JP CESTE FEDERACIJE BIH

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN FOR THE PROJECT OF THE CONSTRUCTION OF THIRD LANE FOR SLOW VEHICLES ON SECTION DONJI VAKUF 1- TURBE (M5)

September, 2018

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LIST OF ABBREVIATIONS

BH - Bosnia and Herzegovina
CFD - Central Feedback Desk
CSOP - Construction Site Organization Plan
EIB - European Investment Bank
EIA - Environmental Impact Assessment
EMP - Environmental Monitoring Program
ESMF - Environmental Social Management Framework
ESMP - Environmental and Social Management Plan
EP - Environmental Permit
FBH - Federation of Bosnia and Herzegovina
FMoET - Federal Ministry of Environment and Tourism
CBC - Central Bosnia Canton
IFI - International Financial Institutions
MP - Main project
MPCA - Management Plan in Case of Accidents
OP - Operational Policy of the World Bank
PAP - Project Affected Person

PPE - Personal Protective Equipment

PC Roads FBH - Public Company Roads of the Federation of Bosnia and Herzegovina

RAP - Resettlement Action Plan

RPF - Resettlement Policy Framework

TD - Tendering Documentation

TMP - Traffic Management Plan

WB - World Bank

WMP - Waste Management Plan

AEHS - Annual Environmental Health and Safety

EXECUTIVE SUMARY

INTRODUCTION AND OBJECTIVES OF THE ESMP

This Project of Construction of third lane for slow vehicles on major road M5, section Donji Vakuf 1 – Turbe (the Project) for which this ESMP is developed, is one of the sub-projects included in the group of sub-projects (Roads Modernization in FBiH) co-financed by the WB and EIB. The project of construction of the third lane on the major road *M-5*, section Donji Vakuf 1 – Turbe, is screened as a category B project according to the triggered Operational Policies OP 4.01 on Environmental Assessment of the WB as well as the screening procedure outlined in the project-specific ESMF. As such, this activity needs to have an ESMP developed, whereas pursuant to the local legislation this project does not require a water permit, an environmental assessment or an environmental permit - whether federal or cantonal. PC Roads FBH will ensure all required local permits for this Project are obtained.

LOCATION AND TRAFFIC DESCRIPTION

The projected third lane is situated on the main traffic direction of Donji Vakuf and Travnik municipalities, on the major road M-5, section Donji Vakuf 1 – Turbe. This road section is located in the central part of Bosnia and Herzegovina and connects Donji Vakuf with Travnik via the Turbe settlement. The area of reconstruction is located outside of the urban area of Donji Vakuf and Travnik, and no residential, public or commercial facilities are situated near the project. The section passes in a hilly-mountain area, covered with forests and low vegetation, which is rarely inhabited, mostly with abandoned buildings. The nearest relevant traffic count device on main road M5, located on the mountain Komar, less than two kilometers from the location of the project third lanes shows that, in 2016, the average annual daily traffic on the project location was 3109.

PROJECT DESCRIPTION

The total length of the considered section of the road is about 5 km long. It crosses the Komar mountain pass which is 930 m above the sea level and is the highest point of this section, and separates the Lašva river valley (tributary of Bosnia) from the Vrbas river valley. The existing route is a curved road with a lot of horizontal curves with small radius and serpentines. The existing width of the pavement is different and ranges from 2x3.00 m to 2x3.50 m, the width of the berm and the shoulder is about 80 cm. Drainage is solved by collecting rainwater with rigs and drainage pits, and by leaking this water through pipe culverts. There are visible surface damage of the pavement, which is largely cracked with many mesh cracks, uneven pavement. The road is rebuild only on small parts. Due to lack of

funds only two of the first proposed three stretches will be implemented in this subprojects stretch 1 and stretch 3 (referred as stretch 2 in this ESMP). These stretches are planned for the following M5 sections:

- km 12+190 to km 12+650, L=460m
- km 15+475 to km 16+735, L=1260m

BASELINE OF PARTICULAR INTEREST

The terrain of the Project is mostly hilly with an attitude in the range from 600 to 800 meters above sea level. Meteorological station in Komar, closest to the site of reconstruction, reports following data: the average multi-annual temperature is 7.4 °C, the warmest month is July, with an average perennial air temperature of 16.6 °C and the coldest month is January when the average perennial temperature is - 3.2 °C. The average rainfall measured at the same meteorological station, during multi-year period is 1001 mm per year. Judging by the location of the Project, it can be concluded that the highest air pollution refers to the traffic of the major road. Waters of the wider area belong to the Black Sea watershed. There are no surface watercourses in the project area, and no monitoring of noise levels near the Project area was conducted; therefore there is no available baseline data of the impact of the noise on the environment. The largest source of noise, in general, is traffic. Woodland, pastures and agriculture is the dominant land cover type covering large areas in the wider area of the third lanes according to the CORINE methodology. The location of the Project is not located within a protected area according to the Spatial Plan of FBiH and Spatial plan of Central – Bosnia Canton and Commission to Preserve National Monuments. There are also no recorded archeological findings in the observed area.

Since the sub-project is being implemented in two stretches, two municipalities are affected. Municipality Donji Vakuf where stretch one (km 12+190-12+650) is located, and The Municipality of Travnik where the second stretch lies (km15+475-16+735). The project area is located on the border between municipalities Travnik and Donji Vakuf and is uninhabited. Therefore, its significance is for the local community is low. However, the project's importance is reflected by connecting other municipalities, and their centers, Jajce and Donji Vakuf, to the cantonal capital as well as in the transit connection of north and south of the country.

IMPACTS DURING PRECONSTRUCTION

Socio economic impacts: this project envisages adding a third lane to two stretches of the existing road M5 on Section Donji Vakuf-Turbe and was part of the integrated RAP for 9 subprojects which was disclosed and publically consulted in March 2016. Project activities imply the expropriation of 5 publicly and 21 privately owned land plots.[1] The number of

[1] *The Prepared and disclosed RAP for 9 sub-projects included the implementation of 3 stretches under this sub-project. In the mean time, due to lack of funds, it has been decided that only two of the initially planned*

Project Affected People (PAP) is 14. According to integrated RAP the area affected on 13 private land plots is 10% or less of the total land area, 10%-26% of land is affected on 4 land plot, 20% - 26% of land is affected on 2 land plots, while 2 land plots are planned to be entirely expropriated (plot number 862 and 869). No structures or other assets have been detected on any of the affected land plots, and no economic nor physical displacement that is caused by the respective sub-project will take place during project implementation. Furthermore, no arable agricultural land is affected by the project. The walkover survey has been conducted on the 17th of December 2017 and it has been concluded that the public land necessary for the respective project activities, such as material and machinery storage, is not used in any way, neither formally or informally.

IMPACTS DURING CONSTRUCTION

The main impacts associated with the construction works include: emissions from the machinery used on site, dust generation from works, potential increases in noise and vibration levels, impact on soil from accidental leaks and spills, impact on geomorphology, soil quality and land use, and trafic safety impacts. The contractor is bound by the provisions of this ESMP to conduct a baseline of the biological and natural resources specific to the site, and to adapt the measures of the ESMP and their work performance based on such findings.

Impact on Traffic Safety and Traffic Flow

Traffic congestion and obstructions on the road - increased traffic load, leading to congestion and obstruction is likely to be experienced on local roads and on major roads (M5).

Socio-economic impacts:

- At this time, it is not expected that it will be necessary to temporarily occupy any privately or publicly owned land plots for lodging machines and disposal of materials. Machines and materials will be disposed on land owned by the Investor.
- New business opportunities are expected to be created for local businesses such as transporters, suppliers and other service providers.
- Although the project area is uninhabited, following adverse impacts during construction are expected: Noise increase, Inappropriate disposal of construction waste, Local businesses can be affected in means of late delivery of goods and products.

MITTIGATION MEASURES

The mitigation measures focus on the major identified impacts during pre-construction and construction works, such as emissions from the machinery used on site, dust generation from works, potential increases in noise and vibration levels, impact on soil from accidental

three stretches are to be implemented (mentioned in chapter 4. Project Description). The data given in this ESMP refers to the two stretches that are to be implemented.

leaks and spills, impact on geomorphology, soil quality and land use, trafic safety impacts, waste management, impacts on living conditions and impacts on local traffic. Mitigation measures concerning land acquisition envisage the implementation of the integrated Resettlement Action Plan (ARAP).

ENVIRONMENTAL MONITORING PROGRAM

The monitoring measures focus on the major identified impacts during pre-construction and construction works, such as emissions from the machinery used on site, dust generation from works, potential increases in noise and vibration levels, impact on soil from accidental leaks and spills, impact on geomorphology, soil quality and land use, trafic safety impacts, waste management, impacts on living conditions and impacts on local traffic.

IMPLEMENTATION AND REPORTING

PC Roads FBH is the implementer of the project and will be responsible for the implementation and compliance of the project in line with ESMP. The Contractor will be responsible for the implementation of the environmental mitigation measures during construction.

PUBLIC DISCUSION AND INFORMATION DISCLOSURE

Public consultation of the subject ESMP will be organized in Travnik and/or Donji Vakuf after the WB and PC Roads FBH approve the draft of the ESMP. The record on public discussion, that is, grievances presented at the public discussion shall be recorded in the Grievance Register, and opinions and suggestions of the public shall be integrated into the final ESMP. The results of the public consultation will be incorporated into the final ESMP.

Grievance Mechanism

Besides the institutionally available ordinary and extraordinary legal remedy, and existing institutional channels, PC Roads FBH will ensure and form a special Grievance Redress Mechanism in collaboration and direct involvement of those municipalities under whose administrative authority the project is carried out, in this case with the Municipality of Travnik and Donji Vakuf.

Requirements for start of works

The Contractor shall establish all required baseline data before the commencement of works. The Baseline – Monitoring data shall include air quality data, soil quality data, survey and analysis of vegetation cover prior to the beginning and upon completion of works on construction site. The Contractor shall develop a Construction Site Organization Plan (CSOP) that is made up of Implementation Plan of this ESMP, a detailed Waste Management Plan (WMP), Study on Safety (includes Elaborate on Safety at Work and Elaborate on Protection From Fire and Explosions), Traffic Management Plan (TMP) must be developed, which will be created by the Contractor prior to the beginning of construction works. As for social aspects

the requirements for start of work include, public consultations the implementation of the integrated RAP, payment of compensation in accordance to the integrated RAP.

1. INTRODUCTION

Based on the guidance and requirements from the Environmental and Social Management Framework[2] this site-specific Environmental and Social Management plan (ESMP) has been prepared.

The Public Company Roads of Federation of Bosnia and Herzegovina (further in the document referred to as PC Roads FBH) has initiated an overarching program for the project "Modernization of Major roads in the Territory of the Federation of Bosnia and Herzegovina" (The Program) to ensure appropriate road infrastructure by 2020. For this purpose, it has been requested from the Government of the FBH to ensure credit funds from international finance institutions (IFI).

In the framework of the abovementioned umbrella Program, the Public Company "Roads of FBH" (PC Roads FBH), a limited liability company wholly owned by the Government of FBH, has initiated the FBH Road Sector Modernization Project. FBH filed an application for a credit/loan from the European Investment Bank (EIB) and from the World Bank (WB) in total amount of 103,38 million EUR for funding abovementioned Project.

FBH Road Sector Modernization Project comprises several small and mid-sized investment schemes including:

1. This component includes reconstruction of roads:
    - Construction works for completion of the construction of major road M17.3 Neum–Stolac (in total 32,9 km);
    - Construction of third lanes for slow vehicles (in total 40 km on 8 sections of major roads);
    - Reconstruction of roadway, correction of axes (in total 18 km on 5 sections of major roads, where a correction of axes is to be done on one section only in the length of 1 km),
    - Reconstruction of 3 tunnels (with a total length of 1,86 km);
    - Reconstruction of 7 bridges (with a total length of 0,55 km).

[2] *ESMF has been disclosed and available to the public in local language on the website of PC Roads FBH in March 2016., http://jpcfbih.ba/bs/aktivnosti/modernizacija-magistralnih-cesta/38,*

2. Interventions on improving road safety: The reconstruction of intersections, which are classified as "black spots" on major roads, in total 9;
3. Institutional reforms: Road Management in the FBH with a particular focus on sustainability of investments and road safety;
4. Project Implementation Support: Construction supervision and capacity building of the PC Roads FBH.

This Project of Construction of third lane for slow vehicles on major road M5, section Donji Vakuf 1 – Turbe (the Project) for which this ESMP is developed, is one of the sub-projects included in the group of sub-projects co-financed by the WB and EIB.

2. METHODOLOGY AND OBJECTIVES OF ESMP

The project of construction of the third lanes on the major road M-5, section Donji Vakuf 1 – Turbe, is screened as a category B project according to the triggered Operational Policies OP 4.01 on Environmental Assessment of the WB as well as the screening procedure outlined in the project-specific ESMF. As such, this activity needs to have an ESMP developed, whereas pursuant to the local legislation this project does not require a water permit, an environmental assessment or an environmental permit - whether federal or cantonal[3]. PC Roads FBH will ensure all required local permits for this Project are obtained.

This ESMP aims at identifying all of the potential environmental and social impacts associated with this project activity. As such, the ESMP includes mitigation measures for all identified potential impacts that are to be undertaken throughout the different phases of the project including preparation, implementation and operation of the facilities. The measures set forth in this ESMP are meant to avoid, neutralize or diminish adverse environmental and social impacts if not completely then to a satisfying level.

ESMP identifies feasible and cost-effective measures which can reduce potentially negative impacts on the environment and society to an acceptable level. If mitigation measures are not possible, profitable or sufficient, compensation should be included as the last measure.

In order to ensure the mitigation measures have been implemented, fully or partially, the ESMP sets forth a monitoring plan to be implemented during the specific stages of project preparation/designing and implementation. Monitoring during project preparation and implementation provides information on the key environmental and social aspects of the

[3] *In FBH investments requiring EIA are identified by the Regulation on Plants and Facilities Subject to Obligatory Environmental Impact Assessment, and Facilities Which May be Constructed and Commissioned Only if Granted Environmental Permit (Official Gazette of FBiH No. 19/04). In Central Bosnia Canton investments requiring an EP are regulated by Regulation on Activities, Plants and Facilities Which May be Constructed only if Granted Environmental Permit (Official Gazette of CBC, No. 5/06).*

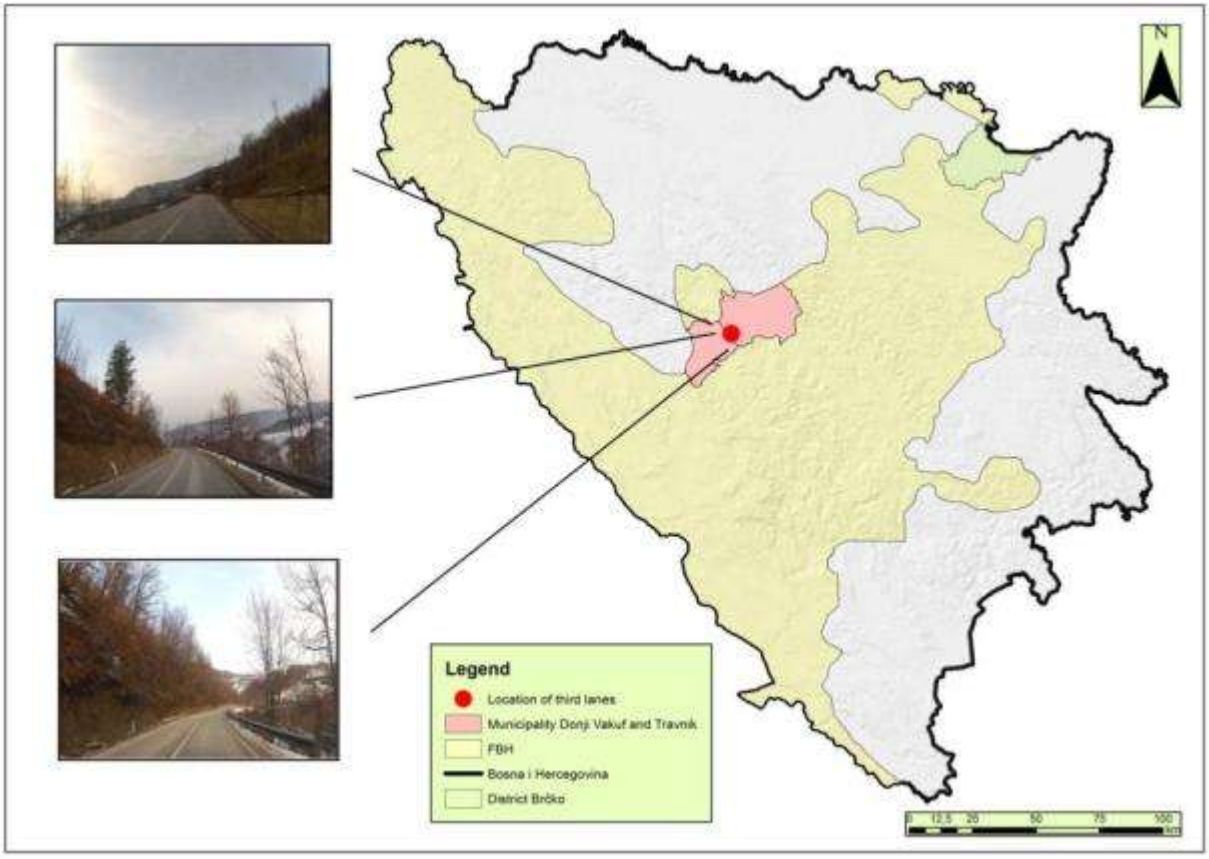
project, particularly on the environmental and social aspects of the project and efficiency of mitigation measures. Prior to commencement of works, in accordance with requirements of the ESMP, and a minimum of monitoring requirements, described in this ESMP, without limitation to these requirements, the Contractor shall prepare detailed list of mitigation measures and parameters to be monitored.

3. LOCAL DESCRIPTION

The projected third lane is situated on the main traffic direction of Donji Vakuf and Travnik municipalities, on the major road M-5, section Donji Vakuf 1 – Turbe. This road section is located in the central part of Bosnia and Herzegovina and connects Donji Vakuf with Travnik via the Turbe settlement.

The major road M-5 connects the international border crossing Izačić near Bihać in the northwest of the country and Višegrad in the east of BH. In addition, the major road M-5 is part of the international E-road network E761 that connects Bihać in Bosnia and Herzegovina and Zaječar in Serbia.

Figure 1: The geographical location of the project



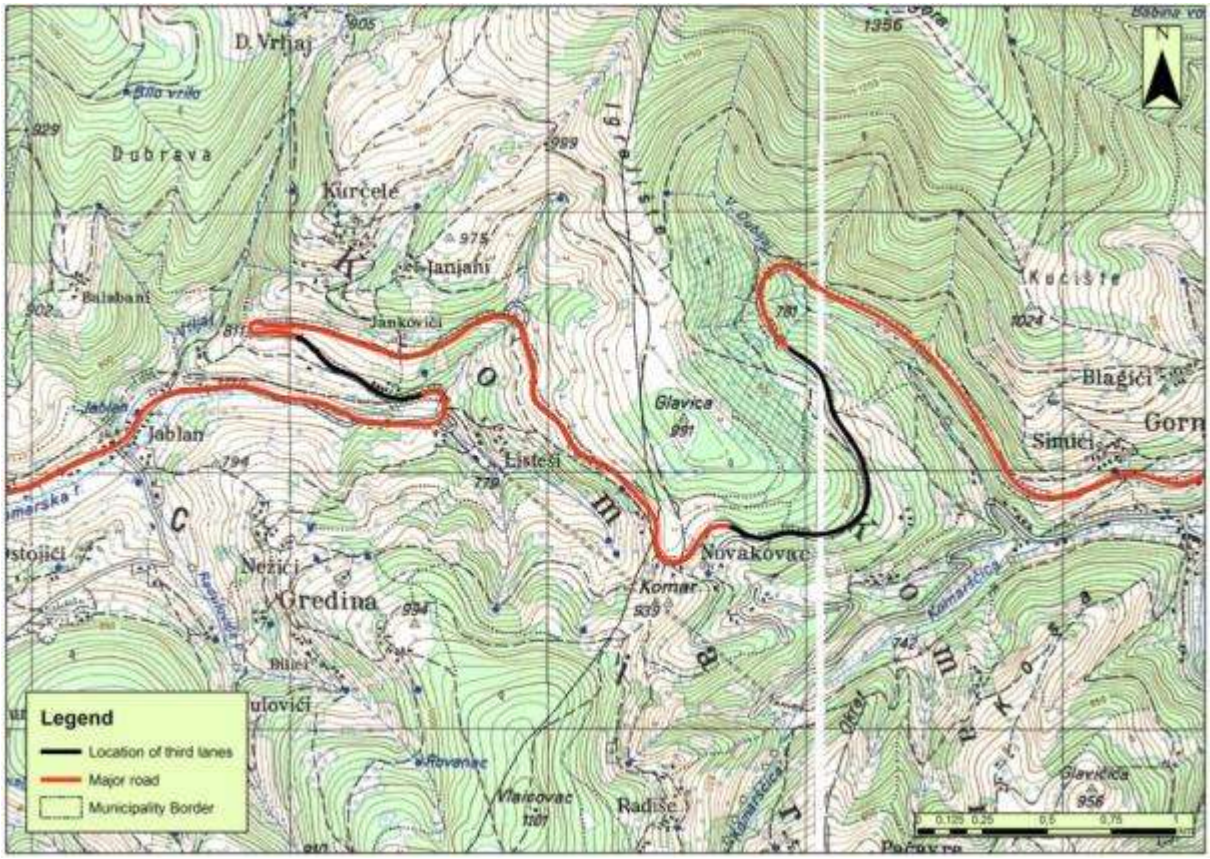
Source: PC Roads Federation of BH

The area of reconstruction is located outside of the urban area of Donji Vakuf and Travnik, and no residential, public or commercial facilities are situated near the project. The section passes in a hilly-mountain area, covered with forests and low vegetation, which is rarely inhabited, mostly with abandoned buildings.

Along the route there are several buildings that are mostly abandoned, with no permanent population. Before the Komar mountain pass, from the direction of Donji Vakuf there is a winter road service. Other objects on the route are supporting walls that prevent the soil from slipping or sloping below the road. Along of the route there are several places with extension and parking areas for vehicles.

This section of the major road M5 is used as a transit since it lies on the most important direction to the capital city of Sarajevo from the direction of the Una – Sana Canton and Central Bosnia Canton. This area is hilly and predominantly mountainous, and the main road M5 is the best choice for traffic between the mentioned parts of Bosnia and Herzegovina.

Figure 2: Lookup Map of Wider Area with the Project Location

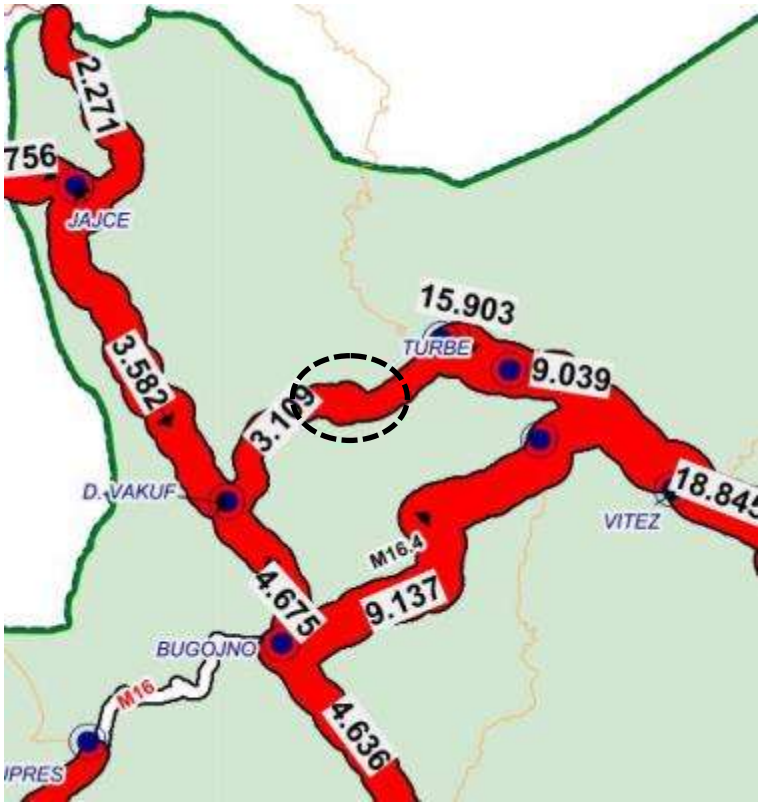


Source: PC Roads Federation of BH

3.1. TRAFFIC DATA

PC Roads FBH has installed automatic traffic counting devices along the main traffic network throughout FBH. Automatic traffic counting is done since the 2005 and, last report[4] was published in 2017 with data for the previous year. The nearest relevant traffic count device on main road M5, located on the mountain Komar, less than 2km down the road, west from the start of the first stretch of the project third lanes shows that, in 2016, the average annual daily traffic on the project location was 3109 (*Figure 3*). This number increases to 3714 in during the summer.

Figure 3: AADT in 2016



Source: PC Roads FBH, 2017

By the request of PC Roads FBH, traffic prognosis for the traffic network was developed by IPSA Institute Sarajevo in 2014[5] for the period 2013 to 2040. Analysis of the traffic flow was made for every year by applying "equilibrium" procedure. For this particular section, the amount of predicted annual average daily number of vehicles is shown in the *Table 1* below.

[4] *"Traffic count on major roads in Federation of BiH in 2016", PC Roads Federation BiH, Sarajevo 2017*

[5] *„Justification studstudy for modernization of major roads in FBiH programme",IPSA Institute Sarajevo, 2014*

Table 1: Traffic prognosis for M5, section Donji Vakuf North-Turbe

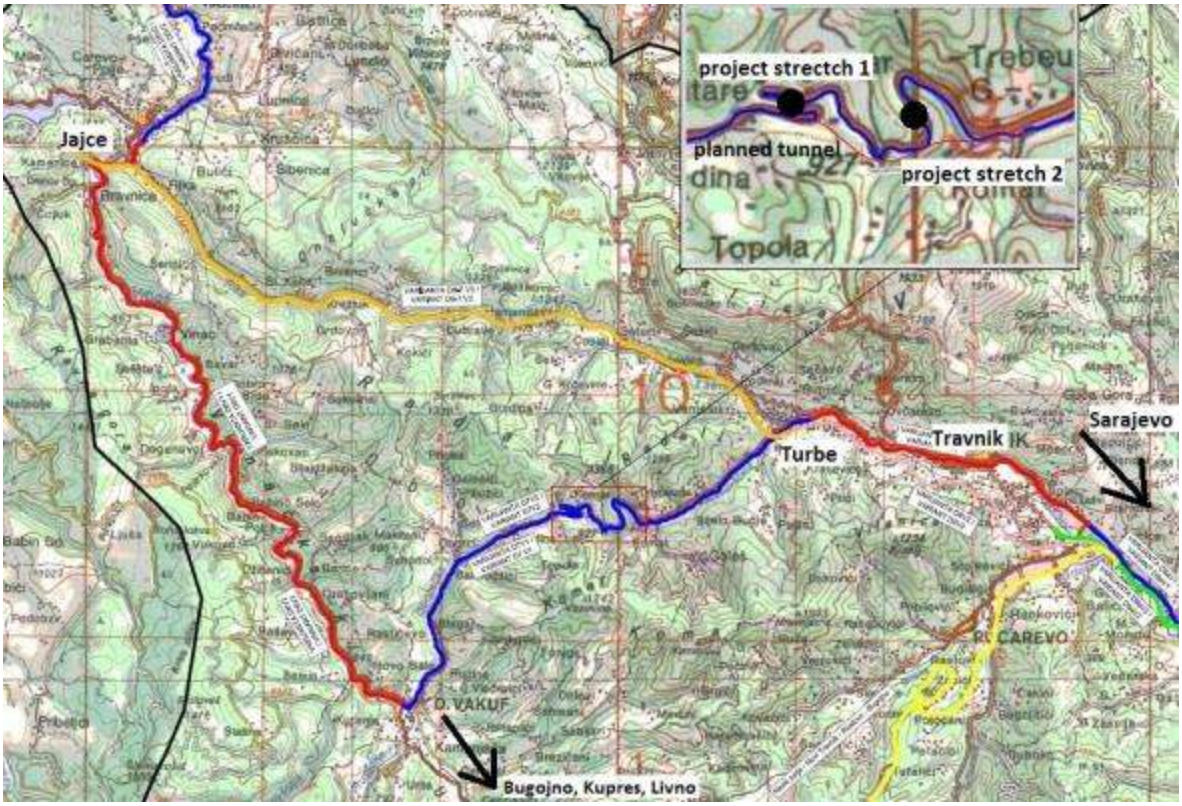
Major road	Section name	AADT								
		2018	**2020**	**2022**	**2023**	**2025**	**2030**	**2035**	**2037**	**2040**
M 5	Donji Vakuf North-Turbe	2625	2644	2818	2880	159	180	201	209	221

Source: Feasibility Study for Betterment Program of Trunk Roads in FBH, PC Roads FBH, 2014

Table 1 depicts that the predicted number of vehicles for the period from 2018 to 2023 has already been overcome. After 2023 a rapid decrease of the AADT has been predicted. This is due to the fact that a high speed road was planned in the vicinity of the project location has been took into consideration The referred Feasibility Study for Betterment Program of Trunk Roads in FBH was completed in 2014. At that time, as a part of the planned high speed road, a Tunnel under the Mountain Komar was planned (The enlarged section on figure 4, red line). Since that time, the design was changed as depicted on figure 4 (dark yellow route), leaving the route of the high speed road far from the town Donji Vakuf. A feasibility study for the new design of the high speed road has not been developed, thus the predictions for the AADT after the completion of the high speed road have not been updated.

Having such changes in mind, it is obvious that the Project of the Construction of a third lane on the section Donji Vakuf—Turbe will benefit the population of the towns of Donji Vakuf, Bugojno and even Kupres and Livno in the south-west of the country, in terms of better and faster connections to the future high speed road.

Figure 4: Route of the planned high speed road



Source: PC Roads FBH, 2018

4. PROJECT DESCRIPTION

Main road M5, section Donji Vakuf-Turbe, is located in the central part of Bosnia and Herzegovina and connects Donji Vakuf with Travnik via the Turbe settlement. This section is also a connection between the main road Sarajevo - Zenica with the western parts of Bosnia and Herzegovina. The total length of the considered section of the road is about 5 km long. It crosses the Komar mountain pass which is 930 m above the sea level and is the highest point of this section, and separates the Lašva river valley (tributary of Bosnia) from the Vrbas river valley.

The section passes through a hilly-mountain area, covered with forests and low vegetation, which is rarely inhabited. By visual inspection of the terrain surface, soil material mixed with stone material was registered. The ground floor is a rock mass that is visible in certain locations where are rocks without an earthen cover on the surface of the ground there.

Along the route there are several houses that are mostly abandoned, with no permanent population. Before the Komar mountain pass, from the direction of Donji Vakuf there is a winter road service. Other objects on the route are supporting walls that prevent the soil

from slipping or sloping below the road. The slopes of the terrain are steep and there are several potential landslides, which are visible by the odor of the surface layers of the soil, and the sloping trees in the direction of landslides. The details have been elaborated in the geological-geomechanical elaborate.

Along of the route there are several places with extension and parking areas for vehicles.

4.1. Existing Road

The existing route is a curved road with a lot of horizontal curves with small radius and serpentines. From the direction of Donji Vakuf the considered M5 section is constantly rising from 4-5% to Komar mountain pass in km 15 + 200 (930 m nm / convex rounding Rv = 2500 m), followed by a constant drop of 4-6% in the direction of Turbe or by the end of the section in km 17 + 000. The existing width of the pavement is different and ranges from 2x3.00 m to 2x3.50 m, the width of the berm and the shoulder is about 80 cm. Drainage is solved by collecting rainwater with rigs and drainage pits, and by leaking this water through pipe culverts.

The route is mostly in the incision, or on one side in the notch, and on the other in the embankment. Horizontal and vertical road signaling is set on the route, and a protective steel fence is installed on most parts of the section. There are visible surface damage of the pavement, which is largely cracked with many mesh cracks, uneven pavement. The road is rebuild only on small parts.

4.2. New design

Due to lack of funds only two of the first proposed three stretches will be implemented in this subprojects stretch 1 and stretch 3 (referred as stretch 2 in this ESMP). These stretches are planned for the following M5 sections:

1. **km 12+190 to km 12+650:**

-The lane is on the rise of 4-6% from the direction of Donji Vakuf in the direction of Turbe

-The lane is designed in the notch on the right side of the existing route.

Figure 4: Location of the slow lane

Source: Main design, Trafficon

-The length of this section is 460 m and consists mainly of two left and two right curves of radius 180, 200, 160 and 210 m. The slope of the terrain along the existing road is too steep, which is visible on the odor of the surface areas of the ground, while the extension for the third lane should be foreseen with lighter slope.

On the right side of the notch between the chainage 12 + 230 to the km 12 + 588, a reinforced-concrete support wall is designed.

2. **km 15+475 to km 16+735:**

-The lane is on a downhill of 2,3-6,9% from the direction of Donji Vakuf in the direction of Turbe.

-The lane is planned in the notch on the left side of the existing route.

Figure 5: Location of the slow lane

Source: Main design, Trafficon

-The length of this section is 1260 m. At the beginning there are 3 short curves of radius 100, 125 and 190 m, followed by three consecutive left curves of radius 200, 180

and 400 m. The section ends with a mild „S“ curve of radius 250, 180 and 330 m. The section fall is 2, 3% at the beginning, over 6.5% in the middle to 6.9% at the end of the section. There are also places with steep slopes that should be shaped as a sligter slopes.

- On the left side of the notch there are designed three supporting walls made of concrete gabions at locations: from km 15 + 819 to km 16 + 231, from km 16 + 248 to km 16 + 422, from km 16 to 475 to km 16 + 731. It is also planned to install geomesh according to the recommendation from the geological geomechanical elaborate on the left notch side at a station of km 15 + 650 to km 15 + 890.

Technical Standards for extra lane for slow vehicle's:

1. The width of the lane for slow vehicle's is like the width of the traffic line 3.25 m,
2. Cross slope of the lane for slow traffic is the same as the traffic lane.
3. Two consecutive lane for slow vehicle's (if this case appears) should be connected to each other if their distance is less than 300 m.

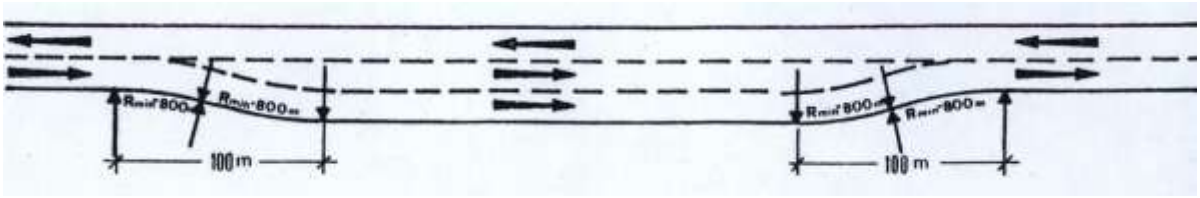
   Planned three lane for slower traffic are at a greater distance of 300m.

4. The minimum length of the transition step is 60 m

   The projected length of the transition is 80 and 100 m.

For the design of lane for slow traffic, the above-mentioned regulations were used, namely for the lane for slow traffic on a two-lane road with traffic in both traffic directions.

Figure 6: Technical standards for slow lanes



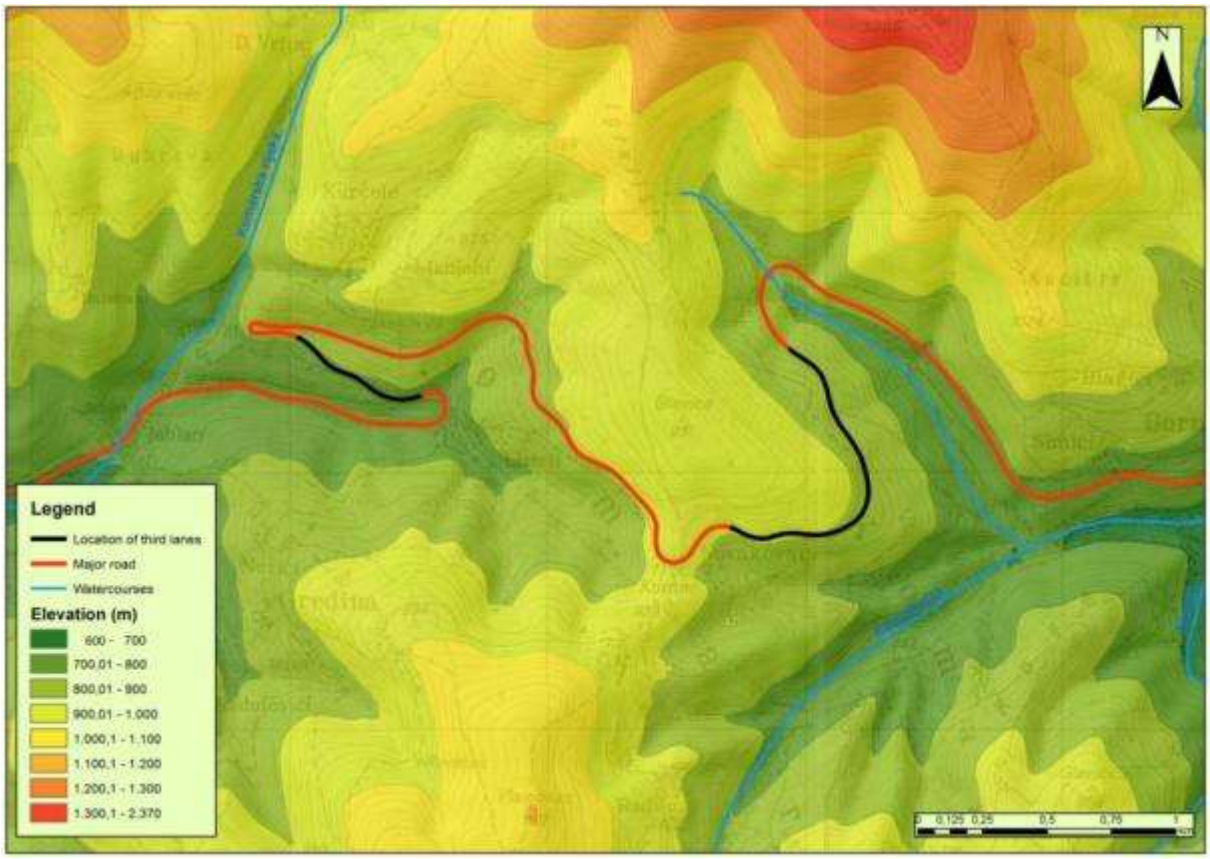
Source:Main design, Trafficom

5. BASELINE OF PARTICULAR INTEREST

5.1. GEOGRAPHIC CONDITIONS

The terrain of the Project is mostly hilly with an attitude in the range from 600 to 800 meters above sea level. In the wider area the altitude goes up to 1400 meters above sea level, as indicated in the next figure. From stratigraphic – petrographical point of view this area is composed from stable and waterproof rocks, and from structural geomorphological point of view this type of relief belongs to fluvial – denudational type of morphostructure. Hydrogeological complexes are mostly without aquifers.

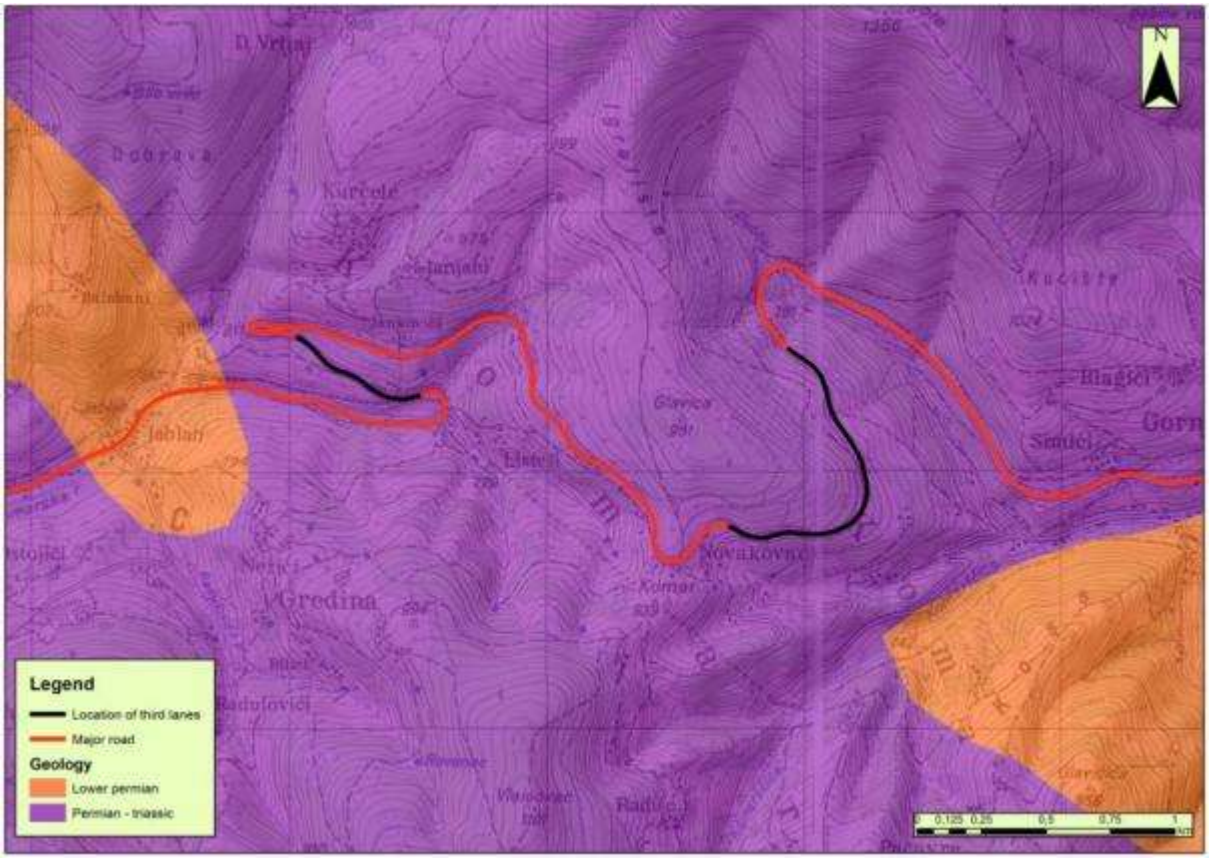
Figure 7: Geographical Map of Wider Area with the Project Location



Source: PC Roads Federation of BH

The geological structure of the area of reconstruction is characterized by Permian – Triassic sediments represented by clastic facies: sandstones, slate rocks, conglomerates, amphibolites, quartz sandstones, tuff rocks, limestone and magmatites.

Figure 8: Geologic Map of the wider area of the Project



Source: Draft of Spatial plan of FBiH 2008.-2028.

5.2. CLIMATE FEATURES

Climatic features of subject area are determined by the thermal and pluviometric regime, and therefore it is necessary to define its basic parameters, using climatological monitoring and a detailed analysis of the same. It can be said that this area is under the influence of the moderate continental climate or moderately warm and humid climate type (Cfb climate according to Köppen climate classification), while the higher zones are characterized by subalpine and alpine climate (areas over 1000 meters above sea level).

Meteorological station in Komar, closest to the site of reconstruction, reports following data: the average multi-annual temperature is 7.4 °C, the warmest month is July, with an average perennial air temperature of 16.6 °C and the coldest month is January when the average perennial temperature is - 3.2 °C.

Table 2. Average temperature and precipitation for the multi-year period

Month	*I*	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*	*IX*	*X*	*XI*	*XII*	*Avrg./Summ.*
Temperature(°C)	*-3,2*	*0,4*	*2,8*	*6,5*	*11,5*	*14,2*	*16,6*	*16,5*	*12,5*	*8,5*	*2,7*	*0*	*7,4*
Precipitation (mm)	*67*	*61*	*83*	*88*	*102*	*131*	*71*	*59*	*82*	*102*	*79*	*76*	*1001*

Source: Federal Hydrometeorological Institute, Sarajevo

The average rainfall measured at the same meteorological station, during multi-year period is 1001 mm per year. The rainiest month is June, when the average precipitation is 131 mm. The least precipitation occurs in August, only 59 mm on average. This area stands out by the amount of snow cover during the year, and also by the duration of snow cover which lasts 30 days longer than in the valleys. The area has a cool climate (average annual temperature 7,4 °C) characterized by high atmospheric humidity and much harsher winters than in the valleys, so it is suitable for the occurrence of icy conditions on roads.

5.3. AIR QUALITY

No particular monitoring of air quality for this location was performed, neither for the area. Judging by the location of the third lanes, it can be concluded that the highest and the only air pollution refers to traffic of the major road, while there are no other major air polluters near the bridge. As well in the wider area, there are no significant air polluters.

There are no data on air quality on this particular location, but based on geographical features and the fact that there are no significant polluters, and the only polluter is the road traffic in the wider area it can be considered that the air quality is good. The Contractor shall conduct a baseline measurement for air quality monitoring prior to the start of works.

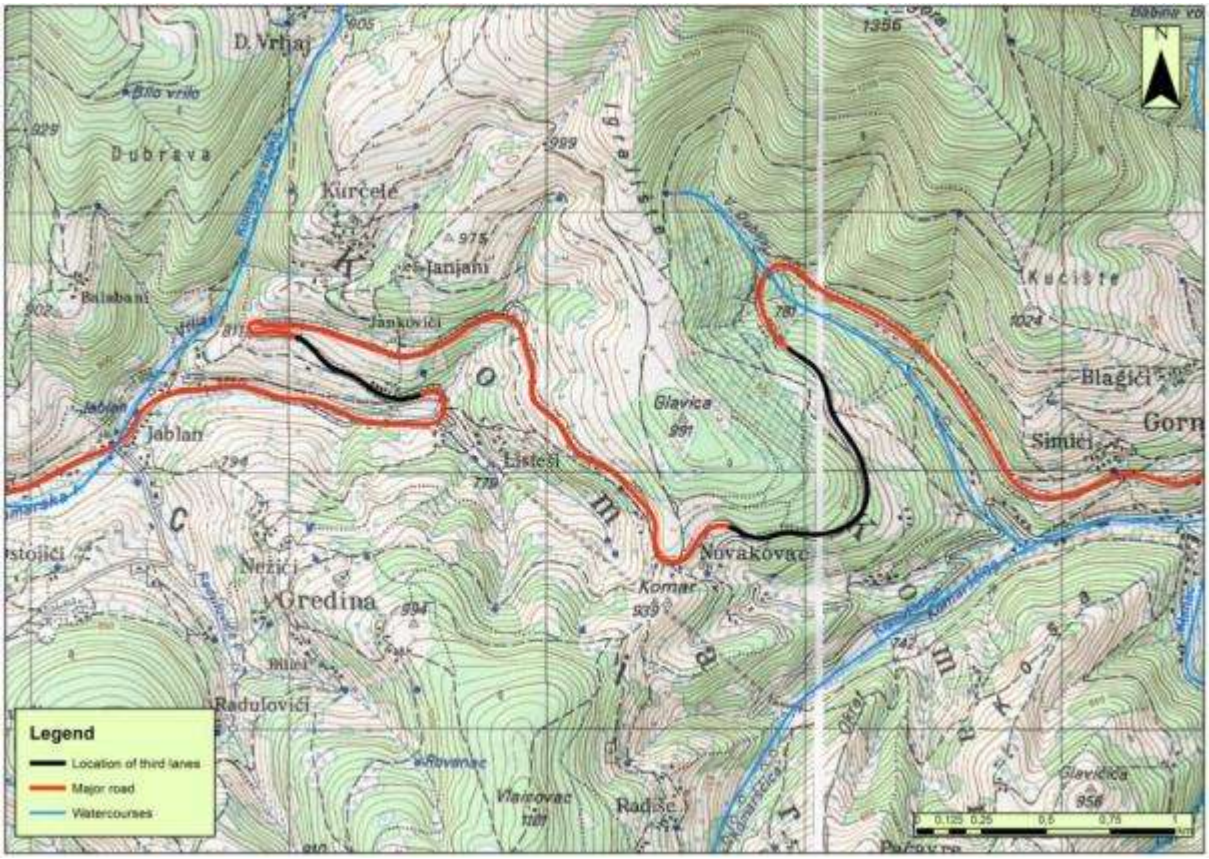
5.4. WATER AND WATER QUALITY

Waters of the wider area belong to the Black Sea watershed. There are no surface watercourses in the project area.

Near the locations of third lanes (app. 500m), we can find only a few streams like Veliki Dubljaj, Komarščica and Komarska river. There is no hydrological monitoring of these watercourses at the Project area.

The watercourses are threatened by human activities such as transport, agriculture, non-sanitary waste disposal and discharging untreated wastewaters from the housing facilities in the area.

Figure 9: Hydrographic Map of the wider area of the Project



Source: PC Roads Federation of BH

5.5. NOISE LEVELS

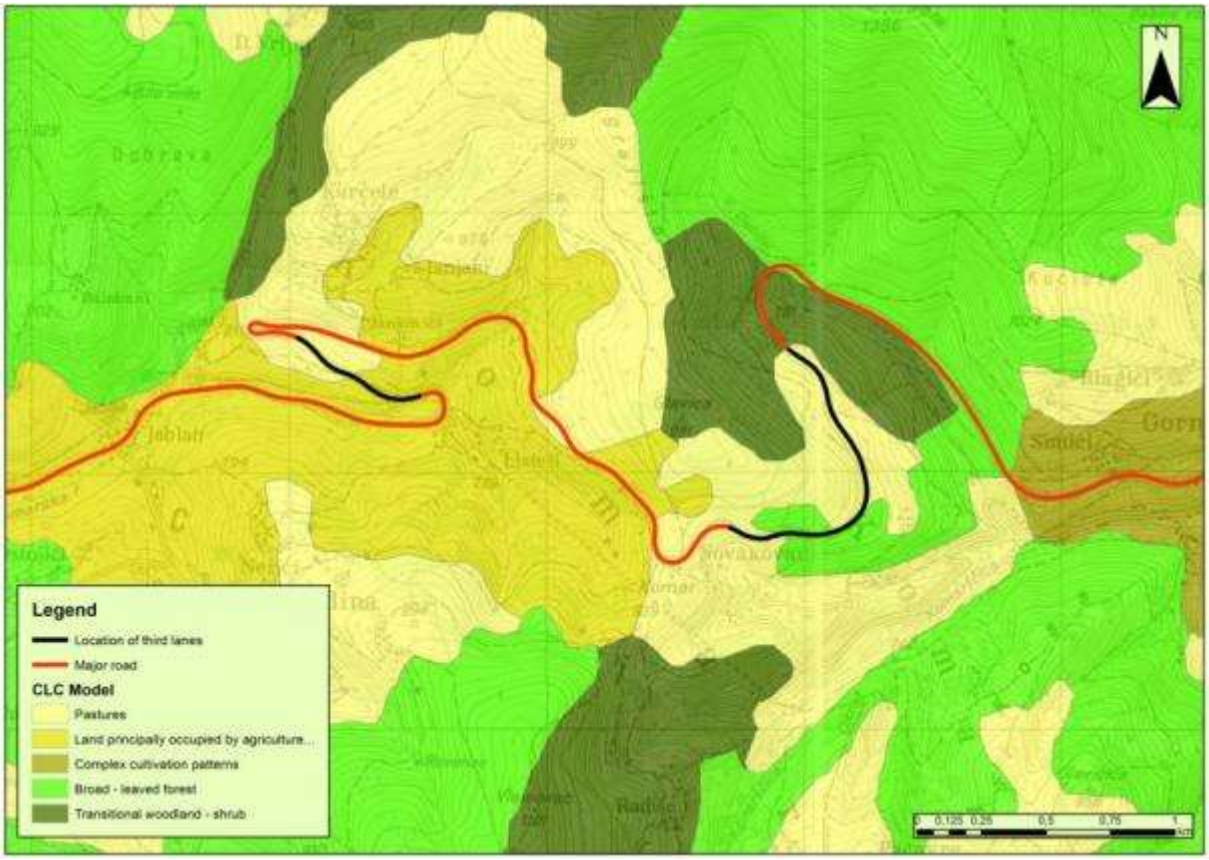
There was no monitoring of noise levels near the Project area; therefore there is no available baseline data of the impact of the noise on the environment. The largest source of noise, in general, is traffic.

In close proximity to the Project area, , there are no facilities for residential (houses) and business purposes (stores), and according to the Law on Noise Protection, they fall under the sixth zone, where allowed noise levels are 70 dBA during day and 70 dBA at night. There are no sensitive receptors (hospitals, health resorts etc.) around the area that could be impacted by an increased noise level.

5.6. LAND AND LAND USE

Woodland, pastures and agriculture land is the dominant land cover type covering large areas in the wider area of the third lanes according to the CORINE methodology[6]. There are no residential or any other objects near the bridge. No land of high importance is located in close vicinity of the site.

Figure 10: Land use in the wider area of the project according to CORINE model



Source: Coordination of information of the Environment, European Environment Agency

[6]Coordination of information of the Environment - **European Environment Agency**

The Project area is located outside of the urban area of Donji Vakuf and Travnik. The section passes in a hilly-mountain area, covered with forests and low vegetation, which is rarely inhabited, mostly with abandoned buildings. Along the route there are several buildings that are mostly abandoned, with no permanent population. Before the Komar mountain pass, from the direction of Donji Vakuf there is a winter road service.

5.7. FLORA AND FAUNA

The area of Central Bosnia Canton where the municipalities Travnik and Donji Vakuf are located, with geographic features of the terrain and large variety of ecosystem, it is considered that in the wider area reside over 4000 species of vascular plants many of which are endemic and relict, and more than 200 species of birds and other elements of the biodiversity.

There is no exact data on the flora and fauna for the particular location of the Project, but based on the fact that this is an existing road section, the risk to the flora and fauna is minimal. However the Contractor shall hire a biologist to conduct a review of the site for the baseline that needs to be prepared for monitoring prior to the start of works.

5.8. PROTECTED AREAS

There are neither protected areas nor cultural-historic heritage near the project area according to Spatial plan of FBH, Spatial plan of Central – Bosnia Canton and Commission to Preserve National Monuments. There are also no recorded archeological findings in the observed area.

5.9. POPULATION AND SETTLEMENTS

Since the sub-project is being implemented on two stretches, two municipalities are affected. Municipality Donji Vakuf where stretch one (km 12+190-12+650) is located, and the Municipality of Travnik where the second stretch lies (km15+475-16+735).

The municipality Donji Vakuf is populated by 13 985 people according to the population census from 2013. The area of the municipality is 320 km^2, thus making the population density equal 43,7 people per square kilometer. The municipality has 64 settlements and 16

local communities. Education in the municipality rests on 4 primary schools and 1 high school, while only primary health care is available.

The municipality Travnik has a population of 57 543 people living in the area of 529km^2. The population density is 102,9 people per km^2 which is considerably higher than the cantonal and Federation BH average. The municipality has 90 settlements and 34 local communities. The municipality of Travnik has eleven primary schools, six high schools and three private universities, which makes Travnik a university center of the region. As for the health care system, both primary and secondary health care are present in Travnik.

Travnik is the capital of the Cental Bosnian Canton making it the educational, administrative, health and economy center. Thus, Travnik has immense significance for municipalities and local communities in the region, such as Jajce, Donji Vakuf, Bugojno, Busovača, Dobretići, Gornji Vakuf, Vitez, Kiseljak, Kreševo, Novi Travnik, Fojnica and particulary Donji Vakuf. The towns (which are also municipality centers) Jajce and Donji Vakuf are connected to Travnik (the Cantonal center) through the use of the project road.

The project area is located on the border between municipalities Travnik and Donji Vakuf and is uninhabited. Therefore, its significance is for the local community is low. However, the project's importance is reflected by connecting other municipalities, and their centers, Jajce and Donji Vakuf, to the cantonal capital as well as in the transit connection of north and south of the country.

Figure 11.The distances of slow lanes from inhabited areas

Source: PC Roads Federation of BH

6. DESCRIPTION OF POSSIBLE IMPACTS DURING PRE-CONSTRUCTION, CONSTRUCTION, OPERATION AND MAINTENANCE

6.1. IMPACTS DURING PRE-CONSTRUCTION

Socio-economic impacts

Land acquisition process: this project envisages adding a third lane to two stretches of the existing road M5 on Section Donji Vakuf-Turbe and was part of the integrated RAP[7] for 9 subprojects which was disclosed and publically consulted in March 2016. Project activities imply the expropriation of 5 publicly and 21 privately owned land plots. The number of Project Affected People (PAP) is 14.

Land acquisition process for public land is in fact administrative transfer of ownership since previous owner has no claims and no compensation will be paid.

On table 3 an overview of the affected private plots is depicted as an excerpt from the Census done during preparation of the integrated RAP.
According to table 3 the area affected on 13 private land plots is 10% or less of the total land area, 10%-20% of land is affected on 4 land plot, 20% - 26% of land is affected on 2 land plots, while 2 land plots are planned to be entirely expropriated (plot number 862 and 869)
No structures or other assets have been detected on any of the affected land plots.

Furthermore, none of the affected land plots are being used for agricultural purposes and no economic displacement will take place.
It is to be noted that neither physical displacement nor permanent access restrictions have been identified on this project.

The walkover survey has been conducted on the 17th of December 2017 and it has been concluded that the public land necessary for the respective project activities, such as material and machinery storage, is not used in any way, neither formally or informally.

[7] *Document available at http://jpcfbih.ba/assets/upload/dokumenti-modernizacija/akcijski_plan_preseljenja_za_pod.pdf*

Table 3: Excerpt from the RAP Census (inventory of impacted private parcels)

No.	Location (section)	Cadastral Municipality	Land plot no.	Type of impact	Category	Total area of plot (m2)	% affected	Structure (commercial or residential)	Other assets (natural objects)	Other assets (auxiliary structures)	Economic / physical displacement
1	Komar - section 1	Donji Vakuf, Komar	837	Part of land	Land plot	1096,00	8,03	No	Trees, grass	No	No
2			839	Part of land	Land plot	831,00	0,84	No	Trees, grass	No	No
3			844/2	Part of land	Land plot	2911,00	11,34	No	Trees, grass	No	No
4			844/1	Part of land	Land plot	3500,00	11,26	No	Trees, grass	No	No
5			847	Part of land	Land plot	3374,00	9,28	No	Trees, grass	No	No
6			857	Part of land	Land plot	456,00	25,22	No	Trees, grass	No	No
7			858/2	Part of land	Land plot	111,00	12,61	No	Trees, grass	No	No
8			861	Part of land	Land plot	724,00	4,83	No	Trees, grass	No	No
9			862	Part of land	Land plot	382	100,00	No	Trees, grass	No	No
10			867/1	Part of land	Land plot	703	6,12	No	Trees, grass	No	No
11			869	Part of land	Land plot	330	100,00	No	Trees, grass	No	No
12	Komar - section 3	Travnik, Varošluk	2241/1	Part of land	Land plot	129017	0,07	No	/	No	No
13			2243	Part of land	Land plot	605	5,87	No	Forest	No	No
14			2343/50	Part of land	Land plot	600	12,17	No	Forest	No	No
15			2369/9	Part of land	Land plot	640	8,75	No	Forest	No	No
16			2369/2	Part of land	Land plot	181473	0,06	No	Forest	No	No
17			2370/1	Part of land	Land plot	9200	21,64	No	Forest	No	No
18			2371	Part of land	Land plot	5820	0,86	No	Forest	No	No
19			2371	Part of land	Land plot	5820	0,86	No	Forest	No	No
20			2373	Part of land	Land plot	3906	1,89	No	Forest	No	No
21			2373	Part of land	Land plot	3906	1,89	No	Forest	No	No

Source: PC Roads of FBH

Figure 12 (a-d): Photographs made during the walkover survey on the 17th of december, 2017

a) land alongside stretch 1

b) land alongside stretch 1

c) land alongside stretch 2

d) land alongside stretch 2

Source: PC Roads of FBH

6.2. IMPACTS DURING CONSTRUCTION

Impact on Air Quality

Exhaust gases - The machinery which is used during the construction and delays, i.e. traffic standstills on the road due to works on construction of third lane will lead to a temporary increased emission of such gasses as SO_2, CO_2, CO, NO_X and Pb.

Dust generation- where the most important polluters are solid particles (PM10 and PM2,5). Possible sources of dust generation include demolition works, site preparation activities, especially excavation and leveling, handling of building materials such as gravel, sand, asphalt, cement and the construction itself.

Impact on Noise Level and Vibrations

Noise emission is likely to appear during site preparation. Possible sources of noise are: ground preparation activities such as excavation and leveling, use of tools and equipment, assembly of building materials on site; offloading of building materials such as gravel, sand, asphalt etc. and the work of construction machines in general.

Impact on Geomorphology and Soil Quality

- Possible occurrence of rockfall depending on the type of terrain and stability of slopes;
- Erosion – removal of topsoil may poses risk from erosion of bare soil and enhances the impact of rainwater;

- Soil compaction due to construction machinery (vehicles and equipment for construction) moving around the location;
- Uncontrolled (storing, handling and depositing) and untreated waste is one of the major sources of pollution that can disrupt soil quality.

Impact on Land use

Construction of the third lanes may lead to:

- Conversion of present land use: from forest and agriculture to construction land,
- Interrupted land use by inadequate waste management in terms of uncontrolled and untreated waste (e.g. accidental spills from construction machinery, solid waste generated by workers on the construction site) that might be harmful to local communities.

Impact on Biological and Natural Resources

- Work of heavy machinery during construction phase may lead to plants being covered with dust (e.g. blockage and damage to stomata, shading, abrasion of leaf surface or cuticle), which will affect plants growth and feeding base for animals;
- Pollution of soil with hazardous substances (fuel and oils in case of spills) can harm biodiversity of the surrounding area.
- Removal of a layer of vegetation may destroy animals' habitats.

Impact on the Protected Areas

- The observed project is not situated in any of the existing or planned protected areas, or in their close vicinity. No impacts on protected areas are expected.

Impact on Landscape Values

Partial alternation of landscape and visual aspects can be expected with organization of construction sites, presence of personnel and machinery on site. These impacts are temporary and negligible.

Impact on Traffic Safety and Traffic Flow

Traffic congestion and obstructions on the road - increased traffic load, leading to congestion and obstruction is likely to be experienced on local roads and on major roads (M5). This is especially expected during delivery of construction material to site and collection of waste from site. During the reconstruction of the lanes, one of the traffic lane

will be closed for traffic therefore there will be decrease in traffic flow and possible standstills on the bridge and surrounding area.

Impacts on local and transit traffic: traffic will be increased (including heavy machinery and trucks) and only one lane will be in function, causing delays and restricted access.

Population Safety Impact

The presence of workers: According to local practice, no working camps will be set up for the purpose of accommodation of workers. All workers will commute daily to the construction site. Thus the impact of worker's presence on local community is minor.

Socio-Economic Impacts

Temporary land acquisition and damage to private property: At this moment it is not expected that it will be necessary to temporarily occupy any privately owned land plots for lodging machines and disposal of materials. Machines and materials will be disposed on land owned by the Investor alongside the project road. However, if temporary occupation of private land is needed during construction, this will be agreed upon with respective owners and the compensation will be paid in accordance with provisions determined in the Ressettlement Policy Framework[8] and Integrated RAP before the land is accessed.

Impact on cultural-historical heritage or protected areas: The respective project is not situated in any of the existing or planned protected areas.

New workplaces and impacts on local businesses (positive): New business opportunities are expected to be created for local businesses such as transporters, suppliers and other service providers. The Project is expected to have positive impacts on the local employment opportunities with opening new workplaces during road construction. This impact is considered to be short-term and small

Impact on living conditions of local communities

The area in the vicinity of the project construction site is not populated, thus, no impact on local communities is identified. Still, following adverse impacts during construction are possible:

- Noise increase,
- Construction waste disposal,
- Short-term disruptions to water and electricity supply, telephone and Internet connections, waste collection, regular public transport, delivery of mail.

[8] *Available at http://jpcfbih.ba/assets/upload/dokumenti-modernizacija/okvir_politike_preseljenja.pdf*

- Local businesses can be affected in means of late delivery of goods and products. The impact is short termed and low due to the fact that there will be no full stoppage of traffic during the construction

6.3. IMPACTS DURING OPERATION AND MAINTENANCE

Neither new negative environmental impacts, nor deterioration of existing negative impacts, during operation and maintenance are expected.

Socio-Economic Impacts: An increase in speed of vehicles is expected due the adding of the third lane.

6.4. POSITIVE IMPACTS

Project implementation will have positive impacts on the quality of life of the local community. There are several social and environmental opportunities which were detected in the project:

- Adding third lanes will improve the connection between the municipalities and cantons in the area;
- Improvement of road drainage;
- Improved quality of life on the whole (better access to important institutions: health, education, job etc.);
- Additional third lanes for slow vehicles as a direct consequence will have better traffic flow and less congestion, what means the emissions from traffic pollutants shall decrease;
- Less damages to vehicles;
- Better traffic flow;
- Easier use of the road in winter conditions.

6.5. Enhancement measures

Table 4: Enhancement measures

Impact	Improvements to be achieved	Cost Assessment (US$)		Institutional Responsibility	
		Operative	Implementation	Operative	Implementation
▪ Traffic	▪ High improvement of drivers safety with constructing a separate lane for slow vehicles and enhancing drivers traffic visibility; ▪ Better traffic flow ▪ Reduction in time travel and cost by enhancing road surface, improving road and travel safety by building a third lane for slow vehicles. ▪ Easier use of the road in winter conditions.	Included in construction works	Included in supervision	Contractor	PC Roads FBH
▪ Socio-economic	▪ New job and business opportunities for local construction workers and firms; ▪ Better acces for local comunity to necessary services such as jobs, education, health; ▪ Improving connections between the middle and the North west of BH;	Included in construction works	Included in supervision	Contractor	PC Roads FBH
▪ Air and Soil	▪ Due to construction of third lanes for slow vehicles there will be less congestion, meaning the emissions of traffic pollutants will decrease what will as a result have better air quality and lesser soil pollution.	Included in construction works	Included in supervision	Contractor	PC Roads FBH

7. MITIGATION MEASURES

The purpose of this ESMP is to set forth mitigation measures associated with the environmental impacts identified for this given project activity. The mitigation measures are included in this section and summarized in *Table 5*. This chapter includes also the general provisions and mitigation measures that the contractor hired for construction of third lane will need to obey and/or perform. The requirements that the Contractor needs to follow, beyond the provisions of the ESMP, will be outlined in a number of planning documents (plans) that will be developed by the contractor prior to any start of works. The development of such documents will allow for adjustments of the ESMP measures based on the potential new findings on the site, as a result of the public consultations or developing the project specific baseline.

As a part of Tendering Documents (TD) for the Contractor, PC Roads FBH will require that the Contractor submits a Construction Site Organization Plan (CSOP), which will highlight certain requirements both for completion of works and implementation of mitigation measures.

CSOP consists of following components[9]:

(i) Description of the preparation works and description of location organization during and after the construction (design of access roads, internal roads, manipulative and parking spaces, layout of installations, design and organization of temporary construction site facilities, terrain rehabilitation upon completion of works). This part of CSOP needs to contain technical description, calculation and graphical appendices, and BoQ.

(ii) Technological scheme (location and operation of the storage and disposal sites of the materials, location of the mechanization maintenance, disposal sites for special types of waste, storage of dangerous and harmful substances). This part of CSOP needs to contain technical description, calculation and graphical appendices, and BoQ.

(iii) Elaborate on safety (Elaborate on safety on work and Elaborate on protection from fires and explosions), which shall include according to provision of this ESMP a Management Plan in Case of Accidents (MPCA); and

(iv) Practical plan of the implementation of this ESMP and among other a detailed Waste Management Plan (WMP)].

Additional request for the Contractor, as stipulated by ESMF and this ESMP, is to design and submit a detailed Traffic Management Plan (TMP) 30 days prior to commencement of works (in accordance with *Appendix 4. Road Safety Management* of the ESMF). The TMP

[9] *Ordinance on Construction Site Organization, Mandatory Documents on Site and Participants in Construction (Official Gazette of the FBH No. 48/09)*

shall also include management of traffic according to the season, notably trying to minimize impacts during the summer months where the traffic in this area is exceptionally high.

Within the framework of the project, PC Roads FBH prepared a Resettlement Policy Framework (RPF) which clarifies land acquisition/resettlement and compensation principles, organizational arrangements and procedures for planning land acquisition/resettlement. In this sub-project no land acquisition of private land is expected.

7.1. MITIGATION MEASURES IN PRE-CONSTRUCTION PHASE

7.1.1. Contractor Management

PC Roads FBH will ensure that the construction activity is carried out without risk to the health and safety of all workers and local community though contract clauses. Therefore, the Contractor will plan, coordinate, control and monitor the undertaken activities to effectively minimize the risks presented during their work.

The ESMP is an integrated part of the TD and the Contract for Execution of Works. It is the Contractor's obligation to include the implementation of environmental and social mitigation measures into the overall cost.

The Contractor will be required to provide a short statement that confirms that:

- The ESMP conditions have been estimated and included into the bid price,

- The Contractor for Execution of Works has a qualified and experienced person on the Contractor's team who will be responsible for the environmental and social compliance requirements of the ESMP.

- The Contractor will comply with applicable BH and FBH laws, EU standards and WB requirements, including the relevant Operational Policies, this ESMP, framework ESMF and the Environment, Health and Safety guidelines, where applicable.

The following contractual conditions shall apply to the Contractors for Execution of Works employed by PC Roads FBH:

- The Contractor will be required to prepare site-specific CSOP in accordance with the requirements of this ESMP. All submitted CSOPs shall be formally reviewed by PC Roads FBH prior to agreement and signing.
- The Contractor will provide formal written reports to PC Roads FBH in accordance with requirements set-out in the ESMP which is part of this document;
- PC Roads FBH is responsible to introduce all contractors and sub-contractors and personnel working on the Project on the contents and provisions of this ESMP and any penalties arising from non –compliance therewith;
- The Contractor is responsible for notifying PC Roads FBH immediately upon receiving any complaints or grievances, as well as immediately upon identifying and

implementing any of any corrective actions. The Contractor shall inform the complainant of the Grievance redress mechanism. All grievances will be registered with the Central Feedback Desk (CFD) and logged in the Central Grievance Log. Contractor will fill out the grievance registration template provided in Appendix 2 of this ESMP on aregular basis and will make it a part of the monthly reports to the Contractor.

The Contractor shall provide monthly reports on its management and monitoring of the working conditions of direct and indirect employees on the work site and ensure that systems are in place to monitor compliance with labor and health and safety standards.

The contractor shall:

- Ensure that all workers are required to comply with all national/federal legislation on labor and health and safety, as well as any other relevant standards including the World Bank Group EHS guidelines; and be held responsible if compliance is not met
- Be responsible for all activities undertaken by his subcontractors;
- Maintain regular effective two-way communication with all workers, sharing information and assisting in dealing with any unforeseen problems promptly.
- Exchange information and request any plans from sub-contractors which deals with significant health and safety hazards and risks created by or associated with their work activities.

The recommendations and proposed mitigation measures will be attached to the tendering documentation and subsequently the contract with the Contractor. The ESMP is a part of the work program and as such, it needs to be addressed to the Contractor and carried out as required.

During the construction phase, Contractors will be required to allocate the responsibility of overseeing day-to-day compliance with the SS ESMP to a senior member of staff. Contractors will be responsible for the implementation of all measures included in the SS ESMP for all activities undertaken in terms of the construction contract (including work undertaken by subcontractors). Compliance of Contractors with these measures will be assessed by the Construction Supervisor appointed by the JP Ceste FBIH, in line with the Decree on Construction Site Organisation, Mandatory Documentation on Construction Site and Construction Work Participants.

7.1.2. Land Acquisition and Involunterry Resettlement

This project is a part of the integrated Resettlement Action Plan (RAP) for 9 sub-projects which was publicly consulted and disclosed in March 2016. As described in the integrated RAP, small parts of 21 private and 5 public land plots will be expropriated.

All land acquisition and expropriation will be conducted in compliance with the applicable legislation in FBiH (in particular, the Law on Expropriation of FBiH), the requirements set by WB OP 4.12 on Involuntary Resettlement and the Integrated RAP.

All owners, occupants and users of affected properties at the time of the cut-off date, whether with or without fully recognized ownership rights, are eligible for compensation or assistance as outlined in the Entitlements Matrix in the integrated RAP.

All compensation must be paid in line with provisions determined the integrated RAP and Resettlement Policy Framework (RPF). Compensation will always be effected prior to land entry or taking of possession over property by the expropriation beneficiary. The land cannot be taken physically (i.e. any civil works or construction cannot start) before compensation has been paid to the affected persons.

All affected persons will be informed, meaningfully consulted and encouraged to participate throughout the land acquisition process, in accordance with the information disclosure and consultation requirements set out in the integrated RAP.

In addition, an effective grievance mechanism is in place for receiving and addressing in a timely fashion specific concerns about compensation and relocation raised by displaced persons, in the manner described in more detail in Chapter 10.2.1 of this ESMP (Grievance Mechanism).

7.2. MITIGATION MEASURES IN CONSTRUCTION PHASE

7.2.1. Environmental Management

During the construction phase, the Contractor shall award the responsibility of supervising everyday compliance with ESMP to a senior engineer.

The Contractor will be responsible for the implementation of all measures included in the ESMP for all activities undertaken in terms of the construction contract (including work undertaken by sub-contractors).

Compliance of Contractors with provision of ESMP will be assessed by the Construction Supervisor appointed by PC Roads FBH, in accordance with the Ordinance on Construction Site Development, Obligatory Documents on Construction Site and Participants in Construction Work (Official Gazette of the FBH, No. 48/09, 75/09 and 93/12).

Compliance reviews will be submitted by Contractor to PC Roads FBH on a monthly basis. Non-conformances, incidents and deviations from the ESMP will be communicated to PC Roads FBH, or the Supervisor, as soon as possible, within 24 hours form the time of occurrence, where PC Roads FBH shall react to the occurrence a.s.a.p. and impose corrective measures with a deadline for undertaking them.

All mitigation measures are specified in the Table 5. Environmental and Social Impacts Management Plan.

7.2.2. Health and Safety

Works on the construction of the slow lane may pose health and safety risks for construction workers and visitors to the construction site. Population near the construction site and construction workers, as well as road users will be exposed to the risk of: biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, wastewater, vector transmitted diseases etc.), and (ii) road accidents from construction traffic.

Therefore, the Contractor is obliged to:

- Ensure that only properly trained/licensed people operate heavy machinery;
- Implement suitable safety standards for all workers and site visitors, which should not be less than those laid down in the international standards[10] in addition to complying with the national standards the FBH,
- Make sure basic safety features for visitors are in place, such as construction warning signs for protecting unsafe areas from being accessed or the obligation for every visitor to wear a helmet before entering the construction site
- Provide the workers with a safe and healthy work environment, taking into account inherent risks in its particular road rehabilitation activity and specific classes of hazards in the work areas,
- Provide personal protective equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty equipment and by replacing damaged equipment with new one.
- Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job.
- Appoint an environment, health and safety manager to look after the health and safety of the workers.

[10] *- Occupational Safety and Health Convention, 1981 (No. 155)*

- Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187)

- The Safety and Health at Work Directive 89/391/EEC

- and other Recommendations and EU directives

7.2.2.1. Safety Engagements

The Contract should ensure that all possible risks in the course of work are eliminated or reduced to a minimum. In order to prevent the possibility of higher-scale accidents it is necessary to plan and develop the measures to help reduce the adverse impacts. The Contractor's duty is to create a Management Plan in Case of Accidents (MPCA).

The MPCA should include organizational structure, responsibilities, procedures, communication, training, resources and other measures needed to provide appropriate reaction of the Contractor in case of accidents which might occur during the project. The most important items of the MPCA are as follows:

- Identify potential hazards and large-scale accidents,
- General procedures for all emergencies and accidents that might occur during the project due to natural disasters, defects on equipment of human errors,
- Description of preventive measures against accidents,
- Workers training for their roles and responsibilities when accident occurs,
- Determining responsible person at the spot,
- Urgent communication procedures,
- Information and contacts of important local authorities and emergency services,
- Internal and external alarming,
- Response plans for specific types of hazards, for example medical assistance, fire etc.

The MPCA should include:

- Spill Response Plan,
- Emergency Preparedness,
- Response Plan to Accidents.

The contractor is also obliged to:

- The contractor should provide portable toilets at the construction sites, if about 25 people are working the whole day for a month. Location of portable facilities should be at least 6 m away from storm drain system and surface waters. These portable toilets should be cleaned once a day and all the sewerage should be pumped from the collection tank once a day and should be brought to the common septic tank for further treatment.
- Contractor should provide bottled drinking water facilities to the construction workers at all the construction sites.

7.2.2.2. First Aid

The Contractor shall:

- Ensure that facilities that provide health care and first aid are easily accessible. Appropriately equipped first aid stations are to be easily accessible in the whole work area;
- Documenting and reporting accidents, diseases and incidents on workplace;
- Prevent accidents, injuries and diseases originating from, in connection with or arising in the course of work, reducing as much as possible the possible cause of danger in the way which is in accordance with good international practice;
- Identify potential dangers for works, particularly those that might pose threat to life, and provide the necessary preventive and protective measures;
- Ensure that construction site drivers strictly comply with the rules of driving;
- Ensure appropriate lighting alongside roads.

7.2.3. Traffic and Road Safety

The Contractor shall develop the CSOP which includes preparation and organization of construction site during and after construction, including roads on the construction site i.e. Traffic Management Plan (TMP). Traffic on construction site is to be regulated the same way as public traffic roads.

The Contractor is obliged to:

- Prepare and deliver the TMP to PC Roads FBH for its approval, no later than 30 days upon the beginning of works on any component of the project included in traffic redirection and management.
- For the purpose of uninterrupted traffic movement during the reconstruction of the crossroads, include in TMP the following parts: detailed drawings of traffic solutions by showing all bypasses, temporary roads, temporary turns, necessary barricades, signalization/lighting, traffic signs etc.
- Ensure signs in strategic parts of traffic roads.
- Install and maintain a sign on each important crossroads, on roads which will be used during reconstruction works, which will clearly indicate the following data in a local language:
    - Location: station label and settlement name,
    - Duration of construction,

- Name and contact address/telephone number of responsible personnel,
- Name and contact address/telephone number of contractor,
- Sincere apology for the caused inconvenience.

According to the Law on Roads FBH, article 77. For every construction on public road, for works on regular maintenance or any other works under traffic, appropriate temporary signage has to be set up. Respectively traffic has to be regulated in a way that will guarantee safety of traffic and contractor with minimum traffic flow disruptions.

The appropriate signage will be determined based on the Regulations on Traffic Signs (Regulations on Traffic Signs and Signage on Roads, Ways of Marking Works and Obstacles on Roads and Signs that an Authorized Person Can Give to Participants in Traffic ("Official Gazette of BiH", No. 16/07)) and in line with the Guidelines for Design, Construction, Maintenance and Control on Roads (Sarajevo/Banja Luka 2005).

TMP should include details about the following:

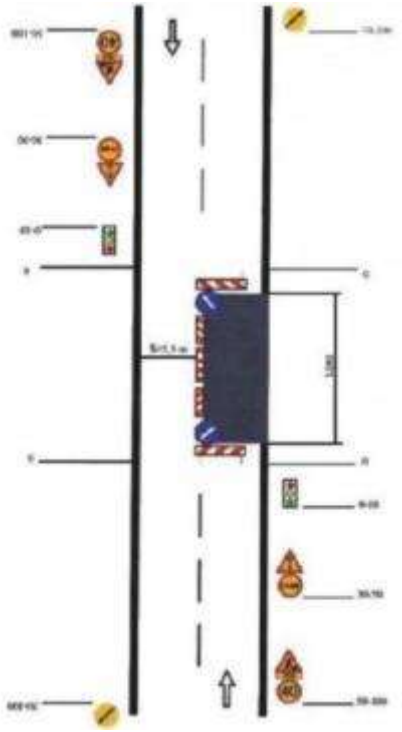
- Construction plan by phases,
- Beginning and duration of works,
- Overview of the existing conditions near the construction site,
- Identification of affected areas,
- Mitigation measures
- Circulation plans, including zones of entry and exit, routes for towing of material, turnaround points, parking areas, zones of interlocking with other traffic roads etc.,
- Routes for pedestrians and vehicles,
- Traffic controls for each expected intervention, including illustrations of barriers, paths, signalization plan, warning signs etc.,
- Requirements for special vehicles, for example, those of large dimensions,
- Construction works paths (access, ramps, loading, unloading),
- Connection roads for supply vehicles and storage of material,
- Expected interaction of pedestrians and vehicles,
- Roles and responsibilities of persons on construction site regarding traffic management,
- Instructions on the procedures regarding traffic control, including urgent situations.

TMP should also include appropriate communication with affected population about traffic and timely information of traffic changes/road blockage.

TMP should be monitored on a regular basis (responsibility of the supervision engineer) and audited to ensure effective implementation and to take into consideration any changes on construction site. All workers on construction site should get acquainted with the TMP.

Road safety measures that will be in place during the reconstruction of the bridge include light and vertical traffic signage as shown on figure 13.

Figure 13: Scheme of an example of road safety measures during the construction phase



Source: PC Roads Federation of BH

7.2.4. Construction Site Safety

The Contractor shall secure the construction site. The construction site should be accompanied with a board with information on works and participants in construction (investor's name, contractor's name, project designer's name, name and type of construction being built, beginning and end of works). These measures are necessary so the Contractor could ensure safety of construction site and prohibit entry ensure of unauthorized persons.

The *Elaborate on safety on work* and *Elaborate on protection from fires and explosions* should include detailed measures of safety on construction site in order to ensure safety of location and remove possible risks and adverse impacts on employees and unauthorized persons.

7.2.5. Land Acquisition, Involuntary Resettlement and Economic Displacement

At this moment, it is not expected that any public or private land will have to be occupied during construction for lodging machines and disposal of materials. Land owned by the investor alongside the road will be used for such purpose.

However, if temporary occupation of private land is needed during construction, this will be agreed upon with respective owners and the compensation will be paid in accordance with provisions determined in the integrated RAP and RPF before the land is accessed. The contractor is responsible for keeping the works within the right of way.

7.2.6. Construction waste management

Due to inappropriate waste management and construction waste pollution of soil and water is possible. Therefore, the Contractor is obliged to create and implement a WMP (Waste management plan) that shall ensure environmentally sound collection of waste and excess material, its storage, transport and final disposal, and primarily reuse/recycling and submit it to PC Roads FBH for approval.

All excavated material will be transported to the landfill according to the Scope of Works. The Contractor is obliged to develop and implement the Construction Waste Management Plan, and to determine the location of the landfill in accordance with the national legislation. Accordingly, the Contractor undertakes to find a landfill site, develop a landfill project if necessary, and obtain the permits from the relevant institutions and all that is necessary to permanently deposit the material.

7.2.7. Conversion of present land use

According to the Scope of Works it is planned to remove shrubs and trees with trunks up to 10 cm in diameter and branches with rare and densely covered surfaces. In accordance with the legislation of the Central Bosnian Canton (CBC), that is, By the Forest Law (Official Gazzete of CBC nr. 5/14), the Forestry Society “Srednjobosanske šume˝ manages the forests of this Canton. In accordance with the aforementioned Law, a permit for deforestation is issued by the competent Ministry, which determines the total area for deforestation, the amount of compensation for the shrinkage and change in the use of forest land. The applicant for deforestation is obliged to pay a fee which is determined in the amount of the costs of raising and maintaining the new forest on the surface which cannot be less than the area for which the forest clearance is granted and the market value of the wood obtained by cutting. The fee shall be paid as the specific revenue of the Budget of the Canton and may be

used only for the purpose of raising new forests and for purchasing forests in accordance with the provisions of the said Law.

Therefore, forestation is carried out by the competent Forestry Society from the paid fee for deforestation. It is a practice to leave the spawn tree, in addition to paying the fee, to the Forestry Society.

7.3. MITIGATION MEASURES IN OPERATIONAL PHASE

It is required from PC Roads FBH to undertake the instructions given in the Table 5. Environmental and Social Impacts Management Plan in operational phase.

7.4. SUMMARY OF MITIGATION MEASURES

Table 5: Environmental and Social Impacts Management Plan

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
PRE-CONSTRUCTION PHASE						
▪ Impacts on living conditions	▪ Informing the local communities on the extent of works and duration prior to the commencement of construction works via local newspapers, the municipality's notice board and website and via PC Roads' website as soon as the contract is signed. ▪ informing road users via the construction site information board, and an information leaflet at the construction site	Internal resources	Internal resources	PC Roads FBH	PC Roads FBH	▪ Road users are orderly informed about constructi on works on roads via radio news and auto-moto club's press releases
▪ Compliance with national legislation	▪ Obtaining all necessary permits for Project implementation.	Internal resources	Internal resources	PC Roads FBH + Project designer	Competent body for issuing the permit	▪ Complianc e with national legislation
▪ Job creation and impacts on local business	▪ Informing the public in advance about the construction works, in order to enable businesses and workforce in the area to prepare for the demand on the market via	Internal resources	Internal resources	Contractor + PC Roads	Contractor + PC Roads FBH	Applicable if the Contractor

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	local newspapers, the municipality's notice board and website and via PC Roads' website as soon as the contract is signed ▪ Informing business owners in advance about the construction works, in order to be able to plan the necessary road use accordingly (via local newspapers, the municipality's notice board and website and via PC Roads' website as soon as the contract is signed)			FBH		needs new workforce.
▪ Expropriation and involuntary resettlement	▪ Implementation of provisions made in the integrated RAP ▪ All land acquisition and expropriation will be conducted in compliance with the applicable legislation in FBiH, World Bank OP 4.12. Involunaqtry Resettlement and the integrated RAP ▪ Compensation will always be *paid out* prior to land entry or taking of possession over property by the expropriation beneficiary. -. Cash compensation will be provided at replacement cost according to the entitlement matrix in the integrated RAP ▪ All affected persons will be informed, meaningfully consulted and encouraged to participate throughout the development of ARAP and the land acquisition process, in accordance with the information disclosure and consultation requirements set out in the integrated RAP. ▪ Assuring an effective grievance mechanism for receiving and addressing in a timely fashion specific concerns about compensation and relocation raised by displaced	Internal resources	Internal resources	PC Roads FBH	PC Roads FBH + Municipalities of Donji Vakuf and Travnik	

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	persons, in the manner described in more detail in Chapter 10.2.1 of this ESMP (Grievance Mechanism).					
▪ Restrictions on land use and damages on private property.	▪ Avoid private properties where possible; ▪ The Contractor will organization the construction site in collaboration and agreement with the municipality of Travnik and Donji Vakuf; ▪ In case occasional land occupation cannot be avoided, compensation will be provided to affected owners/users (application of RPF and RAP), as well as compensation for loss of the possibility to continue to use land and businesses as intended.	Internal resources	Internal resources	Contractor + PC Roads FBH	PC Roads FBH	If occasional land use cannot be avoided, it will be agreed upon with respective owner and compensation will be paid before the land is accessed
CONSTRUCTION PHASE						
▪ Access restriction	▪ Implementation of the provisions on providing timely information to citizens through the media about upcoming construction works, expected duration of the works, alternative routes, etc. via local newspapers, the municipality's notice board and website and via PC Roads' website as soon as the contract is signed	Included in construction works	Included in supervision	Contractor	Supervisory body*	

* *Supervisor shall be a Consultant appointed by PC Road FBH according to Federal Legislation.*

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	▪ Implementation of TMP. ▪ Clear signs posted. Notifications made through media or other road safety clubs on road closure. ▪ Area where materials and equipment are stored are clearly marked and closed off to unauthorized access. ▪ If access restriction cannot be avoided the owner will be timely notified. The duration of the restriction will be agreed upon with respective owners. All applicable compensations will be paid according to the provisions determined in the Integrated RAP and RPF					
▪ Temporary occupation of privately owned land plots for the purpose of construction of access roads and placement of staff, machines and material.	▪ Avoidance of temporary occupation of privately owned plots; ▪ In case avoidance is not possible, minimize size of the area used and impacts on the vegetation and implementation of RPF and RAP provisions on temporary occupation.	Internal resources	Contractor	PC Roads FBH	Contractor	
▪ Impacts on living conditions of local community	▪ Providing timely information to the citizens on any type of disruption and inconvenience; via local newspapers, the municipality's notice board and website and via PC Roads' website, as soon as the type and duration of the disruption and inconvenience is known. ▪ Implementation of TMP; ▪ Implementation of CSOP; ▪ Implementation of ESMP provisions.	Included in construction works	Included in supervision	PC Roads FBH (providing informations to the citizens) + Contractor(following the provisions	Supervisory body*	

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
				of the TMP, CSOP, ESMP		
▪ Impacts on local traffic (increase of local traffic, including heavy machinery and trucks), operation of roads with only one lane causing traffic delays and limited access	▪ Implementation of TMP; ▪ Introduction of appropriate signalization and warning signs; ▪ Timely information to public on traffic disruptions.	Included in construction works	Included in supervision	Contractor	Supervisory body*	In collaboration with the local Ministry of the Interior Relations and BIHAMK
▪ Air emissions: - exhaust gasses; - dust generation	▪ High quality fossil fuels (with low percentage of sulphur and lead) need to be used for construction machinery and equipment; ▪ All machines and vehicles to be used in construction/ reconstruction/ rehabilitation activities must have use permit; ▪ Vehicles need to be regularly maintained ; ▪ Equipment with installed filters to reduce soot emission needs to be used; ▪ When not in use the equipment and machinery need to be shut down; ▪ Maximum speed of the vehicle on unpaved roads should be restricted to 20 km/h; ▪ Moistening/ wetting the site to prevent dust	Included in construction works	Included in supervision	Contractor	Supervisory body*	

* *Supervisor shall be a Consultant appointed by PC Road FBH according to Federal Legislation.*

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	occurrence (in areas with dry soils or where activities generate dust); ▪ Sand and gravel materials need to be transported in covered trucks.					
▪ Increased level of noise and vibration: - noise emission and noise disturbance; - vibration	▪ In the case of noise complaints by local residents, simultaneous use of machines that generate noise over 70 dB needs to be limited; ▪ In the case of noise complaints by local residents, number of trucks per day visiting the site needs to be reduced; ▪ All machines and vehicles to be used in construction/ reconstruction/ rehabilitation activities must have use permit; ▪ When not in use the equipment and machinery need to be shut down; ▪ Maximum speed of the vehicle on unpaved roads should be restricted to 20 km/h.	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Soil degradation and emissions to soil: - soil erosion; - soil contamination by oils, fuels and other hazardous substances; - occurrence of rockfall.	▪ Control during earthworks to prevent degradation of terrain stability is required; ▪ Proper waste disposal; separation of hazardous waste; engagement of authorized companies for final waste disposal; track of the final disposal sites especially for removed asphalt; note/record of the waste amounts; ▪ Oil and fuel collection systems to be fitted to prevent leakage	Included in construction works	Included in supervision	Contractor	Supervisory body*	

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
▪ Conversion of the area and conversion of present land use: - changes in land use; - deforestation;	▪ The land determined for use by the Project can only be used for the construction activities and no other land is available for i.e. storage of building material, parking of the heavy machinery etc. in terms of preventing land disturbance. ▪ Oil and fuel collection systems to be designed to prevent leakage; ▪ Rehabilitate deforested areas after completion of works. ▪ Replacement afforestation activities for the areas where forest/trees will be removed to compensate for the third lane; ▪ All trees will be removed in cooperation with the responsible authorities who will manage the lumber.	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Removal of vegetation cover and topsoil, degradation of biological and ecological resources at the construction site; ▪ Decrease in the current aesthetic value of the landscape (construction site); ▪ removal of vegetative cover.	▪ Prevent and control oil, fuel, and chemical spillages that can find their way to the ground water; ▪ Topsoil must be must be returned and re-vegetated after construction activities are done; ▪ Planting ligneous plants around roads and adjacent areas can help to support local flora and fauna; ▪ All trenches up to 0,5 m of depth must be sloped or have ramps in case of necessity for animals' exit. All trenches shall be checked whether there are any animals before covering them with soil; ▪ Seeding, planting and re-vegetation with autochthonous species should cover areas affected by the Project; ▪ The land intended for the Project needs can only be used for the construction activities and no other land is	Included in construction works	Included in supervision	Contractor	Supervisory body*	

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	available for i.e. storage of building material, parking of the heavy machinery etc. in terms of soil disruption.					
▪ Inadequate waste handling ▪ Inadequate storage and disposal of the excavated material	▪ Implementation of WMP that shall ensure environmentally sound collection of waste, its storage, transport and final disposal, and primarily reuse / recycling. ▪ All excavated material should be removed in line with WMP and Scope of works; ▪ The excavated material should be stored for a short period of time and should be removed as soon as possible; ▪ No clandestine waste disposal will be allowed on site, including open burning of wastes. ▪ The waste should be stored for a short period of time and should be removed as soon as possible. ▪ The waste should be primarily recycled or reused where possible and then finally disposed ▪ No open burning of wastes is allowed on site ▪ All waste that cannot be reused should be handed over to a licensed company or agent (amounts are to be recorded as well as types of handling actions). ▪ Disposal sites of construction material will be determined by the municipality and should be handled in the most appropriate environmental manner.	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Inadequate workers safety	▪ Implementation of work safety measures: - Provide workers with a safe and healthy work environment as defined in the Occupational Health and Safety Management Plan (OHSMP), developed as a part	Included in construction works	Included in supervision	Contractor	Supervisory body*	

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	of the Construction Site Organization Plan (CSOP) that will be developed for the Project - Provide personal protective equipment, - Respect safety procedures, - Provide portable toilets, - Provide drinking water					
▪ Accidental situations i.e. spills, leakage of oils, fats, fuels and similar hazardous materials	▪ Implementation of Environmental Management Plan which includes: - Spill Response Plan, - Emergency Preparedness and Response Plan. ▪ Implementation of Management Plan of Fire and Explosion ▪ Implementation of Labor Protection Law	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Materials supply and transport	▪ Implementation of CSOP to ensure materials are transported in covered vehicles to reduce impacts on environment	Included in construction works	Included in supervision	Contractor	Supervisory body**	
CHANCE-FIND PROCEDURES DURING CONSTRUCTION PHASE						
▪ Impacts on cultural heritage	▪ If archaeological findings or other chance finds appear on or near construction site immediate work suspension and local authorities notification is required;	Included in construction works	Included in supervision	Contractor	Supervisory body*	In case of finding cultural heritage, supervision is

* *Supervisor shall be a Consultant appointed by PC Road FBH according to Federal Legislation.*

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
						implemented by the competent institution
OPERATION PHASE						
▪ Problems due to lack of maintenance	▪ Regular road maintenance works	Included in maintenance works	Internal resources	Contractor for maintenance works	PC Roads FBH	
▪ Decrease in road safety due to the increase of traffic and speed	▪ Regular maintenance of road safety equipment and signage	Incl. in maintenance works	Internal resources	Contractor for maintenance works	PC Roads FBH	

8. ENVIRONMENTAL MONITORING PROGRAM

The table below presents monitoring plan necessary for construction site – developed in connection with mitigation measures to avoid or reduce negative impact.

Prior to commencement of works, in accordance with requirements of the ESMP, and a minimum of monitoring requirements, described in table below, without limitation to these requirements, the Contractor shall prepare detailed list of mitigation measures and parameters to be monitored and prepare the site-specific baseline data as foreseen in the monitoring plan below.

The monitoring plan on construction site will be used by Supervision Engineers of PC Roads FBH. These signed lists will be forwarded to PC Roads FBH, who will be responsible for monitoring and reporting about the compliance.

PC Roads FBH will maintain a registry of grievances, which will contain all information on grievances or complaints received by the community or other interested parties. That will include: type of grievance, time and actions for their resolution and outcome.

Table 6: Environmental and Social Monitoring Program

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
PRE-CONSTRUCTION PHASE								
▪ Job creation and impacts on local businesses	▪ Number of employed persons from local communities ▪ Timely informing the local communities about the forthcoming works	Wider area of construction	Inspection	Prior to construction	Included in performance	Included in performance	Contractor	Contractor
▪ Expropriation and involuntary resettlement	▪ Implementation of integrated RAP provisions	PC Roads of FBH	Monthly and quatery internal reports	Prior to construction	/	25000	PC Roads of FBH+ Supervisory body	PC Roads of FBH+ Supervisory body
▪ Temporary occupation of privately owned land plots for the purpose of construction of access roads and placement of Staff, machines and material	▪ Implementation of RPF and integrated provisions	Construction site	Visual inspection and inspection	Prior to construction and during construction when necessary	Included in construction contract	Included in construction contract	Contractor	Contractor
CONSTRUCTION PHASE								
▪ Access restrictions	▪ TMP in place, ▪ Implementation of RPF, provisions on compensation	Construction site	Visual inspection	Random checks at least once a week during the construction	Included in supervision	Included in supervision	Supervisory body + PC Roads	Supervisory body + PC Roads

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
	procedures						FBH	FBH
▪ Restrictions on land use and damage to the private property (agricultural plots, horizontal infrastructure, fences and railings) due to disposal of construction waste, work camps and parks of heavy machinery	▪ CSOP in place, ▪ Disposal of construction and maintenance materials, ▪ Implementation of RPF and integrated RAP provisions on compensation procedures in case occasional land use cannot be avoided, compensation will be provided to affected owners/users ▪ grievances	Construction site	Visual inspection	Prior to construction and random checks at least once a week during the construction	Included in supervision	Included in supervision	Supervisory body + PC Roads FBH	Supervisory body + PC Roads FBH
▪ Impacts on local traffic (increase of local traffic, including heavy machinery and trucks, operation of roads with only one lane causing traffic delays and limited access)	▪ TMP in place ▪ Traffic patterns, ▪ Timely information to the citizens	On construction site and nearby	Visual inspection and inspection	Random checks during the week	Included in supervision	Included in supervision	Supervisory body	Supervisory body
▪ Air emissions: - exhaust gasses; - dust generation	▪ Level of dust (amount of particles of sediment and floating particles) ▪ Emissions of exhaust gases from vehicles and equipment ▪ (SO_2, NO_2, dim and PM_{10})	Construction site	Measuring devices	As a baseline and during construction when needed and upon complaints by the citizens	-	500 USD/measuring	Contractor	Authorized laboratory

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
▪ Increased level of noise and vibration: - noise levels - vibration	▪ Level of noise	In populated places near the construction site	Measuring devices	Upon order by supervisory organ or upon complaints by the citizens	-	500 USD /measuring	Contractor + Supervision	Authorized laboratory
Soil pollution	▪ Soil quality, including, PH, heavy metals, phosphorus, nitrogen, Na, Ca, salts, PAHs hydrocarbons	On representative plots of land near construction sites	Taking samples and standard laboratory analyses	As a baseline and upon order by supervisory organ or upon complaints by the citizens	-	500 USD /measuring	Contractor + Supervision	Authorized laboratory
▪ Emissions into soil due to improper waste handling	▪ CSOP in place, ▪ WMP in place	Construction site	Visual inspection, disposal records or receipts from landfills	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Soil degradation: - soil erosion; ▪ occurrence of landslide and rockfall.	▪ Implementation of CSOP; ▪ Implementation of WMP.	Construction site	Visual inspection	Regularly during construction	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Conversion of the area and conversion of present land use: - changes in land use;	▪ Implementation of CSOP	Construction site	Visual inspection	Regularly during construction, as appropriate.	Included in performance	Included in performance	Contractor + Supervision	

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
- deforestation;								
▪ Removal of vegetation cover.	▪ Number and type of planted vegetation and analysis of vegetation cover prior to the beginning and upon completion of works.	Construction site	Visual inspection and record-taking	Prior to beginning (baseline) and upon completion of works	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Degradation of biological and ecological resources	▪ All trenches up to 0,5 m of depth must be tilted or have ramps in case of necessity for animals' exit. All trenches shall be checked whether there any animals in the prior to covering them with soil.	Construction site	Visual inspection	Regularly during construction, as appropriate.	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Waste and excavated material management	▪ Implementation of WMP	Construction site	Visual inspection, disposal records or receipts from landfills	Regularly during construction, as appropriate. Amount and disposal records internal reports will be made daily and monthly	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Accidental situations i.e. spills, leakage	▪ Implementation of EMP which includes: - Spill Response Plan,	Construction site	Visual inspection	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
	- Emergency Preparedness and - Response Plan							
▪ Materials supply	▪ Implementation of CSOP (the origin of material, material approvals etc.)	Construction site	Reports	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Material transport	▪ Implementation of CSOP (the origin of material, licenses etc.)	Construction site	Visual inspection	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Workers safety	▪ Implementation of work safety measures (protection equipment, toilets, drinkable water etc.) ▪ Implementation of World Bank Occupational Health and Safety Guidelines	Construction site	Visual inspection	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor

Note: All mitigation measures and parameters to be monitored should be included in total price of works performance. The table includes additionally provided prices of sampling and laboratory testing, solely as information for assessment of overall costs of construction.

9. IMPLEMENTATION AND REPORTING

9.1. PROJECT IMPLEMENTATION

PC Roads FBH is the implementer of the project and will be responsible for the implementation and compliance of the project in line with ESMP.

The public has the right to participate directly or indirectly, with a possibility to state their interests and opinion in decision-making process during the entire period of project activities.

The application of all identified environmental and social mitigation measures and the environmental monitoring program will be ensured. The Contractor will be responsible for the implementation of the environmental mitigation measures during construction. The contracted supervisor will employ environmental experts to supervise the implementation of Contractor's responsibilities, and will be in communication with the investor. PC Roads FBH will constitute a Grievances Committee which will receive all grievances during Project implementation in accordance with grievance mechanisms as prescribed in the Environmental Management Plan and Environmental and Social Management Framework for the Program of Modernization of Major roads of the FBH (ESMF). Furthermore, the Project Implementation Unit of PC Roads FBH includes an environmental and a social expert. During project implementation, the Investor will supervise compliance of the Contractor with provisions and ESMP.

Upon project completion, PC Roads FBH will be in charge of structures' management and maintenance. Regular and timely payment will be carried out in accordance with monitoring plan.

9.2. REPORTING PROCESS

9.2.1. Contractor to PC Roads FBH

The Contractor shall prepare a Report on compliance with ESMP in form of a monthly progress report and submit it to PC Roads FBH in a local language (C/S/B and in English, in analogue and digital form.

In case of any accidental situations or jeopardizing the environment and society the reporting process must be immediate. The Contractor is obliged to inform the PC Roads FBH and local community immediately after any accidental situations that happened over the phone +387 33 250 370 or via email form at the PC Roads FBH website: http://www.jpcfbih.ba/ba/kontakti/kontakti.shtml.

The Contractor's reports to PC Roads FBH are to include a list and description of the performed activities, as well as recommendations and planned future activities and protection measures.

9.2.2. Supervision Engineer to PC Roads FBH

The Supervision Engineer shall prepare a Report on compliance with ESMP in form of a monthly progress report and submit it to PC Roads FBH in a local language (C/S/B and in English, in analogue and digital form.

9.2.3. PC Roads FBH to WB

PC Roads FBH shall prepare Annual Environmental Health and Safety Reports (AEHS), including monitoring indicators and reports on the implementation of their requirements set in ESPM and submit them to the World Bank for review.

In case of higher-scale accidents or deaths on construction site, PC Roads FBH shall promptly notify the World Bank thereof.

10.PUBLIC DISCUSSION AND INFORMATION DISCLOSURE

10.1. PUBLIC CONSULTATION

Public consultation of the subject ESMP will be organized in Travnik and/or Donji Vakuf after the WB and PC Roads FBH approve the draft of the ESMP.

The public consultations will be announced in the local newspaper, on the web page of the municipality and on the web page of PC Roads FBH minimum 15 days prior to the set date.

The record on public discussion, that is, grievances presented at the public discussion shall be recorded in the Grievance Register, and opinions and suggestions of the public shall be integrated into the final ESMP. The public consultations are to be held prior to the start of works but once the bidding documents have been issued.

After public discussion the documents shall be disclosed again.

10.2. INFORMATION DISCLOSURE

ESMP draft will be available on the website of PC Roads of the (www.jpcfbih.ba) in a local language and on the website of the World Bank in English. During the process of public consultation the interested public will obtain all information regarding the project, including social and environmental issues.

During construction works the Contractors will submit monthly information to PC Roads FBH regarding process of work, which will be published on the websites of PC Roads FBH and BIHAMK (Car Association of B&H) regarding temporary traffic regulation.

Schedule of works and potential changes to the schedule will also be reported two weeks prior to the beginning of works on the website of PC Roads FBH and in local newspapers, radio and television stations for disclosure. The schedules will provide information on the beginning and end of works, which can impact the affected groups (such as changes to traffic/water/regime of electric energy supply and access, noise and dust due to construction works).

10.2.1. Grievance Mechanisms

Besides the institutionally available ordinary and extraordinary legal remedy, and existing institutional channels, PC Roads FBH will ensure and form a special Grievance Redress Mechanism in collaboration and direct involvement of those municipalities under whose

administrative authority the project is carried out, in this case with the Travnik and Donji Vakuf municipality.

Grievance Redress Mechanism designed for this project is the **Central Feedback Desk (CFD)** at the level of the implementing agency PC Roads FBH which shall serve as both Project level information center and grievance mechanism, available to those affected by implementation of all project sub-components. The CFD shall serve the persons affected directly or indirectly by construction works.

The Grievance Registration Sheet (Appendix 1) as print out shall be available at municipal administration, at the construction site and in the offices of PC Roads FBH and shall be available for download on the website of JP Roads FBH (www.jpcfbih.ba) and the municipality's website.

The grievance can be logged in writing with the Contractor, at the construction site as well as in the contractor's offices. The contractor is obliged to hand out the Grievance Registration Sheet, explain the grievance mechanism to the concerned citizen and forward the filled in Grievance Form to the central Feedback Desk in PC Roads FBH . The grievance can also be filled in within PC Roads FBH, by phone, by fax, and by e-mailing it to the designated e-mail address zalbena@jpcfbih.ba, or by mail to the address Terezija 54, 71000 Sarajevo.

An information leaflet concerning the grievance mechanism will be available at the construction site at all times, weather the construction site is closed or open. The information leaflet will be plasticized and hung on the construction site information board to be available to road users at all times

All grievances will be recorded in the register and assigned a number, and acknowledged within 3 working days.

The CFD will make all reasonable efforts to address the complaint upon the acknowledgement of grievance. If the CFD is not able to address the issues raised by immediate corrective action, a long-term corrective action will be identified. The complainant will be informed about the proposed corrective action and follow-up of corrective action within 14 working days upon the acknowledgement of grievance.

If the particular issue raised through the grievance mechanism cannot be addressed or if action is not required, a detailed explanation/ justification will be provided to the complainant on why the issue was not addressed. The response will also contain an explanation on how the person/ organization that raised the complaint can proceed with the grievance in case the outcome is not satisfactory.

At all times, complainants may seek other legal remedies in accordance with the legal framework of FBiH.

11. Requirements for start of works

11.1. Environmental aspects

The Contractor shall establish all required baseline data before the commencement of works. The Baseline – Monitoring data shall include air quality data, soil quality data, survey and analysis of vegetation cover prior to the beginning and upon completion of works on construction site. The Contractor is also obliged to ensure these measurements during and after completion of the construction works. The Contractor will ensure that the measurements are conducted by authorized agencies and that they are based on the findings and recommendations of a qualified expert.

The Contractor shall develop a Construction Site Organization Plan (CSOP) that is made up of:

a. Implementation Plan of this ESMP,
b. a detailed Waste Management Plan (WMP)]
c. Study on Safety (includes Elaborate on Safety at Work and Elaborate on Protection From Fire and Explosions),
d. Traffic Management Plan (TMP) must be developed, which will be created by the Contractor prior to the beginning of construction works.

These studies are to be developed in accordance with federal acts[11], before starting the execution of works, while the Contractor's legal obligations defined in the Bidding Documents and Contract shall be based on the a provisions of this ESMP . The Contractor shall submit these studies to the PC Roads FBH supervisory engineer, Environmental and Social Specialists, before beginning of works, and the company has to accept and approve them prior to start of works.

Due to the time constraints related to the issuance of the bidding documents, the public consultations are to be held prior to the start of works but once the bidding documents have been issued; therefore the EMP included in the bidding documents may need to be subsequently updated after the consultations. The contractor will be obliged to follow the updated ESMP.

[11] Provision on arrangements of construction site, mandatory documentation at the construction site and participants in construction, Official Gazette of FBH 48/09, 75/09 and 63/12

11.2. Social aspects

- public consultations
- implementing the changes derived from the public consultations (if any) to the ESMP
- Implementation of integrated RAP, including:
    - Expropriation of 21 private land plots
    - Expropriation of 5 public land plots
- Agreement upon payment of compensation with respective owners
- Payment of compensation in accordance to provisions determined in the integrated RAP

APPENDICES

APPENDIX 1. GRIEVANCE FORM

	REFERENCE NUMBER (Filled by the office)		
CATEGORY OF COMPLAINTS	A) Affected by expropriation		
	b) All others		
PARTICIPANT INFORMATION OF GRIEVANCE			
FULL NAME			
YEAR OF BIRTH			
GENDER	M	F	
ADDRESS			
TELEPHONE/MOBILE NUMBER			
E-MAIL			
Description of Incident for Grievance (What happened? Where did it happen? Whom did it happen to? What is the result of the problem?)			
Date of the Incident?			
• One-time incident/grievance – Date: _____ • Happened more than once (How many times?) _____ • On-going (currently experiencing problem)			
What would you like to see happen?			
DATE:	SIGNATURE:		
RETURN THIS FORM TO:	*CENTRAL FEEDBACK DESK* *PC ROADS OF THE FBH* *Terezija 54,* *71000 Sarajevo* *Note: All copies are returned to PIU*		

APPENDIX 2. GRIEVANCE REGISTRATION TEMPLATE TABLE

No.	Date of receipt	Type of grievance	Description of grievance	Complainant		Date of acknowledgement of receipt	Description of actions undertaken	Date of solvation of grievance
				Status	Sex			

APPENDIX 3. REPORT ON PUBLIC DISCUSSION