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Report No: PAD2427

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US\$ 300 MILLION

TO THE

ARGENTINE REPUBLIC

FOR A

NORTHWESTERN ROAD DEVELOPMENT CORRIDOR PROJECT

NOVEMBER 21, 2017

Transport & ICT Global Practice  
Latin America And Caribbean Region

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## CURRENCY EQUIVALENTS

(Exchange Rate Effective November 1, 2017)

Currency Unit = Argentine Peso (AR\$)

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AR\$ 17,671 = US\$1

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US\$ 0,056 = AR\$ 1

## FISCAL YEAR

January 1 - December 31

Regional Vice President: Jorge Familiar Calderon

Country Director: Jesko S. Hentschel

Senior Global Practice Director: Jose Luis Irigoyen

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Task Team Leader(s): Veronica Ines Raffo

## ABBREVIATIONS AND ACRONYMS

AADT	Annual Average Daily Traffic
ANSV	National Road Safety Agency ( <i>Agencia Nacional de Seguridad Vial</i> )
ARAP	Abbreviated Resettlement Action Plan
CAE	Child abuse/exploitation
CAPEX	Capital expenditure
CPS	Country Partnership Strategy
DNV	Road National Directorate ( <i>Dirección Nacional de Vialidad</i> )
ECLAC	Economic Commission for Latin America and the Caribbean
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FM	Financial Management
FMA	Financial Management Assessment
GBV	Gender based violence
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	Greenhouse gas
GIF	Global Infrastructure Facility
GPP	Gross Provincial Product
GRM	Grievance and Redress Mechanism
GRS	Grievance Redress System
HDM-4	Highway Development and Management Tool
IBRD	International Bank for Reconstruction and Development
ICT	Information and Communication Technologies
INDEC	National Institute of Statistics and Census ( <i>Instituto Nacional de Estadísticas y Censo</i> )
IPP	Indigenous Peoples Plan
IRI	International Roughness Index
MoF	Ministry of Finance
MoT	Ministry of Transport
M&E	Monitoring and Evaluation
NAMA	Nationally Appropriate Mitigation Action
NBI	Unmet Basic Needs ( <i>Necesidades Básicas Insatisfechas</i> )
NDC	Nationally Determined Contribution
NPV	Net Present Value
NR	National Road ( <i>Ruta Nacional</i> )
NW	Northwestern
OCCOVI	Control Agency Road Concessions ( <i>Órgano de Control de Concesiones Viales</i> )
PDO	Project Development Objective
PIVIP	Provincial Road Infrastructure Project
PPP	Public-Private Partnership
PPSD	Project Procurement Strategy for Development
RUC	Road User Cost
SEDLAC	Social Economic Database for Latin America and the Caribbean
SESA	Strategic Environmental and Social Assessment
SIDIF	Integrated Budget and Accounting IT System ( <i>Sistema Integrado de Información Financiera</i> )
TA	Technical Assistance
ToR	Terms of Reference
VOC	Vehicle Operating Cost
WBG	The World Bank Group

## BASIC INFORMATION

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

- ☐ Situations of Urgent Need of Assistance or Capacity Constraints
- ☐ Financial Intermediaries
- ☐ Series of Projects

Approval Date	Closing Date	Environmental Assessment Category
14-Dec-2017	30-Jun-2023	B - Partial Assessment

Bank/IFC Collaboration
No

### Proposed Development Objective(s)

The Proposed Project Development Objectives (PDO) are to improve connectivity and road safety along targeted road sections of the Northwestern Corridor and to support corridor development in the Northwest of Argentina.

### Components

Component Name	Cost (US\$, millions)
Road Infrastructure	300.00
Infrastructure for Development Corridor Management	7.25
Project management	3.00
Front-end fee	0.75

### Organizations

Borrower : The Argentine Republic

Implementing Agency : Dirección Nacional de Vialidad

#### PROJECT FINANCING DATA (US\$, Millions)

<input checked="" type="checkbox"/> Counterpart Funding	<input checked="" type="checkbox"/> IBRD	<input type="checkbox"/> IDA Credit	<input type="checkbox"/> IDA Grant	<input type="checkbox"/> Trust Funds	<input type="checkbox"/> Parallel Financing
Total Project Cost: 311.00	Total Financing: 311.00		Financing Gap: 0.00		
	Of Which Bank Financing (IBRD/IDA): 300.00				

#### Financing (in US\$, millions)

Financing Source	Amount
Borrower	11.00
IBRD-88100	300.00
<b>Total</b>	<b>311.00</b>

#### Expected Disbursements (in US\$, millions)

Fiscal Year	2018	2019	2020	2021	2022	2023
Annual	0.00	73.95	79.05	71.20	55.40	20.40
Cumulative	0.00	73.95	153.00	224.20	279.60	300.00

#### INSTITUTIONAL DATA

##### Practice Area (Lead)

Transport & ICT

## Contributing Practice Areas

### Climate Change and Disaster Screening

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

### Gender Tag

Does the project plan to undertake any of the following?

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

Yes

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

Yes

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

Yes

## SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● Moderate
2. Macroeconomic	● Moderate
3. Sector Strategies and Policies	● Moderate
4. Technical Design of Project or Program	● Moderate
5. Institutional Capacity for Implementation and Sustainability	● Moderate
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

### Conditions

Type

Effectiveness

Description

The Subsidiary Agreement has been executed on behalf of the Borrower, through MoF and MoT, and the DNV.

**PROJECT TEAM**

**Bank Staff**

Name	Role	Specialization	Unit
Veronica Ines Raffo	Team Leader(ADM Responsible)	Senior Infrastructure Specialist	GTI04
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Santiago Scialabba	Social Safeguards Specialist	Social safeguards	GSU04
Shomik Raj Mehndiratta	Team Member	Practice Manager	GTI04
Somik V. Lall	Peer Reviewer	Economist	GSU19
Steven Farji Weiss	Team Member	Economist	GTC01
Yohannes Yemane Kesete	Team Member	Disaster Risk Management	GSU10

**Extended Team**

Name	Title	Organization	Location
Esteban Travaglianti	Roads Engineer		





**ARGENTINA  
NORTHWESTERN ROAD DEVELOPMENT CORRIDOR PROJECT**

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## **I. STRATEGIC CONTEXT**

### **A. Country Context**

1. **The Government of Argentina (GoA) has introduced a number of reforms since taking office in December 2015.** The Government unified the exchange rate, ended the dispute with holdout creditor, abandoned the system of discretionary import licenses, resumed the publication of credible official statistics, significantly lowered export taxes, and reduced energy and transport subsidies. Several important governance reforms were initiated, including the passage of the Access to Information Law<sup>1</sup> as well as the approval by Congress of a bill establishing a framework for criminal responsibility for legal entities for crimes of corruption.<sup>2</sup> The Government expanded several social benefits such as child allowances and increased unemployment insurance significantly. A comprehensive plan to settle social security lawsuits and to adjust pensions upwards was also introduced. The recent mid-term election results were interpreted as a display of support for the current administration. These results are expected to empower the government to contribute to its reform agenda, which includes a tax and labor reform, among others.

2. **Economic activity is expected to continue to recover in 2018.** Economic activity contracted 2.2 percent during 2016, taking a toll on labor markets, where up to 0.6 percent of formal private sector jobs were lost.<sup>3</sup> However, GDP has expanded for four consecutive quarters (2.7 percent) since the second quarter of 2016, and employment in the formal private sector recovered to its December 2015 level. The economy is expected to grow for two years in a row in 2017 (+2.7 percent) and 2018 (+2.7 percent),<sup>4</sup> for the first time in seven years, on the assumption that the positive impact of policy changes kicks in and the global economy recovers. Inflation was 36 percent in 2016,<sup>5</sup> mostly due to currency depreciation and the reduction of energy and transport subsidies. However, inflation has decelerated rapidly and is expected to be 22 percent in 2017,<sup>6</sup> despite further increases in energy and transport tariffs. The central government overachieved its primary deficit target in 2016 (4.3 vs. 4.8 percent of GDP) and is expected to do so in 2017 (4.0 vs. 4.2 percent of GDP). The target primary deficit for 2018 (3.2 percent of GDP), will require further fiscal consolidation efforts.

3. **The Government has made important steps to address the key macroeconomic imbalances with the objective of creating an environment conducive to economic growth and employment creation.** Argentina offers many opportunities in a weak global environment, and there is a strong interest from foreign investors and firms. Going forward, Argentina aims to continue building a growth enabling policy framework to enhance credibility and support broad based growth and quality employment. In particular, the following policies will be important to permanently reduce inflation and put Argentina on a sustainable growth path: (i) increase public spending efficiency as well as its efficacy and reduce the fiscal deficit in line with government targets; (ii) continue fostering the credibility of the Central Bank so that monetary policy can further anchor inflation expectations; (iii) strengthen competitiveness and productivity through an improved business environment and investments in infrastructure and increasing

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<sup>1</sup> Law N°27275/16.

<sup>2</sup> Approved on November 8, 2017.

<sup>3</sup> Source: Ministry of Labor, Employment and Social Security.

<sup>4</sup> Source: World Bank Group. 2017. *Global Economic Prospects, January 2017 Weak Investment in Uncertain Times*. Washington, DC: World Bank. doi:10.1596/978-1-4648-1016-9.

<sup>5</sup> Simple average of City of Buenos Aires, Córdoba, and San Luis.

<sup>6</sup> Source: *Relevamiento de Expectativas de Mercado (REM)*, Banco Central de la República Argentina, August 2017.

competition in markets and improving the regulatory framework in sectors; (iv) continue strengthening the credibility of official statistics; and (v) continue improving the provision of public goods (including transportation, health, and education) and reducing regional disparities.

4. **The provinces in the Northwest of Argentina<sup>7</sup> epitomize the marginalization and service availability gaps enduring in parts of the country.** While poverty has been falling since 2002, poverty incidence in the Northwest -measured at \$5.5 per person per day (2011 PPP)- has traditionally been among the highest in the country (together with the Northeast), at 14.3 percent.<sup>8</sup> Access to basic services has been improving and indeed converging with the rest of the country, but the region still lags in terms of access to basic services and human development outcomes. The region has an average of 0.04 health centers and 0.09 schools per 1000 population against the national average of 0.14 and 0.19 per 1000 population respectively.<sup>9</sup> For example, the illiteracy rate (at 3.7 percent) is double the national average, the infant mortality rate (at 16.2 per 1000 live births) is above the national average of 13.3 per 1000, and the proportion of homes with Unmet Basic Needs (*Necesidades Básicas Insatisfechas*, NBI) is 15.9 percent compared to the national average of 9.1 percent.<sup>10</sup> Improved connectivity will help address social service access and human development gaps, as a precondition for ensuring convergence of the lagging provinces of the Northwest with the rest of the country. Complementary actions that improve access to markets, stimulate trade and investment, and boost productivity and efficiency can help tackle the challenges posed by high population densities and long distances to economic opportunities faced by this region.<sup>11</sup>

5. **Climate change vulnerability context.** In recent years, Argentina has experienced, more frequently and intensely, extreme climatic and ecosystemic events. Among others, the intensity and frequency of droughts, frosts, floods, severe storms, and hailstorms have significantly increased, with a significant impact on different sectors of the economy. ECLAC (2014)<sup>12</sup> estimates that climate change related impacts could represent between 4.5 and 7 percent of GDP. The Northwest of Argentina, based on climate projections comparing data scenarios from 1961 to 1999 versus projections to year 2071, shows projected anomalies in the increase of minimum and maximum temperatures, and in increased rainfall, with subsequent floods and landslides.

## **B. Sectoral and Institutional Context**

6. **While the road transport network in Argentina is the main facilitator for accessibility and trade, the network is constrained in terms of capacity and quality.** Roads are the primary transportation mode in Argentina carrying nearly 90 percent of total long haul goods transported in 2015. In contrast, rail transports slightly over 5 percent of volumes, measured in ton-kilometers, and inland waterways and air transport each have a marginal share (1.5 percent). The National and Provincial road network has a total

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<sup>7</sup> The Northwest region comprises the provinces of Catamarca, Jujuy, La Rioja, Salta, Santiago del Estero, and Tucumán.

<sup>8</sup> SEDLAC Project (World Bank and CEDLAS-UNLP).

<sup>9</sup> These calculations were obtained as part of an accessibility analysis carried out during project preparation and supported with data from the Ministry of Education and the Ministry of Health.

<sup>10</sup> *Censo Nacional de Población y Vivienda* (INDEC).

<sup>11</sup> The WDR 2009 recognizes three types of challenges for the economic development of regions: density, distance, and division. To tackle each challenge, a different instrument is proposed. When density is the main challenge, institutions are posed as the most effective instrument. When distance to economic opportunity is the main concern, connective infrastructure will be necessary. When divisions prevail, targeted interventions may be necessary. The framework presented in the WDR suggests that unity, not uniformity is the key to development, and for that, different challenges must be tackled with different instruments; and where several challenges coexist, several instruments must be used to address them.

<sup>12</sup> Economic Commission for Latin America and the Caribbean (ECLAC), 2014. *“La Economía del Cambio Climático en la Argentina”*.

length of about 240,000 km, of which only 81,355 km (34 percent) are paved. The primary network, with a length of 40,290 km (of which 90 percent is paved, but only 38 percent in good condition) and an estimated asset value of US\$45.3 billion, concentrates over two thirds of total traffic volumes. As a key lifeline of economic activity, primary roads facilitate trade and enable greater access to both rural and urban areas. Therefore, efficiency gains achieved in the primary road sector are crucial to enhance overall transport sector performance.

7. **While Argentina has achieved important milestones and outcomes in the transport sector, important institutional and governance shortcomings still hinder logistics competitiveness.** These challenges require a holistic approach to transport infrastructure planning and management, for which the World Bank can bring state-of-the art expertise, with innovative perspectives on a wide range of issues that are key for the sector, such as climate change adaptation and mitigation, efficiency, inclusion, safety, private sector participation, among others (see Annex 7). The Northwestern (NW) Corridor is particularly illustrative of many of these shortcomings, and provides an entry point to advance some of these key agendas.

8. **Argentina lags behind in terms of competitiveness and logistics performance and the Northwest of Argentina records the highest logistics costs in the country.** Logistics costs in Argentina are nearly double the OECD average. Argentina dropped from the 89<sup>th</sup> position in 2010/2011 to the 104<sup>th</sup> place in the Global Competitiveness Index (GCI) in 2016/2017, but improved slightly in the overall quality of transport infrastructure moving from 89<sup>th</sup> to 85<sup>th</sup> place over the same period. However, Argentina still ranks well below its middle-income neighbors in this indicator.<sup>13</sup> In terms of logistics performance, Argentina ranked 66<sup>th</sup> among the 160 countries included in the survey in 2016 down from 47 in 2007. Geography is a structural challenge. The great distances that separate the Northwest region from the ports and the country's main centers of consumption is a key driver for elevated transport costs which calls for provision of high quality transport assets and efficient provision of ancillary services. The average cost of transporting one ton of cargo from the Northwest to the country's main ports of Rosario and Buenos Aires averages US\$73 per ton, which is between 15 and 20 percent higher than in other regions of the country. The size and development of markets is also determinant of the high logistics and costs of transport services. There is a conspicuous imbalance of freight flows from the South, the region that acts as the main outlet and market for the Northwest production, but provides limited goods and services in exchange, creating empty backhaul mark-ups over transport costs. Finally, the volume of production is limited and scattered when compared to other regions in the country. As a consequence, the sector of logistics services has not fully matured, is precarious, with very low competition, and poor services at high costs.

9. **The GoA has placed priority to transport development and infrastructure service improvement in Northern Argentina as necessary conditions to unlock the economic potential of this lagging area.** The current government adopted the National Transport Plan<sup>14</sup> for the 2015-2019 period, which amounts to about US\$33 billion, including US\$25 billion from public sector funding and strong focus on private sector participation through a Public Private Partnership (PPP) approach, which this Project will support. A more comprehensive poverty reduction and territorial development strategy articulated in the 2016 flagship **Plan Belgrano** includes addressing persistent infrastructure and service availability gaps in the Northern region. The Plan Belgrano envisages over US\$16 billion in road, rail, and air transport

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<sup>13</sup> For example, Brazil ranked 72<sup>nd</sup>, Mexico 57<sup>th</sup>, Uruguay 47<sup>th</sup> and Chile 44<sup>th</sup> in the Infrastructure Pillar of the GCI.

<sup>14</sup> For more information on this and other government-led initiatives see annexes 6 and 7.

investments to: (i) integrate the Northern Provinces; (ii) make multimodal freight and passengers flows within the North-South and East-West axes (roads but also rail, inland waterways and airports) more seamless and efficient; and (iii) ensure adequate accessibility to towns and villages through upgrades in the provincial and local road network.

10. **The proposed Corridor is assigned the highest priority in the Plan Belgrano and represents a key opportunity for complementary initiatives by the Bank and GoA to maximize the territorial development impacts of the Project.** The Plan Belgrano underscores the importance of corridors as potential engines of economic growth through increased trade and job creation, and National Road (NR) 34 (hereby NW Corridor),<sup>15</sup> together with the Northwestern branch of the Belgrano Railway, are considered among the main transport interventions in the region playing a central role for regional competitiveness. Nowadays, however, the NW Corridor presents capacity, quality, safety and security challenges: first, existing two lanes are insufficient to support the sharp increase in inter-regional traffic observed in the last decade; second, a non-trivial proportion of road segments along the NR 34 alignment depict low quality standards as measured by the Level of Service indicator assembled by the National Roads Directorate (DNV by its acronym in Spanish),<sup>16</sup> and third, the NR 34 has one of the highest rates of fatal crashes of any corridor in Argentina. The upgrade of the Corridor will stimulate investment and industrial activity in the Northwest region facilitating inter-regional trade and growth of traditional exports, notably sugar cane, tobacco, and horticulture, and mining products, but also promoting the establishment of nontraditional ones such as tourism. Technical assistance (TA) activities and logistics initiatives envisioned under the Project will provide an entry point to enhance multi-modality and logistics services to enable economic development along the Corridor, decreasing transportation obstacles to production and helping reduce some cost drivers for sectors that are key in the regional economy.

11. **The design and selection of the Project components aims at tackling physical and logistic capacity and safety constraints of the NR 34 while setting the stage for an integrated spatial development along the Corridor that would benefit the poor, foster healthy growth of the fringe of currently feeble SMEs, and contribute to an increased economic integration of the Northwest territory with the rest of the country.** As such, the NW Corridor is conceived as a development corridor that contributes to a broader effort of achieving spatial integration and convergence in living standards in the country, supporting market access and economies of scale for local producers. The proposed development corridor lens aims at: (i) improving market integration, (ii) supporting the policy environment and the business ecosystem, (iii) improving the quality of governance and institutions, and (iv) addressing basic service gaps. These four supporting policies are complements and not substitutes among themselves and implicitly acknowledge that for a linear infrastructure project to trigger economy-wide long-term impact, other conditions need to be met. The proposed Project will offer a platform for synergies from regional and provincial development plans and other sector investments along the NW Corridor.<sup>17</sup>

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<sup>15</sup> The NW Corridor extends along NR 34 from Salvador Mazza in the Province of Salta to Rosario in the Province of Santa Fe, and its access roads, including NR 66 and NR 1V 66.

<sup>16</sup> The Level of service indicator is a composite index measuring traffic flows, delays, road quality, and other quality parameters between 0 and 5.

<sup>17</sup> The proposed approach has been conceptually laid out in the World Bank's World Development Report published in 2009.

### **C. Higher Level Objectives to which the Project Contributes**

12. **The proposed Project is closely aligned with the World Bank Group's Country Partnership Strategy (CPS) for Argentina for the period FY2015–FY2018 discussed by the Board of Directors on September 9, 2014 (Report No. 81361-AR).** The Project is fully aligned with the CPS's Pillar 1 "Unlocking long-term productivity growth and job creation", which includes an indicator on reducing the cost of freight in the norther provinces of Argentina. The Project also incorporates resilient infrastructure to adapt to climatic and ecosystemic events that are specific to the region.<sup>18</sup> To support the Transport Program of the current administration, the Bank has formulated an engagement strategy which identifies key areas for potential collaboration over a 5-year horizon. The Strategy grouped infrastructure and policy needs under four broad thematic principles: (i) competitiveness, (ii) private sector participation, (iii) inclusion, and (iv) climate change adaptation and mitigation. By boosting trade and competitiveness in the region, making the Northwest a more attractive location for investment and economic activity, by improving connectivity of this lagging region with the rest of the country, and by incorporating resilient transport infrastructure into project design, this Project responds to the four organizing principles set out in the engagement strategy.

13. **The Project contributes to the Bank's corporate goals of reducing extreme poverty and boosting shared prosperity.** The Project is geared at addressing existing accessibility constraints and helping bridge social service supply gaps in the underserved Northwest. By improving connectivity and facilitating trade, a development corridor can become an important channel for diminishing inequalities among regions within middle income countries such as Argentina. Corridors may impact the distribution of economic activity and market development across regions promoting poverty reduction and inclusive growth. The upgraded Corridor will improve connections between major industrial and agricultural centers of the underserved Northwest and enable the creation of direct and indirect employment opportunities. It will also promote prosperity through more efficient trade and production sharing and through the development of larger regional value chains in key sectors such as mining, agriculture and tourism. Responding to the issue of regional connectivity within Argentina by improving primary road links is crucial for the country's development and the high-level objective of the proposed Project. By integrating this lagging region to the more prosperous regions of Argentina and improving access to markets and basic social services, the Project will ultimately contribute to territorial development, reducing differences in living standards between the Northwest and the rest of the country.<sup>19</sup>

14. **Addressing climate vulnerability.** Building resilience to climate change and geophysical hazards is also a vital step in the fight against poverty and for sustainable development. To that end, works under the Project consider the vulnerability to climate change and disaster risks in their design and construction. The Project will also build capacity of DNV and Ministry of Transport (MoT) in vulnerability assessment; design, construction, and maintenance protocols for climate resilient infrastructure; and emergency management and disaster preparedness.

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<sup>18</sup> In recent years, extreme climatic and eco-systemic events have been observed more frequently and strongly in Argentina. These adverse climatic events have a significant impact on different sectors of the economy and erode natural capital with long-term effects. See ECLAC (2014). A recent study by UNDP indicates that the recurrence of weather anomalies (e.g. higher than average temperatures) and the precipitation levels in certain areas within the Province are expected to increase in all scenarios considered in the study.

<sup>19</sup> Reshaping Economic Geography, WDR 2009.



## II. PROJECT DEVELOPMENT OBJECTIVES

### A. PDO

15. The Proposed Project Development Objectives (PDO) are to improve connectivity and road safety along targeted road sections of the Northwestern Corridor and to support corridor development in the Northwest of Argentina.<sup>20</sup>

### B. Project Beneficiaries

16. **The primary project beneficiaries are all road users who use the corridor for economic or social purposes.** On average, 10,000 vehicles use the project roads each day, of which about 15 percent are heavy vehicles. Among road-users, freight and logistics operators, are expected to benefit through reduced travel times and operating costs, increased comfort and level of serviceability, and enhanced road safety. Reduced cargo transport costs will not only unlock market access for local producers will also reduce the costs of inputs and goods for the overall population. Private car users will also face reduced vehicle operating costs and improved road safety. In relation to their income, these types of cost savings are more valuable to the poor.

17. **A secondary group of beneficiaries include households and firms in the corridor area of influence.** The Project will address the mobility and accessibility needs of approximately 400,000 inhabitants residing in the immediate vicinity of the corridor which includes the cities of San Salvador and San Pedro de Jujuy, while improving intra-regional accessibility throughout the Northwest. SMEs, which make up the lion share of commercial activity in the region, and large firms will see the expansion of their potential market for both intra-trade (within the Northwest) and for export. Easier access to the region's main cities such as San Salvador de Jujuy, San Pedro de Jujuy and southbound to Salta and Tucumán opens new opportunities in terms of new markets. At a second order level, expanded markets and increased economic activity will create more employment opportunities; skill development; the tearing down of financial, market and regulatory barriers to SME development; and ultimately to a more balanced and integrated development of the Northwest with less income disparities and more opportunities to the poor.

18. **A third group of beneficiaries will include:** (i) the DNV, the MoT through the Secretary of Planning; the provincial revenue and customs control offices, and the National Gendarmerie. The Provincial Governments of Jujuy, Salta, Santiago del Estero and Tucumán will benefit from TA aimed at prioritizing logistics centers along the extended corridor area of influence, as part of component 2a. Moreover, the implementation of interventions in the NR 34 and logistics centers, could be a critical governance investment to help deal with institutional and regulatory barriers hindering inter-state and state-federal government interventions. This strategic governance investment can attract future private investors for the remaining segments of the Corridors.

### C. PDO-Level Results Indicators

19. The following PDO level indicators are proposed (see Section VII for further details):

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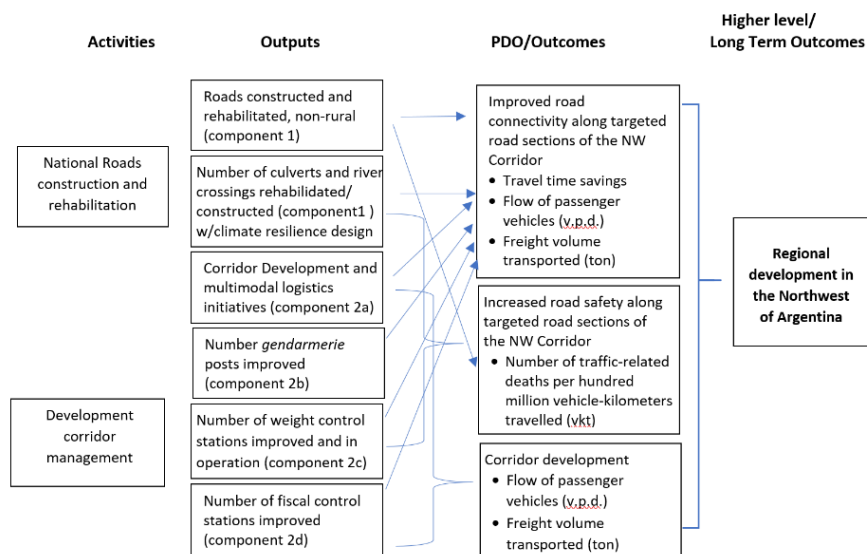
<sup>20</sup> The Project area of influence comprises the provinces of Jujuy, Salta, Santiago del Estero and Tucumán.



Table 1: PDO Indicators

PDO Indicator	Assessed Aspect of PDO
Travel time savings (cars, trucks)	Improved connectivity
Flow of passenger vehicles (cars, buses)	
Freight volume transported along targeted road sections of the Northwestern Development Corridor	Improved transport and freight connectivity, corridor development
Number of traffic-related deaths per hundred million vehicle-kilometers travelled (vkt) on the targeted road sections of the Northwestern Development Corridor	Improved road safety

Figure 1. Theory of Change



### III. ROJECT DESCRIPTION

#### A. Project Components

##### Component 1: Road Infrastructure (US\$300 million, of which Bank financing US\$292 million)

20. **This component will finance infrastructure works** to expand the capacity from two lanes to a four-lane access-controlled expressway with grade-separated intersections and returns, and rehabilitation works, along the most congested<sup>21</sup> and deteriorated sections of the NW Corridor on NR 34, NR 66, and NR 1V66, for a total length of 93.1 km.

21. **Road safety enhancements and climate resilient infrastructure have been incorporated into Project design.** Road crash data obtained from DNV and the National Road Safety Agency (ANSV by its acronym in Spanish) indicates that the fatality rate on the existing road was 7.1 deaths per 100 million vehicle-km for the 2013-2016 period, which is one of the highest in the national road network.<sup>22</sup> Fatalities

<sup>21</sup> The targeted Corridor displays traffic levels that vary from 4,122 to 17,004 Annual Average Daily Traffic (AADT) depending on the section (see Annex 4 for further details).

<sup>22</sup> Per data from the Provincial Road Safety Observatory of Jujuy and the National Road Safety Observatory at the ANSV, there were 160 road crash related deaths in Jujuy in 2016, of which 18 percent were female and 82 percent were male.

caused by frontal impact on the network are more than double those occurring by lateral contact. The foreseen separation of traffic, thanks to a dual carriageway four lane road, should result in a significant reduction in fatalities as frontal crashes will be eliminated.<sup>23</sup> Similarly, in order to adapt the Project's civil works to climate change events affecting the region, works include the construction and rehabilitation of 127 culverts and river crossings to better respond to temporary or permanent flooding of roads, damage to bridges, increased maintenance costs due to damage, and service disruption resulting from changing climatic conditions (See Annex 6).

**Component 2: Infrastructure for Development Corridor Management (US\$7,25 million, all financed by the Bank)**

22. This component will finance works and TA activities that will improve the Corridor's management and contribute to roadside service and logistics development along the Corridor. This component is at the core of the MoT strategy to foster regional development in the Northwest of Argentina.

- **Sub-component 2.a (US\$2 million) Corridor Development and Multimodal Logistics Initiatives:** This sub-component will finance TA and feasibility studies related to logistics, multimodality and roadside service facilities. This component entails (i) TA and feasibility studies (including Environmental Impact Assessments- EIAs and its Environmental Management Plan (EMPs) for prioritized intermodal logistics centers); (ii) other initiatives for logistics development and diagnostics to assess needs for corridor development; and (iii) an assessment of trucking industry market failures and TA for improved regulatory framework (competition, efficiency, B-double regulation).
- **Sub-component 2.b (US\$1 million) Road Safety Control and Awareness:** This sub-component will finance (i) infrastructure works related to the relocation of the National Gendarmerie post in Pampa Blanca, improving existing facilities and access roads; and (ii) road safety mitigation measures identified in the road safety audits, such as road safety awareness campaigns aimed at vulnerable corridor users (pedestrians, motorcyclists, and cyclists).
- **Sub-component 2.c (US\$1 million) Weight Control Enforcement:** This sub-component will finance improvement of existing infrastructure and provision of technological equipment for the DNV weight control station in Barro Negro, to perform dynamic and static weight control for freight trucks. This measure is geared at ensuring efficiency, sustainability, and safety in freight movements taking place throughout the Corridor, which would ultimately ensure that the road network can be maintained and operated at a lower cost and preserved in the long term.
- **Sub-component 2.d (US\$3.25 million) Fiscal control enhancement:** This sub-component will finance Improvement of infrastructure facilities of the fiscal control station of the Province of Jujuy Revenue Directorate (*Dirección Provincial de Rentas* of Jujuy) and the General Directorate of Customs Control (*Dirección General de Control de Aduanas*), located in Pampa Blanca. By relocating the current station, better location and improved building facilities and technology would allow the authorities to strengthen the fiscal control measures being carried out throughout the Corridor and therefore increase tax revenue from Corridor operations.

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<sup>23</sup> Independent road safety audits have been carried out for final designs to ensure design standards comply with international best practices.

**Component 3: Project Management (US\$3 million, all financed by the Borrower)**

23. **This component will finance TA and operating costs for project management and implementation.** The component will finance, inter alia: (i) the installation by DNV of fauna crossings in some of the road works, (ii) the preparation of draft environmental management plans for the works operation and maintenance phase, (iii) the implementation of a monitoring plan to assess the effectiveness of the wildlife crossings during the entire project life-span, (iv) specialized technical, environmental and social supervision of civil works; (v) administrative and operational support to DNV in the administration, monitoring, coordination, and supervision of project implementation; (vi) an assessment of the impact of climate change on the Intensity-Duration-Frequency (IDF) rainfall curve along the NW Corridor, and additional climate resilient solutions ranging from spatial planning to post-disaster risk and recovery support to address the growing climate risks which could impact the entire transport value chain (with support from a Global Facility for Disaster Reduction and Recovery-GFDRR grant); (vii) studies to prepare the PPP bidding documents of the NW Corridor, including a Strategic Environmental and Social Assessment (SESA); (viii) activities included in the Indigenous Peoples Plan (IPP) to reduce the gender gap; (ix) implementation of a road user and citizen engagement platform to close citizens' feedback loop; and (x) technical supervision of works by junior engineers from local universities.

**B. Project Cost and Financing**

Project Components	Project cost (US\$ millions)	IBRD or IDA Financing	Counterpart Funding
1. Road Infrastructure	300.00	292.00	8.00
2. Infrastructure for Development Corridor Management	7.25	7.25	0.00
3. Project Management	3.00	0.00	3.00
Total Project Costs	310.25	299.25	11.00
Front End Fees	0.75	0.75	0.00
<b>Total Financing Required</b>	<b>311.00</b>	<b>300.00</b>	<b>11.00</b>

**C. Lessons Learned and Reflected in the Project Design**

24. **Road sector projects are most effective when they support and build on a broader sectoral dialogue.** The Bank has been a key supporter of the road sector in the last decade by financing seven projects throughout the country, executed at both the national and provincial levels (see Annex 7). The proposed Project is part of a continued dialogue and long-term engagement on sectoral issues: it builds on the impacts and successes of previous projects (road asset management tools, independent road safety audits for safe infrastructure, environmental and social management, etc.), and opens new agendas (private sector participation, climate change resilience, development corridor approach).

25. **Development corridor.** The proposed Project endorses a corridor approach, developing links to urban and rural constituencies to enhance connectivity and inclusion. Development corridors capitalize on efficient multimodal transport network within a defined geography with the help of quality infrastructure, logistics, distribution networks that link production centers, urban clusters, and international gateways. Equally important for transforming transport corridors into development corridors is an enabling policy framework that eases doing business and non-tariff measures to facilitate trade. To that end, the proposed Project goes beyond a linear infrastructure project to adopt instead a

multi-sectoral lens which packages civil works with complementary interventions needed to address market failures. Component 2a is geared at addressing some of the logistics constraints in the region which negatively affect the supply chains of key agro-industrial sectors (see Annex 5). Further, moving away from a sectoral perspective to development of a territorial approach can help bring together the complementary instruments that are needed to transform a region. Further analytical work will be leveraged through the ASA on Territorial Development in Argentina led by the Urban, Rural and Social Development Global Practice (P164059), where a spatial lens will be used to identify the most binding constraints to the development of the region. This is expected to contribute to outlining a road map for complementary efforts on institutions and infrastructure along the Corridor, necessary to achieve the wider economic benefits expected.

26. **Road safety and climate change resilience.** The World Bank has been engaged in country level assistance for road safety for the last two decades and country initiatives in road safety have been considered as best practice for World Bank engagement in other countries. In addition to the safety management policies and interventions already in place, this operation will support the enhancement of policies for increased climate resilience of road infrastructure with a GFDRR grant.

27. **Private sector participation and public financing.** Limited public financing results in the need of finding financing alternatives. PPPs have proven to be an effective way to build and implement new infrastructure or to renovate, operate, maintain or manage existing transport infrastructure facilities. However, their implementation requires a sound and favorable regulatory framework, which the current administration has developed<sup>24</sup> with TA and financial support from the WBG and a Global Infrastructure Facility (GIF) grant. Component 3 will finance the traffic and technical studies to finalize the PPP bidding documents to take NR 34 Corridor to the market in the medium term, with future road sections of the Corridor benefiting from private sector participation and financing in the design, implementation and operation phases. The Project will ensure adequate attention to equity dimensions in the development of the PPP program (see Annex 7).

## IV. IMPLEMENTATION

### A. Institutional and Implementation Arrangements

28. **Borrower and implementing agency.** The Borrower is the Argentine Republic and the implementing agency will be DNV,<sup>25</sup> as decentralized agency under the jurisdiction of the MoT. Within DNV, the *Subgerencia de Préstamos BIRF* will function as liaison between the Bank and DNV technical areas. At present, DNV is coordinating several programs financed by the World Bank, including the Norte Grande Road Infrastructure Project (P120198, loan 7991-AR), and other multilateral development banks programs. DNV has sound experience in implementing road infrastructure projects financed by development banks and national funds.

29. **DNV will be in charge of overall Project administration and execution.** DNV will coordinate and implement all Project activities, including the handling of procurements, contracts, and payments to

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<sup>24</sup> Decree 118/2017.

<sup>25</sup> DNV was created by Law 11,658 and established by the Borrower's Decree-Law No. 505/58, dated January 16, 1958. From that date, it operates with the autonomy dictated by the law and can act both in the public and private spheres in accordance with what is established by the laws of the network to be built.

contractors. Flow of funds will be centralized; there will be no transfers of funds to provinces (for more details see Annex 2). DNV will undertake technical, environmental and social supervision of works. A technical assessment has been conducted and confirms DNV capacity for supervision of works. To coordinate planning and implementation of key priority activities for corridor management, the MoT has established an inter-agency working group including provincial governments, the Ministry of Production, Ministry of Interior, Public Works and Housing, and the Belgrano Cargas railway SOE.

## **B. Results Monitoring and Evaluation**

30. Project progress reports will be prepared by DNV on a semi-annual basis and submitted to the Bank. These reports will indicate the progress made under the different components of the project and measure performance against the results indicators established in the results framework (Section VII). Progress reports will include information regarding: (i) disbursement performance and an updated disbursement calendar; (ii) a procurement report, and an updated procurement plan; (iii) progress in implementation of the Environmental and Social Management Plan (ESMP) laying out problems identified as well as documenting environmental and social impacts of the project in the area of intervention; (iv) a section describing potential developments that could affect project implementation, which should consist of a review of the main risks and the impact of mitigation measures envisioned at appraisal; and (v) an annual operation plan for the following year, presented in the second semester report.

## **C. Sustainability**

31. **Key sustainability concerns relate to: (i) asset management effectiveness; (ii) climate vulnerabilities; and (iii) financing for the sector.** In relation to asset management, direct measures have been taken under past Bank-financed loans and will be strengthened throughout Project implementation to improve DNV's road asset management capacity. Efforts in this area have supported much needed institutional changes and efficiency improvements in DNV's road network management practices, such as the development of multi-year investment plans, management and operations plans, cost management systems, capacity building in the use of road asset management software, laboratory equipment, and technology and knowledge transfers in application of internationally recognized road construction and maintenance practices.

32. **As per vulnerability to climate events, the Project incorporates resilient design to address climate risks specific to this region.** Component 1 and 3 finance: (i) solutions to retrofit project design (drainage systems) to better respond to changing climate conditions; (ii) improved design and construction protocols for climate resilience in the future capacity expansion of the Corridor; (iii) introduction of good and suitable road maintenance regimes to support enhanced climate resilience of the Corridor, to reduce connectivity disruptions for businesses and households and protect them from disaster induced poverty; and (iv) institutional strengthening in DNV for vulnerability reduction tools and solutions, emergency management and disaster preparedness.

33. **In the longer term, Project sustainability will ultimately depend on the continued availability of resources and the commitment and ability of the GoA to efficiently use the resources allocated to the road sector.** Given the financing needs of the National Transport Plan, a critical part of ongoing Bank support is focusing on identifying optimal financing strategies including PPPs mechanisms to operate and preserve road assets (including technical studies to be financed under Component 3). This entails

leveraging private sector funding to finance the sections of the NW Corridor not included in this Project, as well as NW Corridor operation and maintenance (see Annex 7).

## V. KEY RISKS

### A. Overall Risk Rating and Explanation of Key Risks

34. **The overall risk of achieving the Project's development objective is assessed as Moderate.** The main risk identified as Substantial is the Environmental and Social Management. From an environmental perspective, the primary risk lies mainly on the incremental fragmentation of forests that could result from the road capacity expansion, together with potential induced longer-term and indirect impacts from the eventual expansion of the works to new areas. To mitigate this risk, the Project will finance the development of a Strategic Environmental and Social Assessment (SESA) to better evaluate the indirect impacts and improve GoA's readiness for potential future expansion of the Corridor. From a social perspective, risk is also substantial, but limited and site-specific, given that the works under the Project require land taking that will generate physical and/or economic displacement, and there is presence of Indigenous Peoples (IPs) in the Project implementation area.<sup>26</sup> In addition, the Project area is prone to social conflicts, linked to the likelihood that third party actions may cause unintended negative impacts (e.g. economic or physical displacement) on vulnerable groups. While the Project has neither generated nor is exacerbating these situations, they could affect Project implementation because they could, for instance, lead to road blockades. For example, the anticipated transfer of the La Esperanza Sugar Mill in San Pedro, from public to private sector management, has generated the potential risk that a number of workers may lose their employment and/or housing (since several of them live in houses owned by the Sugar mill or within its premises). While it is uncertain that this risk would materialize at this point, the Provincial Government is considering few mitigation measures including the possibility of providing alternative employment opportunities and/or new housing solutions to the affected groups. Furthermore, the Project may contribute to reducing the social conflict in the area (i.e. by providing new employment opportunities). The Project would also include specific activities focused on promoting economic development for indigenous women and youth based on positive experiences under the Norte Grande Road Infrastructure Project (P120198) and the First and Second Norte Grande Water Infrastructure projects (P120211 and P125151). This would also help to address some of the issues identified related to youth unemployment and gender based violence (by strengthening youth and women's agency).

## VI. APPRAISAL SUMMARY

### A. Economic Analysis

35. **The Project will upgrade one of the main transport vectors in the Northwest of Argentina.** Civil works consist of the capacity expansion and rehabilitation works along NR 34, NR 66 and NR 1V66 for a total length of 93.1 km clustered in three groups of works. The terrain is largely flat, and the existing road carries an AADT of between 5,000 and 10,000 vehicles depending on the road section. Except for the 23 km that make up the section under Group 3, the existing road is a single carriageway two-lane road with asphalt concrete wearing course. The unit cost per four-lane kilometer is estimated at US\$3.1 million per kilometer; routine maintenance of the upgraded roads is estimated at US\$7,500 per kilometer per annum and periodic repairs at US\$152,000 per kilometer per annum.

<sup>26</sup> IPs present in the Project Area will not be affected by involuntary resettlement.



36. **Methodology and Assumptions.** The economic analysis conducted using the Highway Development and Management Model (HDM-4), yielded, in the base scenario<sup>27</sup> an overall Economic Internal Rate of Return (EIRR) of the project of 18.5 percent, with a Net Present Value (NPV) of US\$365.8 million, at 6 percent discount rate. In the sensitivity analysis, which models a worst-case scenario by which capital works are increased by 20 percent and road user benefits are reduced by 20 percent, the overall EIRR of the project falls to 12.7 percent for the costliest maintenance alternative, confirming the Project's robust economic justification.

37. **Greenhouse gas emissions have been modelled in the HDM-4 analysis.** Over the evaluation period, total CO2 emissions will increase from 2.86 million tons without the project to 3.26 million tons with the project (14 percent increase) due to increased speeds added to normal and generated traffic. The inclusion of the CO2 emission costs<sup>28</sup> in the economic evaluation slightly affects the EIRR, from 18.5 percent to 18.2 percent in the consolidated baseline scenario for all subprojects.

38. **Maximizing Finance for Development.** This operation foresees a complementary use of public and private sector financing. While the NW Corridor has been identified as one of the priority corridors to be included in the PPP Roads Program<sup>29</sup> that DNV will be launching in 2018 to finance additional expansions, operation and maintenance, the sections targeted by the proposed Project have been prioritized for public financing considering: (i) the need to reduce levels of capital expenditure (CAPEX) in PPP contract to align this Corridor to the business and financial models of the broader PPP Roads program, designed following preliminary market sounding vis a vis investors risk appetite; and (ii) urgency in addressing highest levels of congestion, deterioration and fatalities. The Bank team is providing support to DNV through a GIF grant in the analysis and design of risk matrix, validation of traffic studies, preparation of data room documentation, preparation of bidding documents, in parallel to the support being provided to the PPP Unit in the Ministry of Finance on enabling environment (PPP legislation and regulatory framework, assessment of foreign investors risk appetite, risk mitigation strategy, strengthening institutional capacity in the Ministry of Finance (MoF) and sectoral ministries to deliver infrastructure assets and services with value for money for users, taxpayers and investors, etc.).

39. **Value added of Bank's Support.** The Bank brings a comprehensive development approach to corridor development. The proposed Project implements a holistic multifaceted intervention that reflects the Bank's value added in a sophisticated upper MIC like Argentina, fostering innovation in key agendas, such as: logistics and competitiveness, territorial development, road safety, PPPs, climate resilience, inclusive growth, gender equality, citizen engagement, and transparency (see Annex 7). The Bank's value added in this specific Project goes beyond lending for linear infrastructure projects and road asset management. The Project's focus on development corridor will serve as an entry point to integrate corridor development into territorial development planning in Northern Argentina through Plan Belgrano. To meet this goal, the Bank brings a range of experience with turning road investments into development corridor projects, and builds on the analytical work<sup>30</sup> on territorial development challenges in Argentina.

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<sup>27</sup> Annex 4 expands this analysis by including additional estimations of the Project's economic return considering different scenarios.

<sup>28</sup> As per Bank guidelines, in a base scenario the social value for 1 metric ton of CO2 is equivalent to US\$30 in 2015, US\$35 in 2020, US\$50 in 2030, and US\$65 in 2040.

<sup>29</sup> For more info on the PPP program see <http://ppp.vialidad.gob.ar/> accessed on November 6, 2017.

<sup>30</sup> Argentina Territorial Development (P164069).

## **B. Technical**

40. The Corridor will provide an all-weather, divided connecting highway. Group 1 and 2 of works comprise the reconditioning of the existing two-lane asphalt road along the existing alignment through its rehabilitation with reinforcement of asphalt concrete and the construction of a second two-lane road with asphalt concrete pavement thus transforming the Corridor into a four-lane access-controlled highway, with grade separated intersections and grade-separated returns.<sup>31</sup> Group 3 sub-projects consist in the rehabilitation of an existing stretch of the highway in asphalt concrete pavement for a 15 year-design period, with the same geometric condition profile. The three groups of civil works include bridges, overpasses, and elevated pedestrian crossings, all of which were informed by social impact assessments and independent road safety audits. In order to mitigate and adapt the project's civil works to climate change events, hydraulic calculations were verified, and sewers, bridges and drainage were designed, considering the climate change projections and their impact on the intensity-duration-frequency (IDF) curves (see Annex 6 for a description of climate risks and incremental costs). Two-lane projects are economically justified in Argentina for traffic levels above 4,500 vehicles per day (vpd). The average AADT for the 93.1 km section is of 9,992 vpd. NR 34 specifically has an AADT of 7,425 for Group 1 of works and 11,018 vpd for Group 2. NR 1V66 and NR 66 Group 1 sections have an average transit of 5,575 vpd. Moreover, a third lane would not be justified by the importance of the Corridor, and the national government's policy of doubling the roadway in the NW Corridor as a logistics corridor.

## **C. Financial Management**

41. A Financial Management Assessment (FMA) was carried out to assess the adequacy of the Financial Management (FM) arrangements in place at the DNV to support project implementation. It was determined that FM arrangements in place are acceptable to the Bank because they are: (i) capable of correctly and completely recording project transactions; (ii) facilitate production of the requisite financial reporting on timely manner; (iii) safeguard project's assets; and (iv) are subject to auditing arrangements acceptable to the Bank.

## **D. Procurement**

42. **Procurement will be conducted according to the World Bank's "Procurement Regulations for IPF Borrowers"**, issued in July 2016, for the supply of goods, works, non-consulting and consulting services under the Project. Based on the assessment and the fact that the expected activities are not complex in terms of procurement, it was determined that the procurement risk is rated as Moderate.

43. The implementation of the Procurement function will be under the responsibility of DNV through the Procurement Department (*Dirección de Licitaciones y Contrataciones*). A procurement capacity assessment of the implementing agency within DNV was carried out by the Bank, which concluded that the Procurement Department has sound experience and counts with seasoned professionals implementing Bank's procurement procedures, in particularly, high value contracts of works of similar nature and complexity to the ones included in this Project.

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<sup>31</sup> The geometric characteristics were designed for a 120 km/h speed, with highway design, access control, for a flat and wavy terrain by sectors, with crossings and returns at different levels and consisting of: (i) roadway width of 7.30 meters in both directions; (ii) a 3 meter- wide external bench, 2.5 meters of which are paved; (iii) a 3 meter internal bench, 0.5 meter of which are paved; (iv) normal width separation bed of 16 meters and a minimum width of 2.6 meters; (v) and a 2 percent transverse slope in the roadway and of 4 percent in the outer banks.



44. DNV has worked on a Project Procurement Strategy for Development (PPSD) focused on the high value road works under Component 1. One of the conclusions of the PSD is that the foreseen works should be divided into 3 groups based on: (i) technical characteristics and social-environmental aspects that have different impacts on each one of the groups, and (ii) the conclusions of the market analysis. Even though Groups 1 and 2 correspond to the same roadway and include the construction of a second paved road, the second group demanded further social analysis and a determination of appropriate social approach before moving into implementation. On the other hand, Group 3 comprises low value works for the maintenance of existing roads (see Annex 2). A preliminary procurement strategy initially focused on Group 1 considering this activity was implemented as advanced contracting and the Borrower launched the bidding process following Bank's procedures before Loan's negotiations.

#### **E. Social (including Safeguards)**

45. **Social safeguards triggered.** Indigenous Peoples (IPs) are present in the Project area and are among the most vulnerable groups since they are disproportionally affected by land tenure insecurity; lower access to services, markets and social services; and gender based violence. These communities belong to the Guaraní and Kolla Peoples. OP 4.10 (Indigenous Peoples) is triggered to ensure that: (i) IP groups can participate in planning that affects them; (ii) opportunities to provide such groups with culturally appropriate benefits are considered; and (iii) any Project impact that adversely affects them is avoided, or otherwise minimized and mitigated. To address OP 4.10 requirements, the Borrower prepared an Indigenous Peoples Plan (IPP) to protect IPs' rights while minimizing any potential negative impact, and to support the maximization of positive ones. The IPP has been disclosed in country and through the World Bank's public webpage on October 19, 2017 and consulted to get broad community support; and a revised version, incorporating comments received and responses to such comments was disclosed in country and through the World Bank's public webpage on November 6, 2017.

46. The Project also triggers OP 4.12 (Involuntary Resettlement) since works under Component 1 will imply involuntary taking of land that will require physical and/or economic displacement and/or loss of assets. To address OP 4.12 requirements, the Borrower has prepared two Abbreviated Resettlement Action Plans (ARAPs) to address and mitigate any risk linked to the involuntary resettlement processes generated by the Project, and to transform these processes in opportunities of development for Project affected people by supporting them to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of Project implementation. Although the loan will not finance land acquisition, construction of houses has been included as an alternative for compensation related to resettlement. The ARAPs for Group 1, and for the Groups 2 and 3 of works were disclosed in country and through the World Bank's public webpage on August 29 and October 18, respectively. The final version of both documents, incorporating comments received from Project Affected People (PAPs) and responses to such comments were disclosed in country and through the World Bank's public webpage on November 6, 2017.

47. **Gender.** Activities under the Project will promote women participation at different levels of intervention, as a means of contributing to address identified gender gaps, linked to the lack of opportunities for economic development and gender based violence. The focus will be on young indigenous women that are one of the most vulnerable groups in the Project implementation area. Baseline gender gaps in Jujuy are significant: the labor participation rate among women is about 51.6 percent compared to 72.6 percent for men; the employment rate is 47.7 percent in women and 69.7

percent in men, and finally unemployment in women reaches 7.6 percent compared to 4 percent for men. Focusing on indigenous populations, unemployment rate is 5.3 percent for men, while 8.3 percent for women. Also, gender violence indicators show that the Province of Jujuy has the highest rates in the entire country. Therefore, prevention of gender violence potentially associated with road workers in project sites is a key priority. The Project will also aim to create development opportunities for women, with special focus on indigenous women. The IPP foresees building three community centers where women will have a place to gather and perform productive activities such as clothing manufacturing, and receive skills training.

48. **Labor Influx.**<sup>32</sup> An assessment of risks and potential impacts associated to labor influx and Occupational Health and Safety (OHS) has been carried out and bidding documents include clear guidelines for contractors to apply the corresponding mitigation measures. Given the typology of the works and the technology involved, the Project will not require a considerable amount of labor influx and the impact from the presence of non-local personnel on the community is expected to be low. Yet, the following actions are proposed as preventive and mitigation strategies: (i) prior to the beginning of works, the Project will seek the support of existing indigenous women's organizations to facilitate good management of the works; (ii) including in the bidding documents the requirement of a Code of Conduct to outline the contractor's responsibilities to create a positive workplace culture, managers to ensure that culture is implemented, and individuals to adhere to the principles of that culture and not to engage in gender based violence (GBV) and/or child abuse/exploitation (CAE); (iii) the GRM will be able to receive reports on GBV and child abuse and refer the survivors to the corresponding support services; (iv) including in the bidding documents the requirement for the contractor to require all employees to attend trainings prior to start of works to reinforce their understanding of HIV/AIDS, GBV and CAE; and (v) services and accommodation will be provided by the contractors in the cities of San Salvador and San Pedro de Jujuy, both cities with large labor markets, wide variety of business and industries, relatively high population density, and capacity to absorb incoming workers.

49. **Grievance and Redress Mechanism (GRM).** The Project will have a two-layer GRM: first, establishing obligations to the contractors to implement an active social communication plan about the works and to have different communication means for beneficiary feedback (including grievances and suggestions). Second, strengthening Citizen Engagement, with DNV's new mobile phone app that will allow users to not only receive real-time information about traffic, works and roads availability, but also will give them a tool to provide real-time feedback to the government to report problematic situations related to the status of any road section or complaints and/or suggestions related to works under implementation (see Annex 1).

## **F. Environment (including Safeguards)**

50. **Environmental Categorization and Bank Safeguards Policies triggered.** The proposed category for the Project is "B" as the works to be financed by the Project are not likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. The expected impacts will be mostly site-specific and few are considered irreversible. Well known mitigation and/or compensation measures were designed to address them. The Project triggers the following World Bank environmental safeguard

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<sup>32</sup> Defined as the rapid migration to and settlement of workers in the project area, typically in circumstances where the required labor force and associated goods and services are not available locally.

policies: Environmental Assessment (OP4.01), Natural Habitats (OP4.04), Pest Management (OP4.09), Forests (OP4.36), and Physical Cultural Resources (OP4.11).

51. **Safeguards instruments and Environmental Assessment (EA) process.** The environmental safeguards instruments prepared by the Borrower are EIAs and their respective EMPs for each of the three groups of works (and their ancillary investments) to be financed by the Project. The Project's EA included three cross-cutting pieces of analysis that covers the three groups of works. Analyses concluded (i) the risks of an eventual failure of any of the two dams operating in the proximities of the Project area (Las Maderas and La Ciénaga) over the Project's investments are negligible; (ii) conversion or degradation of forest areas will not be significant (nevertheless, mitigation and compensation measures were included in the EMPs); and (iii) mitigation measures to the incremental fragmentation to be caused by the Project to natural habitats were identified. Findings and specific measures arising from these analyses were also included in the relevant EIAs and EMPs and embedded in the project design. A SESA will be financed under Component 3 to better evaluate the indirect and cumulative impacts and improve GoA's readiness for eventual future expansion of the Corridor.

52. **Public consultation and disclosure.** The public consultation of the EA for Group 1 works was conducted during the preparation of the engineering design and its EIA (2009-2012), by means of interchange of letters with public entities, as well as private companies operating or providing public services in the area, local NGOs, and eight local schools. The public consultations of Group 2 and 3 works took place in July 2017, by sharing (by e-mail) with key institutional stakeholders (public entities, NGOs, schools and private sector from the Project area) the summaries of the Project profile and the environmental impacts identified. The public consultations for Groups 2 and 3 works were complemented with face to face meetings, held on October 23-24, 2017 with indigenous peoples' groups and groups subject to resettlement. The referred summaries, ARAPs and IPP were shared with them.

53. **Borrower capacity to plan and implement the described management.** The proposed operation will be implemented by an existing and well established institutional structure within DNV. The Borrower already has, and regularly uses, the Environmental Management Manual (MEGA II, 2007) prepared by DNV under another IBRD loan to guide the implementation of standard mitigation measures usually implemented to manage direct environmental impacts of roadworks. DNV has successful experience and capacity in the implementation of similar projects.

## **G. World Bank Grievance Redress**

54. Communities and individuals who believe that they are adversely affected by a World Bank (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 World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit [www.inspectionpanel.org](http://www.inspectionpanel.org).



## VII. RESULTS FRAMEWORK AND MONITORING

### Results Framework

COUNTRY : Argentina

Northwestern Road Development Corridor Project

#### Project Development Objectives

The Proposed Project Development Objectives (PDO) are to improve connectivity and road safety along targeted road sections of the Northwestern Corridor and to support corridor development in the Northwest of Argentina.

#### Project Development Objective Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
<b>Name:</b> Travel time savings (percentage)		Percentage	0.00	20.00	Annual	Data collection through DNV speed measurement stations	DNV
Travel time savings (cars)		Percentage	0.00	25.00	Annual	Data collection through DNV speed measurement stations	DNV
Travel time savings (trucks)		Percentage	0.00	17.00	Annual	Data collection through DNV speed measurement stations	DNV



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
<p><b>Description:</b> Travel Time Savings refers to the benefits from reduced travel time in the targeted road sections of the Northwestern Development Corridor where Group 1, 2 and 3 of works are located.</p> <p>The methodology consists of comparing the with and without project scenarios to estimate travel time ex ante, for an average speed by length, recorded in the targeted sections. This value must be checked against the travel time ex post, corresponding to the average speed registered in the same network, once the works are executed, i.e. considering a road with different design, better pavement conditions and greater vehicular volume. The indicator assumes a traffic composition of 80% cars and 20% trucks.</p> <p>Civil works along the corridor will benefit users of reduced travel times, increasing the connectivity along the Corridor.</p>							
<b>Name:</b> Flow of passenger vehicles (vehicles per day)		Number	8745.00	10011.00	Annual	Data collection	DNV
Flow of passenger vehicles (cars)		Number	8268.00	9492.00	Annual	Data collection	DNV
Flow of passenger vehicles (buses)		Number	477.00	519.00	Annual	Data collection	DNV
<p><b>Description:</b> This indicator measures de light traffic (cars and buses) volume in the targeted sections of the Northwestern corridor. Volume is measured by number of vehicles per day.</p> <p>Works planned under the Project are expected to increase connectivity and therefore traffic volume in the targeted area.</p>							
<b>Name:</b> Freight volume transported along targeted road sections of the Northwestern Development Corridor (millions of tons per		Number	6.63	7.87	Annual	Estimate produced by DNV according to methodology outlined above.	DNV



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
year)							
<p><b>Description:</b> This indicator measures the quantity of goods in tons transported per day in trucks along the targeted sections of the Northwestern Road Development Corridor. The current load was calculated per year, as the weighted average per km of loads that circulate for each segment of the Groups 1, 2 and 3, for light trucks at an average of 15 tons/ truck and heavy trucks at an average of 28 tons/ truck. In the situation without project, between the years 2017 and 2020, it was considered 55% of the trucks circulate loaded and 45% empty. In the WITH project situation, it is estimated an increase of 5% for loaded trucks, reducing empty trucks to 40%.</p>							
<p><b>Name:</b> Number of traffic-related deaths per hundred million vehicle-kilometers travelled (vkt) along targeted road sections of the Northwestern Development Corridor</p>		Number	7.10	5.00	Annual	<p>DNV and ANSV.</p> <p>Weighted average by length of the mortality index recorded per year, depending on the number of fatalities on the road.</p> <p>Baseline obtained through 2013-2016 average of fatalities. End-line will be measured as an average of the 2021-2023 when project closes.</p>	DNV
<p><b>Description:</b> This indicator measures number of traffic-related deaths per hundred million vehicle-kilometers travelled (vkt) along the targeted sections of the corridor.</p> <p>The foreseen separation of traffic, thanks to the enabling of a dual carriageway four lane road, should result in a significant reduction in fatalities as frontal crashes will be eliminated. Works design includes independent safety audit recommendations to increase road safety along the Corridor.</p>							



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
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#### Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
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<b>Name:</b> Roads constructed	✓	Kilometers	0.00	70.00	Annual	Supervision and works certificates	DNV
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Description:

<b>Name:</b> Roads rehabilitated	✓	Kilometers	0.00	23.10	Annual	Supervision and works certificates	DNV
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Description:

<b>Name:</b> Number of culverts and river crossings rehabilitated/constructed with climate resilience design		Number	0.00	127.00	Annual	Supervision and works certificates	DNV
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Description: Number of culverts and river crossings built or rehabilitated incorporating climate resilient design



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
<b>Name:</b> Regional Development and logistics initiatives prioritized and formulated		Number	0.00	3.00	Annual	Secretary of Planning, Ministry of Transport	Secretary of Planning, Ministry of Transport
Description: Number of feasibility studies and other logistics initiatives prioritized and formulated by the Ministry of Transport in order to promote economic development along the corridor.							
<b>Name:</b> Number of gendarmerie posts improved		Number	0.00	1.00	End of project	DNV	DNV
Description: This indicator measures the number of gendarmerie posts intervened (relocated/rehabilitated/built). The targeted post is located in Pampa Blanca.							
<b>Name:</b> Number of weight control stations improved and in operation		Number	0.00	1.00	End of project	DNV	DNV
Description: This indicator measures the number of weight stations intervened (relocated/rehabilitated/built). The targeted weight station is located in Barro Negro, within Group 2 of works.							
<b>Name:</b> Number of Fiscal Control stations improved		Number	0.00	1.00	End of project	DNV	DNV
Description: This indicator measures the number of fiscal stations intervened (relocated/rehabilitated/built). The targeted fiscal control post is at the beginning of the							





Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Group 1 of works stretch (progressive + 0 + 500), near the border between the Provinces of Salta and Jujuy, in the locality of Pampa Blanca.							
<b>Name:</b> Percentage of grievances received through the Platform that were responded accordingly to DNV's protocol		Percentage	0.00	100.00	Annual	ViaL Platform	DNV office for Citizen Engagement
<b>Description:</b> This indicator measures the percentage of grievances received through the platform ViaLCitizen that were responded.							
<b>Name:</b> Number of indigenous women trained in road safety, gender, and gender-based violence activities and participating in productive initiatives		Number	0.00	400.00	Annual	DNV	DNV
<b>Description:</b> This indicator measures the number of indigenous women participating in road safety, gender, and gender-based violence activities organized within the project's scope. Productive initiatives includes clothing manufacturing, among others.							



## Target Values

### Project Development Objective Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Travel time savings (percentage)	0.00	0.00	0.00	10.00	20.00	20.00	20.00
Travel time savings (cars)	0.00	0.00	0.00	12.00	25.00	25.00	25.00
Travel time savings (trucks)	0.00	0.00	0.00	8.00	17.00	17.00	17.00
Flow of passenger vehicles (vehicles per day)	8745.00	8919.00	9180.00	9449.00	9726.00	10011.00	10011.00
Flow of passenger vehicles (cars)	8268.00	8434.00	8687.00	8947.00	9216.00	9492.00	9492.00
Flow of passenger vehicles (buses)	477.00	485.00	493.00	502.00	510.00	519.00	519.00
Freight volume transported along targeted road sections of the Northwestern Development Corridor (millions of tons per year)	6.63	6.74	6.86	6.97	7.74	7.87	7.87
Number of traffic-related deaths per hundred million vehicle-kilometers travelled (vkt) along targeted road sections of the Northwestern Development Corridor	7.10	7.10	7.10	7.10	5.00	5.00	5.00



### Intermediate Results Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Roads constructed	0.00	0.00	11.00	47.00	70.00	70.00	70.00
Roads rehabilitated	0.00	0.00	10.00	23.10	23.10	23.10	23.10
Number of culverts and river crossings rehabilitated/constructed with climate resilience design	0.00	20.00	80.00	127.00	127.00	127.00	127.00
Regional Development and logistics initiatives prioritized and formulated	0.00	0.00	0.00	1.00	2.00	3.00	3.00
Number of gendarmerie posts improved	0.00	0.00	0.00	1.00	1.00	1.00	1.00
Number of weight control stations improved and in operation	0.00	0.00	0.00	1.00	1.00	1.00	1.00
Number of Fiscal Control stations improved	0.00	0.00	0.00	1.00	1.00	1.00	1.00
Percentage of grievances received through the Platform that were responded accordingly to DNV's protocol	0.00	0.00	0.00	100.00	100.00	100.00	100.00
Number of indigenous women trained in road safety, gender, and gender-based violence activities and participating in productive initiatives	0.00	50.00	200.00	400.00	400.00	400.00	400.00



## ANNEX 1: DETAILED PROJECT DESCRIPTION

**COUNTRY : Argentina**

### Northwestern Road Development Corridor Project

- The NW Corridor made up by NR 34, NR 66 and NR 1V66 constitutes the key transport vector to access the Northwest of the country and an important transit link for the Mercosur.** The Project, linking the Northwestern-most provinces of Jujuy and Salta and facilitating connectivity throughout the Northwest and beyond, occupies an important role in the distribution of goods to and from the interior of the country, connecting mainly the Northwest region with the rest of the country, Chile and Bolivia. By virtue of its location, the works will be a complementary link to trade with Mercosur and could also become a factor in consolidating the regional integration process by linking the ports of the South of Brazil and the ports of Northern Chile, through Paraguay, Bolivia, and Northern Argentina (Bi-Oceanic Corridor). Such link will enhance connectivity in a remote, underserved region acting as a catalyzer for territorial development.
- The Project's area of influence is formed by a network of national roads in the center of the Province of Jujuy, including NR 34, from Jujuy's border with the Province of Salta to the city of San Pedro de Jujuy, NR 66 and NR 1V66 in all their extensions.** At present, these roads are paved and have one traffic lane in each direction. In terms of their condition, the pavement shows a series of faults as a consequence of intense traffic and insufficient vehicular capacity. Both factors, i.e. deterioration and excess vehicle demand, are the leading causes for frequent road crashes. The Corridor displays traffic levels that vary from 5,228 to 10,180 Annual Average Daily Traffic (AADT) depending on the road section. Private light vehicles make up the lion share of automobiles transiting the corridor (82 – 88 percent depending on the road section), and the average speeds range between 70km/h to 94km/h depending on vehicle type. Finally, registered road crashes along the segments of the corridor to be intervened totaled 151 with 19 fatalities in 2015.

### Component 1: Road Infrastructure (US\$ 300 million, of which Bank financing US\$292 million)

- This component will finance infrastructure works consisting of duplication and rehabilitation works along NR 34, NR 66, and 1V66 for a total length of 93.1 km, with total access control, within the NW Corridor in the following sections located in the Province of Jujuy, clustered in three groups of works:**

**Table A1.1: Corridor Road Infrastructure Civil Works**

Group	Work	Section	Sub-project length (Km)	US\$ million
1	NR 34: Border with Salta - Junction NR 66; NR 66: Junction NR 1V66 -Junction NR 34; NR 1V66: Junction NR 66 - Junction NR 34.	NR 34, Section: Border with Salta - Junction NR 66	25,22	162,8
		NR 1V 66, Section Junction NR 66 - Junction NR 34	11,175	
		NR 66, section: Junction NR 1V 66 - Junction NR 34	11,076	
2	NR 34: Junction NR 66 - North Access to San Pedro	NR 34, Section: Junction NR 66 - North Access to San Pedro	22,62	98,4
3	NR 66 – Junction NR 1V66 – Junction NR 9	NR 66 – Junction NR 1V66 – Junction NR 9	23	30,0
<b>Total</b>			<b>93,1</b>	<b>291,2</b>

Source: own elaboration based on Project profile prioritized by the GoA and executive project for Group 1 works.



4. **Under Group 1 and 2**, works include refurbishing of the existing roadway and the construction of a second paved road, thus transforming the corridor into an expressway with distributors and railroad crossings. In all the crossings of the current road with paved national and provincial roads, transit interchanges are projected. Additionally, in road sections of more than 6 km with no connections to other roads, returns are projected to facilitate return maneuvers. Bus-shelters, pedestrian pathways, elevated pedestrian crossings, interchanges, bridge and drainage structures, and road safety furniture, will also be included. Differentiated women's and men's personal security concerns will be taken into account for the design of these improvements. **Under Group 3**, main works to be carried out include (i) road rehabilitation along the existing alignment, (ii) road shoulders paving, (iii) road safety improvements in the southern access to San Salvador de Jujuy, (iv) one return, and (v) improved conservation techniques along the existing alignment. To meet the expected generated traffic and extra loads from heavy vehicles, resurfacing of the existing carriageway plus the construction of an additional carriageway, with two lanes in each direction has been proposed.

5. **Significant road safety enhancements and climate resilient infrastructure have been incorporated to project design to reduce road crashes.** Road crash data obtained from DNV indicates that the fatality rate on the existing road was 7.1 deaths per 100 million vehicle-km for the 2013-2016 period, which is one of the highest in the national road network. For this specific road section, about 25 percent of crashes are caused by lateral friction while only five percent are caused by a frontal impact. However, fatalities caused by frontal impact on the network are more than double those occurring by lateral contact. The foreseen separation of traffic thanks to the enabling of a dual carriageway four lane road should result in a significant reduction in fatalities as frontal crashes will be eliminated. Similarly, in order to adapt the Project's civil works to climate change events affecting the region, these include the construction and rehabilitation of 127 culverts and river crossings to better respond to temporary or permanent flooding of roads, damage to bridges, increased maintenance costs due to damage, and service disruption resulting from changing climatic conditions (See Annex 6).

**Component 2: Infrastructure for Development Corridor Management (US\$7.25 million, all financed by the Bank)**

6. This component will finance additional works and TA activities that will improve the Corridor's management and contribute to roadside service and logistics development along the Corridor.

7. **Sub-component 2.a (US\$2 million) Corridor Development and Multimodal Logistics Initiatives:** TA and feasibility studies related to logistics, multimodality and roadside service facilities. This entails (i) TA and feasibility studies (including Environmental Impact Assessments- EIAs and its EMPs for prioritized intermodal logistics centers); (ii) other initiatives for logistics development and diagnostics to assess needs for corridor development; and (iii) an assessment of trucking industry market failures and TA for improved regulatory framework (competition, efficiency, B-double regulation). The Bank will finance a diagnostic to identify the logistics centers that would be prioritized in the Provinces of Tucumán, Santiago de Estero, Salta, and Jujuy. This is the entry point for a more comprehensive logistics strategy for the region. This sub-component will be implemented by the Secretary of Planning within the MoT, in close collaboration with the Ministry of Production, the Ministry of Interior, Public Works and Housing, and Provincial Governments. It will also serve a role in piloting the coordination of trade facilitation and corridor management practices of agencies with different but complimentary roles working at different levels of Government. This TA will also test the ability of leveraging private sector funding for the eventual



construction and operation of the centers, as logistics being essentially a private sector business, has a high potential for PPPs financing.

8. In the Northwest, modern logistics operate from a few central hubs located close to high-density population centers. Indeed, consultations with firms in the region that were carried out in the context of a World Bank study on logistics in Argentina<sup>33</sup> identified the construction of inter-modal logistics centers as a priority for the region. Various reasons were given to support this conclusion, the most important being the lack of priority assigned to logistics in provincial development plans, lack of awareness of potential efficiency gains and cost reductions derived from the setting up of zones for logistics activities, lack of funding, and lack of discussion and coordination among the leading players in the sector. The development of an integrated network of logistics centers in the Northwest to be financed at a later stage through both public and private sector means, along with the capacity expansion of the NW Corridor, will ensure that these urban hubs are better connected with regional value chains through the NW Corridor. In this respect, the Northwest could develop as a leading trade and logistics hub in the Bi-oceanic corridor. As a final point, the sub-component also aims to provide guidance on how to improve coordination and governance mechanisms between the different stakeholders in the municipal, provincial and central levels and among public and private stakeholders to ensure efficiency in the implementation and operation of logistics centers. While the sub-component will exclusively focus on the feasibility studies for the logistics centers and other ancillary initiatives in influence, all financed activities and outputs will comply with the Bank's social and environmental safeguard policies.

9. **Sub-component 2.b (US\$1 million) Road Safety Control and Awareness:** This sub-component will finance infrastructure works related to the relocation of the National Gendarmerie post in Pampa Blanca, improving existing facilities and access roads. This post comprises a guard office, a chief office, jail, warehouse and public restrooms. In accordance with the independent safety audit, this sub-component includes road safety mitigation measures, including road safety awareness campaigns addressed to vulnerable Corridor users (pedestrians and cyclists).

10. **Sub-component 2.c (US\$1 million) Weight Control Enforcement:** Improvement of the DNV weight control station in Group 2 of works (at 5.3 km from the start of the section and before the entrance to the town Barro Negro), to enforce control of weights and dimensions for freight traffic on national roads in compliance with Transit Law N°24,449 and its regulating and modifying decrees N°779/95, 79/98, 574/14. Works under this sub-component include the execution and improvement of the infrastructure to perform dynamic and static weight control, with the use of photo technology for direct sanction for overweight in the dynamic control, based on the use of dynamic standardized scales, allowing penalty enforcement when overweight is registered. Weight will be checked per axle and total weight.

11. To the access of the control station a dynamic weighing zone will be located, with reduced circulation speed to identify excess trucks that will be derived to the static weighing zone, and the corresponding penalty will be applied in case of excess of load per axle or total weight. An automated barrier will be placed after the dynamic weighing zone preventing the return of the vehicle exceeded to the route and deriving it to the static weighing zone. A barrier after the static weighing zone will enable or not vehicles re-entrance to the route. Barriers will be automatically driven by sensors.

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<sup>33</sup> World Bank, Logistics in Argentina. 2010.



12. All weighing instruments must be homologated by Legal Metrology of the National Institute of Industrial Technology (INTI). Instruments must meet the conditions established by the International Metrology Organization for class III instruments. Weighing equipment will be installed together with online connectivity software so the weight control station will have the appropriate connectivity for the operation of a weighing and load control system.

13. In addition to the infrastructure to improve the cargo control system, this sub-component will finance consulting services for the development of the freight control system, and the acquisition of technological equipment for dynamic weighing and photo technology for automatic overweight sanction. Infrastructure will include (i) improvement in pavement with concrete surface; (ii) beach to regulate loads so that trucks can discharge excess loads; (iii) accesses; (iv) pits for the placement of platforms for dynamic and static scales; (v) dynamic scales; (vi) total weight scale; (vii) axes scale; (viii) accessories, traffic lights, automated barriers with sensors, posters, display, computers, photo cameras; (ix) access, beach and freight control lighting; and (x) control offices and equipment.

14. **Sub-component 2.d (US\$3.25 million) Fiscal control enhancement:** Improvement of infrastructure facilities of the fiscal control of the Province of Jujuy Revenue Directorate (*Dirección Provincial de Rentas of Jujuy*) and the General Directorate of Customs Control (*Dirección General de Control de Aduanas*). The fiscal control station is at the beginning of the Group 1 of works stretch (progressive + 0 + 500), near the border between the Provinces of Salta and Jujuy, in the locality of Pampa Blanca. The objective is to improve fiscal controls on the NR 34, preventing merchandise smuggling and tax evasion. The improvement will include the construction of (i) a police station, (ii) a post for the province of Jujuy's Revenue Directorate and the General Directorate of Customs Control, (iii) staff housing, (iv) a customs scales office, (v) a tourist information booth, and (vi) a warehouse for seizures and complementary works, including facilities for the installation of camera and data control systems.

### **Component 3: Project Management (US\$3 million, all financed by the Borrower)**

15. **This component will finance TA and operating costs for project management and implementation.** The component will finance, inter alia: (i) the installation by DNV of fauna crossings in some of the road works, (ii) the preparation of draft environmental management plans for the works operation and maintenance phase, (iii) the implementation of a monitoring plan to assess the effectiveness of the wildlife crossings during the entire project life-span, (iv) specialized technical, environmental and social supervision of civil works; (v) administrative and operational support to DNV in the administration, monitoring, coordination, and supervision of project implementation; (vi) an assessment of the impact of climate change on the Intensity-Duration-Frequency (IDF) rainfall curve along the NW Corridor, and additional climate resilient solutions ranging from spatial planning to post-disaster risk and recovery support to address the growing climate risks which could impact the entire transport value chain (with co-financing from a GFDRR grant; (vii) studies to prepare the PPP bidding documents of the NW Corridor, including a SESA; (viii) activities included in the IPP to reduce the gender gap; (ix) implementation of a road user and citizen engagement platform to close citizens' feedback loop; and (x) technical supervision of works by junior engineers from local universities.

### **Environmental aspects**

16. **The Project area** is located in the south-east of the Jujuy Province, just by its border with the Salta Province (Northwest of Argentina, near the tropic of Capricorn). The Project area spans a wide



topographic range, from mid altitude areas in the Andes mountain range, through to river floodplains in low lying valleys. It is subject to seismicity and land-slides, and is part of the “Yungas” eco-region, characterized by a narrow North-South belt of highly bio-diverse cloudy rain-forests lying on the eastern facing slopes of the mountain range, and for which National and Provincial laws have set land use change regulations and conservation measures. To the west of the project area there is a Municipal multiple-use reserve called “Serranías de Zapla”. However, the forests matrix in the landscape where the Project is located is highly fragmented, particularly in the valleys and flat areas, due to the extensive agricultural land use where sugar cane, tobacco, citric, soy, and other beans are commonly produced. Archaeological sites are not known in the area to be directly affected by the project. Nevertheless, there are many in other areas within the province, so chance findings are not unlikely. Present day structures with cultural or religious significance (such as "Gauchito Gil" or "Difunta Correa" altars, etc.) are widespread across the whole Project area, both in rural and urban settings. It was determined that the risks of an eventual failure of any of the two dams operating in the proximities of the project area (Las Maderas and La Ciénaga) over the Project's investments is negligible. The Project does not involve international waters neither disputed lands.

17. **Project area of influence.** From an environmental standpoint, besides the area where the works will be executed, the Project area of influence includes the watersheds of the Las Pavas river and the Perico river, as well as the floodplains, the agricultural lands and the forests remnants and towns located in the surroundings of the mentioned network of roads. Areas where works will take place are not densely populated. The referred network of roads has an economic role which extends to the Provinces of Jujuy and Salta, and the neighbor countries, so the indirect influence of the project will extend to that area during the operation phase.

18. **Main adverse impacts.** The main adverse impacts to be caused by the Project are related to activities during the short-term construction stage. Such impacts are expected to be essentially soils compaction and pollution, generation of noise, vibration, dust, construction debris and waste of different types; as well as temporal disruption of transport and other public services. More permanent impacts, such as the alteration of the topography, the expansion of borrow pits and the opening of quarries, are expected to be localized. The widening of the right of way for some of the works would require the clearing of small fractions of natural forest (estimated in 40.3 Ha, plus 1,271 disperse trees) in the proximity of the roads and will increase the existing barrier effect between forest remnants. The foreseen works have also risks related to chance archeological findings, labor influx and crashes (e.g. with heavy construction equipment). These impacts and risks are considered mostly moderate, temporary, reversible and readily manageable with appropriate prevention, mitigation and supervision measures.

19. **Mitigation measures to be implemented.** In addition to the standard mitigation measures usually implemented to manage direct environmental impacts of roadworks, some specific measures will be implemented to mitigate and/or compensate the impacts to be caused on natural habitats (particularly, the clearing of small fractions of natural forest and the incremental barrier effect and fragmentation caused by the second road lane to be constructed). Key areas will be reforested or afforested with native three species to offset the small forests patches to be cleared; and wildlife crossings will be constructed in key points along the roads to improve the connectivity between the remnants of natural habitats that would be incrementally isolated due to the new road lane. A monitoring plan will be financed under Component 3 in order to assess the effectiveness of the wildlife crossings during the entire Project life-span, and eventually promote adaptive management measures.





20. **A SESA will be financed under Component 3.** Incremental regional and indirect impacts of the eventual upgrade of other segments of the same roads network, but beyond this Project (e.g. induced impacts from expansion of agricultural and mining activities in the wider corridor) are, in principle, deemed small since the involved roads already exist and have been part of an active transport corridor for decades. However, they will be further assessed during Project implementation.

### Social aspects

21. **Main social impacts and risks.** The main social impacts are substantial but limited and site-specific. The works under the Project require land taking that will generate physical and/or economic displacement and there is presence of IPs in the Project implementation area. In addition, there is a substantial risk linked to the fact that the Project will be implemented in an area with social conflict that, although not directly related to the Project -since it has neither generated nor is contributing to exacerbate it<sup>34</sup> could affect Project implementation (e.g. affected people may protest blocking the Road). Nevertheless, it is important to highlight that the Project may contribute to reduce the social conflict in the area (i.e. by providing new employment opportunities for the period).

22. **Mitigation measures.** The Project prepared a Social Assessment and a series of social safeguards instruments to mitigate the identified impacts associated to its implementation. These instruments include an Indigenous Peoples Plan (IPP) to ensure that: (i) IP groups are afforded opportunities to participate in planning that affects them; (ii) opportunities to provide such groups with culturally appropriate benefits are considered; and (iii) any project impact that adversely affects them is avoided, or otherwise minimized and mitigated. This will not only protect indigenous peoples' rights but will also minimize any potential negative impact and will support the maximization of positive ones. The IPP will finance activities and works that will enhance the visibility of the IP communities in the Project implementation area, enhancing communitarian facilities and promoting economic development, in particular for indigenous women. The IPP has a strong gender perspective and promotes women participation at different levels of intervention, with special attention to gender rights. In this frame, prevention of gender violence related with road workers is a priority, contributing to reduce the high level of gender violence in the affected communities. Particularly directed to young women, which are especially vulnerable, the Project will build three community centers for labor and entrepreneurship training, sexual education and gender rights promotion. Through the three community centers and road signs, the Project will promote a Touristic Road for the "Yungas region", to generate job opportunities for women, valorizing their culture. The IPP ensures informed and culturally appropriate participation of the affected communities, integrating indigenous representatives to the social team, as translators and cultural mediators.

23. In addition, the social safeguards instruments include two Abbreviated Resettlement Action Plans to address and mitigate any risk linked to the involuntary resettlement processes generated by the Project, and to transform these processes in opportunities of development for Project affected people by supporting them to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of Project implementation.

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<sup>34</sup> These situations are linked to the likelihood that third party actions may cause unintended negative impacts (e.g. economic or physical displacement) to some vulnerable populations in the Project area (e.g. there is an associated potential loss of employment -and housing in some cases- for a number of workers from La Esperanza sugar mill, located in San Pedro).



24. **Labor Influx.** An assessment of risks and potential impacts associated to labor influx has been carried out and bidding documents includes clear guidelines for contractors to apply the corresponding mitigation measures, including the need of having a code of conduct for the contractor, management and workers, the advantages of hiring local labor, and measures to avoid or mitigate the potential impacts of workers on the host communities.<sup>35</sup> The Project is expected to have a low to medium impact, taking into account both its configuration and activities and the socioeconomic context:

- (i) There is a relatively small non-local workforce: It is estimated that for the three groups of works, 720 direct jobs would be generated and an additional 60 percent of indirect jobs (430), during an average period of 22.5 months. Approximately 500 workers would be hired from the Project area (Jujuy, Salta and Tucumán), and around 220 people would be brought in (laboratory staff, managers, administrative staff, etc.). The latter would be divided into five lots of works (less than 50 people per contract), with housing costs covered by the contractors in San Salvador and San Pedro de Jujuy, cities with capacity to absorb that number of people;
- (ii) San Salvador and San Pedro de Jujuy are cities with high capacity to absorb the estimated number of incoming workers and are cities with large labor markets, wide variety of business and industries and relatively high population density;
- (iii) services and accommodation will be provided by the contractors;
- (iv) Though both the national and provincial governments are intensively working to generate social development at the local level, there is still incidence of crime and violence, poverty and vulnerability in the Project area.

25. On crime and violence prevention, based on its relative proximity to international borders (300km), this is an area that has a history of above average incidence. In addition, statistics show that it is an area with high prevalence of gender based violence, in particular domestic violence. Although this affects all local population, the higher incidence is in the area related to Group 2 of works, where there are IP communities.

26. Nevertheless, it is important to highlight that further assessment with local authorities and experts indicated that all the activities to be financed by the Project will create new barriers to any kind of illegal activities, in particular through the support of: (i) enhancing road safety control and awareness through improving facilities for a Gendarmerie post in Pampa Blanca (Sub-component 2.b - US\$1 million); (ii) enhancing of traffic control through improvement of a weight control station in Barro Negro (Sub-component 2.c - US\$1 million); and (iii) improvement of the Province of Jujuy Revenue Directorate's station on the Corridor (Sub-component 2.d - US\$3.25 million).

27. In addition, regarding IP Communities, the Provincial Government is implementing a series of actions to address the issues identified during the first mission. In this sense, the provincial government has, inter alia: (i) created a community police force of 450 indigenous agents; (ii) trained non-indigenous peoples policemen on culturally appropriate proceedings for action with or in areas with IPs, (iii) promoted an inter-agency dialogue on policies to prevent gender-based violence; (iv) is securing land tenure for indigenous communities through bilateral agreements; and (v) carried out joint actions with the national

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<sup>35</sup> See *Guidance Note on Managing the Risks of Adverse Impacts on Communities from Temporary Project Induced Labor Influx* <https://hubs.worldbank.org/news/Announcement/Pages/New-guidance-note-on-managing-risks-related-to-labor-influx-05122016-150220.aspx>.



Secretariat of Integral Policies on Drugs (SEDRONAR) to prevent problematic use of drugs and alcohol among indigenous youth.

28. **Gender.** Activities under the Project will promote women participation at different levels of intervention, as a means of contributing to address gender gaps. Gender gaps in Jujuy are significant: the activity rate in women is about 51.6 percent compared to the 72.6 percent in men; the employment rate is 47.7 percent in women and 69.7 percent in men, and finally unemployment in women reaches the 7.6 percent compared to 4 percent for men. Focusing on indigenous populations, unemployment rate is 5.3 percent for men, while 8.3 percent for women. Also, gender violence indicators show that Jujuy province has the highest rates in the entire country (comparing 0.86 percent in the City of Buenos Aires to 2.68 percent in Jujuy). In this context, prevention of gender violence related to road workers will be a priority, contributing to reduce these high levels of gender violence in affected communities. Particularly directed to young women, which are especially vulnerable, the Project will build three community centers for labor training, human rights promotion, and access to technologies. Measures such as a Protocol of Prevention of Gender Violence will be incorporated in bidding documents to raise the visibility of this issue and increase accountability of contractors. The Project also aims to generate development opportunities for women, with special focus on indigenous women. Through the three community centers and dedicated road signs, the Project will promote a Touristic Road for the "Yungas Region", to generate employment and income-generation opportunities for women, while at the same time valorizing their culture.

29. **Grievance and Redress Mechanism (GRM).** The Project will have a two-layer grievance and redress mechanism. In addition to establishing obligations to the contractors to implement an active social communication plan about the works and to have different communication means for beneficiary feedback (including grievances and suggestions), DNV is developing a mobile phone app that will allow users to not only receive real-time information about traffic, works and roads availability, but also will give them a tool to provide real-time feedback to the government in order to report problematic situations related to the status of any road section or complaints and/or suggestions related to works under implementation.

30. DNV will implement for the works financed by the Bank (except for the works in Group 1 already bidden) an Information Program addressed to the community and the Corridor users, and a Resolution of Claims Program, for which the contractor will bear responsibility during the execution of works.

31. The Information Program will inform the population of the area of influence of the Project, in a timely and convenient manner, about the scope, possible impacts, duration and objectives of the works to be undertaken, start date of works, deadline, work progress, planned detours, alternative routes, road traffic hazards, speed reduction, modification of access, route alternatives, special recommendations to pedestrians and motorists, and all other information necessary to reduce the negative impacts works will generate. The Resolution of Claims Program will provide a solution and response in a prompt and appropriate manner to the claims and suggestions that may appear.

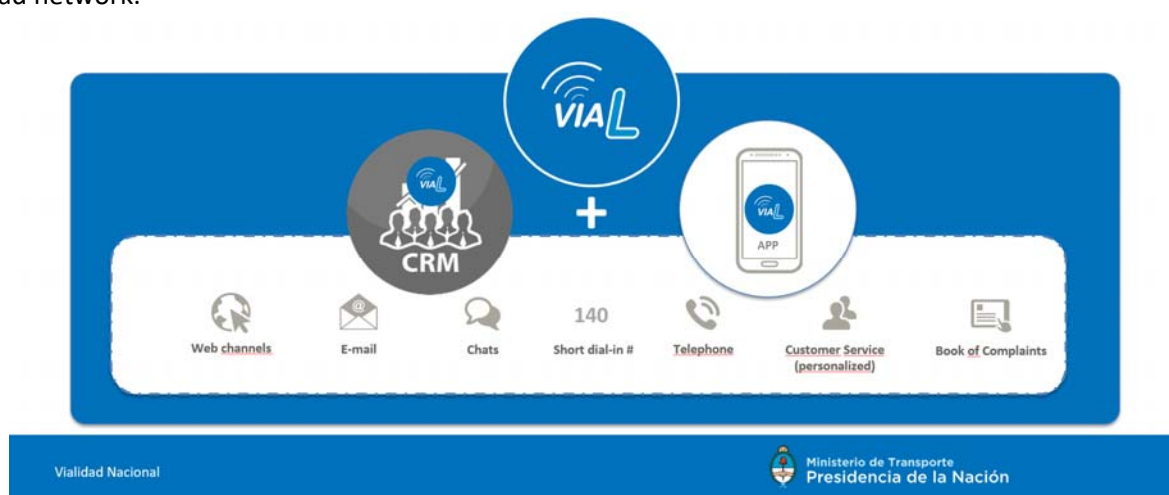
32. The GRM will also be geared at addressing other concerns which affect only women, for instance throughout referral pathways, so that women vulnerable to violence and abuse can make a claim and receive specialized attention.

33. At the same time, DNV is developing under the Norte Grande Road Infrastructure Project (P120198, loan 7991-AR), an integrated platform called "ViaL", which will be oriented to provide



experiences and services (in concessioned and non-concessioned roads) focused on the user as the main beneficiary of the State's public policies, monitoring the execution of road infrastructure works, and rights based on the concessionary companies' obligations. The Platform will include the premises of optimization of the benefits, the supervision of the roads, the coordination between the different stakeholders and instances, and the access to real time information.

34. The Platform will be supported by two key components: a Customer Relationship Management solution and a mobile application. It will integrate the different resources, channels and instances of users' attention currently offered in an atomized and decentralized way by the control authority (OCCOVI, by its acronym in Spanish) and the operating companies, which do not have the possibility of having strategic information nor minimum monitoring functions and traceability of consultations and claims made in the road network.



35. Hence, the Platform integrates all channels of communication and contact ways used by road users (telephone, web, email, mobile application, etc.) with DNV, its dependencies, and the specific areas of the concessionary companies. It contemplates as well different roles and functions, such as (i) road users, (ii) control authority administrators, (iii) concessionary companies' representatives, (iv) DNV inspectors, and (v) DNV supervisors. Therefore, closing the citizens' feedback loop.

36. Primarily, DNV will be able to measure through ViaL (i) the number of complaints and inquiries processed; (ii) response time; (iii) downloads and use of the application; (iv) and processes and resources used.



## ANNEX 2: IMPLEMENTATION ARRANGEMENTS

COUNTRY: Argentina

Northwestern Road Development Corridor Project

### Project Institutional and Implementation Arrangements

1. **Borrower and implementing agency.** The Borrower is the Argentine Republic and the implementing agency will be DNV<sup>36</sup>, a decentralized agency under the jurisdiction of the MoT. Within DNV, the *Subgerencia de Préstamos BIRF* will function as liaison between the Bank and DNV technical areas. At present, DNV is coordinating several programs financed by the World Bank, including the Norte Grande Road Infrastructure Project (P120198, loan 7991-AR), and other multilateral development banks programs. DNV has sound experience in implementing road infrastructure projects financed by development banks and national sources.
2. **DNV will be in charge of overall project administration and execution.** DNV will coordinate and implement all project activities, including the handling of procurements, contracts, and payments to contractors. It will act as necessary to meet the Bank's contractual conditions. Flow of funds will be centralized; there will be no transfers of funds to provinces. As regards sub-component 2a, the Secretary of Planning within the MoT will oversee the execution of the sub-component, specifically the preparation of ToR, evaluation of proposals, and supervision of the activities related to the sub-component. All FM and procurement aspect of these activities will remain under DNV.
3. **Technical, environmental and social supervision.** DNV will undertake technical, environmental and social supervision of works. A technical assessment has been conducted and confirms DNV capacity for supervision of works. Presence in the Project area is guaranteed by DNV regional branch in Jujuy.
4. **DNV will carry out works inspections** as it has been doing in works currently under execution. For that purpose, DNV will organize a works inspection team for each of the contracted lots, due to the magnitude of the works. Even if a firm is awarded two lots, two teams will be formed. Technical supervision of works under the Project will be also reinforced by participation of young engineers who will collaborate with DNV through cooperation agreements with Universities, particularly from the Northwest region.

### Financial Management

5. **Introduction.** A Financial Management Assessment (FMA) was carried out to assess the adequacy of the Financial Management (FM) arrangements<sup>37</sup> in place at the DNV to support project implementation. It was determined that FM arrangements in place at the DNV are acceptable to the Bank because they are: (i) capable of correctly and completely recording project transactions; (ii) facilitate production of the requisite financial reporting on timely manner; (iii) safeguard project's assets; and (iv) are subject to auditing arrangements acceptable to the Bank.

<sup>36</sup> DNV was created by Law 11.658 and Regulated by Decree 14.137 in 1932. From that date, it operates with the autonomy dictated by the law and can act both in the public and private spheres in accordance with what is established by the laws of the network to be built.

<sup>37</sup> The Financial Management Assessment (FMA) is conducted in accordance with OP/BP 10.00 and in line with specific Bank Guidelines Manual for World Bank-Financed Investment Operations; document issued by Operations Policy and Country Services OPCFM on March 1, 2010.



## **Description and Assessment of Project FM arrangements**

6. **Institutional Arrangements for FM.** As noted earlier, DNV will be responsible for Project FM aspects comprising: budgeting formulation and execution; treasury operations including payments of eligible expenditures; managing the Designated Account (DA) and submission of withdrawal applications to the Bank; maintaining Project's accounting records and preparing the requisite Project financial reports; and complying with Project's external auditing arrangements. DNV is an autonomous agency of the Executive of Argentina and its Public Financial Management (PFM) processes and systems will be extensively used for Project implementation. Project transactions will follow the Government streamlined procedures for registering and executing Project budget in the Integrated Financial Management Information System, the E-SIDIF; recording Project transactions and treasury operations including the use of the Treasury Single Account (TSA) for payments of eligible expenditures, and will then be subject to the government-wide financial management arrangements and control framework

7. **Organization and Staffing.** The DNV line departments have qualified FM staffers who can undertake the Project FM function. Furthermore, DNV FM professionals have relevant experience in WB-financed project implementation.

8. **Budgeting.** National budget formulation and implementation are guided by rules established by the National Constitution and the Financial Administration Law. The preparation of the annual budget, which integrates current and capital expenditures, is coordinated by the Treasury and follows a clearly defined calendar that is generally adhered to. The Federal Government integrated budget and accounting IT system SIDIF, *Sistema Integrado de Información Financiera* will be used for fulfilling project budget accounting needs. The Project will rely on the DNV own procedures for budget formulation and execution.

9. **Accounting and Financial Reporting.** The accounting module of the SIDIF will be used for recording project transactions. Since certain accounting information in SIDIF accounting module is recorded and maintained in an aggregate manner; it will be supplemented by the Project Executing Units with External Financing, Unidades Ejecutoras de Proyectos con Financiamiento Externo (UEPEX) system. The UEPEX, which is the Federal Government IT module for accounting and financial reporting of donor-financed operations will be used to generate the annual financial statements and bi-annual Interim Financial Reports (IFRs). The DNV will be responsible for: (i) maintaining Project accounts with the chart of accounts reflecting the Project categories, components and source of funding; and (ii) producing the requisite annual financial statements following the International Accounting Standards (IAS). The cash basis accounting is expected to be used to maintain project records. Project financial reports will consist of annual financial statements and semi-annual Interim Unaudited Financial Reports (IFRs). Format and content of financial statements and IFRs are incorporated in the Operations Manual.

10. **Internal Control and Internal Auditing.** The internal control environment to be used for the Project is anchored in Argentina's legal and institutional framework and e DNV operational processes and procedures. These allow for the establishment of roles and responsibilities for financial management, and the proper segregation of duties. The internal controls relevant to the Project include arrangements to provide assurance that: (i) operations are conducted effectively, efficiently, and in accordance with relevant financing agreements; (ii) financial and operational reporting is reliable; (iii) applicable laws and regulations are complied with; and (iv) assets and records are safeguarded. The use of the national SIDIF system, with its inbuilt controls that ensure proper authorization of transactions, contributes to the observance of these controls. Besides, the DNV is under the scope of the General Syndicate of the Nation



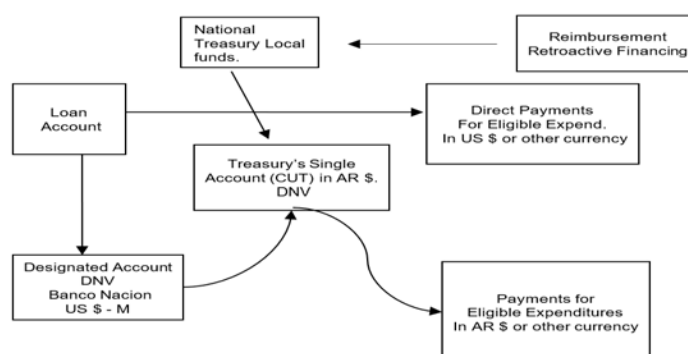


or SIGEN, which is the Federal Government’s internal audit office under the executive branch. The SIGEN supervises and coordinates the actions of the Internal Audit Units in all government agencies, approves their audit plans, and conducts independent audits. Also, the DNV has its own internal audit department, which carries out audit activities within the DNV in general.

### External Auditing Arrangements

11. The Project’s annual financial statements will be audited under Terms of Reference (TORs) prepared according to Bank guidelines and performed by an independent auditor and following standards both acceptable to the Bank. Audited financial statements will be furnished to the Bank no later than six months after the end of each fiscal year—or another period agreed upon with the Bank (not exceeding 18 months)—when, due to Project circumstances, it is more cost effective to join periods to be audited. Auditors should submit (i) opinions on the Project financial statements, the SOE Statement and the Designated Account Statement, in case of the traditional disbursement mechanism or opinion on the IFRs presented, in case of report-based disbursement mechanism and (ii) a Management Letter. Audit terms of reference will be included in the Project Operational Manual. In accordance with the Bank’s Access to Information Policy, upon receipt of the annual audited financial statements of the Project, they will be made available to the public by the Bank. The Borrower agrees to disclose the audited financial statements to the public on time.

**Figure A2.1 - Flow of Funds**



12. **Disbursements.** The following disbursement methods may be used under the loan: (i) Advance; (ii) Reimbursement; and (iii) Direct Payment.

13. The main disbursement method will be the advance to the Designated Account (DA). Bank funds will be transferred to the DA, in dollars, to be opened in the Banco de la Nación Argentina (BNA). When a payment of eligible expenditures needs to be made, funds from the DA will be transferred in local currency to the Treasury’s Single Account (CUT, by its acronym in Spanish), also managed by the DNV, from where payments to local suppliers are completed.

**Table A2.1. Disbursement Arrangements**

Direct Payments and Advances to the DA	<ul style="list-style-type: none"> <li>Direct payments to suppliers. The minimum application size for direct payment requests will be defined in the DL.</li> <li>Advance to a segregated designated account in USD managed by the DNV in as explained earlier with a proposed ceiling of USD 45 million.</li> </ul>
Retroactive expenditures	Eligible expenditures: <ul style="list-style-type: none"> <li>Are paid up to 12 months prior to the date of loan signing;</li> <li>Do not exceed 20 percent of the loan amount; and</li> </ul>



	<ul style="list-style-type: none"> <li>▪ For items procured in accordance with applicable Bank procurement procedures.</li> </ul>
Reimbursement of eligible expenditures pre-financed by the Government after the date of loan signing	<ul style="list-style-type: none"> <li>▪ Reimbursement of eligible expenditures into an account managed by the DNV. The minimum application size for reimbursements requests will be defined in the Disbursement Letter (DL).</li> </ul>
Supporting documentation	<ul style="list-style-type: none"> <li>▪ Statement of Expenditures (SOEs);</li> <li>▪ Records (supplier contracts, invoices and receipts) for direct payments.</li> </ul>

14. Loan proceeds would be disbursed against the following expenditure categories:

**Table A2.2. Disbursements per Expenditure Category**

Category	Amount of the Loan Allocated (expressed in USD)	Percentage of Expenditures to be financed (inclusive of Taxes)
(1) Works under Parts 1 and 2 (b), (c) and (d) of the Project	297,050,000	100%
(2) Goods, non-consulting services, consulting services, Operating Costs and Training for Part 2 of the Project	2,200,000	100%
(3) Front-end Fee	750,000	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 2.07 (b) of the General Conditions
(4) Interest Rate Cap or Interest Rate Collar premium	0	Amount due pursuant to Section 4.05 (c) of the General Conditions
<b>TOTAL AMOUNT</b>	<b>300,000,000</b>	

### Risk Assessment and Mitigation

15. The overall FM risk before and after mitigating measures is assessed Moderate, based on the accounting and flow of funds to be managed centrally by the DNV and the DNV's wide experience in WB-financed projects. The following mitigating measures are designed to cope with the identified Project's FM residual risks: (i) preparation of an Operational Manual (OM) including a section with FM arrangements acceptable to the Bank; and (ii) annual audit of Project's financial statements following auditing standards and terms of reference acceptable to the Bank. The Project risk rating will be reviewed regularly in the course of Project supervision.

### FM Implementation Support Plan

16. The FM supervision plan and the resources to be allocated thereto have been determined in accordance with the risks identified. During Project implementation, FM staff will assess the continuing adequacy of the financial management arrangements for the Project. In addition to monitoring the timeliness of receipt of the interim and annual audited financial statements, FM staff will review these reports. Project FM Specialist (FMS) will participate in at least one implementation support mission every year and will provide ad hoc support through emails and phone calls as needed. The FM supervision plan will be adjusted by the assigned FMS according to Project's fiduciary performance and updated risk.

### Loan Covenant

17. No other than standard conditions for FM are applicable to this Project.





## Procurement

18. **Procurement will be conducted according to the World Bank's Procurement Regulations for IPF Borrowers**, issued in July 2016, for the supply of goods, works, non-consulting services and consulting services. The World Bank's Standard Procurement Documents will govern the procurement of World Bank-financed Open International Competitive Procurement. For procurement involving National Open Competitive Procurement, the Borrower will use Standard Procurement Documents acceptable to the Bank that will be included as Annexes to the Operational Manual.

19. The implementation of the Procurement function will be under the responsibility of DNV through the Procurement Department (*Dirección de Licitaciones y Contrataciones*). A procurement capacity assessment of the implementing agency was carried out by the Bank's Team and concluded that the procurement department within DNV counts on experienced professionals implementing Bank's procurement procedures and particularly high value of road works contracts with similar nature to the ones included in this Project. Also, it was agreed to adjust some of the current procedures that the DNV carries out to adjust them to Bank's Regulations. The functions and responsibilities of the Procurement Department, as well as these changes on the procedures will be reflected in the Operational Manual.

20. Based on the assessment and the fact that the expected activities are not complex in terms of procurement, and do not imply major risks, it was determined that the procurement risk is rated as Moderate.

21. The Implementing Unit has worked on a full Project Procurement Strategy for Development (PPSD) focused on the high value road works under Component 1 (Groups 1, 2 and 3). The works were divided into 3 groups based on: (i) technical characteristics considering their size, complexity and other aspects for a more efficient development, (ii) socio-environmental aspects given the results of the global evaluation of the Corridor that was carried out. As in any project, social and environmental issues are closely related to the different stages of engineering design and their definition. For Groups 1 and 2, considering the progress of technical designs and social and environmental studies, different situations emerged that promote the division of this Corridor into two groups as the most efficient way to achieve value for money. Furthermore, the conclusions of the market analysis reinforced the division of the works into two groups. On the other side, Group 3 comprises low value works for the maintenance of current existing roads, that presents a degree of social and environmental complexity much lower than the other two groups.

22. Based on the market analysis and lessons learned from previous similar experiences, it was concluded that the best alternative for the 3 groups is a straightforward approach via Requests for Bids in an open competitive process, applying the current country thresholds, which were defined as completely valid and applicable for this Project. Therefore, it is expected that the processes for the roads civil works under this subcomponent will have an international market approach. The analysis also concluded that a prequalification process is not needed giving the low complexity of the works with standards Technical Specifications. Procurement arrangements for these and the rest of the activities expected to be carried out during the first 18 months are detailed in the relevant Procurement Plan.

23. A preliminary PSD was initially developed focused on Group 1 considering that this activity was to be implemented as advanced contracting, and the Borrower launched the bidding process following Bank's procedures. The final analysis concluded that the most appropriate procurement approach was to



carry out an open international competitive process through a Request of Bids divided into 2 lots (being this the optimum number that arises from the analysis of the local market and technical requirements). The Request for Bids for works of the Group 1 (NR 34, Section: Border with Salta – San Pedro Access), prepared based on the Bank's SPD, was reviewed and found acceptable by the Bank (NO was granted on May 12, 2017). The bid opening was carried out in July 14, 2017 and 13 bids were received.

24. Aside from that, the strategy (PPSD) also addressed the supervision of the works that is going to be carried out by DNV itself. The Bank carried out a technical analysis over the existing technical capacity and the proposed approach to deliver the results. As a conclusion, the proposed scheme was found technically acceptable, including a crossed physical and financial control, quality control by an external party and mobile regional laboratories. The Bank suggested to strengthen the team with additional professionals to cover the three groups and include a social-environmental professional to follow up on the Bank's safeguard policies.

25. In addition to the prior review, supervision to be carried out from Bank offices, the capacity assessment of the implementing agencies has recommended annual implementation support missions in the field to carry out the post review of procurement actions.

#### **Environmental and Social (including safeguards)**

26. The Borrower has the capacity to plan and implement the described management. The proposed operation would be implemented by an existing and well established institutional structure within the DNV, through its provincial branch in Jujuy. Implementation arrangements would also include a Project Coordination Unit within DNV's national office. The Borrower already has, and regularly uses, the Environmental Management Manual (MEGA II, 2007) prepared by DNV under another IBRD loan to guide the implementation of standard mitigation measures usually implemented to manage direct environmental impacts of roadworks, such as the environmental management of construction camps, disposal of construction waste, management of borrow pits, quarries, etc. In this sense, DNV has successful experience and capacity in the implementation of similar projects. DNV will assign a full-time environmental specialist and a full-time social specialist to this operation, in order to ensure a successful execution of works under this Project.

#### **Monitoring and Evaluation**

27. DNV will have overall responsibility for the Project's monitoring and evaluation (M&E). This unit will monitor and evaluate the Project based on the results framework (see Section VII). DNV will prepare semiannual progress reports during Project implementation in a manner and format acceptable to the Bank. These reports will describe the overall progress made and current status of all components and activities and specifically, progress towards achievement of the PDO and other content specified in the Operational Manual. Furthermore, DNV will conduct a midterm evaluation to analyze progress with respect to the results framework, relevant actions to reduce implementation risks, and identify pertinent project restructuring in the event that dynamics on the ground necessitate changes to achieve the PDO indicators. DNV will also carry out a final evaluation to determine whether the Project achieved its PDO, and analyze implementation performance and lessons learned. DNV will include M&E and planning staff to report directly to the Project coordinator.



### **ANNEX 3: IMPLEMENTATION SUPPORT PLAN**

**COUNTRY:** Argentina

**Northwestern Road Development Corridor Project**

#### **Strategy and Approach for Implementation Support**

1. Implementation Support Plan has been designed based on the following considerations:
  - The Project will be supervised by a mix of Headquarters (HQ) and Country Office (CO) based staff. In addition to sector specialists and safeguard and fiduciary staff, the Bank's team will also be supported by international and local consultants, particularly in relation to technical issues.
  - Frequency of implementation support missions will likely be higher at the beginning (3 per year) to decrease to 2 per year after Project implementation regularizes.
  - Fiduciary and safeguards training will be offered to DNV, and to relevant provincial staff as part of the institutional strengthening activities in component 2.
2. The Implementation Plan will be revised regularly during implementation on the basis of Project progress and continuous risk assessment.

#### **Implementation Support Plan and Resource Requirements**

3. Technical Support. An engineer will conduct site visits on demand when necessary—in addition to the three/two missions every year. Engineering inputs will also be required to review bid documents, technical specifications, etc. During construction and commissioning, technical supervision will be warranted to ensure technical contractual obligations are met.
4. Fiduciary support. As stated in Annex 2, DNV has experience implementing several programs financed by multilateral banks.
5. Safeguards support. To support the management of social and environmental issues, a special focus will be placed on safeguards supervision, including training in specific areas identified as part of the Bank's assessment (See Annex 1).
6. The Bank's supervision team includes an Environmental Specialist and a Social Specialist, and will require additional support from consultants during key implementation phases such as: review of EIAs, EMPs, resettlement and land acquisition plans, and environmental supervision.



Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	Procurement process for works Group 1 and 2	Procurement specialist FM specialist Safeguards specialist Technical specialist	Supervision budget based on norm	--
12-48 months	Keep project implementation on track	Procurement specialist FM specialist Safeguards specialist Technical specialist Operations	150% of supervision norm	--
Closing	Drawing lessons learned and mainstreaming good practices		Supervision budget based on norm	--

#### Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Sector specialist	8		Based in CO
Sector specialist	3	2/year	Based in HQ
Procurement specialist	5		Based in CO
FM specialist	4		Based in CO
Social specialist	5		Based in CO
Environmental specialist	5		Based in CO
Operations	3		Based in CO
Technical specialist	3		Based in CO
Consultants	4		Based in CO/HQ



## ANNEX 4: ECONOMIC ANALYSIS

### COUNTRY: Argentina

#### Northwestern Road Development Corridor Project

1. The Argentine Republic has requested Bank assistance for upgrading a section of the Northwestern Development Corridor comprising NR 34, NR 66 and NR 1V66, linking the Northwestern-most provinces of Jujuy and Salta, and occupying an important role in the distribution of goods to and from the interior of the country. This Project constitutes the first in a program of investments to enhance capacity of the NW Corridor and enhance regional and inter-regional connectivity. The Project will bring direct benefits to road users arising from a reduction in vehicle operating costs, passenger time and CO2 emissions costs thanks to shortened trip distance, improved driving quality and comfort, and relief of road congestion. Similarly, road safety enhancement along the existing alignment will reduce road related crashes. The Project will also have a positive impact on communities located near the Project road and the wider regional area of influence of NR 34. By improving inter-regional connectivity and access to markets, services, and employment opportunities, the Project can enable the conditions for territorial development of the Northwest of Argentina.

2. This annex presents the economic appraisal carried out for Component I which totals US\$291 million or 93 percent of Project cost and consists of the capacity expansion and rehabilitation works along NR 34, NR 66 and NR 1V66 for a total length of 93.1 km, clustered in three groups of works, as follows:

**Table A4. 1. Corridor Road Infrastructure Civil Works**

Group	Work	Section	Sub-project length (Km)	US\$ million
1	NR 34: Border with Salta - Junction NR 66; NR 66: Junction NR 1V66 -Junction NR 34; NR 1V66: Junction NR 66 - Junction NR 34.	NR 34, Section: Border with Salta - Junction NR 66	25.2	162.8
		NR 1V 66, Section Junction NR 66 - Junction NR 34	11,1	
		NR 66, section: Junction NR 1V 66 - Junction NR 34	11	
2	NR 34: Junction NR 66 - North Access to San Pedro.	NR 34, Section: Junction NR 66 - North Access to San Pedro	22.6	98.4
3	NR 66 – Junction NR 1V66 – Junction NR 9	NR 66 – Junction NR 1V66 – Junction NR 9	23	30.3
<b>Total</b>			<b>93.1</b>	<b>291.2</b>

Source: Project profile prioritized by the GoA and executive project for Group 1 works.

### Justification for Proposed Technical Solution

3. The proposed Corridor upgrade will provide an all-weather, divided connecting highway. Group 1 and 2 sub-projects comprise the reconditioning of the existing two-lane asphalt road along the existing alignment through its rehabilitation with reinforcement of asphalt concrete and the construction of a second two-lane road with asphalt concrete pavement thus transforming the Corridor into a four-lane highway. The geometric characteristics were designed for a 120 km/h speed, with highway design, access control, for a flat and wavy terrain by sectors, with crossings and returns at different levels and consisting of: (i) roadway width of 7.30 meters in both directions; (ii) a 3 meter- wide external bench, 2.5 meters of which are paved; (iii) a 3 meter internal bench, 0.5 meter of which are paved; (iv) normal width separation bed of 16 meters and a minimum width of 2.6 meters; (v) and a 2 percent transverse slope in the roadway and of 4 percent in the outer banks. Group 3 sub-projects consist in the rehabilitation of an existing stretch



of the highway in asphalt concrete pavement for a 15 year-design period, with the same geometric condition profile. The three groups of civil works include bridges, overpasses, and elevated pedestrian crossings, all of which were informed by social impact assessments and independent road safety audits.

4. The road stretch that will be upgraded currently has an average AADT of 9,992, with values ranging from 5,575 AADT for sections of Group 1 of works to 11,018 AADT for Group 2. Solutions other than the proposed enabling of a dual carriageway four lane road would not address current congestion problems observed in the Corridor nowadays as well as its relatively deficient level of service. NR 34 and its network of access roads present capacity and quality challenges. Two lanes are insufficient to support the sharp increase in inter-regional traffic observed in the last decade. As the regional economies, there will be higher volumes of vehicles, particularly trucks. While the highway maximum design speed is 120km/h, actual speed averages 77km/h with much lower speeds in peak seasons. Capacity expansion along the busiest segments will be needed to accommodate safe increases in traffic speed and improved market access and connectivity. Second, a non-trivial proportion of road segments along the RN 34 alignment depict low quality standards as measured by the Level of Service indicator assembled by DNV, which has a composite measure of speed, travel time, freedom of maneuver, delays and comfort. The methodology establishes six levels of service ranked from A to F depending on driving conditions. As illustrated on table A4.1, close to 60 percent of the road section (55 km) is currently in very bad or bad condition, while only the road stretch which has two-lanes (Group 3) is considered to have a good level of service. Bringing the score up to the same level of comparable corridors in Argentina is considered a Government priority and a one of the main motivations behind the proposed project.

**Table A4. 2. Level of Service Indicators for Bank-financed Project**

Grupo	Ruta	Distrito	Descripción	NS_H	NS_NH
Grupo 1	0034	Jujuy	LTE. C/SALTA - INT.R.N.1V66 (I)	D0	D6
	0034	Jujuy	INT.R.N.1V66 (I) - INT.R.N.66 (I)	B6	B9
	0066	Jujuy	INT.R.N.1V66 (D) - INT.R.N.34	C2	C3
	1V66	Jujuy	INT.R.N.66 - INT.R.N.34	C7	C9
Grupo 2	0034	Jujuy	INT.R.N.66 (I) - B/N R.P.56 (EX R.N.56)	D2	D3
	0034	Jujuy	B/N R.P.56 (EX R.N.56) - ACC.A SAN PEDRO DE JUJUY	D1	D1
Grupo 3 (1)	0066	Jujuy	A/N ACC.A PALPALA - INT.RN.1V66 (D)	A6	A6

5. The Project sections of NR 34 have service levels, in the higher congestion sectors, of a D6 level, which implies vehicular congestion problems, compared to an average level B4 in the NW Corridor (1,009 km in length), compared to a national average service level of B2 (over a processed total of 34,787 km), a level C2 for the Province of Salta (2,188 km evaluated), and a level D1 for the Province of Jujuy (1160 km evaluated). This implies that Jujuy, on average, has greater congestion problems than Salta, where investments begun to improve the Corridor's capacity.

### Methodology and Assumptions of the Economic Analysis

6. The economic analysis was conducted using the Highway Development and Management Tool (HDM-4), which simulates life-cycle predictions of road deterioration, road works effects and their costs and road user costs and CO2 emission costs, and provides economic decision criteria for road construction and maintenance works. The HDM-4 analyzes projects by computing present values, at a given discount rate, of costs and benefits of different investment options in terms of savings in road maintenance costs, vehicle operating costs and travel time costs. The comparison is done between the “do something”



scenario (with project case) and the “do minimum” scenario (without project case) over the analysis period. The “do minimum” scenario incorporates an assessment of what would happen to the road infrastructure and road users if the project was not undertaken. The project scenario consists of the project construction works followed by proper maintenance works over the analysis period and for the different road sections that make up the Project – in the case of the NW Corridor, the three groups of civil works. Within each group, in turn, a representative homogeneous section was modeled separately, incorporating their unique construction and maintenance cost structure and their traffic forecasts. The results for each group of works were later weighted and consolidated to obtain the Project’s EIRR and the NPV.

7. The economic analysis follows a standard cost-benefit analysis framework, estimating and valuing exclusively the direct benefits to transport users when the transport system - in this case the road corridor - is incrementally improved. Other direct external impacts are also often accounted for, such as impacts on congestion and the environment. As follows, this is a partial equilibrium analysis which does account for changes in economic geography (e.g. agglomeration effects, land use or other economy-wide and social impacts which the project could facilitate. Similarly, it assumes that transport services providers are price takers and the transmission of lower vehicle operating costs to lower transport costs are intermediated by the market structure of the domestic transport industry as well as the supply response of transport services. In other words, the model assumes perfect competition and hence no possibility for transport service providers to behave in monopolistic fashion.

8. The economic analysis considered a 6 percent discount rate and a 20-year evaluation period. The model assumes 3 years of investment, with 39 percent of civil works completed in year 1 (2018), 46 percent in year 2 (2019) and 15 percent in year 3 (2020). The operations phase would begin from 2020 and last until 2036. Traffic growth forecasts used for the evaluation were calculated by DNV in a demand study<sup>38</sup> which considered mainly two sources of growth: (i) normal traffic growth along the road based on a conservative estimate of annual GDP growth for the period of analysis and (ii) locally traffic generated traffic consisting mainly of induced travel thanks to road improvements and reduction in road user costs. The economic analysis also considered changes in GHG emissions resulting from generated traffic and increased speeds. Road related crashes were also factored in, particularly the impact of a 100 percent reduction in road related fatalities from frontal crashes which will materialize following the separation of traffic in two lanes along the Corridor. Finally, the economic analysis assumed a conservative modal shift from light vehicles to trucks in the order of 5-10 percent, which represent that portion of induced traffic that can be captured as containerized freight. This is a plausible assumption in light of the Corridor’s great transit potential for freight from within and outside the region as envisioned in both the Government’s Transport Plan and Belgrano Plan for the 2015-2019 period. It would hence be expected that growth in freight traffic increases more than in proportion than growth in passenger traffic for the period under analysis. Similarly, Plan Belgrano and the Individual Provincial Development Plans foresee an increase in the production of high value-added goods produced in the region, it is expected that the total value of freight flows in the Corridor will increase resulting in a higher economic rate of return. For simplicity, this analysis is not included in the economic appraisal.

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<sup>38</sup> DNV-Origin Destination Study of RN 34, RN 66 and RN 1V66 which was carried out in 2010 with an update in 2015.





## Road Conditions Data

9. Roads Conditions Data derived from a 2016 road survey were used in the HDM-4 model to calculate the index of road condition index<sup>39</sup> which is constructed by DNV as the main parameter to measure current pavement conditions. Table A4.3 lists the road condition index of the different road sections that have been evaluated under Groups 1, 2 and 3, along with other roads parameters including the International Roughness Index (IRI). The weighted average obtained through the road condition index for the road segments under scrutiny was 4.3 and an IRI of 3.0, indicating a relatively poor road condition and a looming need for resurfacing and rehabilitation in addition to the foreseen capacity expansion along Groups 1 and 2.

## Projected Traffic Demand

10. The traffic forecast was based on available traffic data provided by the origin-destination study conducted by DNV in 2010 with an update in 2015. Table 3 summarizes traffic demand for the various sub-projects taking into 2015 as the baseline year. Normal traffic growth along the road is based on: (i) a conservative estimate of annual GDP growth of 1.5 percent for 2017 and 2 percent thereafter for a 20-year time horizon<sup>40</sup>; and (ii) the variations in traffic measurements from two traffic count stations located in different points along the alignment of the project, which were used to forecast changes in the traffic growth rate for this specific road corridor. Adding the normal growth to the baseline traffic obtained in 2015 resulted in an increase in the number of private vehicles of 2 percent up to 2018, and of 3 percent up to 2026, stabilizing at 2.5 percent from 2026 onwards. The demand model also considers generated traffic with an elasticity of demand averaging 1.06, which results in an average annual increase of 3 percent (from both normal and induced traffic) from 2020 onwards in the demand scenario with the project vis-à-vis the do minimum scenario. The model only included vehicle travel (shifts from other modes, longer trips and new vehicle trips) resulting from the Corridor's capacity expansion. For this specific group of civil works, no diverted traffic was incorporated in the demand model. This is a plausible assumption as road users from other national roads in the region are not expected to use these specific road sections. When factoring normal and induced traffic, annual average daily traffic increases by 9 percent from an average of 9,992 in 2015 to 10,934 in 2020 when the project should be completed.<sup>41</sup>

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<sup>39</sup> The Index of road condition is measured on a scale from 0 to 10, with values between 10 and 7 corresponding to good pavement condition; between 7 and 5 fair condition; and finally, values of 5 or less, correspond to bad or very bad conditions.

<sup>40</sup> The analysis was also carried out using estimates of the National Statistics Agency (INDEC) of Gross Provincial Product (GPP) for the average growth in Provincial GPP in the Province of Jujuy. This scenario resulted in an average increase of 2.7 percent for light vehicles and 2.5 percent for heavy trucks in the period of analysis. The demand forecast then results in a slightly lower AADT for the Corridor of interest. Nevertheless, the results of this scenario are excluded from the rest of the analysis as i) the NW Corridor has a national scope and hence taking the change Gross Provincial Product specifically would be misleading and ii) in Argentina official figures of GDP are known to be more accurate and reliable than those reported for GPP. The analysis with GPP and corresponding HDM-4 runs are contained in the project files.

<sup>41</sup> Current traffic is made up by approximately 85 percent of light vehicles and 15 percent of trucks. In the base scenario, this modal composition is maintained but we also estimate the EIRR assuming a conservative increase of 10 percent in the proportion of vehicles transiting the road.





**Table A4.3 Parameters from 2016 Road Survey**  
**Road Condition and International Roughness Index (IRI m/ km)**

Road Condition and International Roughness Index (IRI) / km²								
						Road Condition		
Subprojects	Road Segment	Section	Section Length (Km)	Road width (m)	IRI (m / km)	IE	Condition	AADT
Group 1	NR N° 34: Limit with Salta - Junction NR N° 66	Section 1 (10.94 km)	25.22	7.3	3.3	3.2	Bad	11,697
		Section 2 (14.28 km)		7.3	3.3	3.2	Bad	4,152
	NR 66: Junction NR N° 1V66 - Junction RN N° 34		11.18	7.3	2.7	3.9	Bad	5,845
	NR 66: Junction NR N° 1V66 - Junction RN N° 34		11.08	7	2.5	5.5	Regular	5,302
Group 2	NR N° 34: Junction NRN° 66 - North Access to San Pedro.		22.62	7.3	3.3	3.4	Bad	10,071
Group 3	NR N° 66 – Junction NR N° 1V66 – Junction NR N° 9		23	14.6	2.6	6	Regular	17,004
	Weighted Average		93.1		3	4.3	Bad	9,992

**Table A4.4. Estimated Average Annual Daily Traffic Projections and Modal Composition from 2020**

Table 10.10 Estimated Average Annual Daily Traffic Projections and Road Composition from 2020						Traffic Composition (%)	
Subprojects	Road Segment	Sections	Section Length (Km)	AADT (2015)	AADT (2020)	% Light vehicles	% Total Heavy
Group 1	NR 34: Border with Salta - Junction NR 66	Section 1 (10.94 km)	25.22	11,697	12,765	80.40%	19.60%
		Section 2 (14.28 km)		4,152	4,530	80.71%	19.29%
	NR 66: Junction NR 1V66 -Junction NR 34		11.18	5,845	6,380	81.07%	18.93%
	NR 66: Junction NR 1V66 -Junction NR 34		11.08	5,302	5,802	85.50%	14.50%
Group 2	NR 34: Junction NR 66 - North Access to San Pedro		22.62	10,071	11,018	84.26%	15.74%
Group 3	NR 66 – Junction NR 1V66 – Junction NR 9		23.0	17,004	18,639	90.85%	9.15%
	Total		93.1	9,992	10,934	84.70%	15.30%

### Road User Costs

11. The economic analysis accounts for costs and benefits associated with the project. They include the cost of construction/upgrading/rehabilitating each of the road sections, as well as maintenance and periodic repair costs; vehicle operating costs for existing and generated traffic, costs associated with travel time, road safety benefits and CO2 emission costs with and without the project. Vehicle operating costs



were estimated using HDM-4 and country-related input data and included representative costs and parameters available for Argentina (e.g. vehicle price, fuel, annual vehicle km, etc.)<sup>42</sup>

### Construction and Maintenance Costs

12. To calculate maintenance costs following capacity expansion, two technical alternatives were appraised and compared with the “do minimum” scenario, which only includes routine maintenance for the existing two-lane road. The first alternative (Alternative A) includes maintenance for all bumps, fissures, sewers and periodic maintenance for a dual-carriage with a 4-centimeter pavement reinforcement, the second alternative (Alternative B) incorporates a costlier 8-centimeter pavement reinforcement. The difference between the two alternatives hence, lies on a variation in the thickness considered for the final layer of asphalt concrete. Moreover, for both alternatives rehabilitation of the existing pavement was considered. Only the weighed results for alternative A, which is the one proposed for the project are presented in this analysis. Construction costs in basic civil works, bridges and sewers remained unchanged under both scenarios and are presented for each group of civil works<sup>43</sup> in Table A4.5.

**Table A4.5. Road Works and Costs**

Group	Section	Length (Km)	Mill US \$ Total cost of works (w/o expropr.)	Unit costs (million US \$ / km)
Group 1	NR 34, Section: Border with Salta - Junction NR 66	25.2	101.1	4.01
	NR 1V 66, Section Junction NR 66 - Junction NR 34	11.1	35.1	3.16
	NR 66, section: Junction NR 1V 66 - Junction NR 34	11.07	26.6	2.40
Group 2	NR 34, Section: Junction NR 66 - North Access to San Pedro	22.6	98.4	4.35
Group 3	NR 66 – Junction NR 1V66 – Junction NR 9	23	30.0	1.30
	<b>TOTAL</b>	<b>93.1</b>	<b>291.2</b>	<b>3.12</b>

### Travel savings and reduction in vehicle operating costs

13. The main project benefits were calculated as the reduction in the road user costs (RUC)<sup>44</sup> as well as the reduction in cost of specific travel time for light and heavy trucks. Road user benefits occur entirely as a result of the expected capacity expansion from 2 to 4 lanes and improvement in pavement conditions. The Project’s vehicle operating costs, travel times, and road user costs with and without and project are presented in table A4.5, along with the savings for each of the parameter expected for 2020. As illustrated by the table, the consolidated group of works will generate a reduction in road user costs of 12.8 percent for cars, 14.3 percent for light trucks, and 9.1 percent for heavy trucks in the “with project” scenario against the “without project” scenario. The expected reduction in travel times will be 38.5 percent for cars, 20.8 percent for light trucks and 23.8 percent for heavy trucks.

### Incorporating Improvements in Road Safety Outcomes

14. Road accident data obtained from DNV indicates that the fatality rate on the existing road was 7.1 deaths per 100 million vehicle-km for the 2013-2016 period. For this specific road section, about 25

<sup>42</sup> The full list of vehicle fleet characteristics is contained in the project files.

<sup>43</sup> The associated costs of infrastructure works associated with (i) the relocation of the of the Gendarmerie post in Pampa Blanca (Component 2b), (ii) infrastructure of weight control station in Barro Negro (Component 2c), and (iii) relocation of AFIP Provincial fiscal post (Component 2d) are already incorporated in the road works outlined on Table A4.5.

<sup>44</sup> Consisting of Vehicle Operating Costs (VOC) plus travel time costs.



percent of crashes are caused by lateral friction while only five percent are caused by a frontal impact. However, fatalities caused by frontal impact on the network are more than double those occurring by lateral contact. The foreseen separation of traffic thanks to the enabling of a dual carriageway four lane road should result in a significant reduction in fatalities as frontal crashes will be eliminated.

**Table A4.6. Road User Costs upon Project Completion in 2020 (US\$ per veh-km)**

		Car	Heavy truck
Without Project	VOC	0.17	1.62
	Time	0.13	0.52
	RUC	0.3	2.14
With Project	VOC	0.18	1.53
	Time	0.08	0.42
	RUC	0.26	1.95
Savings (percent)	VOC	5.9%	-5.6%
	Time	-38.5%	-23.8%
	RUC	-13.3%	-8.9%

15. The economic analysis incorporates the exogenous flow of benefits resulting from the project's road safety enhancements, particularly the foreseen reduction in frontal crashes. In all, the economic evaluation considered a 30 percent reduction of the fatality rate with the proposed road works. The economic appraisal considered a monetary value of life of US\$145,000 per fatality based on the future stream of average per capita income for Argentina<sup>45</sup> and the same GDP and normal traffic growth included in the demand study.

### Overall Economic Evaluation Results

16. The evaluation considers road agency costs, normal traffic, generated traffic road user costs, road safety benefits and CO2 emissions costs, evaluated over a 20-year period, at a discount rate of 6 percent. Table A4.7 presents the economic evaluation results for each road section and the project. In the most conservative scenario, the overall EIRR of the project is 18.5 percent, with a NPV of US\$365.8 million. When incorporating a shift in the modal composition of current traffic from light vehicles in favor of trucks, which is highly likely following the increase of inter-regional trade resulting from the highway expansion and logistics initiatives envisaged in this project, the EIRR increases to 21.1 percent and NPV to US\$463,73 million. Lastly, the measures foreseen as part of Component 2b to decrease overloading are ultimately geared at decreasing maintenance costs for the road network in the long term. Incorporating the costs of weight stations and the resulting savings in maintenance into the base scenario increase the NPV by US\$7.67 million to US\$373.46 million to 18.9 percent.

**Table A4.7. Economic Evaluation Results**

Group 1		Group 2		Group 3		Consolidated		25% Consolidated Trucks from Base Scenario		Net Benefits from expected reduction in overloading	
NPV (in mill US\$)	EIRR (in%)	NPV (in mill US\$)	EIRR (in%)	NPV (in mill US\$)	EIRR (in%)	NPV (in mill US\$)	EIRR (in%)	NPV (in mill US\$)	EIRR (in%)	NPV (in mill US\$)	EIRR (in%)
224,41	19,9	105,63	17	36,52	18,1	365,8	18,5	463,73	21,1	373,4	18,9

17. In the base scenario, differentiating benefits between (i) lower vehicle operating costs, (ii) travel

<sup>45</sup> The analysis estimates monthly income per capita of US\$1500.



time savings, and (iii) reduced road crashes yields the following benefit incidence: (i) 26.2 percent, corresponds to a decrease in VOC, (ii) 72.3 percent corresponds to the expected reduction of travel time savings; and (iii) the remaining 1.5 percent is explained by the reduction in road crashes (Table A4.8).

**Table A4.8. Distribution of Project Benefits**

	NPV (in mill US\$)	Share in total benefits
Benefits VOC	138.74	26%
Benefits Travel Time	382.77	72%
Benefits Crashes	7.99	2%
<b>Total Benefits</b>	<b>529.5</b>	<b>100%</b>

<b>Total (Discounted) Costs</b>	<b>163.66</b>
<b>NPV (Benefits-Costs)</b>	<b>365.8</b>

18. Sensitivity analysis also tested robustness of results of economic evaluation against changes in capital costs and traffic. Capital costs were increased by 20 percent. Road user benefits on the project roads after the improvement works were decreased by 20 percent. In a strict worst-case scenario by which capital works are increased by 20 percent and road user benefits are reduced by 20 percent, the overall EIRR of the project falls to 13.1 percent for the costliest maintenance alternative, confirming the project's robust economic justification. Switching values analysis shows that if capital costs increase by 175 percent the overall project EIRR becomes 6 percent and the NPV becomes zero.

**Table A4.9. Sensitivity analysis with 20 percent increase in capital costs and 20 percent decrease in road user benefits**

GROUP	EIRR	NPV in US\$ million
GROUP 1	14,1%	142
GROUP 2	12,2%	64
GROUP 3	13,2%	24
<b>CONSOLIDATED SENSITIVITY RESULTS</b>	<b>13.1%</b>	<b>229</b>

## GHG Emissions

19. **GHG Emissions:** Carbon dioxide (CO<sub>2</sub>) emissions are estimated based on aggregated composition of traffic, existing travel conditions, and possible impacts from project interventions. The evaluation compares anticipated baseline without project emissions, when there are no project interventions, and with project scenario emissions. Baseline emissions are estimated from the existing traffic allowing for annual growth, while the "with" project scenario accounts for changes in emission levels of (i) the normal traffic, due to increased speeds which result in greater fuel consumption; and (ii) the added generated traffic with the project. Annual emission variations were priced at a cost of US\$30 per ton increased by 3 percent per year.

20. According to the HDM-4 model, in year 2020, when the road improvement road works are completed, total CO<sub>2</sub> emissions will increase from 2.86 million tons without the project to 3.26 million tons<sup>46</sup> with the project (14 percent increase). The increase in CO<sub>2</sub> emissions with the project is due to: (i)

<sup>46</sup> The model results in a net increase of 0.4 million tons during the Project life cycle, which corresponds to 0.02 million tons per



the increase traffic and increase corresponding CO2 emissions; and (ii) the added generated traffic with the project in vehicle speeds of the normal traffic resulting from the project<sup>47</sup> that increase fuel consumption of the normal. The inclusion of the CO2 emission costs in the economic evaluation affects slightly the economic evaluation results, from 18.5 percent to 18.2 percent and an NPV of US\$355.0 million in the consolidated baseline scenario for all subprojects, assuming a base scenario with a social value of US\$30 in 2015 gradually increasing to US\$65 by 2040.<sup>48</sup>

21. **Rationale for Public Sector Financing.** Public investment in road infrastructure is a key tool for the GoA to promote the country's development. However, after years of underinvestment, current investment needs outstretch public budget possibilities. In order to meet the ambitious investment targets set out in the GoA's Transport Plan, it will be important to leverage commercial financing for the construction, operation and maintenance of the transport network and review the funding sources. In order to mobilize commercial financing in the road sector the World Bank is providing support to the GoA on a set of key actions: (i) developing a sound institutional and regulatory framework; (ii) setting-up a solid project preparation framework, through a pipeline approach (rather than a project by project approach) to reduce transaction cost and attract relevant industries; and (iii) creating specific vehicles to fill market gaps that limit private sector financing or optimize the terms and conditions offered. Such programmatic approach requires strong political support, as many of these pillars need to be fully developed. A WBG team (IBRD and IFC), funded by the Global Infrastructure Facility (GIF), is helping to identify a pipeline of suitable projects consistent with the market conditions and the appetite of investors. Under this grant, the WBG is providing guidance on the optimal strategy for implementing the road sector program, including pacing and sequencing of projects, and providing TA on strengthening the cross-sector enabling environment to enable successful implementation of the identified early-mover projects, and in turn support the broader PPP program in Argentina.

22. This operation foresees a complementary use of public and private sector financing. The NW Corridor has been identified as one of the priority corridors to be included in the PPP Roads Program that DNV will be launching in 2018 to finance additional expansions, operation and maintenance, and the sections targeted by the proposed Project have been prioritized for public financing considering: (i) the need to reduce levels of CAPEX to be included in the PPP contract, to align this Corridor to the business and financial models of the broader PPP Roads program; and (ii) urgency in addressing highest levels of congestion, deterioration and fatalities. As part of project preparation, the Bank has provided support to define the Corridor's business and financial models (preliminary market sounding for investors risk appetite, including construction risks), with initial CAPEX for this segment funded with public treasury, and CAPEX of future segments and operating expenses (OPEX) to be included in the PPP contract. The Bank team, through a GIF grant to be complemented with Component 3, is providing support to DNV in the analysis and design of risk matrix, validation of traffic studies, preparation of data room documentation, preparation of bidding documents, in parallel to the support being provided to the PPP Unit in the MoF on enabling environment (PPP legislation and regulatory framework, assessment of foreign investors risk appetite, risk mitigation strategy, strengthening institutional capacity in MoF and sectoral ministries to deliver infrastructure assets and services with value for money for users, taxpayers and investors, etc.).

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year to 2036.

<sup>47</sup> Vehicle speeds are estimated to increase from around 80 to 110 km per hour after project completion.

<sup>48</sup> As per Bank guidelines, in a base scenario the social value for 1 metric ton of CO2 is equivalent to US\$30 in 2015, US\$35 in 2020, US\$50 in 2030, and US\$65 in 2040.



## ANNEX 5: ECONOMIC DEVELOPMENT POTENTIAL OF THE NORTHWESTERN CORRIDOR

COUNTRY: Argentina

### Northwestern Road Development Corridor Project

1. **The Northwestern Road Development Corridor constitutes an important lifeline of Argentina's Northwestern Region.** Close to 900km of roads that make up the NW Corridor in this lagged region, serve important agricultural and mining production and consumption centers and provide cohesion to the territory. The proposed Bank-financed Project, which entails (i) an upgrade of a 93.1-kilometer within the northernmost portion of NR 34, and (ii) the development of road side services and modern logistics services is part of an on-going comprehensive transport program to improve inter-regional connectivity in the Northwest focusing on Federal Highway NR 34 as the backbone of the system. Civil works under this project include upgrading existing links along Federal Highway NR 34 and its access roads in the Provinces of Jujuy (T-07 on Table A5.1) while future interventions will upgrade key road links along the Highway which link Santiago del Estero in the South with the border with Bolivia, and NR 34 with NR 7 towards San Salvador de Jujuy. The project also includes the design and implementation of road service facilities and as well as the design of logistics centers and ancillary activities. The aim of Bank-financed interventions is to jump-start the upgrading of the Northwest Development Corridor and, *inter alia*, facilitate intra and interregional trade, promote seamless and multi-modal freight transport, and ultimately contribute to the competitiveness of leading agro-industrial sectors and SMEs in the region. To complement the economic appraisal presented in Annex 4, this annex presents the economic rationale of the proposed project, delving deeper into the direct benefits and economy-wide benefits that the project will bring to the Northwest of Argentina.

Table A5.1: Planned Investments along the Northwestern Corridor

Project	Road Segment	Civil Works	Length Km
Northwestern Development Corridor	T-01: NR 34, Taboada - La Banda	Duplication of highway capacity	57,0
	T-02: (SN) La Banda - Termas de R. Hondo	Juncture between 1+1 between NR 9 and NR 34	<i>Not yet established</i>
	T-03: NR 9, Termas de R. Hondo - Tucumán (RN 9)	New highway along different alignment	70,0
	T-04: NR 9, 38 y A016 Access to Tucumán	Peri-urban Highway to be constructed	25,0
	T-05: NR 9, Tucumán - Rosario de la Frontera	Road safety enhancements to meet Ruta Segura Standards	101,0
	T-06: NR 9/34, Rosario de la Frontera - Salta	Upgrade to highway	123,0
	<b>T-07: NR 34, 66 t 1V66, Acc. a Salta –S. Pedro</b>	<b>Duplication of highway capacity</b>	<b>120,2</b>
	T-08: NR 34, RP 1, S. P. de Jujuy - Pichanal	Paving and Road safety enhancements to meet <i>Ruta Segura</i> Standards	102,0
	T-09: NR 50, Pichanal – Orán	Duplication of highway capacity	21,0
	T-10: NR 34, La Banda - R. de la Frontera	Road safety enhancements to meet <i>Ruta Segura</i> Standards	260,0

2. **Direct beneficiaries of the projects are in the order of half a million inhabitants, with indirect beneficiaries quickly reaching over 4 million persons.** For the purposes of this analysis we identify two areas directly benefiting from the project; first, an immediate area of influence encompassing the Jujuy province, specifically the cities of San Salvador de Jujuy and San Pedro de Jujuy and south to the border with Salta Province; and second, an "extended area of influence" made up by the Provinces of Jujuy, Salta, Tucumán, and Santiago del Estero. The direct area of influence is defined as a buffer of 15 kilometers around the Bank-financed interventions. Such area hosts 410,737 inhabitants or direct beneficiaries. The extended area of influence of NR 34 includes the four provinces of the North representing a universe of

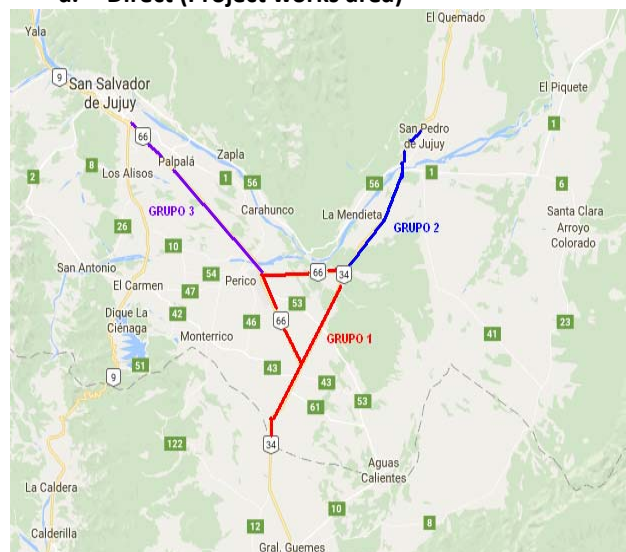




4.2 million of indirect beneficiaries based on the 2010 census.

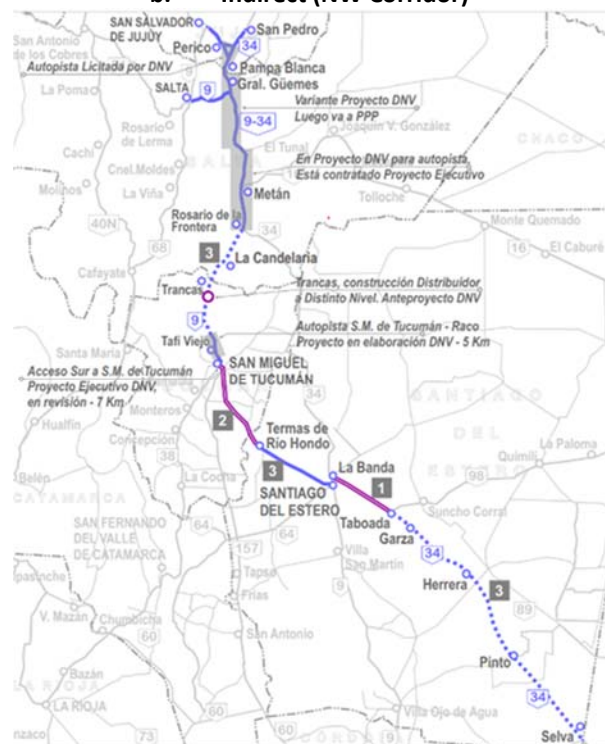
Figures A5.1: Area of influence of the NW Development Corridor

a. Direct (Project works area)



Source: DNV

b. Indirect (NW Corridor)



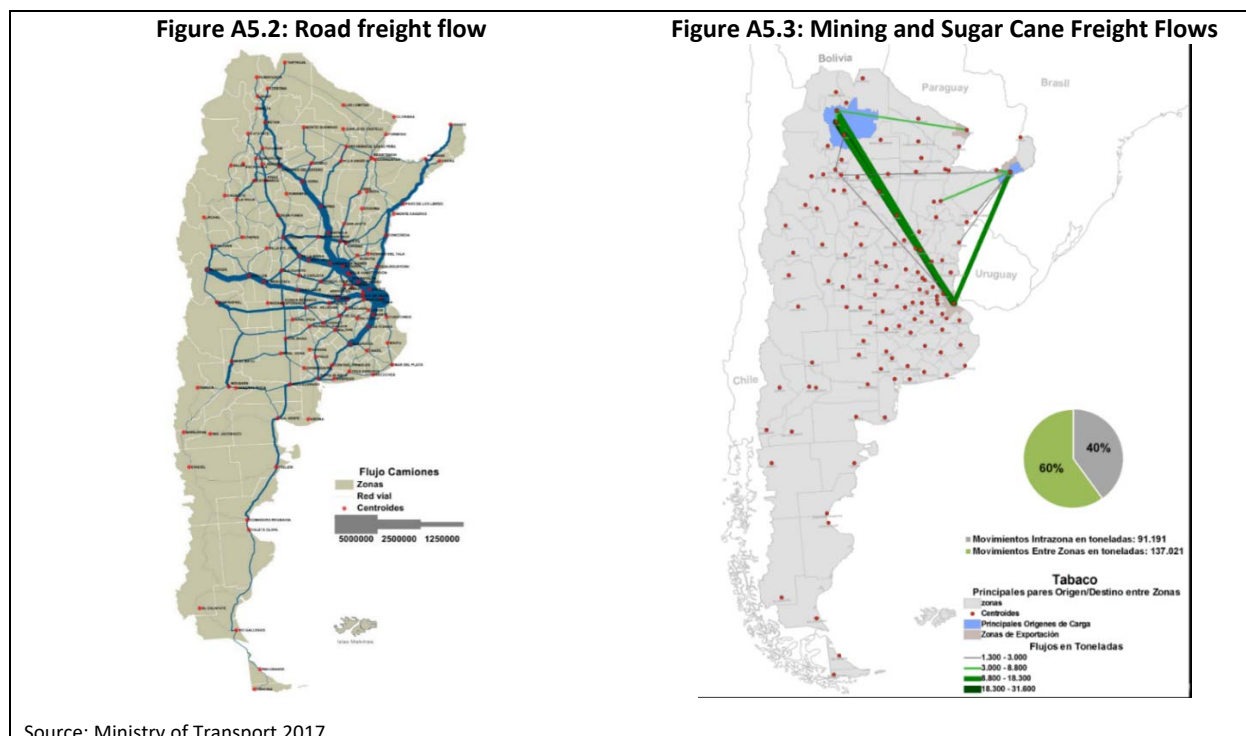
*Productive Structure and Nature of Freight Flows*

3. **The NWDC caters 3 types of domains: intra-regional, domestic markets in the South, and export outlets.** The intra-regional or intra-Northwest freight movements represents less than 15 percent of flow movements. There are no large centers of population or commercial/industrial centers in the Northwest demanding raw materials from the Northwest for further processing or consumption. Moreover, centers of consumption are scattered over a wide geographic area, generating difficulties in the handling of intra-zone flows. In the first place, these complexities affect short freight runs for large companies transferring raw materials to their processing centers. They also have a negative impact on transport flows for SMEs that provide goods and services to larger companies that supply the regional market. The absence of large and compact markets in the Northwest also affects the dynamics and balance of incoming flows of products to be shipped from the south into the region vis-à-vis the outgoing flows. Most of the regional output is intended to serve the demand from domestic markets in the South (large population centers around Buenos Aires, Santa Fe, Rosario and Cordoba), and export markets (creating *de facto* two salient physical destinations of the Northwestern products to the ports of Rosario and Buenos Aires; and the border crossings with Chile and Bolivia).

4. **There is a conspicuous imbalance in freight flows along the north-south axis with most of the production in the Northwest being transported South to the consumption centers and export ports.** The outgoing flows are hardly compensated for the small demand of inputs and goods from the South for



either consumption or industrial production. As elaborated in the National Study on Freight Flows (Ministry of Transport, 2017), on average, only 25 percent of the freight traveling from north to south returns directly to the Northwest, either as input or finished goods for consumption in the region. Trucks returning to the region after unloading in Buenos Aires or Rosario attempt to minimize unproductive routes by modifying circuits and diverting to other cities, leading to significant delays on the south-north route (World Bank, 2010). Figure A5.2, illustrates freight flows for Argentina evidencing the pressure and congestion that currently exists on the North-South axis, while figures A5.3, A5.4 and A5.5 depict the largely unidirectional flows of three of the region's major products (tobacco, sugar cane, and mining).



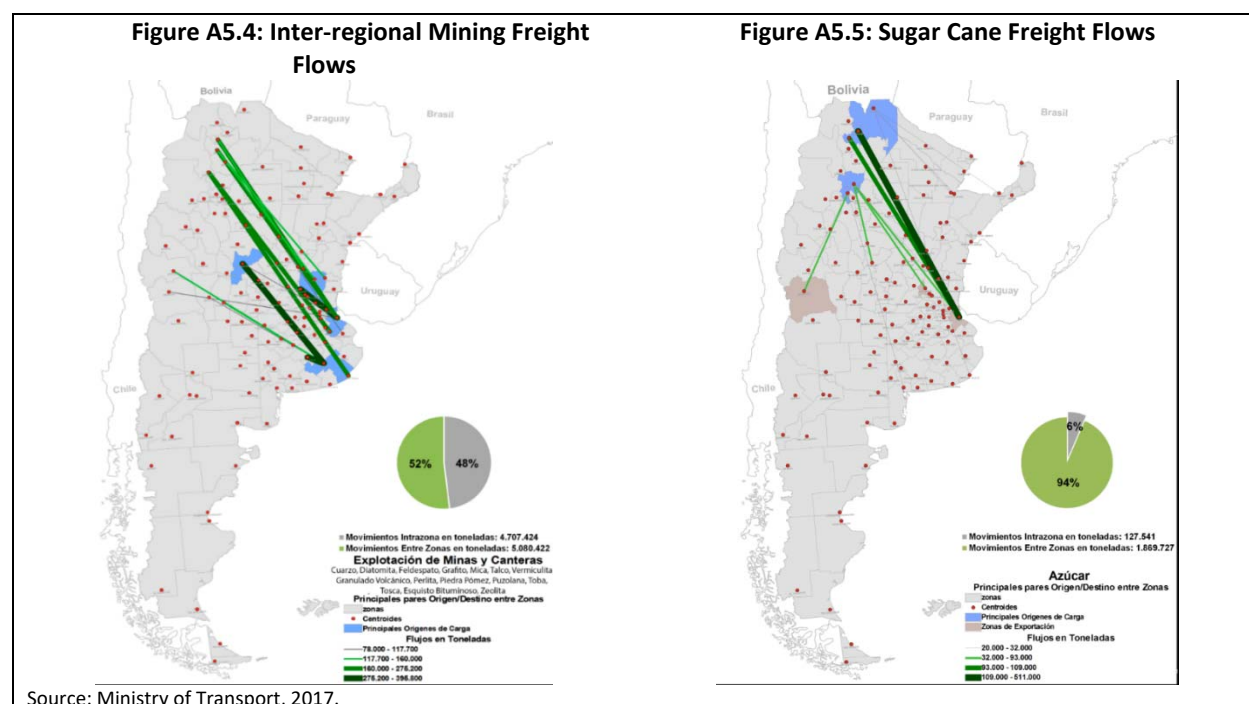
5. **Most of the long-haul freight intended for the center and south is of unprocessed bulky material, predominantly mineral products for export and agricultural products for domestic consumption.** Main mineral products originating in the Northwest are lithium, iron ore, oil and gas while primary agricultural products are sugar cane, tobacco and horticultural products. The most significant export sector is that of Bulk Solids, in terms of both volume and value. The main products in this group are minerals and bulk agricultural goods principally transported to the Rosario port system but also to Buenos Aires and the Borders with Chile and Bolivia. Mining and non-traditional exports constitute the lion share of exports. In 2015, the region's exports totaled US\$3.1 million with horticulture and copper leading the export list with 23 and 15 percent respectively. The more traditional commodities in the northwest have traditionally catered domestic markets. For instance, in the case of sugar cane, the region's most dominant crop, 78 percent (1.9 million tons) supply the national demand and only 22 percent of national output is exported (0.56 million tons).

6. **The industrial activity in the Northwest is heavily dominated by a fringe of SMEs dedicated to non-traditional products while the market of traditional agro-industrial products is led by large integrated conglomerates.** The Northwest contains 8 percent of the country's industrial establishments,





and most of which are in Salta and Tucumán. About 94 percent of registered companies are SMEs, 64 percent of which are in agricultural activities. These establishments mostly supply the domestic market with goods and services, or have businesses linked to those of the larger corporations with exporting potential. Some non-traditional sectors dominated by SMEs are starting to gain importance in the regional economy. The nascent tourism industry for instance, has become the second largest employer in Salta and third in Jujuy. Other prominent non-traditional sectors include forestry products and paper goods. Most recently, the region's agricultural frontier has expanded to cultivate soybean, as a means of spreading out production of Argentina's most popular cash crop away from the more traditional soybean growing areas in the center and north east. Throughout the region, in the more traditional agricultural sectors, there are limited vertically-integrated large conglomerates, which, in some sectors account for a large share of total provincial production. In the sugar cane industry for instance, the 5 sugar mills of Jujuy and Salta produce about 95 percent of total output in the region totaling 62 million or 11.6 percent of Gross Provincial Product.



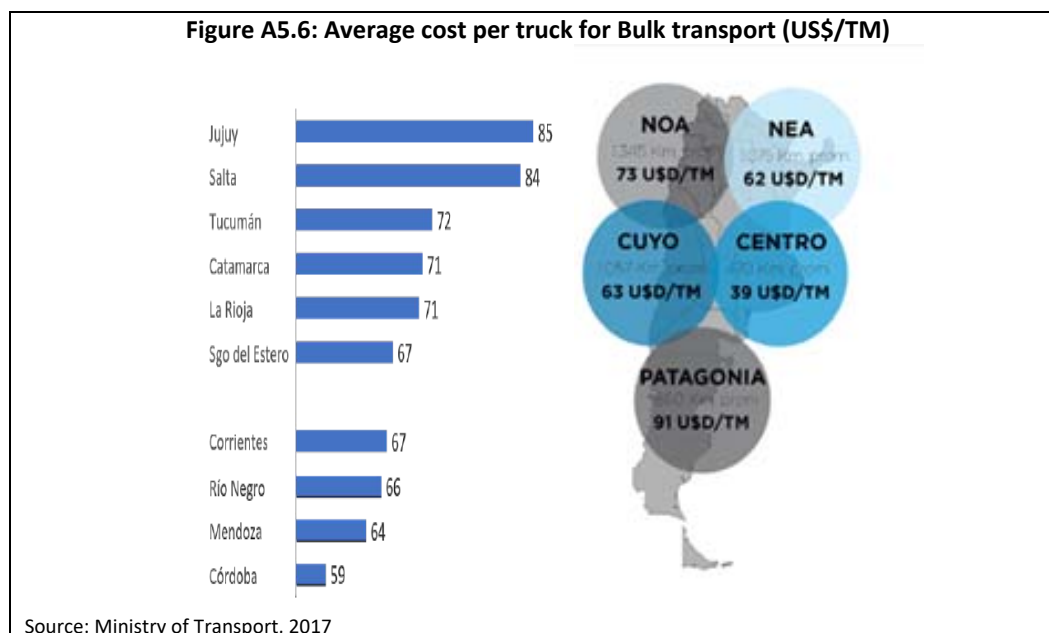
7. Since 2016, the Northwest has shown visible increases in exports vis-à-vis other regions of the country. The bulk nature of the cargo and the long-distances to be travelled underscore the importance of having efficient and reliable corridors connecting the production areas and the main markets to reduce transport costs and guarantee the competitiveness of the products. However, of equal importance is to promote logistics ancillary services such as consolidation centers and corporatized truck services that would paved the ground for SMEs to become more competitive and grab the benefits of the economies of scale of long-haul and efficient trucking services.

## Transport and Logistics Services in the Region

8. Transport costs in the Northwest are the highest in the country after the Patagonia region. It is estimated that transporting a ton of cargo from the Northwest region to the port of Buenos Aires costs



about US\$73 on average, 40 percent higher than a ton mobilized from the center (Figure A6.6). This cost mark-up reflects challenges imposed by geography. Distances of between 1150 and 1500 km separate the region from the ports and the country's main centers of consumption. But geography is not the only leading cause of high transport costs in the Northwest. The limited volume of their production presents a smaller, and therefore less competitive market for logistics services in general, making them less efficient, and likely costlier.



9. **Transport cost mark-ups imposed by distance and limited logistic markets call for targeted interventions to reduce (costs and enhance connectivity, which in turn, could support regional development.** For example, key ancillary interventions could include:

- Improving quality and increasing capacity of the highway and provincial network to match increasing demand. As the regional economies expand, there will be higher volumes of vehicles, particularly trucks using the road network. Capacity expansion along the busiest segments will be needed to accommodate safe increases in traffic speed, driving improved market access and connectivity.
- Placing and developing strategic partnerships with the private sector to provide logistics services including multimodal transfers and consolidation centers to improve functioning of key agricultural supply chains in the region.
- Promoting formality, integration and corporatization of the trucking industry. Using higher-capacity modes in conjunction to trucking would significantly decrease long-haul transport costs. Transport services in the Northwest are dominated by small and medium sized trucking companies with little participation from other modes. At present, trucking is the most popular transport mode (approximately 90 percent) with railways, inland waterways, and air transport carrying less than 10 percent of the long-distance freight.

10. **Salient as a challenge is improving the capacity, quality, safety of the physical infrastructure, particularly that of NR 34.** No service or good flows will be possible if this physical bottleneck is not addressed. First, existing two lanes are insufficient to support the sharp increase in inter-regional traffic



observed in the last decade. As the regional economies, there will be higher volumes of vehicles, particularly trucks. While the highway design speed is 80km/h, actual speed averages 70km/h with even lower speeds in peak seasons. Capacity expansion along the busiest segments will be needed to accommodate safe increases in traffic speed, driving improved market access and connectivity. Second, a non-trivial proportion of road segments along NR 34's alignment depict low quality standards as measured by the Level of Service indicator assembled by the National Roads Directorate (DNV)<sup>49</sup>. At present, around 20 percent of the alignment between Jujuy and Santiago del Estero has a low score in the composite index (less than 3 in a scale of 0 to 5). Bringing the score up to the same level of comparable corridors is a key requirement to ensure regional competitiveness. Third, Highway RN34 has one of the highest rates of fatal crashes of any corridor in Argentina. By separating traffic flows into two lanes, frontal impact crashes, which make up as much as 25 percent of fatal crashes on the Corridor will be eliminated.

**11. Of equal priority is to improve the breath and quality of logistics services in the NW region.** The clear majority of companies operating in the Northwest continue to rely on in-house logistics, foregoing the potential benefits of scale and specialization that could be provided by modern logistics hubs. Thus, the cost of logistics is higher and supply chains using these services are less efficient, thereby reducing the competitiveness of local companies. This limitation, added to the long distances, concentration of flows on a single axis, and the difficulties in intra-zone transport, present significant challenges from a transport perspective. Some of the reported constraints in the logistics supply chains include<sup>50</sup>:

- Inadequate logistics infrastructure to support agricultural and mining supply chains. There are relatively few processing and distribution areas for the agricultural value chains that operate in the region. Packaging, washing and refrigeration facilities are scarce, constraining the marketing potential of thriving industries such as horticulture and citrus fruits. Well-integrated logistics centers could solve this bottleneck if their functions are well integrated and fine-tuned to the trading needs of each province and the region in general.
- A high degree of fragmentation as long-distance transportation involves several transport providers and uneven flow of information across different systems;
- Lack of competition, with limited access of private operators to the road-based freight market and intermodal transportation;
- Lack of an integrated network of logistics hubs and to develop inter-modal logistics centers;
- Very little participation of SMEs as logistics operators. Skills mismatches to develop integrated logistics education programs and to advance professional and vocational training in transport logistics.
- Unreliability caused by uncertainties at the border crossing points between Chile and Bolivia, resulting in longer than necessary waiting times, inefficient customs procedures and requests for unofficial payments.

**12. There is room for improving road-side services and amenities in the region.** Existing facilities and service points do not meet the needs of the long-distance traveler, particularly, trucks. There are few rest stops and service points. Weighting stations are not equipped with state-of-the art technology to allow over-weight vehicles to be detected and without proper weighting control, this may pose problems to the sustainability of highway pavement. Similarly, the regional branch office of federal agencies such as the

<sup>49</sup> The Level of service indicator is a composite index measuring traffic flows, delays, road quality, and other quality parameters. between 0 and 5.

<sup>50</sup> This data was collected through a series of interviews which took place in April as part of a Bank-financed diagnostic and documentation produced by the Ministry of Production.



provincial revenue and customs control offices, *Gendarmerie*, and require expansion, refurbishment, and in some cases enhancements to their access roads and parking areas. Adequate infrastructure is critical if both enforcement agencies to improve are to improve their regional operations.

### **Transforming NR 34 into a Development Corridor**

13. **A key priority of the Government consists of transforming NR 34's present physical and functional dimension of transport corridor into a development corridor.** Capacity expansion and quality improvement of the existing network will also be accompanied by the so-called "soft infrastructure" of transport services and transport logistics. The Government recognizes that existing accessibility constraints to markets, services and employment opportunities constitute an important impediment to regional development and competitiveness. To this end, Government launched an unprecedented US\$12 billion-dollar Transport Plan for investing in roads, railways, ports and airports many of which are in the Northwest. In tandem with the investment, the Government's Plan also specifies broad interventions that would enable an ecosystem of logistics activities to serve the needs of industrial and agricultural clusters. The foreseen capacity expansion of the NR 34 financed by Component 1 of the Proposed Project, along with the roadside services and logistics initiatives included in Component 2, are fully aligned with the strategy for corridor development that has been advanced by the Government.

14. **The proposed Project will result in direct and positive impacts for both freight and passenger transport companies relying on the corridor for their inter-regional mobility needs.** Road users will benefit from lower transit times, lower vehicle maintenance and operating costs stemming from better roads and pavements, as well as from the associated improvements in mobility and access to jobs, markets, social services and road safety. Captive users of public transport will benefit too from higher inter-regional mobility. It is expected that transportation expenses fall, thanks to more competitive tariffs for coach services. Among road users and beneficiaries, the project equally targets both men and women.

15. **Firms and household situated in the corridor area of influence are also set to benefit from the highway expansion.** Households and communities located near project road sections are likely to benefit from transport induced local market development, increased investment and employment, improved access to public services and ultimately improved and more sustainable livelihoods. Greater connectivity and lower cost of transportation are important factors which facilitate both farm and off-farm opportunities. Higher employment in turn, translates into higher income for each household, thus expanding the household's consumption possibility frontiers. Another beneficiary of greater connectivity are firms along the corridor and potential economic units in the wider area of influence, particularly established agro-industrial value chains (e.g. tobacco, sugar cane, mining, etc) but also SMEs which make up the lion share of firms in the region but, as explained above, have limited trading capacity. Easier access to the region's main cities such as San Salvador de Jujuy, San Pedro de Jujuy and southbound to Salta and Tucuman opens new opportunities in terms of new markets where goods produced in notoriously can be sold. Lower transportation cost implies that the goods do not lose their competitiveness in terms of prices as the products may travel further from the region. This too should improve household budget constraints as additional income could be expected to be gained from improved access to markets. While added demand for goods tends to put upward pressures on regional prices, it is expected that more supply needs of local dwellers are met thanks to lower transportation prices.

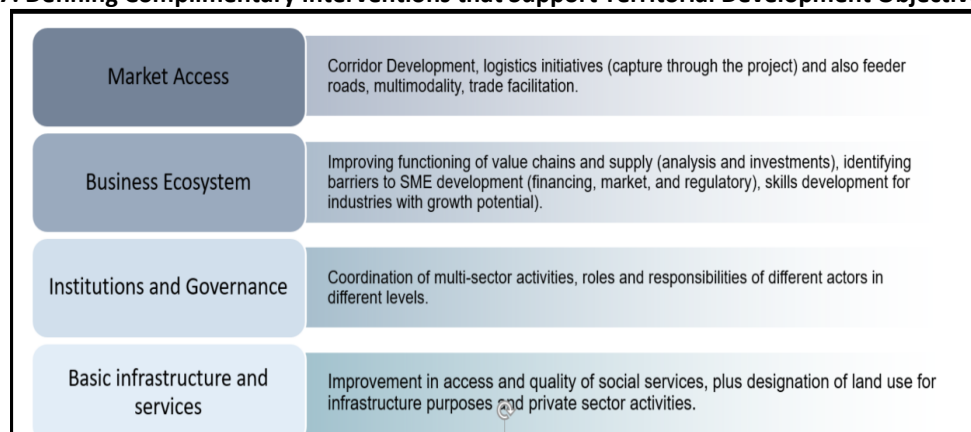
16. **The envisaged investments in road side services and logistics activities that will accompany civil works are important pre-requisites for developing the full potential of the corridor.** The development



of modern road-side service facilities along the corridor can also be seen as an opportunity for economic growth for the surrounding regions, and job creation through the supply of added value services including restaurants, convenience stores, information kiosks, and small retailer shops for local agriculture products. Similarly, the development of modern and integrated logistics facilities will also support competitiveness and trade facilitation. A successful logistics sector depends on the interrelationship of many factors and needs support from both the private and public sectors. As the Northwest seeks to diversify its economic base as a mechanism for sustainable growth and job creation, it will be critical to develop external trade opportunities. As discussed above, the Northwest has a relatively small economy mainly geared at supplying the domestic market, so for firms to expand to competitive scale and deliver substantial jobs and profits they will need to serve wider markets. Further, trade offers firms access to technology and knowledge that drives productivity gains.

17. **The NW Corridor contributes to a broader effort of achieving spatial integration and convergence in living standards in the country.** In parallel to improving regional connectivity and market access, there is a need to think strategically about other complements which could enhance broader economic benefits of the NW Corridor. In this spirit, a multi-sectoral lens could capture the following dimensions: (i) market integration, (ii) policy environment and the business ecosystem, (iii) quality of governance and institutions, and (iv) addressing basic service gaps. These four supporting policies are complements and not substitutes, acknowledging that for a linear infrastructure project to trigger an economy-wide long-term impact, other conditions need to be met (Figure A5.7). The case of the Northwest is more critical as the region depicts some of the highest poverty levels and unique barriers to trade and private sector development.

Figure A5.7. Defining Complimentary Interventions that Support Territorial Development Objectives in the NW



18. **To fully bridge the regional divide between the Northwest and the rest of the country ultimately requires a territorial development lens addressing multi-sectoral constraints.** The Bank and Government of Argentina have stressed the importance of anchoring the project requested into a wider context of territorial development approach by identifying complementary activities along the four guiding principles identified above to enhance the impact of the investments in terms of poverty reduction and shared prosperity. In this regard, the Bank will be supporting corridor expansion along the NR 34 and its feeder roads and in parallel, support the Government through TA and analytical work aimed at identifying complementary investments along the development Corridor and quantify the additional benefits associated (in terms of economic growth and job creation). Moving forward, the Bank could also support



the Government's territorial development plans through potential investment operations addressing the key multi-sectoral constraints identified above.



## **ANNEX 6: BUILDING CLIMATE RESILIENCE**

**COUNTRY: Argentina**

### **Northwestern Road Development Corridor Project**

1. Climate change is a defining challenge of our time. Actions to reduce greenhouse gas (GHG) emissions and stabilize warming at 2 degrees Celsius will fall short if they do not include the transport sector. Transport contributes to GHG emissions; but it is also vulnerable to the impacts of climate change, and action is needed to adapt transport systems to better withstand those impacts. Climate change is putting at risk the lives of millions of people worldwide, many coastal cities, and trillions of dollars of investment in transport infrastructure and services (World Bank, 2015).
2. In recent years, extreme climatic and ecosystemic events have been observed more frequently and intensely in Argentina. Among other events, the intensity and frequency of droughts, frosts, floods, severe storms, and hailstorms have significantly increased in recent years. These adverse climatic events have a significant impact on different sectors of the economy and erode natural capital with long-term effects. A recent study by ECLAC (2014)<sup>51</sup> estimates that climate change related impacts could represent between 4.5 and 7 percent of GDP.
3. The MoT's Infrastructure and Transport Plan for the 2016- 2019 period includes as a key pillars the design of resilient transport infrastructure to mitigate and adapt to climatic changes, particularly in regions that are experiencing higher precipitation rates such as the Northwest.

#### **Climate Change in Argentina**

4. A recent study by the Research Center of Sea and Atmospheric Administration (CIMA)<sup>52</sup> of Argentina outlined some of the most important climatic challenges that Argentina has faced in the 1960-2010 period. The study also projected climate change scenarios considering emissions and changes in frequency and intensity of precipitation rates based on forecast models for the next 35 years. The main findings of the study are outlined below:
  - In most of non-Patagonian continental Argentina, there has been an average increase in temperature of up to half a degree between 1960 and 2010.
  - Temperature increases in the East and North of the country are consistent with warming levels observed in the rest of the country with similar changes in minimum and maximum temperatures.
  - Between 1960 and 2010, average annual temperature increased in almost all the Northern and Cuyo provinces by over 0.5°C, with the most notable changes being in the spring.
  - In the period of the study, the average annual temperature increase was 0.6°C on average over the entire Northwest region, reaching an increase of 0.7°C in Salta and Jujuy in the 1960-2010 period.
  - In the 1960-2010 period precipitation increased throughout the country, albeit with regional differences and inter-annual variations.
  - In the autumn, there were significant precipitation increases that exceeded 100 mm in some areas west of Cuyo for the period 1960-2010 and also in the Northwest.

<sup>51</sup> "La Economía del Cambio Climático en la Argentina", ECLAC 2014.

<sup>52</sup> "Una evaluación de las tendencias del clima del pasado reciente (desde la segunda mitad del siglo XX) y una proyección del clima futuro (siglo XXI) de la Argentina", in the context of the Third National Communication Project of the Argentine Republic to the United Nations Framework Convention on Climate Change of the Secretary of Environment and Sustainable Development of the Argentine Nation (SAyDS).





- Between 1960 and 2010 there was a shift towards more frequent extreme weather.

5. The main conclusions of the climate projections for the 35-year future scenarios are summarized below:

- In the near future, the increase in average temperature will not depend so much on emission scenarios but would still be in the range of 0.5 to 1°C in most of the country.
- The projected average temperature increase is higher in the North than in the South, with a maximum in the Northwest, where the project is located.
- Average changes projected by the models in precipitation rates across the country would oscillate between 5 and 10 percent.
- Projections indicate that there will be an increase in extreme indices related to high temperatures and extreme precipitations in most regions of the country.

### **Climate Change events in the Province of Jujuy**

6. Specifically, in the Province of Jujuy where the Project is located, a UNDP study<sup>53</sup> characterized the likelihood of climate related events based on the estimation of extreme climatic threats. Figures A5.1 to A5.4 present the maps elaborated in this study that show projected climatic change in the Province of Jujuy and the results of climate projections comparing data scenarios from 1961 to 1999 versus projections to year 2071, as follows: (i) Location of vulnerability spots close to the location of the Project, (ii) projected anomalies in the increase of minimum temperatures, (iii) projected anomalies in the increase of maximum temperatures, and (iv) projected anomalies of increased rainfall.

### **Considerations in the design of hydraulic aspects for infrastructure resilience to climate change**

7. As part of Project preparation, the NW Corridor includes studies and TA to inform project design with climate resilient solutions ranging from spatial planning to post-disaster risk and recovery support together with investments and infrastructure system solutions to building an enabling environment to address the growing climate risks which could impact the entire transport value chain. Component 1 specifically includes (i) solutions to retrofit project design (drainage systems) to better respond to changing climate conditions, (ii) promoting, updating, and ensuring improved design standards in the future capacity expansion of the Corridor, and (iii) introducing good and suitable road maintenance regimes to support enhanced climate resilience of the Corridor, to reduce connectivity disruptions for businesses and households and protect them from disaster induced poverty.

8. In order to mitigate and adapt the project's civil works to climate change events, hydraulic calculations were verified and sewers, bridges and drainage were designed, considering the climate change projections and their impact on the intensity-duration-frequency (IDF) curves. To do so, the project team considered the above-mentioned studies.

9. The conclusions of the hydraulic verifications were:

- The climatic scenarios of the 21st century were calculated on two temporal horizons: near future climate (2015-2039), and far future climate (2075-2099).

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<sup>53</sup> UNDP Project ARG/10/013, "*Fortalecimiento de Capacidades para Contribuir a Una Economía de Bajo Carbono y Resiliente al Cambio Climático*", INTA, María José Pizarro, Romina Mezher, Pablo Mercuri and Aime Espíndola. SAYDS: Martina Argerich, Eduardo Fenoglio and Nazareno Castillo Marín.

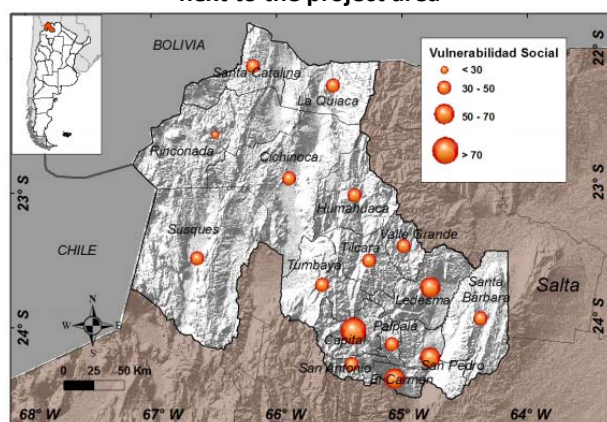




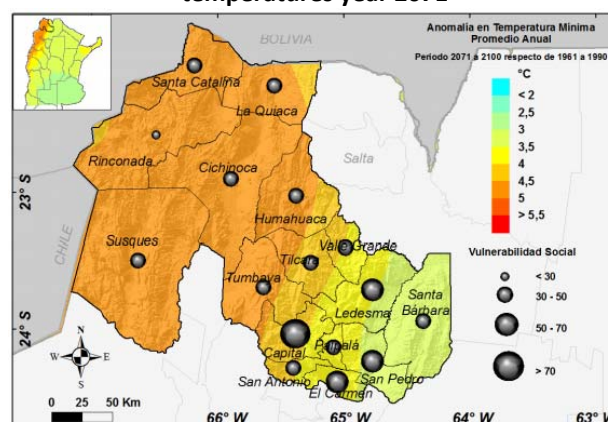
- The average increase per decade of maximum daily precipitation can be estimated in the order of 0.1 mm per decade for the medium term and 2.0 mm per decade for the long term, averaging 1.1 mm per decade if we consider the trend up to 2099.
- For the maximum cumulative rainfall of 5 days, the range of increment varies between 1.4 and 3.6 mm per decade, averaging 2.5 mm per decade if the trend is considered until 2099.
- After 5 decades, an estimate with respect to the moment of departure or representative year of the historical series (1995), yields an increase in rainfall of 5.5 mm by 2045 for a daily maximum and 12.5 mm. These values are in the range of the regional estimates made by CIMA for Argentina.

**Figures A6.1 to A6.4: Vulnerability and anomalies projected climate variables in the Province of Jujuy**

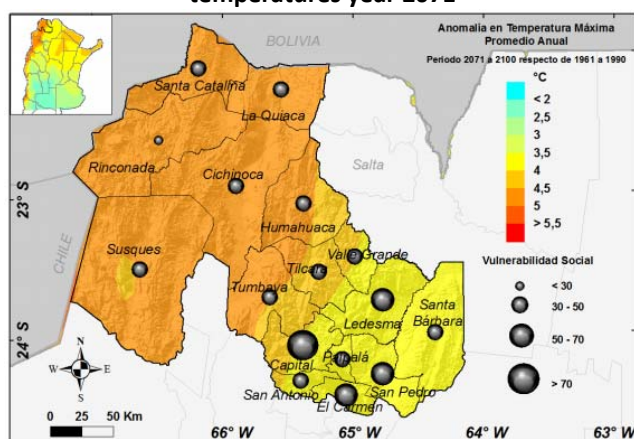
**Figure A6.1: Points of social vulnerability next to the project area**



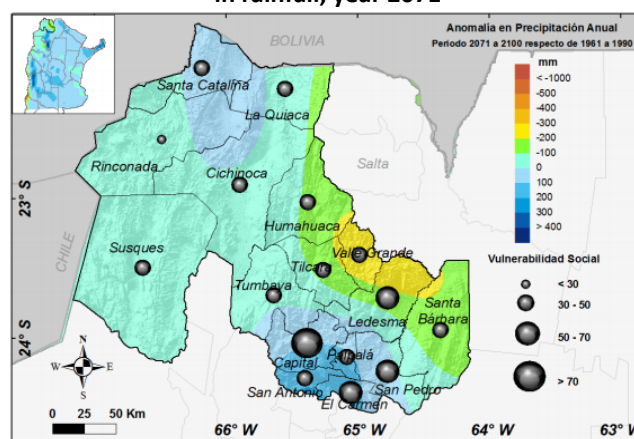
**Figure A6.2: Abnormalities projected increase in minimum temperatures year 2071**



**Figure A6.3: Anomalies projected increase in maximum temperatures year 2071**



**Figure A6.4: Abnormalities projected increase in rainfall, year 2071**



10. Additionally, component 3, with co-financing from GFDRR grant of 200,000 US\$, includes (i) an hydrologic study to update the Intensity-Duration-Frequency (IDF) rainfall curve, (ii) studies to contribute to completion of PPP bidding documents for the NW Corridor, and (iii) technical, environmental and social capacity building.



### Climate Change Co-benefits

11. Considering the above information, the Project climate change co-benefits are calculated for Component I, using the Climate Change coding methodology and then consolidated for the project and presented in table A6.1.

**Table A6.1: Climate Change Co-benefit of the Project**

Component	Group	Section	Length (Km)	% Co-Benefit	US\$ Million Total cost of works (without expropriations)	Adaptation Associated Investment (US\$ million)	Investment Co-benefits/ km (million US\$/ km)
<b>Comp. 1</b>	Group 1	NR 34, Section: Border with Salta - Junction NR 66	25.2	20.3%	101.1	20.5	0.81
		NR 1V 66, Section Junction NR 66 - Junction NR 34	11.1	16.5%	35.1	5.8	0.52
		NR 66, section: Junction NR 1V 66 - Junction NR 34	11.07	14.2%	26.6	3.7	0.34
	Group 2	NR 34, Section: Junction NR 66 - North Access to San Pedro	22.6	20%	98.4	19.6	0.87
	Group 3	NR 66 – Junction NR 1V66 – Junction NR 9	23	15%	30.0	4.5	0.20
<b>Comp. 3</b>		Hydrologic study				0.20	
<b>total</b>			<b>93.1</b>	<b>18%</b>	<b>291.2</b>	<b>54.3</b>	<b>0.55</b>

12. Based on the data presented in the above table, 18 percent adaptation co-benefits can be assigned to civil works under component I, corresponding to US\$54.1 million or US\$0.55 million per kilometer of road along the existing alignment. As presented above, there are no mitigation co-benefits that can be assigned to the project activities nor the project sectors.



## ANNEX 7: THE ROAD SECTOR IN ARGENTINA

COUNTRY : Argentina

### Northwestern Road Development Corridor Project

#### A. Introduction

- 1. The World Bank has had a long partnership with Argentina in the Transport Sector.** Transport and ICT have constituted over 10 percent of the total World Bank engagement with Argentina for the last three decades, with a gradual growth since the year 2000. And while this partnership has contributed to achieving important milestones and outcomes in the sector, there still remains important institutional and governance shortcomings, which are hindering logistics competitiveness in Argentina. These challenges require a holistic approach to transport infrastructure planning and management, for which the World Bank can bring state-of-the art expertise, with innovative perspectives on a wide range of issues that are key for the sector, such as climate change adaptation and mitigation, efficiency, inclusion, safety, private sector participation, among others. While the proposed project will provide an entry point to advance some of these key problems, to sustainably address the structural challenges faced by the sector requires a more programmatic, holistic and long term engagement with the Government of Argentina.
- 2. The road transport sector in Argentina is seen as the main facilitator for trade, and is often a lifeline for economic activity.** Argentina is a country characterized by a large geographic area and a low but highly concentrated population density, with a markedly radial transport infrastructure. Given its unique topographic and demographic features, the role of the road transport sector in the country's economy is of paramount relevance enabling regional integration and facilitating access to international markets. Roads are the main transportation mode of the country concentrating nearly 90 percent total freight volume transported in 2015. In contrast, rail only transports slightly more than 5 percent of volumes, measured in ton-kilometers, and water and air transport have both a marginal share (1.5 percent). With traffic growing at an unprecedented 40 percent since 2003 and with the traffic composition changing, increasing the relative importance of trucks that in some segments of the road network account for more than 45 percent of total traffic, the road sector remains under significant pressure to deliver high-quality services.
- 3. The configuration of the road network reflects the country's social, economic and productive configuration, centered on the La Plata-Metropolitan Area of Buenos Aires-Rosario-Cordoba.** The geographic location of the busiest ports, airports and border crossings, together with the direction and location of the busiest cargo and passenger corridors are essentially deployed around Argentina's main port cluster: the node between Rosario and Buenos Aires. Furthermore, the services it provides are concentrated in the center-east of the territory with branches spreading out to the Litoral (the Uruguayan and Brazilian border), the west (the Chilean border) and, to a lesser extent, the Northwest (the Bolivian and Chilean border). Because of this spatial arrangement, there are areas of Argentina that have been left disconnected from the national system, putting the regions farthest away from the Buenos Aires-Rosario region at disadvantage. This disparity across the different regions of the country is linked to other challenges Argentina faces in transport infrastructure, such as the need to (i) connecting isolated regions, (ii) making more sustainable the transport matrix by promoting efficiency and facilitating intermodal transport; (iii) and reducing logistics costs thus improving competitiveness.
- 4. Freight transport services in Argentina are relatively inefficient and costly, affecting exporting companies' margins and overall logistics performance.** The market for road transport services in



Argentina is mostly made up of small and medium carriers which own few units each. In this atomized market where trucking is virtually the only mode, freight forwarders compete with the scarce supply, especially in harvest seasons, increasing prices. On the other hand, in seasons with low-demand, trucks are under-utilized operating with low load factors in their inter-urban trips generating congestion on the roads and needlessly increasing GHG emissions. In addition, there is not a varied supply of logistics operators with integral management capacity, including multimodal logistics. Some operators are companies that have grown from the provision of services to large export companies with large volumes of freight, and that have diversified their service offer very little. Little competition in the logistics sector and transport services directly affect transport costs, which constitute about 60 percent of total logistics costs in the country. This in turn, undermines Argentina's productive and trading capacity. Hence transport interventions need to address both infrastructure gaps and the market and structural barriers affecting transport services in the country.<sup>54</sup>

## B. Network Characteristics

5. **The road network has a total length of about 740,000 km, divided in three administrative levels: national, provincial and municipal.** The primary network has a length of 43,198 Km and concentrates more than 70 percent of total traffic volumes, with the municipal network consisting of unpaved roads, access roads to farms and feeder roads with very low traffic volumes. Therefore, efficiency gains achieved in the primary road sector are crucial to enhance the overall transport sector performance. At the beginning of the 1990's, the national road network of Argentina was about 38,800 km-long (80 percent paved). Since then, a sustained upgrading and paving program has been implemented that has increased the proportion of paved roads to nearly 90 percent, that is, from 31,000 to 33,500 km.

6. **Argentina has the highest vehicle ownership rate in Latin America which puts additional pressure on the road network.** With 314 vehicles per 1,000 people, Argentina is well above other large countries in the region such as Mexico (275), Brazil (249), and Chile (230). Traffic volumes on the paved network cover a wide range, from less than 500/day up to 10,000 to 20,000/day on the most heavily trafficked corridors. Average annual daily traffic volumes on two-lane rural highways generally range between 500 and 3,000 vehicles/day. Between 1990 and 1995, traffic growth rates on the main corridors were in the order of 8–13 percent per year but fell thereafter to about 3–5 percent. Traffic increase were more pronounced thereafter with Argentina's road sector remains under significant pressure to deliver high-quality services, with traffic growing at an unprecedented 40 percent since 2003. This growth implies a rate higher than 10 percent per year. Traffic composition changed, increasing the relative importance of trucks that in some segments of the road network account for more than 45 percent of total traffic, accountable to the doubling in growth of agricultural production since 2000.

7. **The trunk network, while extensive and serving most high-population centers in the country, still suffers from deficiencies.** As mentioned above, 90 percent of national roads are paved which is a figure significantly higher than other countries in the region.<sup>55</sup> However, only 38 percent are in good or very good condition, 31 percent are in fair condition, and 31 percent are in poor or very poor condition. DNV has prepared a prioritized program for investments in rehabilitation and capacity expansion of the national network to address these deficiencies.<sup>56</sup> For the Provincial road network, covering almost

<sup>54</sup> Serebrisky et al (2010). Logistics. Report No. 54342–AR

<sup>55</sup> In Peru only 60 percent of national roads are paved, in Paraguay 81 percent and 72 percent in Colombia.

<sup>56</sup> See <http://www.vialidad.gov.ar/plan-vial-federal>



200,000 kilometers, only 22.6 percent are paved while the tertiary network estimated to cover about 500,000 kilometers, less than 17 percent are paved. While there is no recorded global road inventory on conditions for the Provincial and rural road networks, the relatively low levels of investment in the last years suggest that the situation in rural areas are a matter of concern.

8. **While there has been an increase in expenditures, investments on the road sector remain very low.** Transport expenditures of the Consolidated Public Sector fell around 40 percent during 2002 as compared to historical values since 1993 (from around 1 percent of GDP in 1993 to 0.67 percent of GDP in 2002). These started to pick up in 2004 and grew significantly through 2009, hovering around 1.0-1.25 percent of GDP since 2007, more than other infrastructure sectors. The increase, while promising is still low when compared to other countries in the region. The current administration has significantly increased sector expenditures as reflected in Figure 7.2.

Figure 7.1: Condition of the National Road Network based on the Index of State (IE)

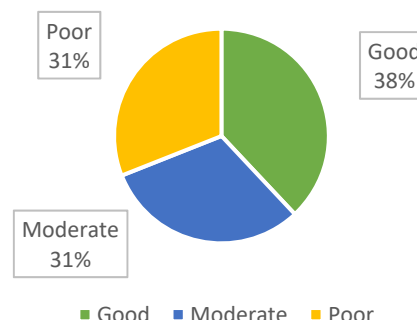
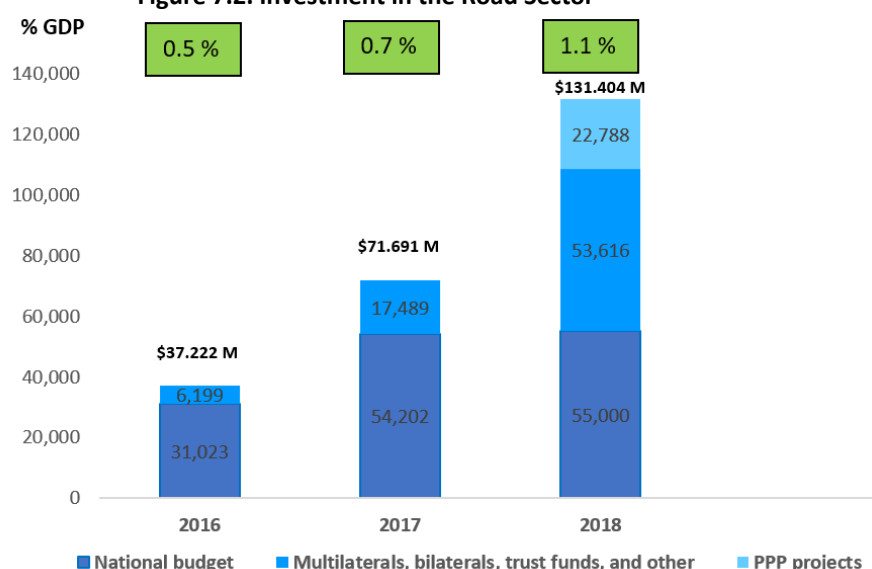


Figure 7.2. Investment in the Road Sector



Source: DNV

9. **Despite its importance in supporting economic activity, the Provincial and Tertiary road networks have historically faced under-investment, particularly in road rehabilitation and maintenance.** Riding quality in both the provincial and tertiary networks remain in very poor condition constraining accessibility to and from rural communities. Underinvestment in the network and the absence of a comprehensive road asset management strategy for this network, have limited the export potential of the country's agricultural sector. This, in turn undermines the competitiveness of agricultural value chains and curtails the dynamism of rural economies. Hence, addressing Argentina's connectivity shortcomings in rural areas is a critical condition for supporting the agricultural sector and meaningfully integrating the rural population into the economy.





### C. Institutional Set up and Main Challenges of the Road Sector

10. **Planning, management and monitoring activities for the road sector are organized based on different jurisdictional roles as follows:**

- I. *The National Road Network*, made up by the primary network is within the jurisdiction of the Federal Government, and managed by the National Roads Directorate (*Dirección Nacional de Vialidad – DNV*);
- II. *The Provincial Road Network*, is under the jurisdiction of the 23 Provincial Roads Directorate (*Dirección Provincial de Vialidad – DPV*) and is under the jurisdiction of Provincial Governments;
- III. *The Municipal or Tertiary Road Network*, which depends directly on municipalities and provincial tertiary network ceded to municipalities by the DPVs or communes for maintenance purposes, where the network of rural roads is concentrated. Tertiary roads run by municipalities and communes are different from those under the jurisdiction of urban and rural municipalities. Among the first, special attention is given to the importance of the Autonomous City of Buenos Aires and the municipalities that make up the Greater Buenos Aires, as well as the most important cities of the country, whose management is particularly urban conservation.

11. **Institutional weaknesses within the road sector as well as jurisdictional coordination issues arising between the different actors inhibit proper sector planning, affecting road sector works and maintenance.** Road sector agencies, particularly at the Provincial and Municipal levels, tend to have inadequate organizational structures and lack technical capacities and financial resources for proper road sector management. Hence, there is a need to build up the institutional capacity to encourage efficient planning policies, adequate resource allocation, transparency, social accountability and enhanced coordination mechanisms between the federal and provincial levels. In such an effort, it is necessary to take into consideration the degree at which the reforms have been internalized at the federal and provincial levels, as there is significant variation among provinces in the degree to which they have operationalized these reforms and translated them into efficient road sector management. In some Provinces, a Public-Private contracting modality for road maintenance known as "*Consortios Camineros*" has been established. Under this scheme, regionally grouped local producers' associations directly engage in road maintenance and conservation works with their own resources and equipment to preserve local road assets in close cooperation with local governments and/or DPVs. The Province of Córdoba is a successful example of this practice, where maintenance activities of about 56,000 km are managed by the "*Consortios*".

### D. Reforms in the Sector and Government Strategy

12. **The road sector in Argentina underwent reforms which transformed the contracting modality for civil works.** Following the deep economic crises of the end of the 1980s, the Government of Argentina supported a series of transformations in the road sector that have enabled important achievements in terms of sector development, including: (i) decentralization of expenditure and financing responsibilities to provincial and local governments; (ii) introduction of private sector financing; (iii) transferring the execution of works to private contractors; and (iv) focusing the capacity of the existing road agencies towards more efficient planning. The first action taken in 1991 by the government was to concession nearly 9,000 km of the paved network with the highest volumes of traffic (above 2,500 vehicles/day). Altogether 18 concession contracts were awarded to the private sector for a period of 12 years and their up-keep was financed essentially by road user tolls. However, one key outstanding issue is how to



adequately address the funding shortfalls faced by DPVs, which limit their efficacy and efficiency in managing the assets they are responsible for.

13. **Private sector participation has become more entrenched.** With the reforms that deregulated the sector, introduced private sector participation and decentralized expenditure and financing responsibilities to provincial and local governments, the road sector has been subject to a series of transformations that have enabled important achievements in terms of sector development. Argentina has been gradually transforming its operations within the road sector, transferring the execution of works to private contractors, focusing the capacity of the participating Road Agencies towards more efficient planning, and the prioritization of investments based on cost- efficient criteria.

14. **The Contracting System of Performance-Based Contracts known as CREMA (*Contrato de Recuperación y Mantenimiento*) was pioneered in Argentina and has become a successful case of best practices for road sector development.** The contractual modality consists of transferring the rehabilitation and maintenance of the non-concessioned road network to private contractor as a means of promoting competition and efficiency in road asset management. The contracts require the contractor to rehabilitate and then maintain a network of roads over a period of five years for a lump sum amount. The scheme effectively allocates part of the risk to the private sector in a transparent and cost-effective matter. Since 1997, when the system was pioneered, about 14,000 km (or 55 percent) of the non-concessioned paved network have been maintained under that system. Since its introduction in Argentina, the CREMA system has been emulated in several countries in Latin America including Brazil, Paraguay, Uruguay, and Bolivia.

15. **Despite its success at the national level, CREMAs are yet to become fully entrenched at the Provincial Level.** Although the CREMA System has worked well at the national level, its record has not been the same at the Provincial level. The Bank has supported the adoption of CREMAs at the provincial level through two loans, with mixed results. On one hand, about 1,800 km of the key Provincial corridors in Cordoba, Corrientes, Entre Rios and Santa Fe were maintained under CREMA-type contracts, demonstrating that this scheme could be executed at lower levels of Government. On the other hand, limited financial resources to ensure continuity coupled with inadequate institutional capacity of DPVs have compromised the long-term viability and sustainability of the CREMA system at the Provincial Level.<sup>57</sup> The last CREMA corridor was completed in 2016 in Santa Fe as part of the Bank-financed Provincial Road Infrastructure Project (PIVIP) but no other provincial road segments in Argentina can be expected, in the short to medium term horizon to be maintained under this modality.

16. **However, private sector involvement in the financing and operation of transport infrastructure is still lagging.** Over the last 15 years, private investment in the transport sector in Argentina has been constrained by both the weak macroeconomic environment, which led to a number of cases of renegotiation and termination of concessions, and by the lack of enabling government policies, programs and regulations aimed at attracting investors. After peaking in the late 1990s, total investment in transport infrastructure with private participation has declined substantially and virtually ceased in the period 2012 to 2015. Argentina's past experience in road concession programs have left key lessons learned: First, the

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<sup>57</sup> Initial evidence from the PIVIP is that CREMA modality, which was significantly successful in the context of national roads – has been less successful in the Provincial context where the total corpus of funds available are so limited that ringfencing funds with CREMA for a section of the roads created severe shortages for the rest of the provincial network and in some cases the budget restrictions were severe enough that government could not even fulfill their obligations under the CREMA.



importance of keeping a well-structured conceptual strategy maintained in time, clear methodological frameworks and transparent bidding criteria. Second, the rules for renegotiating contracts should be spelled out as early and clearly as possible. These rules must recognize the importance to the concessionaire of ensuring that renegotiation does not alter its financial return when there is a change of circumstances beyond its control. Third, institutional building must be taken seriously (including strengthening technical functions within OCCOVI-DNV, improving coordination among DNV and provincial agencies (DPVs); adequately staffing OCCOVI-DNV and DPVs to effectively supervise concessionaires; etc.).

17. **The current administration is advancing to PPPs<sup>58</sup> as the key vehicle to deliver urgent infrastructure investments.** The GoA has managed to restore access to capital markets and this will make the much-needed fiscal consolidation effort more gradual. Improving spending efficiency in infrastructure will be critical to avoid major cuts in public spending and protect pro-poor expenditures. It will also be critical to strengthen competitiveness and productivity of the economy in order to be able to fully reap the benefits of greater trade openness. Improved business environment, investment in infrastructure, increased competition in markets and improved regulatory framework in key sectors will contribute to this objective. All transport subsectors are being evaluated as possible candidates for PPPs, with other forms of commercial financing also being investigated. The approval of Law No. 27,328 in December 2016 provides a new regulatory framework for PPPs, under which the MoT is preparing the bidding document for PPP contracts for the rehabilitation, expansion, maintenance and operation of road corridors with the highest traffic in Argentina. DNV/OCCOVI is designing a PPP investment program along 15,000 km divided in 13 key corridors (with approx. US\$600-700 million CAPEX) to improve efficiency in management of road assets, promote private investment in the road system, improve connectivity and correct regional disparities throughout the national territory.

18. **The launching of this PPP program will imply important challenges for Argentina, including the need to ensure first that an equity dimension is assigned centrality in the design of the program and the prioritization process** (ensuring affordability and equal access/convergence), and that efficiency gains by the PPP contractors translate into savings for road users (distributional impacts). Other challenges include: (i) ensuring adequate design of maintenance and capital improvement plans, business model and corridor financial models; (ii) ensuring adequate risk distribution amongst stakeholders; (iii) designing an adequate financing plan attractive to capital markets that fosters investment in the road system; and (iv) structuring of contracts providing the right incentives and flexibility to adapt to new circumstances. And last but not least, the most important and immediate challenge to boosting private investment in the transport sector in Argentina consists of building investor confidence. Mobilizing private investment into Argentina's transport sector will require overcoming the concerns of private financiers regarding political risk and the limited track-record of private participation projects in recent years. WBG is providing technical assistance in this process with a holistic approach to ensure that all these challenges are addressed.

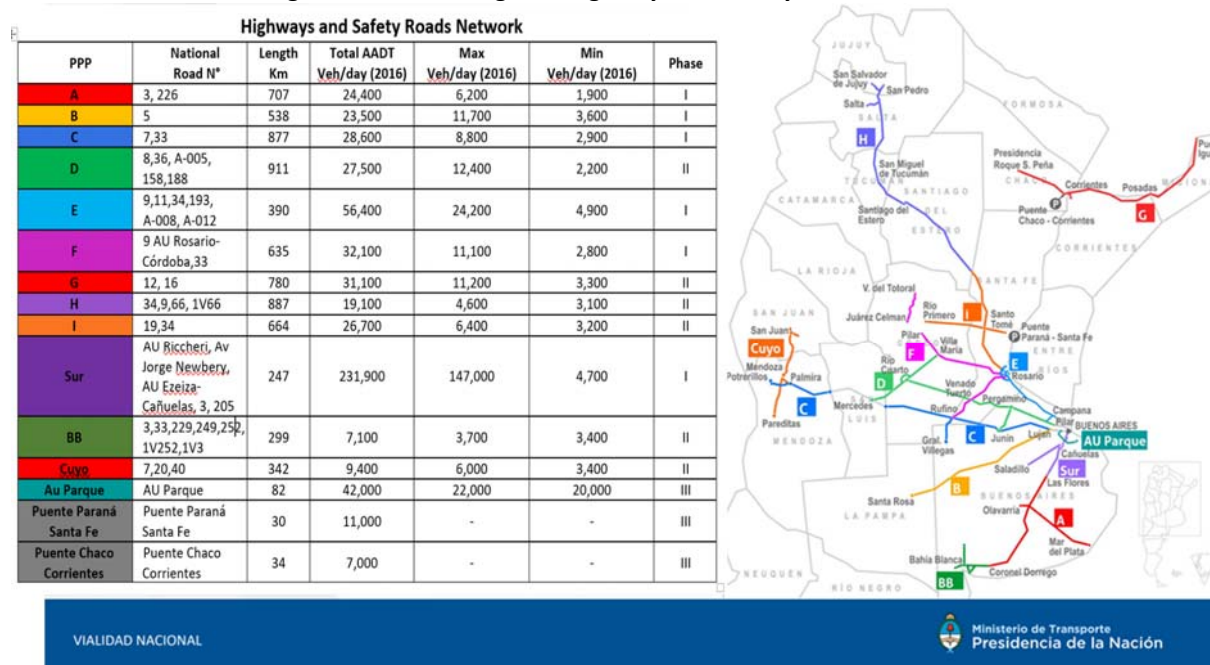
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<sup>58</sup> For more info on the PPP program see <http://ppp.vialidad.gob.ar/>





Figure 7.3: PPP's Program: Highways and Safety Roads Network



Source : MoT. <http://ppp.vialidad.gob.ar/wp-content/uploads/2017/11/PROYECTO-1.pdf>

## E. Looking Forward: WB holistic approach to support Road Sector Development in Argentina

19. A well-developed road infrastructure is key to maintaining and improving Argentina's logistics performance and, more broadly, to delivering on inclusive growth targets. While different transport subsectors all have an important contributing role in formulating the accessibility and logistics base of the country, the inevitable reliance on roads in the configuration of the transport system dictates that the road sector plays a key economic development role in the country. The World Bank will continue to serve as a valued partner in the strengthening of the road sector, with a programmatic and holistic engagement strategy focused on the following pillars:

- **Inclusion:** In Argentina, there are connectivity shortcomings in both rural and urban areas. Improvement in these contribute to inclusion of the population and enhanced mobility for social and economic benefits. Generally, the individual investment in improving such connectivity will be moderate, localized and contribute only to the bettering of the life of the population in the area immediately affected. Collectively, however, such incremental improvements play vital role in a long-term development of the country. The Bank will bring to the table a wide range of multi-sectoral tools to address challenges faced by lagging regions, to ensure convergence in accessibility measures and social development indicators across the country.
- **Efficiency:** Supporting adequate road financing strategies within a sound fiscal framework that enables to achieve the sustainability of the core network, facilitating the conditions for private sector participation. The Bank will continue to build up planning capacity and improving mechanisms to establish investment priorities based on sound economic and technical criteria, and working on investment plans in line with budget constraints, ensuring an efficient allocation of resources between competing needs (capacity expansion, regional integration, rehabilitation and



maintenance). The main goal is to build-up the required institutional capacity and continue to improve sector governance based on the principles of efficiency, social accountability, and transparency to best address user's needs.

- **Sustainability:** The Bank's comprehensive developmental approach to road sector management will help the GoA address sector externalities by mainstreaming key agendas into sector planning and management. This approach will build on the important gains in road safety, continuing this engagement to address pervasive weaknesses in how national, provincial and local governments deal with this complex public health epidemic. It will also incorporate innovative approaches to infrastructure resilience, and climate change adaptation and mitigation helping the GoA deliver on its NDCs under the Paris COP Climate Change agreement. Evolving thinking in design and development of roads takes account not only of climate change for the purposes of ensuring resilience of the infrastructure, but also how landscape and road infrastructure can be a solution, such as using roads for temporary retention of water in areas prone to droughts. Addressing vulnerability and flood mitigation, and building these into the road asset management will protect valuable road infrastructure assets and reduce connectivity disruptions for businesses and households and protect them from disaster induced poverty. This holistic approach will also deepen the dialogue on environmental and social management of road sector planning and management, including biodiversity conservation, inclusion of indigenous peoples, and the mainstreaming of gender perspectives.
- **Competitiveness:** This comprehensive development approach will require a multi-sectoral perspective, with strong coordination efforts with other ministries to ensure that the complex challenges that are hindering Argentina's competitiveness can be addressed. These include: (i) market failures in transportation services; (ii) institutional weaknesses that deter multi-modal development corridor planning and investment; (iii) weaknesses in trade procedures and practices, particularly in international border crossings; (iv) infrastructure deficiencies in international border crossings with key neighboring countries; among others.

20. The NW Road Development Corridor Project serves as a first building block by simultaneously incorporating the outlined elements of these strategic pillars for the road sector, on which to build with a more programmatic and long-term engagement into the future.



## MAPS

