employment through participation in rural road construction works, disaggregated by gender	600.00
Medium and long-term employment through participation in cooperatives for performance-based maintenance, disaggregated by gender	50.00
Direct project beneficiaries	370000.00
Number of vulnerable spots on the road network with implemented countermeasures for climate resilience	7.00
Carbon emissions avoided annually	3133.00
Accident black spots removed on most vulnerable sections of the road network	12.00
Number of road safety professionals members of CONASEV trained	20.00
Number of MTI and FOMAV staff receiving training under the capacity building initiatives	25.00
Share of project beneficiaries surveyed and satisfied	75.00
Time taken to disburse funds requested by the Government for an eligible emergency	4.00
Share of women employed in short-term MCA rural road construction works	30.00
Share of women employed in long-term cooperatives for performance-based maintenance.	30.00
Female beneficiaries	51.00
Number of MTI and FOMAV staff trained, which are female	10.00