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IMPLEMENTATION COMPLETION AND RESULTS REPORT

IBRD-84200

ON A

LOAN

IN THE AMOUNT OF EURO €52 MILLION

(US \$70.98 MILLION EQUIVALENT)

TO THE

Republic of North Macedonia  
Public Enterprise for State Roads

FOR THE

National and Regional Roads Rehabilitation Project (NRRRP)  
March 26, 2020

Transport Global Practice  
Europe And Central Asia Region

## CURRENCY EQUIVALENTS

(Exchange Rate Effective September 30, 2019)

Currency Unit = Euro

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EUR 0.92 = US\$1

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US\$ 1.09 = EUR1

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MKD 61.47 = EUR1

FISCAL YEAR

July 1 - June 30

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## ABBREVIATIONS AND ACRONYMS

<b>CPF</b>	Country Partnership Framework
<b>CPS</b>	Country Partnership Strategy
<b>EIRR</b>	Economic Internal Rate of Return
<b>ESAMF</b>	Environmental and Social Assessment and Management Framework
<b>GoNM</b>	Government of North Macedonia
<b>GRM</b>	Grievance Redress Mechanism
<b>HDM-4</b>	Highway Development and Management Model
<b>IPA</b>	Instruments of Pre-Accession
<b>iRAP</b>	International Road Assessment Program
<b>ISR</b>	Implementation Status and Results
<b>ITS</b>	Intelligent Transport Systems
<b>Moi</b>	Ministry of Interior
<b>NPV</b>	Net Present Value
<b>NRRRP</b>	National and Regional Roads Rehabilitation Project
<b>NTS</b>	National Transport Strategy
<b>OPRC</b>	Output and Performance Based Contracting
<b>PAD</b>	Project Appraisal Document
<b>PDO</b>	Project Development Objective
<b>PESR</b>	Public Enterprise for State Roads
<b>RAMS</b>	Road Asset Management System
<b>RLRPSP</b>	Regional and Local Roads Program Support Project
<b>RUDP</b>	Road Upgrading and Development Project

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**DATA SHEET**

**BASIC INFORMATION**

**Product Information**

Project ID	Project Name
P148023	National and Regional Roads Rehabilitation
Country	Financing Instrument
North Macedonia	Investment Project Financing
Original EA Category	Revised EA Category
Partial Assessment (B)	

**Organizations**

Borrower	Implementing Agency
Public Enterprise for State Roads	Public Enterprise for State Roads

**Project Development Objective (PDO)**

Original PDO

The Project Development Objectives are to enhance the connectivity of selected national and regional roads, primarily to Corridors X and VIII, and to improve Public Enterprise for State Roads' capacity for road safety and climate resilience.



**FINANCING**

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
<b>World Bank Financing</b>			
IBRD-84200	70,980,000	70,980,000	56,641,457
<b>Total</b>	<b>70,980,000</b>	<b>70,980,000</b>	<b>56,641,457</b>
<b>Non-World Bank Financing</b>			
Borrower/Recipient	12,740,000	0	0
<b>Total</b>	<b>12,740,000</b>	<b>0</b>	<b>0</b>
<b>Total Project Cost</b>	<b>83,720,000</b>	<b>70,980,000</b>	<b>56,641,457</b>

**KEY DATES**

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
23-Sep-2014	22-Dec-2014	31-Oct-2016	30-Sep-2019	30-Sep-2019

**RESTRUCTURING AND/OR ADDITIONAL FINANCING**

Date(s)	Amount Disbursed (US\$M)	Key Revisions

**KEY RATINGS**

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Substantial

**RATINGS OF PROJECT PERFORMANCE IN ISRs**

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	09-Jan-2015	Satisfactory	Satisfactory	0
02	15-Jun-2015	Satisfactory	Satisfactory	.85
03	18-Dec-2015	Satisfactory	Satisfactory	7.61



04	18-May-2016	Satisfactory	Satisfactory	11.48
05	27-Dec-2016	Satisfactory	Satisfactory	21.16
06	20-Jun-2017	Satisfactory	Satisfactory	27.43
07	08-Dec-2017	Satisfactory	Satisfactory	33.30
08	29-Jun-2018	Satisfactory	Moderately Satisfactory	35.77
09	26-Dec-2018	Satisfactory	Moderately Satisfactory	39.12
10	20-Jun-2019	Satisfactory	Moderately Satisfactory	41.60
11	05-Oct-2019	Satisfactory	Satisfactory	47.11

## SECTORS AND THEMES

### Sectors

Major Sector/Sector (%)

**Transportation 100**

Public Administration - Transportation 6

Rural and Inter-Urban Roads 94

### Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3) (%)

**Economic Policy 100**

Trade 100

Trade Facilitation 100

**Environment and Natural Resource Management 4**

Climate change 4

Adaptation 4

## ADM STAFF

Role	At Approval	At ICR
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Country Director:	Ellen A. Goldstein	Linda Van Gelder



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## I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

### A. CONTEXT AT APPRAISAL

#### Context

1. The Republic of North Macedonia<sup>1</sup> is a small landlocked country in the Western Balkans region of Europe, bordering Bulgaria, Greece, Serbia, Kosovo, and Albania with a population of roughly 2 million in 2014. At the time the National and Regional Roads Rehabilitation Project (NRRRP) was being appraised, in June 2014, the GDP of the country was US\$10.2 billion and projected to grow in the subsequent years. Despite experiencing economic growth in the years leading up to the appraisal of this project, 40 percent of the population lived in rural areas of which two thirds were poor. The economic recovery of the European Union countries, which are the key export markets for Macedonian goods, was expected to boost the country's exports. To promote its export products and attract foreign direct investment, the country had been focused on efforts that promoted the development of its transport infrastructure.

2. **As a landlocked country, North Macedonia is dependent on a well-connected road and rail network for its economic and social development.** The country is located at the cross point of two major Trans-European Transport Networks (Corridor X, stretching from Austria to Turkey; and Corridor VIII, which connects Albania with the Black Sea ports in Bulgaria). One of the longstanding challenges facing the country had been to reduce the economic distance to major markets and lower the costs of transportation arising from the poor road condition of Corridors X and VIII which carries the bulk of the country's exports and imports (in the first two quarters of 2013, 93 percent of freight was carried on roads). It was, therefore, considered a primary objective by the Government of North Macedonia (GoNM) to improve the condition of regional and national roads linking to these two major corridors.

3. **The overall condition of North Macedonia's 14,159 km road network was aging and considered poor in comparison to EU standards.** Roads in the country were categorized as follows: (i) national roads (primarily connecting to neighboring countries but also to the largest regional centers in the country), (ii) regional roads (connecting two or more municipalities and securing critical in-country connectivity), and (iii) local roads (serving municipal traffic). Aging infrastructure and insufficient maintenance had resulted in a need to improve the regional road network. National roads were in a better condition, due to higher traffic density, but needed more frequent rehabilitation. As a result, the first wide investment program supported by the World Bank and EBRD had focused on the regional road network, which led to a relative improvement in the condition, however, still fell short of linking these roads to major corridors and boosting connectivity.

4. **Despite heightened institutional focus on road safety, road accidents remained a major concern, with more than 4,000 crashes annually with total injuries and deaths nearing 7,000 at the time of appraisal.** The establishment of the National Council for Road Safety, which brings together all national authorities related to road safety, has resulted in greater visibility of road safety issues and better coordination between national agencies, however, the GoNM's capacity to identify, design, and implement road safety improvements remained limited.

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<sup>1</sup> At appraisal the country was formally named the Former Yugoslav Republic of Macedonia. The name change came in to effect in February 2019. Throughout this report, the country will be referred to as Republic of North Macedonia.



5. **Similarly, climate resilience of road infrastructure was another concern for the GoNM at the time of appraisal.** In particular, frequent landslides and erosions that occurred especially during the rainfall or fast snowmelt in the spring had been resulting in significant damage to roads and subsequent disruptions to movement of goods and people. Despite this frequent occurrence, the GoNM lacked the capacity to implement climate resilience measures into the technical designs for roads to help mitigate these risks of erosion and landslides due to sudden short heavy rainfalls.
6. **Management of the road sector is the responsibility of the Public Enterprise for Roads (PESR) which functions as an operationally and financially independent entity since its establishment in 2013 while the maintenance function is entrusted in the state enterprise Makedonija Pat.** The PESR is mandated to plan, construct, reconstruct, and rehabilitate the national and regional roads and collect tolls. PESR prepares the road development and financing plans. National and Regional roads fall under the responsibility of PESR, whereas municipalities are responsible for local roads. Road maintenance is carried out by Makedonija Pat which operates as PESR’s direct contractor with the responsibility for regular, periodic and winter maintenance of the national and regional road network. Annual maintenance contracts are established between Makedonija Pat and PESR to cover routine and winter maintenance. Steps toward the full commercialization of the maintenance sector are ongoing.
7. **The roads included in the NRRRP comprised sections in fair to poor condition in need of pavement rehabilitation or periodic maintenance.** Road deterioration along these segments was mostly due to cracks, potholes and patches, and longitudinal and transversal deformations. The Project repaired the pavement on the existing alignment (without the need for widening), including repair and/or upgrade of drainage facilities within the alignment, as well as small bridges/culverts where needed.

*Figure 1: Road segments before rehabilitation*

Mlado Nagoricane – Pelince

Kumanovo – Sveti Nikole

Tetovo – Popova Sapka



8. **The NRRRP represented a new phase of the Bank’s long-term engagement in North Macedonia’s road sector** aiming to build on the established cooperation with the Public Enterprise for State Roads (PESR) by strengthening its investment planning and financial management capacity. Under the predecessor project<sup>2</sup> that was coming to a close at the time of appraisal, PESR had introduced foundations of a Road Asset Management System (RAMS), which would,

<sup>2</sup> Regional and Local Roads Program Support Project - P107840 (91.51M project that closed December 2015)



during implementation of the NRRRP, create a comprehensive road database for the country's road network and allow PESR to manage its capital investment budgets in a sustainable manner.

9. **The NRRRP was requested by the Government of North Macedonia in response to addressing challenges presented in national strategies.** Most important among these was the *National Transport Strategy* (2007-17), which set out improved regional and national road connectivity as the national priority after the completion of Corridors X and VIII. The strategy highlighted the important role of roads in promoting the landlocked country's competitiveness and harmonious development through ensuring that the national road network was connected efficiently to the corridors and existing bottlenecks were eliminated. The NRRRP also complemented the ongoing efforts of the *National Strategy for Improvement of the Road Traffic Safety* (2009-14) that promoted road safety by identifying and repairing black spots and strengthening road safety audits.

10. **The Project supported Pillar 1 of the World Bank Group's Country Partnership Strategy (CPS) for FY15-18<sup>3</sup>, Growth and Competitiveness.** Upgrading of infrastructure catalytic to economic growth by improving the quality of roads was presented as one of the main avenues to boost growth and competitiveness in the CPS. The Project contributed to the overarching country goal of increasing economic growth and creating employment through an investment program, which aimed at improving infrastructure critical for growth and exports by investing selectively in transport infrastructure providing access to the two trade corridors. The CPS also called for improved fiscal and public financial management and strengthened road infrastructure management. This was reflected in the project activities supporting the improvement of the road asset management system in PESR. Additionally, the Project addressed climate change in line with the recommendation of the CPS for the preparation for climate change challenges and vulnerabilities which required adapting road engineering to better withstand heavier snow and rainfall.

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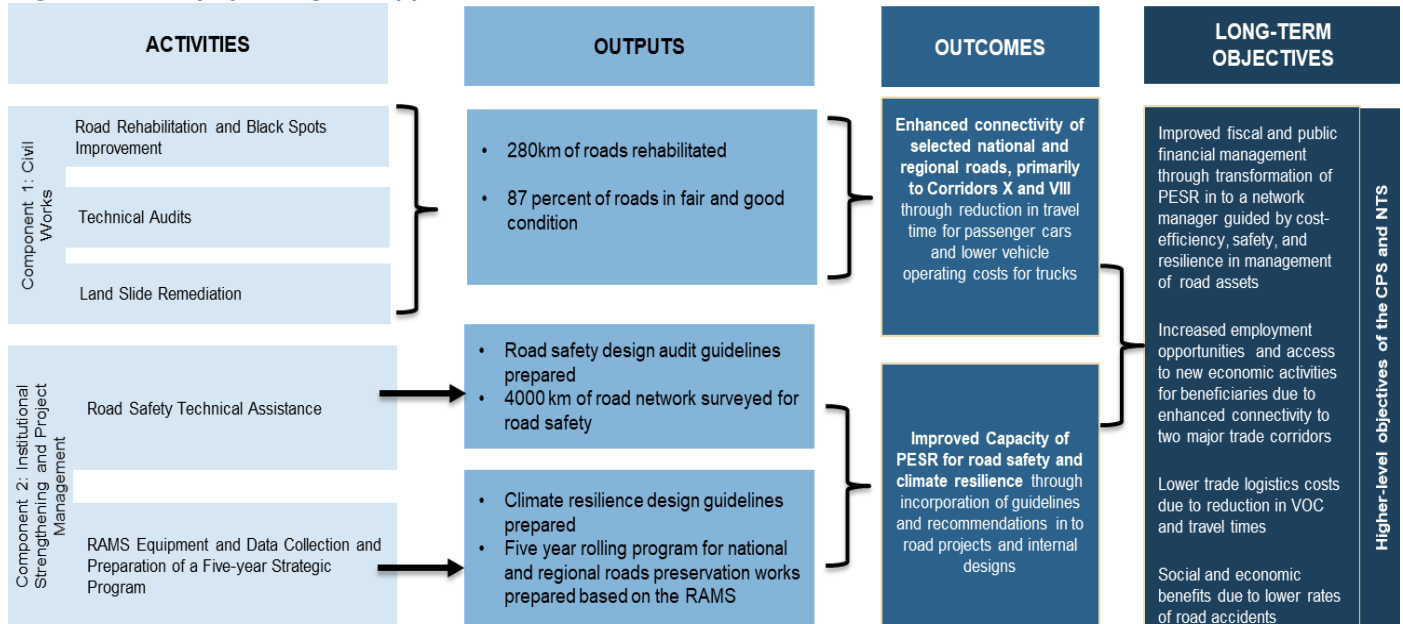
<sup>3</sup> At appraisal, the CPS had not yet been approved but the team had access to the draft version. The CPS was approved by the Board in September 2014.



### Theory of Change (Results Chain)

11. The NRRRP intended to achieve enhanced connectivity of regional and national roads to main corridors and improved capacity of PESR for road safety and climate resilience through a series of civil works and institutional strengthening activities. To achieve these objectives, the project provided support to the rehabilitation of road sections, improvement of blackspots, preparation of technical audits, and landslide remediation. These activities yielded several outputs measured through the intermediate outcome indicators of the project’s results framework. These activities and outputs were intended to support the project’s PDO and higher-level objectives. Figure 2 below illustrates the theory of change at appraisal.

Figure 2: Theory of Change at Appraisal



12. Critical underlying assumptions and external factors relevant to the results chain were:

- PESR’s previous and ongoing experiences with Bank financed projects will have built adequate readiness to implement new tools and concepts such as road safety and climate resilience in to their operations.
- Potential leadership change in PESR will not lead to delays in implementing project activities and political commitment to achieving the objectives of the project will remain the same.
- Capacity and resources are adequate to maintain the rehabilitated road segments following project completion.

### Project Development Objectives (PDOs)

13. The Project Development Objectives as stated in both the Loan Agreement and Project Appraisal Document (PAD) was to “enhance the connectivity of selected national and regional roads, primarily to Corridors X and VIII, and to improve Public Enterprise for State Roads’ capacity for road safety and climate resilience”. There were no changes to the PDO during implementation.



### Key Expected Outcomes and Outcome Indicators

14. For the purpose of this report, the PDO statement was unpacked into two sub-objectives: (i) enhanced connectivity of selected national and regional roads, primarily to Corridors X and VIII; and (ii) improved Public Enterprise for State Roads' capacity for road safety and climate resilience.

15. At appraisal, achievement of the PDO would be measured through four PD-level indicators. Table 1 below shows these indicators for each unpacked sub-objective as described above including the baseline and target values for these indicators as indicated at the time of appraisal.

**Table 1: PDO Indicators<sup>4</sup>**

***Sub-Objective (i): Enhance the connectivity of selected national and regional roads, primarily to Corridors X and VIII***

<b>PDO Indicator Name</b>	<b>Unit of Measure</b>	<b>Baseline</b>	<b>Target</b>
1. Reduction in travel time for passenger cars, in percentage, along the project roads sections to be rehabilitated	Percentage	0.00	10.00
2. Reduction of vehicle operating costs for heavy trucks, in Euro per vehicle-km, along the project road sections to be rehabilitated	EURO	0.79	0.69

***Sub-Objective (ii): improve Public Enterprise for State Roads' capacity for road safety and climate resilience.***

<b>PDO Indicator Name</b>	<b>Unit of Measure</b>	<b>Baseline</b>	<b>Target</b>
1. Percentage of all PESR road projects that incorporate road safety audit recommendations	Percentage	0.00	100
2. Climate resilience design guidelines prepared and integrated by PESR in their internal design process	Yes/No	No	Yes

### Components

16. The project was structured around two components at appraisal. Component 1: Road Civil Works; and Component 2: Institutional Strengthening and Project Management. Each component included several sub-components listed below in Table 2 including corresponding financing amounts at entry and actual.

**Table 2: NRRRP Project Components and Financing at Entry and Actual**

<b>Component</b>	<b>Planned Activities (sub-components) at Entry</b>	<b>Estimated and Actual Resource Allocation (EURO)</b>
<b>Component 1: Road Civil Works</b>	1.1. Road Rehabilitation and Black Spots Improvement	<u>At Entry</u> € 57.76 million total, € 48.95 million Bank financing
	1.2 Technical Audits	
	1.3. Land Slide Remediation	<u>Actual</u>

<sup>4</sup> The full results framework, including the intermediate results indicators, can be found in Annex 1.



		€46.67 million total €46.67 million Bank financing
<b>Component 2: Institutional Strengthening and Project Management</b>	2.1. Project Management and Implementation, including audits 2.2. Road Safety Technical Assistance 2.3. Road Asset Management Equipment and Data Collection and Preparation of a Five-year Strategic Program 2.4. Technical Assistance and Impact Analysis	<u>At Entry</u> €3.44 million total, €2.92 million Bank financing <u>Actual</u> €3.63 million total €3.63 million Bank financing
<b>Front end fee (0.25%)</b>	€0.13 million	€0.13 million
<b>Project Total</b>	<u>At Entry</u> €61.33 million total, €52.00 million Bank financing	<u>Actual<sup>5</sup></u> €50,44 million total €50,44 million Bank financing

**B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)**

**Revised PDOs and Outcome Targets**

17. The Project Development Objectives and the Outcome Targets remained unchanged during implementation.

**Revised PDO Indicators**

18. None of the PDO Indicators were revised during the implementation period.

**Revised Components**

19. No project components were revised during the implementation period.

**Other Changes**

20. There were no other changes during the implementation period.

**Rationale for Changes and Their Implication on the Original Theory of Change**

21. There were no changes to the PDO, Outcome Targets, PDO indicators, intermediate indicators, project components, or any other aspects of the project, therefore, no implications on the Theory of Change will be reported.

<sup>5</sup> All contracts in the country financed under IBRD projects had been subject to VAT of 18 percent until an amendment to the Law on Loan Guarantee published in the Official Gazette No.10 from January 22,2015. With this amendment PESR was made exempt from VAT, which was applicable to the NRRRP.



## II. OUTCOME

### A. RELEVANCE OF PDOs

#### Assessment of Relevance of PDOs and Rating

22. The strategic objective of the current CPF is to support the GoNM *achieve faster, inclusive, and sustainable growth and provide its citizens greater opportunities for a better life and to accelerate income convergence with the EU*. To this end, the SCD identifies three pathways and 10 areas for reform. The NRRRP is strongly relevant to CPF Objective 1: Improve Connectivity and Access to Markets. Specifically, under this objective the two following sub-objectives completely overlap with the objectives of the NRRRP:

- Improve market accessibility index along Corridor VIII
- Reduce trade costs and increase transport efficiency

23. The current CPF states that the Bank will build on the road portfolio under implementation with investments to strengthen the integration of lagging regions and improve maintenance, security, and climate adaptation for local and national roads. The CPF directly references the NRRRP and its successor projects (currently focused on improving transport connectivity for road users along transport Corridors X and VIII and along selected national and regional roads and on improving the asset management and planning functions of the PESR).

24. Furthermore, the CPF states<sup>6</sup> that it will pursue available opportunities to further advance PESR reform. There is also reference to Component 2 of the NRRP (Institutional Strengthening) where the importance of the RAMS being fully mainstreamed into strategic decision making and used for assessing the country network for climate vulnerability and prioritizing interventions for climate resilience is highlighted.

25. **The overall relevance of the Project Development Objectives is High.** This assessment takes into consideration the alignment of the PDO to the current CPF objectives. The objectives set out for the NRRRP are in full alignment with the objectives of the current CPF. As discussed above and presented in the Figure 2 on the Theory of Change at appraisal, the components and activities of the project and objectives they achieved remain highly relevant to the strategic goals of the GoNM as represented in the priority pillars of the current CPF.

### B. ACHIEVEMENT OF PDOs (EFFICACY)

#### Assessment of Achievement of Each Objective/Outcome

26. The evaluation of efficacy is the extent to which the operation's objectives were achieved and that achievement is attributable to the activities supported by the operation as presented in the appraisal stage Results Framework. The PDO for the NRRRP was unpacked in to two objectives for evaluation purposes:

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<sup>6</sup> Country Partnership Framework for the Republic of North Macedonia 2019-2013 (Page 22)





- enhance the connectivity of selected national and regional roads, primarily to Corridors X and VIII
- improve Public Enterprise for State Roads' capacity for road safety and climate resilience.

***PDO (i): Enhance the connectivity of selected national and regional roads, primarily to Corridors X and VIII***

27. **The project objective of enhancing connectivity to the main transports corridors was fully achieved.** At project completion, a total of 280km of national and regional roads linking to Corridors X and VIII were rehabilitated, resulting in 87 percent of roads in fair and good condition as of October 2019. Additionally, 11 land slides along the network were reconstructed and fortified. These activities contributed to the achievement of PDO (i) as measured through two PDO-level indicators shown below in Table 3.

**Figure 3: Road segments after rehabilitation**



28. **Reduced passenger travel times and vehicle operating costs for trucks enhanced connectivity to main corridors.** The target set at appraisal to reduce travel time for passenger cars along project roads by 10 percent was exceeded and the actual achieved at completion was measured as a decrease of 12.5 percent. The target for reduction in vehicle operating costs (VOC) for trucks as measured through Euros per vehicle/km was also met and reduced by 0.10 Euros per km. Both indicators were measured by the RAMS. It is worth noting that indicator 2 was achieved despite an increase in the cost of fuel, one of the key variables in calculating VOC, from 0.5 EUR to 0.65 EUR from 2016 to 2018.

**Table 3: Indicators for PDO (i)**

	Unit of Measure	Baseline	Original Target	Actual Achieved at Completion
1.Reduction in travel time for passenger cars, in percentage, along the project roads sections to be rehabilitated	Percentage	0.00	10.00	<b>12.50</b>
2. Reduction of vehicle operating costs for heavy trucks, EURO per vehicle-km, along the project road sections to be rehabilitated	Amount (EURO)	0.79	0.69	<b>0.69</b>





29. Prior to completion of rehabilitation works along national and regional project roads, the ex-ante beneficiary surveys captured high degrees of dissatisfaction with the condition of the roads and road safety conditions. On most of the routes, beneficiaries were unhappy with existing width of the roads which were perceived as inadequate in relation to the type and frequency of vehicles using them like heavy trucks and wide farm vehicles. Poor condition of the roads was leading to congestion in certain areas and unsafe driving especially during busy times like holidays when non-residents of the area travel through in large numbers.

30. Upon completion of civil works, 84 percent of beneficiaries surveyed in the ex-post analysis expressed satisfaction with the condition of the rehabilitated roads, up from a baseline of 50 percent at project appraisal. Beneficiaries noted a significant improvement in the comfort and duration of travel along rehabilitated sections and a positive impact on quality of life, especially among daily commuters and students.

31. Rehabilitation of project roads increased road safety, with 70 percent of beneficiaries perceiving conditions as being safer than before. Civil works included several road safety specific investments such as reconstruction of eight black spots and enhanced road safety enhancements interventions on the first group of 12 roads based on road safety audits findings. These were not only relevant to improve road safety but also to introduce new speed management techniques on roads in line with EU best practices. Prior to completion of road works, beneficiaries’ main complaints regarding road safety pertained to regional roads passing through inhabited settlements, missing or damaged sidewalks in residential areas, missing or inadequate lighting, sudden narrowing and sharp curves, lack of protection nets for landslides, and unsuitable and obsolete signalization. Before rehabilitation and implementation of road safety improvements, 57.6 percent of beneficiaries perceived safety as below average, compared to 29 percent following completion of the project.

***PDO (ii): Improve Public Enterprise for State Roads’ capacity for road safety and climate resilience***

32. **The project objective to improve the capacity of PESR for road safety and climate resilience was fully achieved.** The efficacy of this objective is measured through two PDO-level objectives shown below in Table 4. Following project completion, 100 percent of all PESR road projects incorporated road safety audit recommendations. 4000km of the road network was surveyed for road safety through the International Road Assessment Programme (iRAP) survey. The iRAP survey provided data about the road safety of the entire road network, which is additional input in the RAMS enabling PESR to consider road safety needs in prioritizing maintenance works. Additionally, this information was used to develop a National Black Spot Investment Program, which is now integrated in to PESR’s annual programs. Under the project, an initial set of eight black spots were retrofitted not only to improve safety, but also as a way to pilot new technical solutions for speed management and as a learning process for PESR engineers, as well as the road design expert community. Climate resilience design guidelines were prepared and integrated by PESR in their internal design process. A five-year rolling program for national and regional roads preservation works was prepared by PESR based on input from the RAMS which incorporated road safety and climate resilience aspects. Increased capacity of PESR in climate resilience is demonstrated through successful design and reconstruction of 11 critical land-slide prone locations, ensuring resilience and increased access for beneficiaries.

**Table 4: Indicators for PDO (ii)**

	Unit of Measure	Baseline	Original Target	Actual Achieved at Completion
1. Percentage of all PESR road projects that incorporate road safety audit recommendations	Percentage	0.00	100.00	<b>100.00</b>
2. Climate resilience design guidelines prepared and	Yes/No	No	Yes	<b>Yes</b>



*integrated by PESR in their internal design process*

33. **The rehabilitation of roads through the NRRRP kick-started the modernization process of PESR** by (i) utilizing for the first ever road safety audits to assess safety of roads following rehabilitation (thereby identifying additional safety needs); and (ii) using output-based procurement (thereby becoming able to move from unit-based procurement towards quality-based). One of the most significant contributions of the project has been the effort to help transform PESR in a network manager that is guided by cost-efficiency, climate resilience, and road safety in the management of the road assets. These aspects are critical for the sustainability of road network management. PESR's road planning and maintenance capacity was increased by equipping it with tools and human capacity to as a new RAMS unit was established in PESR and staff trained to maintain the system and utilize it in the planning process.

34. **The adoption of RAMS has incorporated climate resilience and road safety considerations in to PESR's operations.** PESR has enhanced its RAMS with data on network safety (compiled through the iRAP survey) and enabled the system to consider climate risks (though the addition of data on flooding and landslide risks), while the installation of new traffic counters on the network enables PESR to improve traffic data collection. PESR established a road safety unit, following the terms of reference and internal operating procedures defined during the project and the Unit staff received detailed training. The climate resilience guidelines developed for PESR include instructions on doing field surveys, checklists for PESR supervision to use in surveying, identifying engineering and non-engineering measures to improve resilience of the network, methodology for the assessment of hazard, vulnerability and risk from landslides and floods. Internal procedures in PESR have been updated to include details on the requirements how to consider road safety and resilience in planning processes and all internal guidance documents have been developed. Extensive capacity building, including on-the-job training for relevant staff was carried out for road safety audits and inspections and resilience, including through site-specific investigation work.

35. **The introduction of RAMS is also central to the financial sustainability of the road sector.** RAMS was introduced at a time when the country was increasing road financing to overcome past investment deficits and improve connectivity, but this could have placed the economy under further duress. The introduction of RAMS helped PESR rationalize these investments and safeguard maintenance.

36. In addition to the four PDO results indicators being met, the Intermediate Outcome Indicators included in the results framework have also been achieved: (i) 280 km of roads were rehabilitated; (ii) 87% of the network is in good and fair condition; (iii) road safety design audit guidelines were prepared; (iv) climate resilience guidelines were prepared; (v) 4,000km of the road network was surveyed for road safety (iRAP); (vi) five year rolling program for national and regional roads preservation works was prepared based on RAMS; (vii) annual performance report has been prepared and is being published. Final direct beneficiary count was 123,461, just below the target set at 125,000 with 84.5 percent of beneficiaries expressing satisfaction with the road condition post-completion against the target of 70 percent. The reason for the small discrepancy is the final beneficiary count is a result of the migration trend of the country where inhabitants of the project areas have moved to larger cities or outside of Macedonia - a trend that has been increasing throughout the implementation period.

### **Justification of Overall Efficacy Rating**

37. **The overall efficacy rating is rated as Substantial.** As described above, the targets for indicators of both PDO objectives have been either achieved or surpassed. The project successfully supported the improvement of

connectivity, by providing cheaper, more reliable and safer transport on national and regional roads to Corridors X and VIII. PESR capacity for road safety and climate resilience has demonstrably been improved.

## C. EFFICIENCY

### Assessment of Efficiency and Rating

#### Economic Analysis

38. Ex-ante and ex-post analyses were carried out using the Highway Development and Management Model (HDM-4) to evaluate the economic internal rates of return (EIRR) and Net Present Value (NPV) of the activities at appraisal and after project closing. Both ex-ante and ex-post analyses follow the same methodology and assumptions and focus on the economic evaluation of Component 1 – civil works. The overall economic benefits of the project derive from: (a) savings in travel time; and (b) savings in vehicle operating cost (VOC), which are both due to the improved quality of the roads. All costs and benefits are expressed in constant prices, the analysis considers a period of 20 years at a discount rate of 10 percent. Details of the economic analysis are presented in Annex 4.

39. **Ex-ante and ex-post analysis of EIRR and NPV firmly validates the economic justification of the project.** The ex-ante economic analysis calculated the EIRR as 30.9 percent. Following project closure, an ex-post economic evaluation was done for the same three roads evaluated at appraisal by factoring in actual traffic counted in 2018 and the actual rehabilitation costs<sup>7</sup>. The ex-post EIRR for the three roads was 30.2 percent, which represents a negligible reduction from the appraisal stage estimate. The ex-post evaluation confirms the high economic justification of the three roads of the first-year program of the Project. NPV at 10 percent discount rate for the first-year program roads was estimated as 9.7 million Euros ex-ante, whereas ex-post it was higher at 12.8 million Euros, further confirming the economic justification of the project. Table 5 below shows ex-ante and ex-post EIRR for these roads where the EIRR for two of the roads was actually higher ex-post.

*Table 5: Ex-ante and Ex-post EIRR and NPV Comparison for the first-year program*

Section code	Road Segment		EIRR (%)		NPV at 10% (EUR Mil)	
	Start	End	PAD	ICR	PAD	ICR
<b>RD1</b>	Bitola	Makazi	35.2	39.9	5.3	5.5
<b>RD2</b>	Resen	Bukovo	30.3	28.2	2.8	3.8
<b>RD3</b>	Boskov Bridge	Debar	23.7	23.8	1.6	3.5
<b>Total first-year</b>			<b>30.9</b>	<b>30.2</b>	<b>9.7</b>	<b>12.8</b>

40. **The total ex-post EIRR and NPV of the twenty project roads is 22.6 percent and €38 Million, confirming the satisfactory economic justification of the project.** An ex-post economic evaluation was then done for the rest of the

<sup>7</sup> The first year program was identified during the project preparation phase and includes the three sections: (i) national road Bitola to Makazi (18.1 km); (ii) national road from Resen to Bukovo (11.1 km), and (iii) regional road from Boskov Bridge to Debar (7.5 km). The remaining road segments financed under the Project were identified from a long list of priority roads prepared by PESR in years 2-5 of the project.



project roads<sup>8</sup> in which actual traffic data in 2018 is available. The total ex-post EIRR of the project is lower than the ex-post EIRR of the three roads of the first-year program (30.2 percent) because most of the other project roads are regional and have traffic lower than the initial three roads. The ex-post NPV (at 10 percent discount rate) of the twenty project roads is €38.5 Million. Detailed figures are presented in Annex 4.

### **Project Component Costs and Disbursement**

41. Table 2 above shows project costs at appraisal and actual by component. The project almost fully disbursed the €52 Million stated in the PAD and loan agreement (disbursement rate at completion is 99.3 percent). At appraisal, the total project cost was estimated at €61.33 million which included 19 percent VAT (9.33 million) to be financed by PESR. The reason for the discrepancy shown in the ICR data sheet is due to the figures being reported in USD and the exchange rate fluctuation (appreciation of the USD) from the time of entry to completion<sup>9</sup>.

### **Preparation and Supervision Costs**

42. **Administrative costs were lower than estimated at entry due to the project not undergoing any changes during implementation and closing on time with all components fully completed.** At appraisal it was estimated that 185 staff weeks would be needed for supervision which was lower than the actual of 119 staff weeks. Supervision of the project over the five-year implementation period was carried out at a total cost to the Bank of \$610,000. Project preparation cost \$193,000 and required 47 staff weeks. Another factor that lowered supervision costs and contributed to efficiency is that the effectiveness conditions of the project were fully met in a short timeframe and the project become effective in just two months after signing of the loan agreement, which allowed the team and the PESR to move ahead quickly with implementation.

43. **The overall efficiency of the project is rated Substantial.** The PDO results were efficiently achieved within the original timeframe and budget. The overall economic returns arising from rehabilitation of the roads was on par with appraisal estimates with a higher than average NPV and EIRR observed in this sector. Cost control of the civil works was good despite the delay in the procurement of the second round of roads and did not delay the achievement of the PDOs in a timely manner.

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<sup>8</sup> Twenty project roads were evaluated. On four other roads, actual traffic in 2018 was not available at the time of preparing this ICR.

<sup>9</sup> At entry: 1 USD = 0.78 EURO. At completion: 1 USD= 0.92



#### **D. JUSTIFICATION OF OVERALL OUTCOME RATING**

44. **The overall outcome rating is Satisfactory.** NRRRP demonstrably boosted connectivity by improving the condition of regional and national roads linking to corridors X and VIII, resulting in reduced travel times and VOC for project beneficiaries. The rehabilitated roads provide better access to markets, employment opportunities, education, health, and social services for the beneficiaries along the project roads. The capacity of the PESR to manage the country's road network has been strengthened by incorporating climate resilience and road safety in to its operations. The project's objectives remain highly relevant to the current development priorities of the GoNM and the World Bank. The project was completed on time and within budget, and the ex post economic analysis of activities financed by the project demonstrated their economic viability.

#### **E. OTHER OUTCOMES AND IMPACTS (IF ANY)**

##### **Gender**

45. At the time of appraisal, gender was not one of the corporate priorities of the Transport Global Practice and the PAD makes no mention to gender beyond the monitoring and evaluation section where it refers to collection of gender disaggregated data to establish baselines for beneficiary related indicators.

46. The ex-post beneficiary analysis does, however, pick up on some interesting points relating to how the project has impacted women in several ways. Following completion of the project, 68 percent of women perceived the rehabilitation of roads as having a positive impact on local economic development. Female respondents were more satisfied with the access to public transport services, which became increasingly available once the road conditions were improved. In terms of road safety, the ex-post analysis indicates positive change of women's perceptions regarding road safety due to improved condition of roads.

47. The ex-post analysis indicates that road rehabilitations may have multiple positive effects on women. The improvement of the overall road infrastructure contributes to improved women's access to educational, health, and social institutions as well as with economic operators, markets, banks, employment facilities and arable land. In Macedonian society, women, in addition to their participation in the labor force, play a dominant role in household activities, upbringing of children, taking children to school and extracurricular activities, and, in more rural areas, agricultural activities for provision of additional household income or provision of additional food resources for domestic use. Therefore, improved road infrastructure under the NRRRP, which represents a main route for connecting smaller settlements with larger, more developed settlements and main corridors, has multiple benefits for women who use these roads. Road rehabilitations improved the quality, speed and safety of public transport for women who use this form of transport, the survey found that women relied more on public transport compared to men.

##### **Institutional Strengthening**

48. NRRRP strengthened the institutional capacity of PESR through activities designed to achieve PDO indicator (ii). The project developed the capacity of the PESR in the implementation of the RAMS, introduction of road safety audits and black spot remediation program, preparation of climate resilience guidelines, and use of output-based contracting



methods. All institutional capacity activities involved hands-on experiences for relevant PESR technical staff who were integrated in to project activities. For example, the road safety audits for the first 12 roads were carried out after the development of road safety guidelines and training and included a joint collaboration between road safety consulting team and PESR engineers to enable the PESR engineers to understand the full details of road safety audits. The technical solutions proposed as part of the climate resilience guidelines were drawn out including joint investigations of flood prone locations between the consultants and PESR to allow better comprehension of new engineering techniques.

49. The new procurement modality utilized for the second round of roads (output-based contract vs. the traditional quantity-based approach) has helped PESR understand the logic, challenges, and opportunities of using OPRC for rehabilitation and possibly for maintenance in future projects.

50. The work on road safety was relevant for the EU integration process of the country, as all new measures introduced by PESR were in line with the EU Directive on road infrastructure safety management (2008/96/EC), thus helping the process of legislation adjustment to the EU.

### **Mobilizing Private Sector Financing**

51. Mobilizing private sector financing was not one of the objectives of the project. The introduction of output-based contracting, however, has familiarized the PESR with alternative contracting methods and opens the door to implementing performance-based contracting next in the area of maintenance which involves a longer-term commitment from the private sector. The improved capacity of PESR in contract management could eventually help the GoNM handle commercial financing in the road sector.

### **Poverty Reduction and Shared Prosperity**

52. **The mobility and accessibility gains resulting from the NRRRP impacted poverty reduction and shared prosperity in several ways.** The rehabilitation of National and Regional Roads will bring better connectivity to a catchment area comprising the regions outside of Skopje, home to approximately 1.2 million inhabitants, improving connectivity to public amenities and services, reduced travel time, reduced vehicle operating costs, and reduced road accident risks. Perhaps more importantly, these benefits accrue to local populations who experience positive outcomes in income, consumption, health and education resulting from the project.

53. **The project had positive impacts on households and benefitted the poor in the project road areas by lowering transport costs and travel times.** The beneficiary survey carried out upon completion of the project found that transport costs were reduced through lower fuel costs and amortization, increase in the frequency and reliability of bus and minibus services, which is particularly important for women and students. Beneficiaries also noted improvement in access to health facilities. Actual benefits to communities may be even more, however, because the beneficiary survey was completed just a month after the last road segments were rehabilitated, survey respondents did not have adequate time to fully experience and reflect upon the impact of the improvements in roads.

### **Other Unintended Outcomes and Impacts**



54. **Efforts to build the capacity of PESR spilled over to the private sector.** Although one of the key objectives of the project was to increase the capacity of PESR, this activity expanded capacity building activities to include the private sector and engineering school of the University, as PESR depended on their services for design and construction of civil works. The private sector and academia involved in the project, through their partnership with PESR, was also introduced to concepts like integrating climate resilience and road safety in to design and construction process. Representatives from the construction industry and the School of Civil Engineering was included in the climate resilience training on guidelines on technical solutions to treat landslide and flood prone points. This is a significant outcome since this knowledge and capacity will be very relevant in the maintenance of these roads going forward.

55. In addition, capacity built in road safety through the iRAP network safety assessment and technical assistance allowed PESR to absorb a €2.5 million EU IPA 2 grant financing for design of road safety remediation works on the road network – a development that would not have been possible prior to the institutional strengthening activities implemented under the NRRRP.

56. **Another impact that was not foreseen during project appraisal or captured in the ex-ante analysis is that increased connectivity appears to be supporting nascent agribusiness and tourism sectors in some project areas.** Most notable among these is the cultivation of cannabis for the rapidly expanding medical marijuana industry. The improvement of the road section of Kavadarci - Rosoman has increased investment in facilities that process the crop, based on the ex-post analysis. On road section Drachevo-Oreshani-Taor, there has been a new investment in the industrial zone in Zelenikovo for processing cannabis for medical purposes. In the Bitola-Demir Hisar segment, a new plant will reportedly be established to produce Cannabidiol (CBD) oil. Anecdotal evidence from the ex-post analysis and site visits showed other industries that have seen a positive boost from improved connectivity include winery, spa, and medical tourism.

### III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

#### A. KEY FACTORS DURING PREPARATION

57. **Lessons learned from previous road projects closely guided the preparation of the NRRRP.** The design of the NRRRP benefited from and built on the experience gained during the Regional and Local Roads Program Support Project (RLRPSP), which was close to completion at the time of project preparation. Selection of the project roads for rehabilitation followed the same systematic approach as previously used, with a list of roads prepared using HDM-4 modeling and benefiting from road network data collected under the RLRPSP.

58. **Lessons from prior engagements shaped the implementation arrangements of the NRRRP.** The implementation experience from past projects demonstrated at the time of preparation that implementation by regular PESR staff, as opposed to an externally recruited and staffed Project Management Team, continued to represent the most appropriate arrangement. Previous experience had clearly demonstrated that this arrangement facilitated long-term capacity-building for the institution and would be the best arrangement to help achieve the NRRRP's institutional strengthening objectives.

59. **The design of the road safety component also benefitted from previous project's lessons.** Another important lesson learned from the RLRPSP was that often rehabilitation designs do not consider road safety aspects sufficiently. This lesson is incorporated in the project preparation of the NRRRP which required road safety audits





before the preparation of rehabilitation designs. This helped integrate road safety in to PESR's internal approach to road planning.

60. **The Bank's long-standing engagement with PESR, which had built technical capacity, ensured strong readiness for implementation.** Engineering designs for the first-year program roads with a total length of 36.7 km were completed ahead of appraisal and bidding documents prepared in parallel. This allowed for the implementation to begin quickly and continue smoothly without delays for the three road sections comprising the first-year program.

61. **The well-established engagement allowed the NRRRP design to be more ambitious and introduce new sophisticated concepts to modernize PESR's operations.** The project needed to achieve more than just the rehabilitation of roads and improved connectivity. Implementation readiness of PESR allowed the Bank team to prepare a project with more ambitious objectives like fostering climate resilience and road safety in road asset management.

## B. KEY FACTORS DURING IMPLEMENTATION

62. **Implementation of civil works advanced quickly during the first half of project while progress on the capacity strengthening component lagged.** The rehabilitation of the planned sections of national and regional roads was organized through six different bidding cycles divided in to several lots. Strong implementation readiness of PESR at the onset of the project with designs and bidding documents prepared ahead of time, civil works for the first phase roads kicked off quickly and was completed without delay. During this period of implementation, PESR put a great deal of effort in the tendering and oversight of the civil works and demonstrated good ability to manage the project despite being understaffed with a large portfolio (financed from other IFIs, EU and national budget). Furthermore, oversight provided by the supervision engineers was reported as being inadequate, especially in adhering to environmental safeguards standards, which put further strain on PESR staff. Consequently, progress on the institutional strengthening and capacity building aspects of the project did not match that of civil works which was consuming the project management unit's resources. The contracting of two key consultancies related to the capacity building activities (road safety and road asset management) had been completed by 2017, but climate resilience took more time, and along with other factors described below resulting in the downgrading of the implementation progress rating to moderately satisfactory.

63. **Implementation of Phase 2 roads and black spot improvements was delayed but completed on a tight schedule.** The launch of procurement for the phase 2 roads, comprising 12 roads with about 161 km of rehabilitation works, got off to a late start for several reasons, most notably because of the political turmoil and protracted elections. Another factor was due to PESR using output-based contracting for the first time and needing the extra time for preparing the conceptual designs prior to procurement and managing the procurement of these contracts. Another reason that contributed to the delay was environmental compliance issues. The ESARs and ESMPs, which needed to be submitted prior to the launch of procurement, were submitted to the Bank with some delay. There were also some minor delays with the implementation of the Black Spots Improvements which were due to slow progress in the procurement schedule and weak coordination among relevant state entities, which further added to the need for expediency and precision during implementation of component 1 activities. These delays in two activities, along with delays in component 2, resulted in the Bank team temporarily downgrading





implementation progress from Satisfactory to Moderately Satisfactory for the first time during the course of the project. PESR was able to compensate for the delays during implementation and both activities were completed on a tight schedule and these delays did not affect the outcome.

64. **Implementation of the institutional strengthening elements of the project improved with adequate resource allocation and strong commitment from new PESR management.** With the appointment of new management in late 2017, ramping up the staffing and resources of the PESR was prioritized with the addition of new engineers and environmental specialists and other relevant staff which allowed the PESR staff to allocate the time necessary to move ahead faster with the implementation of RAMS Equipment and Data Collection and Preparation of a Five-year Strategic Program and the road safety elements of the project. With the alleviation of the workload of the RAMS and road safety team on the civil works front, implementation progress improved significantly, and all components were successfully completed on time.

65. **Lack of coordination among government agencies led to some difficulties in the implementation of the road safety activities but did not impact the achievement of objectives.** The inter-institutional coordination on road safety activities saw challenges during the implementation of the project. Progress on the black spots improvement was slow, due in most part to the lack of road crash data that needed to be provided by the Ministry of Interior (Mol). The success of this sub-activity hinged on the timely provision of detailed crash data, however, the Mol was in the process of developing an automatic system for recording traffic crash data as the previous practice was purely paper based with no precise location information. This process of transition from paper to electronic compilation of crash data led to delays in the commencement of the road safety activities, especially the start of the iRAP survey. Better coordination on this front between PESR and the Mol and prior agreement on provision of data could have prevented such delays. This instigated the Bank team to carry out a road safety capacity review for the country and provide guidance to authorities how to improve collaboration within the institutions on road safety and establish a proper road safety management system. This is being taken forward by the government and a high-level working group is currently working on setting up a road safety management system in line with best practice.

66. **Output-based contracting for rehabilitation works was introduced in the second half of the implementation period as a result of operationalizing of the RAMS and stronger capacity of PESR to manage such contracts.** Despite not being planned at the time of appraisal, PESR started using a new method of contracting for rehabilitation of the second phase of roads – output based, instead of the traditional input-based. This shift is important to note because it represents a first step towards building capacity for the introduction of OPRC for maintenance. For the PESR to be able to implement any sort of output-based contracting method, it needed to build tools and capacity to obtain a full understanding of the network condition. The advancement of the RAMS with the availability of all relevant data and staff skilled to apply the system to define quality criteria for the roads was a precondition to carry out the output-based contracting for rehabilitation of phase 2 of works. PESR, with the support of the Bank team, went a step further than initially planned by moving to output-based contracting for rehabilitation works.

67. **Two closely related activities that had a significant impact on the quality of monitoring and evaluation were delayed for various reasons.** Despite repeated public announcements, the recruitment of specialists for monitoring and evaluation and project management was seriously delayed due to lack of interest from the market which was reported in aide memoires as affecting related aspects of implementation. PESR was not able to bring on board a monitoring specialist until 2018 which, in turn, led to a long delay in procurement of the consulting firm



to carry out the ex-ante beneficiary survey. Consequently, this affected the timely collection of baseline data for some of the intermediate outcomes, and delayed overall reporting of progress on indicators for a significant portion of the project.

**68. All components of the NRRRP were completed successfully and within the original envelope despite the implementation timeline coinciding with a period of extended political and electoral crisis during 2015–2017.**

This period of political turmoil led to uncertainty for PESR's operations and changes in management in PESR. The fact that PESR was able to progress with and successfully complete implementation of both civil works and institutional strengthening activities despite operating in a very challenging political environment demonstrates the commitment of the project management unit of PESR and strong supervision support extended by the Bank team throughout the implementation period.

## **IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME**

### **A. QUALITY OF MONITORING AND EVALUATION (M&E)**

#### **M&E Design**

69. The PDO and intermediate results indicators at appraisal stage were designed appropriately to track progress made towards the PDO achievement and the progress of activities under the project. The physical outputs of the civil works component had clear linkages to the PDOs and outcome indicators. The clear structure of the results framework and the straightforward indicators allowed the team to establish appropriate baselines and realistic targets. The Intermediate Results Indicators were designed to confirm the output achievements of the intended objectives. All indicators remained unchanged throughout the implementation period. The results framework was designed in a way that the key indicators could not be measured meaningfully before civil works on rehabilitation and road safety were fully completed (i.e. VOC, time savings, black spot improvements).

#### **M&E Implementation**

70. Monitoring and evaluation remained moderately satisfactory for the duration of the project. Data was based mostly on inputs collected from beneficiary surveys and RAMS. There was no dedicated M&E specialist within PESR's project management unit for the duration of the project due to lack of local specialists. The reporting relied on PESR staff in the form of semi-annual Project Reports. Most of the data for the monitoring and evaluation was to be gathered by the project's supervision consultant and reported by PESR staff. Since none of the indicators needed periodic monitoring and updating and could not be fully measured before completion of civil works and road safety improvements, the absence of a dedicated M&E specialist did not impact the collection and reporting of indicators, therefore, this feature of the results framework design ended up working as a mitigating factor in the absence of a dedicated M&E specialist and enabled others on the PMT and PESR to fill in this gap by utilizing other tools at their disposal.

#### **M&E Utilization**

71. Overall M&E utilization was hindered by delays in reporting and issues with the quality of reports due mostly to the delay in implementation of RAMS which the data was based on. Delays were also observed with beneficiary related



indicator monitoring. This was due to the late start with the ex-ante beneficiary surveys caused by a lack of market interest in responding to the implementation of this activity. Close supervision by the Bank team provided support to the M&E efforts. Overall, throughout the project lifetime all indicators included in the Results Framework were routinely updated and reported in the ISRs despite some delays encountered with RAMS and beneficiary related indicators. M&E was being utilized in the right way throughout implementation despite lack of M&E specialist through tools like RAMS and iRAP.

### Justification of Overall Rating of Quality of M&E

72. **The overall quality of M&E is rated Substantial.** Although the design of indicators was fully adequate to track achievement of the PDO, there were some shortcomings in the M&E implementation and utilization, but challenges were overcome by PESR to report on results. Taking all the above in to consideration, the arrangement put in place by the Bank team and PESR regarding M&E was adequate and justifies the ‘Substantial’ rating.

## B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

73. **The project’s environmental management was Moderately Satisfactory overall.** The project triggered Environmental Assessment (OP/BP 4.01) and was assessed as Environmental Category B. In order to ensure environmental compliance of the project, PESR prepared the Environmental and Social Assessment and Management Framework (ESAMF) which underlined main environmental risks associated with the road rehabilitation, and defined the procedures, responsibilities and implementation arrangements for the preparation of road - specific Environmental Assessments and Management Plans (EAMPs).

74. **PESR faced challenges in oversight of environmental safeguards throughout the implementation period but it did not impact outcome and improved adherence to safeguards and implementation of identified mitigation measures.** The environmental safeguards supervision repeatedly identified a serious concern related to critical understaffing, and respectively inadequate capacity, of the Unit for Environmental Protection and Social Aspects of the PESR. For the first half of the project PESR had only one specialist who dealt with the environmental and social management of all PESR managed road construction and rehabilitation operations including other IFI projects which made it rather challenging to ensure proper environmental compliance of these operations, including the NRRRP. Following the Bank’s repeated recommendations to strengthen this aspect of project management, PESR hired two additional environmental specialists in 2018 which improved supervision.

75. **Citizen engagement practices during the preparation and implementation of the project positively influenced PESR’s internal practices in this area.** During project preparation this involved consultations with communities to share details about planned investments, receive feedback on connectivity needs and share information about the project’s Grievance Redress Mechanism (GRM). This resulted in consideration of local community needs regarding maintaining routes for herd passages, utilization of heavy load vehicle during certain hours, etc. During implementation, collaboration with communities continued and was exemplified in the addition of road underpasses, use of scraped asphalt for local roads in nearby communities, addition of road safety measures. The grievance redress mechanism worked well during the project and offered flexible communication channels for the community (face-to-face at contractor and supervision office; PESR staff by telephone and email).



76. **Social safeguard compliance was overall satisfactory, a rating maintained for the duration of the project.** Social Safeguards were not been triggered due to the rehabilitation nature of the interventions of the NRRRP. In the situation where land access was needed but could be avoided, PESR made adjustment to the technical designs. The challenges were cases where land acquisition could not be avoided, then PESR's approach was to avoid as much as possible. There is one case reported where technical designs were changed to avoid land acquisition on the Debar-Boshkov section. Landslide remediation of the road segment Tetovo-Popova Shapka required partial land acquisition in one parcel. However, PESR decided to drop the intervention at the section because land acquisition could not be avoided and per Macedonian law, required new infrastructure project designs to be prepared.

77. **The project's financial management was Satisfactory overall.** The appropriate financial management (FM) arrangements for the project remained in place throughout implementation. The FM function was adequately staffed within PESR. Internal control system was sound and applied in practice. Project disbursement was healthy throughout implementation and the flow of funds was unimpeded. The quarterly Interim Financial Reports (IFRs) were submitted to the Bank mostly within due dates, and the reports were reliable and acceptable. The audit of the entity financial statements, which was considered as the audit of the project, provided sufficient details about the project transactions. The FM performance was assessed throughout implementation as continuously acceptable.

78. **The project's procurement management was Satisfactory overall.** Procurement was rated satisfactory at entry but was downgraded temporarily to moderately satisfactory after six months because of poor participation of bidders in the procurement of the first round of civil works. During this period, the Bank team identified the areas which needed improvement and proposed mitigation measures for each. The procurement team within PESR gained knowledge and experience in various procurement procedures, as well as the relevant Procurement and Consultant Guidelines. The overall quality of various procurement and technical documents improved the capacity in the PESR for implementing procurement improved substantially.

## **C. BANK PERFORMANCE**

### **Quality at Entry**

79. The NRRRP was built on the foundation of its predecessor, the Regional and Local Roads Program Support Project, and strategically designed to link regional and national roads to the main trade corridors and expand the use of RAMS to adopt climate resilience and road safety considerations – all of which were highly relevant at entry and aligned with national objectives for the development of the road sector.

80. The project was designed in a way to ensure rapid implementation by benefitting from detailed designs and bidding documents that had already been prepared by PESR for the first-year program of roads. Environmental and social safeguards were adequately prepared. The project's technical and economic appraisal, including other aspects of the project, was accurate which is evidenced by the project components being completed without need for additional financing, full disbursement, and an ex-post EIRR and NPV which closely follows the estimates at entry. The project challenged PESR to change its approach to road maintenance and investment by introducing evidence-based tools such



as RAMS. This was a big challenge, as such transformations show to be challenging for most road agencies and depend on political commitment.

81. Design of the project at entry also took in to consideration the full spectrum of risks facing project implementation, however, the team could have better incorporated maintenance arrangements with road maintenance company Public Enterprise, Makedonija Pat, to mitigate the risk to sustainability of the project. This is explained in more detail in the section below.

### Quality of Supervision

82. **The NRRRP benefitted greatly from continuity in supervision.** The same Task Team Leader (TTL), along with most of the core team, presided over the project from identification and preparation, throughout implementation, and to closure. Many members of the team, including the TTL, were closely involved in the predecessor project and carried across the lessons learned from that experience and relationship established with the PESR to ensure a better outcome from NRRRP. Having most team members based in the region and available to provide implementation support frequently and at short notice also helped the NRRRP achieve its outcomes.

83. On average, two full-fledged supervision missions were conducted per year throughout implementation, with some shorter missions in between to address specific issues. Considering the fast pace of implementation of civil works and healthy disbursement rates, the level of supervision support provided by the team was adequate, which is also highlighted in the borrower's completion report. During supervision missions the teams undertook site visits and discussions with contractors, consultants, and communities. Critical issues that emerged during implementation and for which the Bank team was able to provide additional guidance to the PESR included: (i) compliance of safeguards documents with the Bank safeguard policy; (ii) improvement the pace of procurement preparation; (iii) improvement of the reporting of performance monitoring.

84. The Bank team proactively supported the client on road safety, providing access to capacity building activities for PESR staff and in 2017 carried out a road safety capacity review for the country, providing the government recommendations on improving the management of road safety. Based on these recommendations in March 2018 the government adopted the action plan on road safety management and is working with the support of EU pre-accession grant financing to implement it.

85. Despite the fact that the NRRRP was implemented during a prolonged period of political turmoil and long election cycles with changes in PESR management, the project successfully completed activities within the original project period. It's a credit to both the Bank and PESR teams that the project achieved its objectives given the challenges on the ground during much of the period of implementation.

### Justification of Overall Rating of Bank Performance

86. **The overall rating of the Bank's performance is rated as Satisfactory.** At entry, preparations for the first phase of civil works and RAMS implementation were advanced due to prior projects and the team built upon this foundation to design the NRRRP and ensure continuity of the support provided to PESR. Overall, the project was proactively and carefully supervised by the Bank's team and completed on time with no extensions or additional financing required despite a highly uncertain political backdrop for the most part of implementation.



#### D. RISK TO DEVELOPMENT OUTCOME

87. **The risk to development outcome is considered Moderate.** There are several risks to the sustainability of the results achieved including the following:

88. **Road maintenance will be key for the sustainability of project investments carried out under the NRRRP (as is often the case with all road investments).** The rehabilitation contracts under the NRRRP did not build in periodic maintenance of the rehabilitated segments which would have required a much longer project duration. During the field visits, the Bank team noted concerns that routine maintenance was not being carried out adequately. PESR does not have a strong track record of good cooperation with the maintenance supervision teams to ensure that the proper maintenance is provided by the road maintenance company Public Enterprise, Makedonija Pat. Annual programs of PESR show an increase in financing available for maintenance and this suggests a lower risk, as the rehabilitated roads will need only routine maintenance in the first three to five years. Still, the weak capacity of Makedonija Pat will pose a risk for the sustainability of the outcomes of NRRRP. It should be noted that the fact that PESR now has a functioning RAMS meaning that they can define realistic maintenance plans, track road pavement state regularly and provide more detailed guidance to Makedonija Pat about maintenance needed and better supervise its performance quality.

89. **The sustainability of the RAMS hinges on maintaining the system through regular data collection and sustaining adequate staffing and funding provided going forward.** The successful implementation of RAMS now depends on PESR's success in retaining the staff of the RAMS Unit who will continue to dedicate full-time to the system. A second important element of a sustainable RAMS is the regular availability of current network condition data. PESR needs to continue implementing the program for network data collection which it developed in 2018 and which includes detailed timelines and resources (staff and financing) to maintain regular collection of data on roughness, deflections and surface distress. PESR is currently investing to further expand the RAMS system to also include all bridges in the country, which indicates their commitment to the system and that utilizing data to plan maintenance and investment in the road network is now an approach that PESR has already fostered.

90. **Lack of effective enforcement of axle loads, resulting in overloaded trucks on the network, jeopardizes the investments made on project roads.** Measurements of axle and gross vehicle weights completed under the RAMS showed a concerning frequency of overweight trucks, which causes premature road damage and creates additional road safety risks. PESR has correctly identified the need to record the axle weights and gross vehicle weights and improve enforcement and proposed to develop a systematic weigh-in-motion (WIM) system. In the absence of a permanent system of weight control to help enforce axle load limits and keep overloaded trucks off roads, rehabilitated roads under the NRRRP risk returning to the poor condition prior to the project. The Regional Trade and Transport Facilitation project which includes North Macedonia, recently started implementation and includes a component on ITS which envisions the introduction of WIM over the next five-year period. In the meantime, PESR in collaboration with the Ministry of Interior and the State Transport Inspectorate has introduced WIM on key transit points of the road network.

#### V. LESSONS AND RECOMMENDATIONS





91. **Adequate resource allocation and high-level commitment is key to mainstreaming the RAMS into strategic decision making for road safety and resilience in to a road agency's operations.** The experience of the project highlights that allowing for adequate staffing and funding, which coincided with strong commitment from new PESR management, was key to the ownership of the RAMS activity by the client as a critical factor in successful implementation. As explained in previous sections, the RAMS component had gotten off to a late start with implementation due to inadequate human and financial resources allocated to the team in PESR. With the alleviation of the workload of this team on the civil works front, implementation progress improved significantly, allowing PESR to go a step further and use the capacity gained through the project to absorb EU IPA funds in road safety. It took commitment from staff and strong support from management for this to happen.

92. **RAMS is also central to the financial sustainability of the road sector and improving fiscal management.** As mentioned above, RAMS was introduced at a time when the GoNM was beginning to consider new means of financing that may not have been financially feasible. The introduction of RAMS helped PESR, through strategic decision making, to rationalize these investments. Strategic decision making can, therefore, be taken beyond the sector level and applied economy wide by rationalizing road sector investments to provide improved fiscal management.

93. **For a road agency to effectively implement any sort of output and performance based contracting method it needs to have in place a fully functional RAMS (and dedicated staff with adequate resources) to obtain accurate data on the road network.** Projects that introduce output-based contracting before a RAMS has been successfully adopted and a road agency lacks the means to collect data needed to carry out such contracts can lead to serious delays in procurement and the project failing to achieve its objectives. The decision under the NRRRP to introduce output-based contracting only after adequate implementation and internalization of RAMS by PESR is an important lesson for other projects where output-based contracting was introduced prematurely and consequently faced major delays in implementation which has led to numerous road projects being restructured.

94. **Having a realistic understanding of the implementing agency's capabilities through close supervision and open communication is critical to the successful adoption of new concepts in relatively traditional type projects like road rehabilitation.** Through close supervision and trust-based relationship established through long-term engagement, the team was able to correctly identify the readiness of PESR to employ new methods to implement activities under the NRRRP that allowed the project to deliver innovative results for the country (i.e. implementation of output-based contracting, road safety, resilience through RAMS). NRRRP pushed the envelope on traditional road rehabilitation projects by introducing climate and road safety concepts through the use of RAMS and output-based contracting. The team demonstrated sound judgement on timing of project and readiness of client to successfully implement these concepts that have been transformational for PESR's operations.

95. **The network wide adoption of road safety measures requires close collaboration within relevant agencies and high-level commitment.** The NRRRP introduced for the first time new concepts related to road safety along the project roads and highlighted some of the challenges in implementing this component of the project due mostly to poor coordination within government. Road safety continues to be a priority for the GoNM, however, implementing road safety on the entire network will require exchange of data and collaboration among relevant government agencies on a more coordinated and regular basis.







**ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS**

**A. RESULTS INDICATORS**

**A.1 PDO Indicators**

**Objective/Outcome:** Enhance the connectivity of selected national and regional roads, primarily to Corridors X and VIII

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Reduction in travel time for passenger cars, in percentage, along the project roads sections to be rehabilitated	Percentage	0.00 12-Mar-2014	10.00 30-Sep-2019		12.50 30-Sep-2019

**Comments (achievements against targets):**

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Reduction of vehicle	Amount(USD)	0.79	0.69		0.69



operating costs for heavy trucks, in Euro per vehicle-km, along the project road sections to be rehabilitated		12-Mar-2014	30-Sep-2019		30-Sep-2019
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Comments (achievements against targets):

**Objective/Outcome:** Improve Public Enterprise for State Roads' capacity for road safety and climate resilience

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Percentage of all PESR road projects that incorporate road safety audit recommendations	Percentage	0.00 12-Mar-2014	100.00 30-Sep-2019		100.00 30-Sep-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Climate resilience design guidelines prepared and integrated by PESR in their internal design process	Yes/No	N 12-Mar-2014	Y 30-Sep-2019		Y 30-Sep-2019

Comments (achievements against targets):



**A.2 Intermediate Results Indicators**

**Component:** Component 1: Road Civil Works

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Roads rehabilitated	Kilometers	0.00 14-Jul-2014	112.00 24-Sep-2019		280.00 24-Sep-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Roads in good or fair condition as a share of total classified roads	Percentage	64.00 01-May-2015	74.00 24-Sep-2019		87.00 24-Sep-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
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Percentage of beneficiaries expressing satisfaction with condition of the project roads.	Percentage	50.00 14-Jul-2014	70.00 24-Sep-2019		84.50 24-Sep-2019
<b>Comments (achievements against targets):</b>					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries (number), of which female (percentage)	Number	118410.00 29-Jan-2018	125000.00 24-Sep-2019		123461.00 24-Sep-2019
Female beneficiaries	Percentage	49.00	49.00		49.00
<b>Comments (achievements against targets):</b>					

**Component:** Component 2: Institutional Strengthening and Project Management

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Road safety design audit guidelines prepared	Yes/No	N 14-Jul-2014	Y 24-Sep-2019		Y 24-Sep-2019



Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Climate resilience design guidelines prepared	Yes/No	N 14-Jul-2014	Y 24-Sep-2019		Y 24-Sep-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of km of road network surveyed for road safety (iRAP)	Kilometers	500.00 14-Jul-2014	4000.00 24-Sep-2019		4000.00 24-Sep-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Five year rolling program for national and regional roads preservation works prepared	Yes/No	N 14-Jul-2014	Y 24-Sep-2019		Y 24-Sep-2019



based on the RAMS

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Annual performance report prepared and published by PESR	Yes/No	N 14-Jul-2014	Y 24-Sep-2019		Y 30-Sep-2019

Comments (achievements against targets):



**B. KEY OUTPUTS BY COMPONENT**

<b>Objective/Outcome 1: The Project Development Objectives are to enhance the connectivity of selected national and regional roads, primarily to Corridors X and VIII</b>	
Outcome Indicators	<ol style="list-style-type: none"> <li>1. Reduction in travel time for passenger cars, in percentage, along the project roads sections to be rehabilitated</li> <li>2. Reduction of vehicle operating costs for heavy trucks, in Euro per vehicle-km, along the project road sections to be rehabilitated</li> </ol>
Intermediate Results Indicators	<ol style="list-style-type: none"> <li>1. Roads rehabilitated (km)</li> <li>2. Roads in good and fair condition as a share of total classified roads (percentage)</li> <li>3. Percentage of beneficiaries expressing satisfaction with condition of the project roads</li> <li>4. Direct project beneficiaries, of which female(percentage).</li> </ol>
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	<ol style="list-style-type: none"> <li>1. 280km roads rehabilitated.</li> <li>2. Eight black spots improved.</li> <li>3. Road safety audit recommendation measures implemented on 12 roads.</li> <li>4. 11 landslides reconstructed.</li> <li>5. Seven Technical Audits carried out on all rehabilitated roads.</li> </ol>
<b>Objective/Outcome 2: improve the Public Enterprise for State Roads' capacity for road safety and climate resilience</b>	
Outcome Indicators	<ol style="list-style-type: none"> <li>1. Percentage of all PESR road projects that incorporate road safety audit recommendations</li> <li>2. Climate resilience design guidelines prepared and integrated by PESR in their internal design process</li> </ol>



<p>Intermediate Results Indicators</p>	<ol style="list-style-type: none"><li>1. Road safety design audit guidelines prepared</li><li>2. Climate resilience design guidelines prepared</li><li>3. Number of kilometers of road network surveyed for road safety (iRAP)</li><li>4. Five year rolling program for national and regional roads preservation works prepared based on the RAMS</li><li>5. Annual performance report prepared and published by PESR</li></ol>
<p>Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)</p>	<ol style="list-style-type: none"><li>1. Road asset management system developed and installed (including HDM-4, road database, flood maps, landslides, GIS platform)</li><li>2. 4350km of road roughness and deflection data collected.</li><li>3. RAMS Unit in PESR established.</li><li>4. Road safety audit manual developed</li><li>5. Road safety guidelines for auditors developed</li><li>6. 4000km of roads surveyed by iRAP</li><li>7. National Black Spots Improvement Program developed</li><li>8. Road Safety Unit in PESR established, with detailed terms of reference, internal procedure developed, and training provided.</li><li>9. 70 traffic counters installed on the road network; 10 mobile traffic counters made available.</li><li>10. Computer hardware.</li><li>11. PESR staff trained on FIDIC contracts, road safety, road safety audits, climate resilience technical solutions, environmental and social safeguards.</li><li>12. Road design engineers, contractors trained on road safety, road safety audits, climate resilience technical solutions.</li><li>13. Beneficiary surveys completed (ex-ante and ex-post).</li><li>14. Climate resilience guidelines developed.</li><li>15. Conceptual designs for roads prepared.</li></ol>





**ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION**

**A. TASK TEAM MEMBERS**

<b>Name</b>	<b>Role</b>
<b>Preparation</b>	
Liljana Sekerinska	Task Team Leader(s)
Wei Winnie Wang	Transport Specialist
Gentian Keri	Procurement Specialist(s)
Anneliese Viorela Voinea	Financial Management Specialist
Gulana Enar Hajiyeva	Environmental Specialist
Rodrigo Archondo-Callao	Team Member
Bekim Imeri	Social Specialist
Moustafa Baher El-Hefnawy	Team Member
Steven Farji Weiss	Team Member
Luan Aliu	Team Member
<b>Supervision/ICR</b>	
Liljana Sekerinska, Wei Wang	Task Team Leader(s)
Antonia G. Viyachka	Procurement Specialist(s)
Tural Jamalov	Financial Management Specialist
Rodrigo Archondo-Callao	Team Member
Anne N. Ranasinghe	Procurement Team
Mohammad Ilyas Butt	Procurement Team
Irma Khatiashvili	Procurement Team
Moustafa Baher El-Hefnawy	Team Member
Arben Maho	Procurement Team



Gulana Enar Hajiyeva	Environmental Specialist
Bekim Imeri	Social Specialist
Luan Aliu	Team Member
Steven Farji Weiss	Team Member

**B. STAFF TIME AND COST**

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ (including travel and consultant costs)
<b>Preparation</b>		
FY14	38.400	169,601.87
FY15	7.400	23,332.13
<b>Total</b>	<b>45.80</b>	<b>192,934.00</b>
<b>Supervision/ICR</b>		
FY14	0	2,199.36
FY15	19.677	116,751.12
FY16	20.820	74,766.72
FY17	29.139	125,916.98
FY18	20.555	121,324.22
FY19	20.655	111,026.56
FY20	16.145	89,558.42
<b>Total</b>	<b>126.99</b>	<b>641,543.38</b>



**ANNEX 3. PROJECT COST BY COMPONENT**

<b>Components</b>	<b>Amount at Approval (EURO M)</b>	<b>Actual at Project Closing (EURO M)</b>	<b>Percentage of Approval (EURO M)</b>
Component 1: Road Civil Works	48.95	46.67	95
Component 2: Institutional Strengthening and Project Management	2.922	3.63	124
<b>Total</b>	<b>51.87</b>	<b>50.3</b>	<b>97</b>



**ANNEX 4. EFFICIENCY ANALYSIS**

**Ex-Post Economic Analysis  
FYR MACEDONIA: National and Regional Roads Rehabilitation (P148023)**

The ex-ante economic analysis done at appraisal 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 provides economic decision criteria for road construction and maintenance works. The HDM-4 analyses projects by computing 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 (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 if the Project was not undertaken; therefore, consists of the recurrent maintenance practice and reconstruction when the road reaches very poor condition. The project scenario consists of the rehabilitation followed by proper recurrent maintenance and periodic maintenance works over the analysis period consisting of 6 cm overlays triggered at 4.5 IRI, m/km.

The ex-ante economic analysis was done for the three roads comprising the first-year program of the Project. The roads were in poor condition with an estimated average roughness of 6 IRI, m/km, and daily traffic of 2,928 vehicles per day in 2013. Based on the traffic growth assumptions made at appraisal, the average total traffic in 2018 was estimated to be 3,424 vehicles per day, representing a 3.2 percent traffic growth per year from 2013 to 2018. The table below presents the three roads basic characteristics and the resulting Economic Internal Rate of Return (%) estimated at appraisal. The total EIRR for the three roads was estimated to be 30.9 percent at appraisal.

Table 1: PAD Estimates

Section Code	Start Location	End Location	Length (km)	2013 Traffic (vpd)	2018 Traffic (vpd)	Financial Cost (M Euro)	Financial Cost (M Euro/km)	EIRR (%)
RD1	Bitola	Makazi	18.1	3,431	4,012	4.70	0.260	35.2
RD2	Resen	Bukovo	11.1	2,733	3,196	3.03	0.273	30.3
RD3	Boskov Bridge	Debar	7.5	2,003	2,338	2.39	0.319	23.7
Total			36.7	2,928	3,423	10.12	0.276	30.9

An ex-post economic evaluation was done for the three roads evaluated at appraisal considering the actual traffic counted in 2018 and the actual rehabilitation costs. The three roads were milled and received an overlay of 50 mm. The ex-post economic evaluation was done using the HDM-4 model and adopting the same other assumptions made at appraisal. The table below presents the three roads basic characteristics and the resulting ex-post Economic Internal Rate of Return (%) estimated for the ICR.

Table 2: ICR Actual values

Section Code	Start Location	End Location	Length (km)	2018 Traffic (vpd)	Financial Cost (M Euro)	Financial Cost (M Euro/km)	EIRR (%)
RD1	Bitola	Makazi	18.1	3,301	3.48	0.192	39.9



RD2	Resen	Bukovo	10.3	3322	3.19	0.310	28.2
RD3	Boskov Bridge	Debar	7.7	2,941	3.24	0.421	23.8
Total			36.1	3,230	9.91	0.275	30.2

Comparing with the appraisal estimates, the length of two roads has changed somewhat and the financial costs changed, however the total rehabilitation financial cost per km remained at around Euro 0.275 million per km (see Table below).

Table 3: Construction Costs Comparison

Section Code	Start Location	End Location	PAD Financial Cost (M Euro/km)	ICR Financial Cost (M Euro/km)	ICR/PAD Factor
RD1	Bitola	Makazi	0.260	0.192	0.74
RD2	Resen	Bukovo	0.273	0.310	1.13
RD3	Boskov Bridge	Debar	0.319	0.421	1.32
Total			0.276	0.275	1.00

The actual traffic in 2018 is lower on one road compared to the appraisal estimates (18 percent lower), however it is higher on the other two roads (4 to 26 percent higher), resulting on an overall traffic reduction of 6 percent for the three roads (see Table below).

Table 4: 2018 Traffic Comparison

Section Code	Start Location	End Location	PAD 2018 Traffic (vpd)	ICR 2018 Traffic (vpd)	ICR/PAD Factor
RD1	Bitola	Makazi	4,012	3,301	0.82
RD2	Resen	Bukovo	3,196	3,322	1.04
RD3	Boskov Bridge	Debar	2,338	2,941	1.26
Total			3,423	3,230	0.94

Considering the actual traffic in 2018 and the actual rehabilitation costs, the ex-post EIRR for the three roads is 30.2 percent, a 2 percent reduction from the PAD estimate (30.9 percent). The ex-post evaluation confirms the high economic justification of the three road of the first-year program of the Project.

Table 5: EIRR Comparison

Section Code	Start Location	End Location	PAD EIRR (%)	ICR EIRR (%)	ICR/PAD Factor
RD1	Bitola	Makazi	35.2	39.9	1.13
RD2	Resen	Bukovo	30.3	28.2	0.93
RD3	Boskov Bridge	Debar	23.7	23.8	1.00
Total			30.9	30.2	0.98



An ex-post economic evaluation was done for most of the project roads<sup>10</sup> in which actual traffic data in 2018 is available. The table below shows the road characteristics and the resulting ex-post EIRR. The average rehabilitation works unit cost is M 0.161 million per km. The rehabilitation works comprise milling and overlays from 40 to 60 mm. The average 2018 traffic of the project roads is 2,564 vehicles per day. Travel speeds of cars increased on average from 53 to 58 kilometers per hour.

Table 6: ICR Ex-Post Economic Evaluation

Section	Start	End	Length	Width	2018 Traffic	Financial Cost	Financial Cost	EIRR	NPV at 10% (M EURO)
Code	Location	Location	(km)	(m)	(vpd)	(M Euro)	(M Euro/km)	(%)	
RD1	Bitola	Makazi	18.1	7.5	3,301	3.48	0.192	39.9	5.5
RD2	Resen	Bukovo	10.3	7.5	3322	3.19	0.310	28.2	3.8
RD3	Bridge	Debar	7.7	6.0	2,941	3.24	0.421	23.8	3.5
RD4	Mavrovi Anovi	Novo Selo to Mavrovi Anovi	11.9	6.0	2,941	2.43	0.204	22.2	2.1
RD5	Dojran	Nov Dojran to Nikolic	5.4	6.0	2,732	1.33	0.247	23.3	1.0
RD6	Krivogastani	Krivogastani - Vogjani*	26.1	3.5	1,275	1.94	0.074	13.5	1.4
RD7	Dolneni	Lazani - Ropotovo - Crniliste	15.9	3.5	1,275	1.27	0.080	13.7	0.9
RD8	Kocani	Kocani - Delcevo	30.7	6.0	2,596	6.42	0.209	20.1	4.5
RD9	Mlado Nagoricane	Mlado Nagoricane - Pelince	10.0	6.0	1,041	1.15	0.115	12.0	0.3
RD10	Kumanovo	Kumanovo - Sveti Nikole	10.0	6.0	2,281	1.15	0.115	13.7	0.6
RD11	Tetovo	Tetovo - Popova Sapka	18.2	6.0	2,985	2.09	0.115	18.1	2.3
RD12	Kisela Voda	Dracevo - Jurumleri	4.0	7.0	4,690	0.66	0.165	39.9	1.5
RD13	Bitola	Bitola to Demir Hisar	10.0	6.0	2,732	1.64	0.164	17.3	3.6
RD14	Studenicani	Dracevo - Oresani - Taor	9.0	6.0	4,913	1.48	0.164	41.8	1.1
RD15	Delcevo	Delcevo - Zvegor	5.0	6.0	1,042	0.69	0.138	13.0	0.2
RD16	Delcevo	Delcevo - Pehcevo	10.8	6.0	2,028	1.48	0.137	13.4	0.6
RD17	Berovo	Berovo - Vinica	11.1	6.5	2,290	1.52	0.137	15.9	1.0
RD18	Strumica	Strumica - Novo Selo	12.7	6.5	4,669	1.75	0.138	25.0	2.6
RD19	Kavadarci	Kavadarci - Rosoman	6.4	6.5	1,873	0.88	0.138	21.6	1.0
RD20	Bogdanci	Furka - Bogdanci -	10.7	6.5	2,262	1.48	0.138	16.7	1.1

<sup>10</sup> Twenty project roads were evaluated. On four other roads, actual traffic in 2018 is not available.



	Gevgelija					
Total		243.9	2,564	39.3	0.161	22.6 38.5

The total ex-post EIRR of the twenty project roads is 22.6 percent, confirming the satisfactory economic justification of the project. The total ex-post EIRR of the project (22.6 percent) is lower than the ex-post EIRR of the three roads of the first-year program (30.2 percent) because some of the other project roads have traffic lower than the initial three roads.

Table : NPV Comparison

Section Code	Start Location	End Location	PAD NPV at 10% (M Euro)	ICR NPV at 10% (M Euro)	ICR/PAD Factor
RD1	Bitola	Makazi	5.3	5.5	1.04
RD2	Resen	Bukovo	2.8	3.8	1.34
RD3	Boskov Bridge	Debar	1.6	3.5	2.17
Total			9.7	12.8	1.31



**ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS**

Comments received from the client have been reflected in the ICR. The following is the borrower's completion report.

**REPUBLIC OF NORTH MACEDONIA**

**Public Enterprise for State Roads**

**National and Regional Roads Rehabilitation Project**

**Project ID: P148023 - MK**

**IBRD Loan No. 8420 - MK**

**Borrower's Completion Report**

**February 2020**





## **1.1 Project Background**

As a landlocked country, North Macedonia is particularly dependent on a well-developed road and rail network for its economic and social development. Key elements of this network are also part of the Trans-European transport network (Corridor X, which goes from Austria to Turkey, and Corridor VIII, which connects Albania with the Black Sea ports in Bulgaria). Since its independence, the main challenges facing the country have been to reduce the economic distance to markets and lower the costs of transportation arising from the poor road condition of Corridor X and major delays at key border crossing points. It is exactly the road transport network, which plays the critical role in the development of the economy, as it carries the bulk of the country's exports/goods. An enhanced transport network would also contribute to poverty alleviation by providing better quality access to national and international markets of the rural population. Most rural households depend largely on crop and livestock production for their income. Rural poverty increased as a result of the economic transition because rural households are without adequate inputs and access to markets and they lacked financial resources for investment to improve their incomes and living conditions. Thus, a government priority is to upgrade and rehabilitate road infrastructure to improve future growth prospects.

Roads in the country are categorized as follows: (1) national roads (primarily connecting to neighboring countries but also to the largest regional centers in the country), (2) regional roads (connecting two or more municipalities and securing critical in-country connectivity), and (3) local roads (serving municipal traffic). The current road network in North Macedonia includes a total mileage of 14,159 km. The road network is considered to have a reasonable density, but it needs improvement, mostly a result of the age of existing infrastructure and irregular and insufficient maintenance. The national roads, relative to other road categories, are in a better condition, but due to the higher traffic they carry, need more frequent rehabilitation to ensure their longevity and decrease transport costs for freight and passengers. Regional roads are in a greater need of investment, due to past backlogs in investment in these lower-trafficked roads.

The road investment logically focuses on improving the road network linking to the corridors. This includes both the national and regional roads and is a central element of the Government Public Investment Program.

Road management is entrusted to a managerially and financially independent Public Enterprise for State Roads (PESR). The Public Enterprise is mandated to plan, construct, reconstruct, and rehabilitate the national and regional roads and collect tolls. While the Ministry of Transport and Communications (MOTC) remain in charge of road sector strategic guidance and policy, it is with these policies in mind that PESR prepares the road development and financing plans.

This project was a new phase of the Bank's long-term engagement in the country's road sector and is building on the already close cooperation with the Public Enterprise aimed to strengthen its investment planning and financial management capacity.

## **1.2. Project Development Objectives**



The Project Development Objectives (PDO) are to enhance the connectivity of selected national and regional roads, primarily to Corridors X and VIII, and to improve Public Enterprise for State Roads' capacity for road safety and climate resilience.

### **Project duration**

The project under the Loan No. 8420 - MK became effective on **December 22, 2014** with a closing date set on September 30, 2019. The project was closed as planned.

### **Project components**

#### **Component 1: Road Civil Works**

This component consists of the following three sub-components:

##### **Sub-component 1.1: Road Rehabilitation and Black Spots Improvement**

This sub-component financed the rehabilitation and spot improvements of an estimated 112 km of national and regional roads as well as a pilot road safety black spot improvements program.

##### **Sub-component 1.2: Technical Audits**

It financed independent technical audits of civil works during the project implementation.

##### **Sub-component 1.3: Land Slide Remediation**

This sub-component was planned to implement the remediation activities on a selected number of land slide locations.

#### **Component 2: Institutional Strengthening and Project Management**

This component was designed to help strengthening PESR's capabilities on issues related to road safety, climate resilience and road asset management.

##### **Sub-component 2.1: Project Management and Implementation, including audits**

The sub-component supposed to strengthen the technical capacity of the Project Management Team (PMT) through the provision of technical assistance; and to carry out the annual financial audits of the Project and the entity.

##### **Sub-component 2.2: Road Safety Technical Assistance**

This sub-component was to support road safety activities, including: (i) the development of a nationwide road safety program including the identification of black spots and their improvement; (ii) preparation of road safety audits guidelines and manuals; (iii) training, and (iv) carrying out of an iRAP survey of the national and regional roads network.

##### **Sub-component 2.3: Road Asset Management Equipment and Data Collection and Preparation of a Five-year Strategic Program**

This sub-component financed the equipment and the network data collection undertaken by PESR for surveying road condition and collecting traffic data for three years. It also included technical assistance for the preparation of a Five-year Strategic Program (including program for periodic maintenance and



rehabilitation works) based on the network data from Road Asset Management System.

**Sub-component 2.4: Technical Assistance and Impact Analysis**

This sub-component will finance technical assistance for the preparation of potential future investments in PESR’s road sector.

**PROJECT IMPLEMENTATION**

The implementation of project components as of September 30, 2019 is provided as below:

**Component 1 – Road Civil Works**

**Road Rehabilitation and Black Spots Improvement**

The rehabilitation of the planned sections of national and regional roads was organized through six different bidding cycles mostly divided in several lots as follows:

**Cycle No. 1**

<b>Rehabilitation of roads for four lots as below (Y1):</b>
LOT I - Bitola to Makazi (18.1 km)
LOT II - Resen to Bukovo (11.1 km)
LOT III - <del>Boskov Most to Debar (7.5 km)*</del>
LOT IV - Novo Selo to Mavrovi Anovi (12km)

\*- For this lot there were no eligible bidders and rebidding was organized later on

**Cycle No. 2**

<b>Rehabilitation of roads for two lots as below (Y1):</b>
LOT I - Brvenica - Cegrane (16.70)
LOT II - Nov Dojran - Nikolic (5.38 km), Mokrino - Smolari (4km)

**Cycle No. 3**

<b>Rehabilitation of roads for three lots as below (Y1):</b>
LOT I - Krivogastani - Obsani - Vogani (9.0km); Lazani - Ropotovo - Crniliste (16.5 km)
LOT II - Melnicki Most - Centar Zupa (8.0 km)



LOT III - Delcevo - Golak (10.8 km)
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**Cycle No. 4**

<b>Rebidding</b>
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Boskov Most - Debar (7.5km)
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**Cycle No. 5**

<b>Rehabilitation of National Road A3 Kocani-Delcevo</b>
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Kocani - Delcevo (30.65km)
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**Cycle No. 6**

<b>Rehabilitation of roads from Round 2 in four lots as below</b>
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LOT I -Mlado Nagoricane – Pelince L=10 km Kumanovo - Sveti Nikole L=10 km Tetovo – Popova Sapka L=18 km
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LOT II - Jurumleri – Dracevo L=4 km Bitola - Demir Hisar L=10 km Dracevo – Oresani – Taor L=9 km
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LOT III - Delcevo - Zvegor L=5 km Delcevo - Pehcevo L=10 km Berovo – Vinica L=11 km
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LOT IV - Strumica - Novo Selo L=14 km Kavadarci – Rosoman L=8 km Furka – Bogdanci – Gevgelija L=16 km
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Black Spot Improvement was organized in one bidding process and included 8 sections in different parts of the country:

No.	Road No.	Section
1	R1301	Ohrid - Sv Naum
2	R1201	Struga - Debar (village Vranista)
3	R1303	Barbaros - Mak Brod - Kichevo
4	A1	Veles - Petrovec
5	A4	Strumica - Bulgarian Border



6	A2	Kumanovo - Rugince
7	R1202	Zirovnica - Debar - gp Blato
8	R1306	Prilep - Krusevo - Sladuevo

**Technical Audits**

The contract was signed with the JV EGIS International and Highway Institute and they spread their services to all road sections included in the rehabilitation programme of the project till it's closing.

**Land Slide Remediation**

There were two cycles of bidding for land slopes improvement with four lots in total.

**Cycle No. 1**

<b>Land Slopes Improvement 1</b>
LOT I - Mavrovo - Debar km 14+500 Mavrovo - Debar km 43+100
LOT II – Kratovo - Stracin; Openica; Tetovo - P.Sapka km 1+000; Tetovo - P.Sapka km 4+000

**Cycle No. 2**

<b>Land Slopes Improvement 2</b>
LOT I – Tetovo - P.Sapka km 10+000; Tetovo - P.Sapka km 3+500; Mavrovo - Debar; Gostivar - Kicevo
LOT II – Lakavica - Negotino; Delcevo - Berovo; Bitola - Novaci

**Road Safety Remediation of 11 State Roads**

Locations for the Road Safety Remediation Works are the following:

No.	Road No.	Section
1	A3	Bitola - Makazi
2	A3	Resen – Bukovo
3	R1202	Novo Selo - Mavrovi Anovi
4	R2233	Brvenica - Cegrani



5	R1105	Nov Dojran - Nikolic
6	R1402	Mokrino - Smolari
7	R2335	Krivogastani - Obsani - Vogani
8	R2335 and R2336	Lazani - Ropotovo - Crniliste
9	R2249	Melnicki Most - Centar Zupa
10	R2343	Delcevo - Golak
11	R1202	Boskov Most - Debar

## **Component 2 - Institutional Strengthening and Project Management**

### **Project Management and Implementation, including audits**

Public Enterprise has hired individual consultants for Financial Management and Procurement as agreed with the Bank in preparatory phase of the Project in order to strengthen the capacity of the Project Management Team and to take some of the workload from the other members of the Project Management Team. Combined with the excessive experience in cooperation with the World Bank, this measure was very successful.

As for the Financial Audit both for the Project and for the entity Moore Stevens office from Skopje was hired and they produced audit reports that were fully acceptable to the Bank.

### **Road Safety Technical Assistance**

For preparation of guidelines, manual, audits, on the job training of staff and advisory services to establish Road Safety Unit in the Public Enterprise was selected SAFEGE. They were also in charge for the Detailed Design of Measures for Road Safety Remediation.

iRAP road network survey and identification of black spots was carried out by AF-Cityplan.

### **Road Asset Management Equipment and Data Collection and Preparation of a Five-year Strategic Program**



Was carried out by JV IGEA with ROADSCANNERS OY and CESTEL LTD. The assignment will be completed by June 2020 and therefore the last two invoices will be paid from the proceeds of the Public Enterprise. Public Enterprise also purchased hardware for implementation of the RAMS software.

IMC Worldwide prepared the Climate Resilience Design Guidelines as a first step in preparation of future designs for construction and rehabilitation of roads.

Traffic counters for all national roads and mobile traffic counters were purchased and installed to collect data regularly for better planning of future activities of the Public Enterprise.

**Technical Assistance and Impact Analysis**

Beneficiary survey and impact analysis was carried out by BAR ECE and included all road sections that were rehabilitated.

Preparation of Climate Resilience Design Guidelines was executed by IMC Worldwide.

**FINANCIAL MANAGEMENT**

**Project Financing and Disbursement**

The following table describes the disbursement of funds for the project

*in EUR*

Description	Finance source	Loan number	Project amount	Disbursement for 30 September 2019	Undisbursed Balance
National and Regional Roads Rehabilitation Project	World Bank share	8420 - MK	52,000,000.00	51,695,358.30	304,641.70
	Total				

**PROCUREMENT**

**Procurement Management in the PIU**

Procurement arrangements at the project level were reviewed as part of project preparation. PESR was the implementing agency undertaking the procurement tasks for project administration and implementation. PESR has experience in implementing Bank funded projects, nevertheless, implementation of several other projects financed by international donors in addition to this Project, could have strained the technical and procurement capacity of the enterprise. Therefore, PMT was strengthened with one full time procurement consultant recruited on a competitive basis.

During the implementation period of the project, all procurement activities went smoothly with no major issues. In 2015 there was only one case of rebidding, as in the first attempt no responsive bidder



has applied. The Bank provided regular and useful support.

## **LESSONS LEARNT AND SUGGESTIONS**

### **Implementing Agency Performance**

Commitment of the Public Enterprise for State Roads to the project, and its Project Management Team, despite few changes of management during five years of implementation remained unchanged. The team, whose task was to implement the project, performed satisfactorily. The procurement and financial management, as well as other control and supervision arrangements have been generally considered adequate for the implementation of the project. PMT had also in place adequate financial accounting and reporting systems that provided timely and accurate financial information for project implementation.

### **World Bank performance**

The Bank has allocated sufficient resources from the time of project preparation through implementation and project closing date. This had enabled to identify preliminary needs and available options to ensure that activities proposed, and the approach adopted were closely aligned with needs and objectives of beneficiary. The Bank also engaged necessary technical expertise to assist the team in issues related to the technical aspects of the implementation, as well as other components of the project.

Sufficient number of supervision missions were provided by the Bank during project implementation. The aide memoires prepared at the end of each mission were informative and clear, as well as identified the issues that needed to be addressed before the next mission. The supervision missions were sympathetic to both the problems faced by PMT and the obstacles facing under other contracts.

Overall, the Bank's supervision performance is rated by Borrower as satisfactory.

### **Main lessons learned and suggestions**

The following are the lessons learned from this loan:

- The first round of 12 roads implemented through NRRRP had detailed designs prepared by local companies and budgeted through PESR funds. Due to some inconsistencies in the detailed designs during implementation phase some changes lead to increasing of the budget of some of the roads and extension of the period of execution of the construction works. Due to this reason the second round of 12 roads with the assistance of the World Bank team lead to a conclusion to first prepare conceptual designs (engagement of the international company) and preparation of the Bid documents with Performance and output-based Contract. After selection of the lowest evaluated responsive bidders, the performance was done in time and within the available budget. With this approach in future projects PESR will consider either to prepare conceptual designs and continue with Performance and output-based Contract or closely monitor preparation of detailed designs from our staff in cooperation with the revision committee.



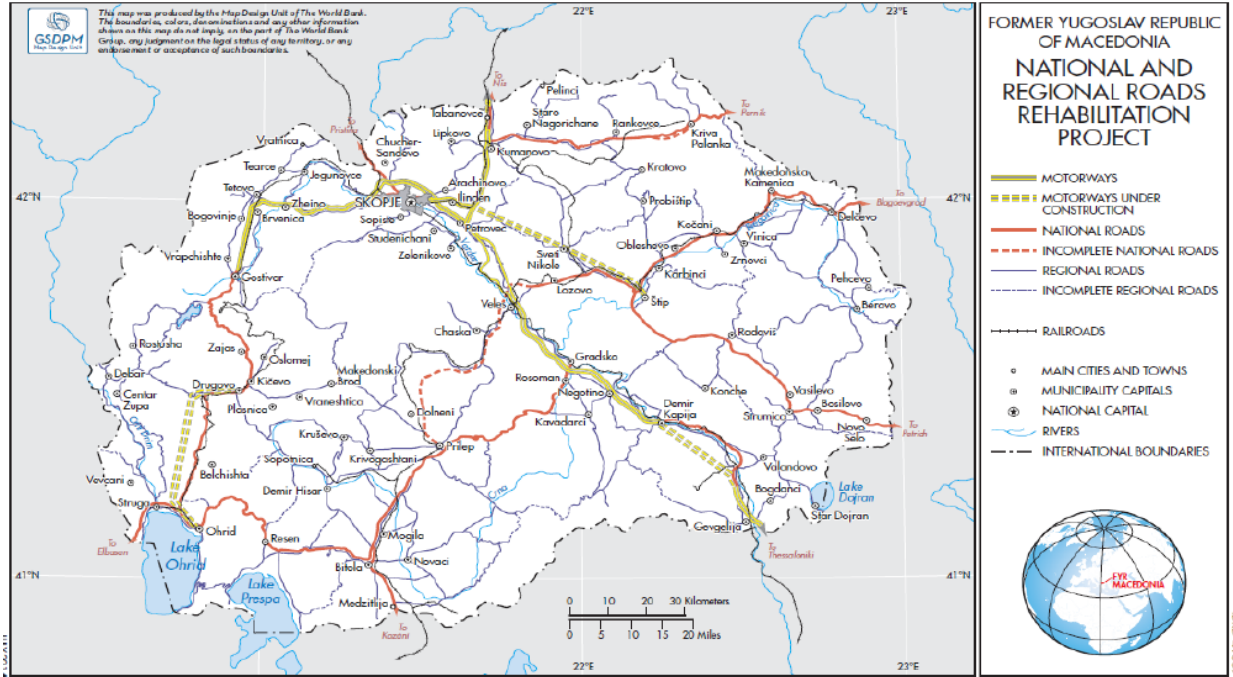


- RAMS – Road Asset Management System was a continuation process from the previous loan RLRPSP. The fully functional road asset management system plays a key role for prioritizing road investments and is closely related to the development of the bridge management system that shall be implemented through RUDP loan. With this system in place, PESR can better plan resources and funds for 1 or more years and prioritize roads that should be rehabilitated/reconstructed.
- Road Safety. Three sub-tasks are included for improving the road safety aspect for Macedonia: Road Safety Advisor (guidelines, manual, audits, on the job training) and advisory services to establish Road Safety Unit; iRAP road network survey and identification of black spots; and Road Safety Design of Black Spot Improvement. The main lesson learnt is that the Republic of North Macedonia through our institutions should closely work together to gather all necessary data (road crash data, black spot identification locations, iRAP surveys etc) and through a new agency or institution should start to train engineers for Road Safety Audit and Road Safety Inspection that shall then be certified by this agency/institution.
- Climate resilience design guidelines are already part of the new Terms of Reference for preparation of detailed designs that shall be implemented through PESR.



**ANNEX 6. Map of NATIONAL AND Regional Roads of North Macedonia**

**National and Regional Roads of North Macedonia**



Source: Project Appraisal Document for the NRRRP