JP CESTE FEDERACIJE BIH

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN FOR THE PROJECT OF THE IMPROVEMENTS OF THE TUNNEL CRNAJA

October, 2017

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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 SUMMARY

INTRODUCTION AND OBJECTIVES OF ESMP

This Project of the Improvements of the tunnel Crnaja (the Project) for which this ESMP is developed, is one of the sub-projects under the FBH Road Sector Modernization Project co-financed by the WB and EIB. *Improvements of the tunnel Crnaja, on the road M-17, section Konjic – Jablanica 1,* is screened as a category B project according to the 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 DESCRITPTION

The tunnel Crnaja is situated on the main traffic direction of Jablanica municipality, on the major road M-17, section Konjic – Jablanica 1. The reconstruction is positioned nearby and on the important traffic routes for Jablanica, as well as for BH. The nearest relevant traffic count device is located in Konjic 10 km east from the project tunnel and it shows the AADT for 2015 equals 8794.

PROJECT DESCRIPTION

Tunnel “Crnaja” is situated at section Konjic – Jablanica of the Main Road M-17 Sarajevo – Mostar. Length of the tunnel is 550 m, roadway width within the tunnel is 2*3,0=6,0 m, while width of bilateral service passages (pavements) is approx.1,0 m. According to the existing documentation, tunnel “Crnaja” is located within active landslide which was activated late 1955. Geomorphological structure of the terrain of wider tunnel area is very complex due to complex tectonic situation, neotectonic activities and different behaviors of rock mass. In order to meet the standards the widening of the roadway from existing 6,00m to 7,10m is required. Furthermore, it will be necessary to lower the grade line within the tunnel by 1,0 m in average, to replace existing compound curves found along the route within tunnel precut with adequate transition slabs, while two bridges (6,5m and 14,0 m long respectively) located in the immediate vicinity of entry and exist portals are to be completed demolished and new spanning structures erected. All designed works on Tunnel rehabilitation can be done with uninterrupted, alternating, one-way traffic.

BASELINE OF PARTICULAR INTEREST

The terrain of the Project is mostly with an attitude in the range from 200 to 400 meters above sea level. The average multi-annual temperature for Jablanica is 11,7 °C, the warmest month is July, with an average perennial air temperature of 21,2°C and the coldest month is January when the average perennial temperature is 1,6°C. The area of Jablanica on average receives the greatest amount of precipitation during the winter season, a total of 1222 mm,

mainly in the form of rain. 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. In the immediate vicinity of the tunnel we can find the Jablanica lake. Jablanica lake is a large artificially formed lake on the Neretva river, between Konjic and Jablanica. In close proximity to the Project area, there are no facilities for residential purposes (houses), business purposes (stores), hospitals, health resorts etc., which could be impacted by an increased noise level. *Woodland* is the *dominant* land cover type covering *large areas in the wider area of the bridge according to the CORINE methodology.* There are neither protected areas nor cultural-historic heritage near the project area.

The municipality of Jablanica has a population of 10.111 people who live in the area of 301 km^2 making it one of the smallest municipalities in FBH. The population density equals 33,6 people per km^2. The project area is uninhabited in a radius of approximately 1 kilometer and is located on the edge of the municipality boarders with the municipality Konjic. Being situated on one of the most important main roads in FBH, the M17, the tunnel is the fastest and most adequate way for locals of the settlement Ostrožac (as well as settlements gravitating to it) to reach Jablanica the administrative center of the region for the needs of secondary education and health and Mostar the cantonal capital and administrative, educational and health center of the region. Also it is the fastest way for locals of the western part of the municipality to reach Sarajevo, the capital and gravitational center of the country. The project has huge importance for transit traffic too, being the fastest and most adequate connection of the eastern part of the country to Neum on the Bosnian coast of the Adriatic Sea.

IMPACTS DURING PRECONSTRUCTION

Socio economic impacts: no land acquisition or resettlement is expected on this project.

IMPACTS DURING CONSTRUCTION

Impact on traffic safety and traffic flow: traffic congestion and obstructions on the tunnel - increased traffic load, leading to congestion and obstruction is likely to be experienced on major road (M17). This is especially expected during delivery of construction material to site and collection of waste from site.

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 and groundwater from accidental leaks and spills and 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.

Socio-economic impacts: At this time, 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. However, if additional temporary occupation of private land in needed during construction activities, this will be agreed upon with respective land owners and compensation will be paid in accordance with provisions determined in the RPF before the land is accessed.

Impacts related to road access difficulties to manufacturing facilities located cca 100m from the construction site are expected to be temporary (short term) and are associated with aggravated access due to traffic congestions and heavy machinery and construction traffic as well as disposal of construction waste.

New business opportunities are expected to be created for local businesses such as transporters, suppliers and other service providers. This impact is considered to be short-term and small. Following adverse impacts on living conditions during construction are expected: noise increase, construction waste disposal, short-term disruptions of utilities. On 15th of September, 2017 social specialist of the Project Implementation Team (PIT) conducted a walkover survey on the location of the Project Tunnel (Tunnel Crnaja). It has been noted that public land plots required for temporary storage of machines and materials are not being used in any way, neither formal nor informal, and do not require clearance.

IMPACTS DURING OPERATION AND MAINTAINANACE

Increase in speed of vehicles is expected due to the rehabilitation of the tunnel during which all technical problems, that were causing the lowering of speed of vehicles below allowed speed limit, will be resolved.

MITTIGATION MEASURES

The mitigation measures focus on the major identified impacts during 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 and safety impacts, waste management, impacts on living conditions, temporary occupation and restrictions on land use, impacts on local traffic.

ENVIRONMENTAL MONITORING PROGRAM

The monitoring measures focus on the major identified impacts during works, such as emissions from the machinery used on site, dust generation from works, potential increases in noise and vibration levels, impact on soil and groundwater from accidental leaks and spills and safety impacts, waste management, impacts on living conditions, temporary occupation and restrictions on land use, 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 was organized in Jablanica after the WB approved the draft of the ESMP. The results of the public consultation are incorporated into the final ESMP.

ESMP draft was available on the website of PC Roads (www.jpcfbih.ba) and on the website of the World Bank.

Grievance Mechanism

PC Roads FBH will ensure and form a special Grievance Redress Mechanism in collaboration and direct involvement of the Jablanica municipality. Grievance Redress Mechanism designed for this project is the Central Feedback Desk (CFD). All grievances will be archived 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.

Requirements for start of works

The Contractor shall establish all required baseline data before the commencement of works (air quality data, surface water quality data, soil quality data, survey of the site for any endangered and endemic species and other environmental issues in zone of corridors of direct and indirect impacts).

The Contractor shall develop a Construction Site Organization Plan (CSOP) that is made up of a 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) and a Traffic Management Plan (TMP) must be developed, which will be created by the Contractor prior to the beginning of construction works.

1. INTRODUCTION

Based on the guidance and requirements from the Environmental and Social Management Framework (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), 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 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. 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 the Improvements of the tunnel Crnaja (the Project) for which this ESMP is developed, is one of the sub-projects included in the first group of sub-projects co-financed by the WB and EIB.

2. METHODOLOGY AND OBJECTIVES OF ESMP

Improvements of the tunnel Crnaja, on the road M-17, section Konjic – Jablanica 1, is screened as a category B project according to the 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 in force this project does not require a water permit, an environmental assessment or an environmental permit - neither federal nor cantonal[1]. 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.

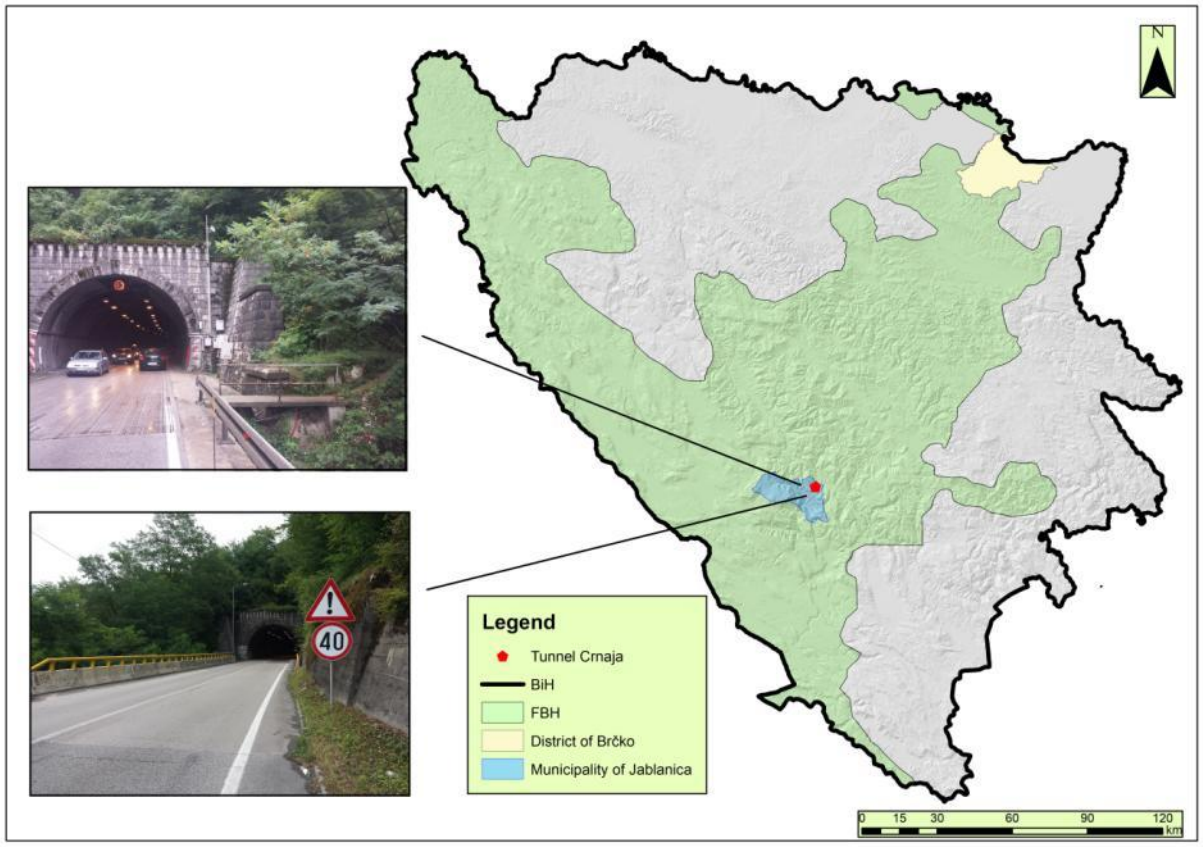
In order to ensure the mitigation measures have been implemented, fully or partially, the ESMP sets forth a monitoring plan to be implemented during the specific stages of project preparation/designing and implementation. Monitoring during project preparation and implementation provides information on the key environmental and social aspects of the 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 table below, without limitation to these requirements, the Contractor shall prepare detailed list of mitigation measures and parameters to be monitored.

[1] *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 FBH No. 19/04). In Herzegovina-Neretva 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 HNC, No. 10/12).*

3. LOCATION DESCRIPTION

The tunnel Crnaja is situated on the main traffic direction of Jablanica municipality, on the major road M-17, section Konjic – Jablanica 1. The reconstruction is positioned nearby and on the important traffic routes for Jablanica, as well as for BH. The major road M-17 is a part of the south European route E73 connecting Central Europe i.e. Hungary and eastern Croatia to BH and the Adriatic sea in the area of the port of Ploče, and it is one the most important roads in the country.

Figure 1: The geographical location of the project

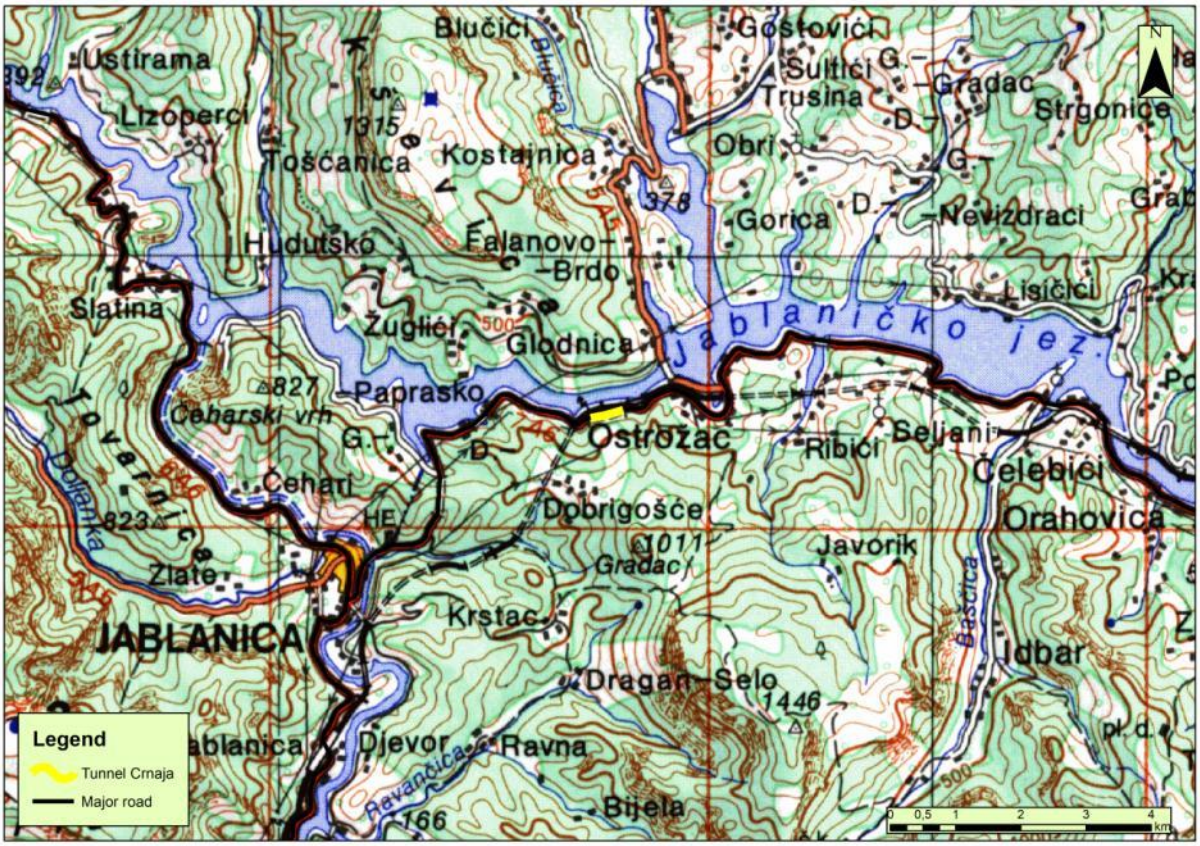


Source: PC Roads Federation of BH (Pictures: July 2017)

There are no public facilities located near the tunnel. This tunnel is used by the local population, by tourist coming directly to the area, and it is used as a transit since it lies on the most important direction to the capital city of Sarajevo from the direction of Mostar.

Figure 2 shows the location of the tunnel in a wider surrounding area on a topographical map.

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[2] was published in 2016 with data for the previous year. The nearest relevant traffic count device is in Konjic, approximately 10 kilometers east from the project tunnel, and it shows that, in 2015, 8794 (Average Annual Daily Traffic-AADT) vehicles were passing daily (*Figure 3*). According to the Traffic count this number rises to 11687 vehicles a day in summer months (Average Summer Daily Traffic- ASDT).

[2] *"Traffic count on major roads in Federation of BiH in 2015", PC Roads Federation BiH, Sarajevo 2016*

Figure 3: AADT in 2015

Source: PC Roads FBH, 2016

By the request of PC Roads FBH, traffic prognosis for the traffic network was developed by IPSA Institute Sarajevo in 2014[3] for the period 2013 to 2040. Analyze 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.

Table 1: Traffic prognosis for M17, section Konjic-Jablanica

Major road	Section name	AADT									
		2016	2018	2020	2022	2023	2025	2030	2035	2037	2040
M17	Konjic-Jablanica	8103	8136	1874	1990	2048	2174	2498	2821	2942	3134

Source: PC Roads FBH, 2014

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

Table 1 depicts an 85% decrease in the number of vehicles in year 2020. Reasons for such a rapid and sudden change in the AADT prognosis is the planned[4] built of the corridor Vc[5] and other alternative corridors which would lead to a decrease of vehicles on the project section. However the need for the reconstruction of the project tunnel is due to the very high current AADT and ASDT which already exceeded the estimates showed in table 1, the importance of the project section and the bad current condition of the tunnel.

4. PROJECT DESCRIPTION

4.1. EXISTING TUNNEL CHARACTERISTICS

Tunnel "Crnaja" is situated at section Konjic – Jablanica of the Main Road M-17 Sarajevo – Mostar. Length of the tunnel is 550 m, roadway width within the tunnel is 2*3,0=6,0 m, while width of bilateral service passages (pavements) is approx.1,0 m.

On several occasions during its exploitation, damages to it compiled and compounded in such degree that occasional interventions of various types and scopes were necessary but with no lasting effect. For example: tunnel lining was grouted, roadway surface was mended on multiple occasions which resulted in elevation of grade line and insufficient dimensions, shotcrete was placed («torkret») onto lining intrados. All these measures failed to prevent infiltration water from penetrating tunnel area, same waters which are the major cause of forefended issues affecting both stability of tunnel structure and traffic safety.

One of the more significant interventions took place in 2005, when works related to elevating degree of tunnel lining static stability and partial arrest of infiltration water were executed. Second stage of that project, which included placement of hydro insulation and lowering of the grade line, was never realized since for it to be executed it was necessary for traffic to be completely suspended which PC Roads FBH found to be unacceptable.

Detailed visual inspection revealed numerous deformities and damages to both the roadway and tunnel lining intrados. Roadway is currently "ripped" and due to numerous surfacing procedures it is now almost at service passages level. For this reason, as well as due to local deformities, clear space lacks the height required for traffic section within the tunnel. Existing roadway width within the tunnel is 6,0 m, while at the Main Road route in

[4] *according to the motorway in Corridor Vc; Feasibility Study*

[5] *Corridor Vc connects Kiev (Ukraine) with Adriatic sea through Lvov and Budapest (Hungary). It is consisted out of three parts and Vc is the part that follows European lane from Budapest (Hungary) to Ploče (Croatia), over Osijek (Croatia) and Sarajevo (BH). The longest part of the corridor Vc - 335 km passes through the territory of BH and it is laid on the most populated and most developed territory (over 50% of the BH population lives in 40 km range of the corridor Vc and earns over 60% GDP of the BH).*

front of and behind the tunnel it is 7,10 m. Visible surfaces of abutments and lining vaults show numerous damages of lesser or greater depths and of various directions which is directly linked to the impact of frost and concrete quality. Apart from this, there are numerous cracks and fissures radiating in all directions. Expansion joints between lining rings have an opening and allow for unobstructed penetration of water into tunnel.

Current road width of 6,0m in the tunnel does not meet prescribed requirements.

Along the road stretch located within precuts and the tunnel, the route lies in opposing curves with very short cross-direction. Entry precut is located in left compound curve of R=120 m (not conforming according to the rulebook in force, Official Gazette F B&H No.63 dated September 13th,2007). At the very tunnel entrance, Route is located in cross-direction which at the ninth kilometer transitions into right curve of 290 m radius with connecting platforms 70m long. Right curve ends at section 87 i.e. at 348th meter of the tunnel and goes on straight until tunnel exit. There it once again moves into left curve. At the entry portal and part of the tunnel (up to section 87), the grade line is located in vertical convex curve with tangential gradient of 1,38% and 3,1%. From There it continues in uniform descent of 3,1% up to the tunnel exit where, within exit precut zone, it transitions into concave curve.

Original technical documentation for Tunnel “Crnaja” was never found, thus it is impossible to gain insight into actual forms and dimensions of executed tunnel structures. However, it is known that Tunnel itself was constructed following new Belgium method.

According to the existing documentation, tunnel “Crnaja” is located within active landslide which was activated late 1955. Geomorphological structure of the terrain of wider tunnel area is very complex due to complex tectonic situation, neotectonic activities and different behaviors of rock mass.

Slope through which the tunnel leads is unstable and is practically located within active landslide “Kukovi” which became active once hydroelectric power plant “Jablanica” lake was formed. Depth of unstable, sliding surface is unknown but it can be safely assumed that both entry and exit part of the tunnel are located within landslide zone because of small overburden. Based on exploratory works (wells in roadway, sides and vault), it should be noted that concrete lining is of very uneven dimensions and that invert is non-existent in certain sections. Lining concrete is locally of such poor quality that it could be classified as “reject concrete”. Drilling revealed that grouting executed as part of rehabilitation works in 2005 partially reinforced existing poor concrete.

Hydrogeological characteristics within “Kukovi” landslide and “Crnaja” tunnel are very complex. Underground waters circulate up to waterproof base, and then are slowly filtered off due to gravity. Within tunnel zone, at the place where underground waters meet concrete barrier, waters concentrate and significantly affect mechanical characteristics of the substrate where it touches the lining. Through porous concrete and at lining joints,

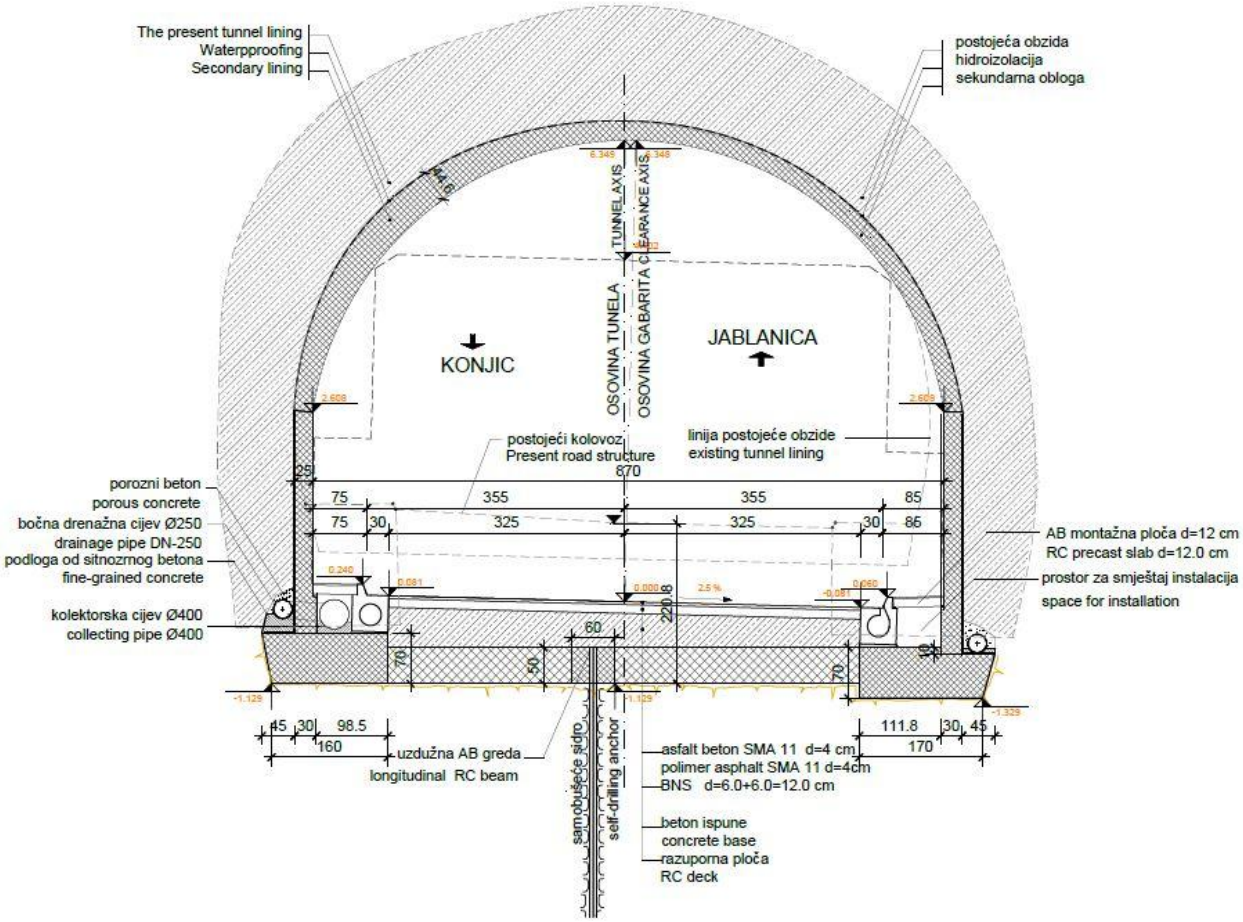
water seeps into tunnel tube whole year around and in various forms: flowing, dripping or dampening of lining.

4.2. NEW DESIGN

In order to meet the standards the widening of the roadway from existing 6,00m to 7,10m is required. Based on detailed analysis of surveyed tunnel cross sections, existing grade line and roadway axis, and pursuant to before mentioned Employer's requirements, new grade line and roadway axis was designed. Benchmarks used for adapting newly designed grade line and axis are actual expansion joints of bridges "Gradiste" and "Crnaja" which are sufficiently removed from the tunnel on both sides. Apart from this, position of newly designed roadway axis was determined by analysis of geological conditions and fact that demolition of high wall located on the left side of the entry precut would result in huge costs and significant works which would in turn compromise stability of steep slope, and by the fact that significant chiseling of left side of tunnel primary lining would compromise lining stability. Considering aforementioned, newly designed axis is positioned in such a way as to avoid demolition of wall at the left side of the precut, to minimize scope of works on chiseling of the left side of primary tunnel lining, and to meet all technical requirements prescribed by standards and laws in force.
In order to fully meet said requirements, it is necessary to lower grade line within the tunnel by 1,0 m in average, to replace existing compound curves found along the route within tunnel precut with adequate transition slabs, while two bridges (6,5m and 14,0 m long respectively) located in the immediate vicinity of entry and exist portals are to be completed demolished and new spanning structures erected.

In the course of designing cross section, all requirements were met: roadway geometry, geological-geomechanical requirements, hydrology, primary lining construction method, traffic flow during construction and stability of existing tunnel lining during rehabilitation works stages.
This resulted in selection of concept of secondary lining making side walls vertical up to the same calotte, while calotte walls are arched. Cross gradient of 2,5% resulted in service passages being 75 cm and 85 cm wide respectively, which minimally surpasses frameworks of prescribed width of service passage i.e. 80 cm. Cross section is structured for roadway width of 710 cm.

Figure 4: Normal cross section of the reconstructed profile



Source: Main design; Trasa Ltd; 2017.

Rehabilitation which took place in 2005 included rehabilitation of major damages, removal of unstable sections of previously placed shotcrete, grouting, reinforcement of primary tunnel lining with self-drilling steel anchors, partial collection of water from locally present tunnel lining with drainage wells and pipes.

Main Design plans for the following works, to be done in stages:

- Chiseling of the existing concrete at the base and chiseling of roadway structure to the depth of 50 cm along the entire tunnel width, including pedestrian paths, for the purpose of reaching required dimensions for temporary traffic flow; construction of access ramps in front of and behind the tunnel.
- Execution of temporary asphalt surface along right traffic lane and construction of structure protecting public traffic in right lane from works executed along the left traffic lane.
- Rehabilitation works are to be done at the left tunnel side first, commencing with rehabilitation of remaining cracks, expansions joints and mending of damaged spits at

visible surfaces. Planned method of rehabilitation shall be detailed in the Main Design, while work items shall be treated under Preliminary Design Bill of Quantities.

- Chiseling of the existing concrete base and excavation to the depth of designed foundation benchmark within left traffic lane, including protection of construction pit with steel sheet piles.
- Execution of cross RC RIBS dim.100/100 spaced 5,0 m each or transversal beams reinforced with self-drilling anchors (depending on quality and depth of the existing structure concrete base and geological conditions), foundations and strut slabs. Chiseling and execution of foundation structure is done in alternating stages in order not to compromise general stability of the structure.
- Arresting water, execution of drainage pipes, and placement of hydro insulation.
- Construction of vertical RC lining wall
- Construction of curbs, collectors, pedestrian path and roadway structure up to finishing asphalt course
- Organization of alternating traffic along left completed traffic lane; all rehabilitation stages to be duplicated along the right tunnel side.
- Construction of movable tunnel formwork ensuring clear span in the middle of the tunnel for unobstructed alternating one-way traffic.
- Placement of hydro insulation and construction of secondary lining at the calotte.

As a part of tunnel rehabilitation, it is planned for completely new roadway structure to be placed, and in accordance with newly designed roadway widths new curbs and new coping slab are to be placed along service passages. In order to place new roadway structure, and at the same time achieve required traffic clear spans, it is necessary to lower the existing grade line by 100cm in average.

Approved roadway structure consists of:

- asphalt concrete t=4 cm
- Dense tar (bitumen) loadbearing course t=6.0+6.0=12.0 cm
- Concrete base

Thus designed roadway structure provides for durable, permanently straight i.e. comfortably spacious traffic surface.

Demolition and construction of new bridges, as well as works on reconstruction of the roadway at tunnel accesses, must be adapted to both work stages of tunnel rehabilitation temporary traffic regime.

Along this stretch, at the bridges it is planned for placement of roadway structure made of leveling concrete course and asphalt courses of 6+4 cm. Along the route us is planned for placement of two layers of dense tar (bitumen) loadbearing course BNS 6+6 cm thick, as well as wearing asphalt course 4 cm thick.

All designed works on Tunnel rehabilitation can be done with uninterrupted, alternating, one-way traffic.

4.3. PLANED WORK STAGES:

1. Chiseling of the existing concrete at the tunnel base and milling of the roadway structure up to 50 cm for the entire tunnel width in order to achieve required dimensions for temporary traffic flow. Preliminary works of this stage include relocation and securing of all installations running through the tunnel.
2. Placement of temporary asphalt course in right traffic lane.
3. Chiseling of the existing concrete at the tunnel base and excavations up to deigned foundations' benchmark within left traffic lane, including protection of construction pit with driven steel sheet pipes. Works to be done in alternating stages, with additional reinforcement with anchors, micro-piles or additional grouting if it is determined that lining concrete which is being chiseled is of poor quality, insufficient thickness or depth. If this be the case, it is planned for quantity of said works to be estimated first. It is necessary to plan for placement of protective structure – asphalt surfacing in order to protect right traffic lane (where alternating, one-way traffic is taking place) from works done at the left traffic lane. Sheet piles or similar tool must be used to ensure complete solidity of roadway structure over which traffic can freely run. In the course of works execution, it is necessary to organize continual geodetic monitoring of the structure over which alternating traffic runs.
4. Execution of traverse RC ribs dim.100/100 spaced 5,0 m each; execution of foundations and strut slab within left traffic lane; alternatively, execution of longitudinal RC beam secured with self-drilling anchors, depending on thickness and actual state of base material found underneath existing roadway structure and geomechanical characteristics of its lithological contents.
5. Arresting water, placement of drainage pipes, placement of drainage galleries, placement of hydro insulation. Construction of vertical RC lining wall. Execution of curbs, collectors, pedestrian footpath and roadway structure up to finishing asphalt course. Execution of these works must be synchronized. Special attention must be given to organization of excavations and securing of planned drainage galleries.
6. Organization of alternating traffic along the left, completed traffic lane. All works stages previously executed at the left tunnel side must be mirrored for the right side of the tunnel. Chiseling of the existing concrete and excavation up to designed foundations' benchmark within right traffic lane.
7. Execution of ribs, foundations and strut beam, arresting water, execution of drainage pipes, placement of hydro insulation Construction of vertical RC lining wall. Execution of curbs, collectors, pedestrian footpath and roadway structure within the right traffic lane up to finishing asphalt course
8. Execution of movable tunnel formwork, achieving clear span in the middle of the tunnel needed for uninterrupted, alternating one-way traffic. Placement of hydro insulation and secondary lining in calotte. This stage to be done with traffic being

organized through the middle of the roadway structure. It is planned for special protective structure to be used in order to protect traffic section from works going on in calotte.

Pertaining to all work stages: due to extremely cramped space within which very complex and numerous activities will be taking place, it is mandatory to pay special attention to organization of works and Site safety.

Due to cramped and arduous working conditions it is expected for works to take longer and by the same token completion time is more extended than usual.

All preliminary activities must be meticulously analyzed and implemented prior to commencement of construction works.

Traffic flow and its suspension are regulated by appropriate signalization and safety measures; this is treated under separate Design.

Frequency of traffic during tourist season suggests that it would be best to suspend all works during that time. In order for this suspension to be feasible, it is necessary to meticulously plan all works to be executed during certain periods in order to provide uninterrupted traffic along both traffic lanes during tourist season.

Execution of the project of such complexity within such cramped space requires previously elaborated Work Programme for all work stages. This Work Programme must also contain possible alternatives for certain work items in regards to engagement of specific mechanization.

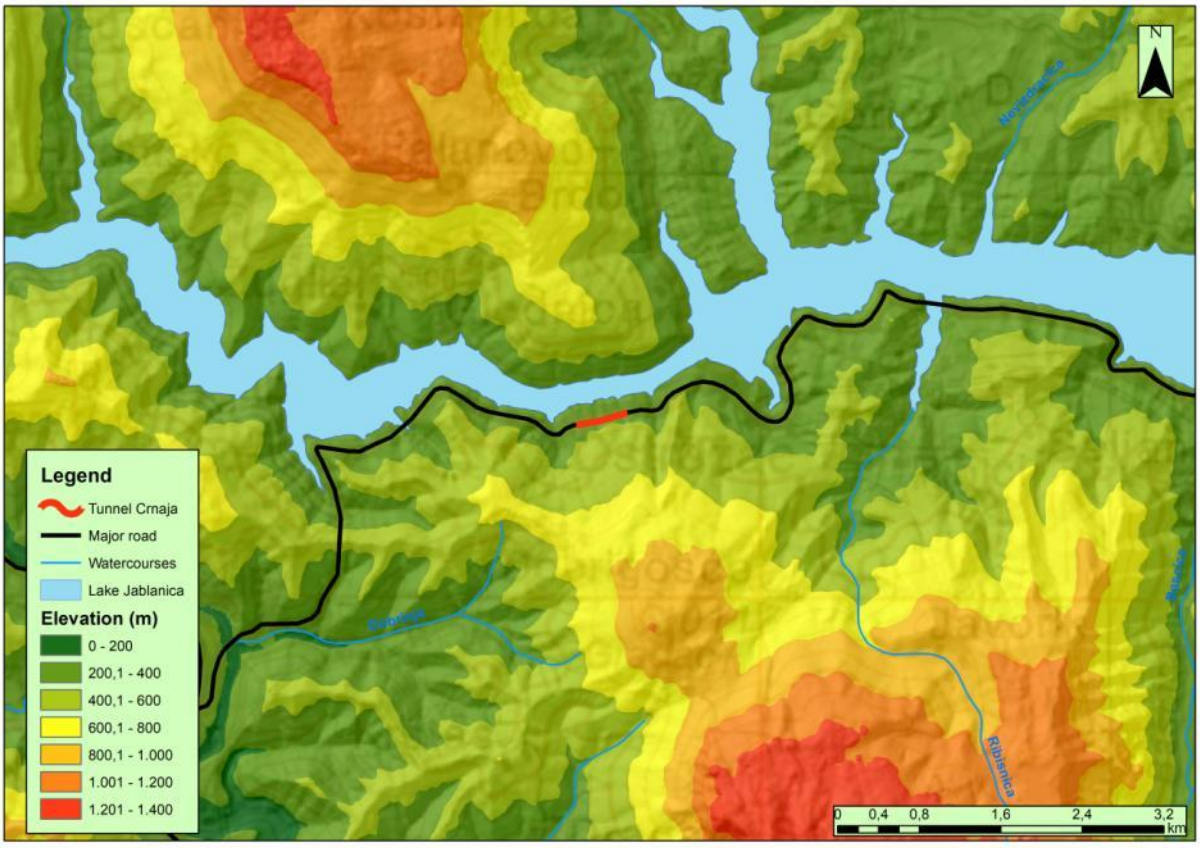
In case the contractor would find it necessary to completely stop traffic during construction period the creation of a bypass would be unavoidable. In the event that any physical interventions are required for creating a bypass beyond the existing structures, or interventions to improve the conditions of an existing bypass, the Contractor shall prepare a separate ESMP and not start works until the ESMP is cleared by both PC Roads and World Bank.

5. BASELINE OF PARTICULAR INTEREST

5.1. GEOGRAPHIC CONDITIONS

The terrain of the Project is mostly with an attitude in the range from 200 to 400 meters above sea level. In the wider area the altitude goes up to 1.200 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 the fluvial – accumulation type of morphostructure without aquifers.

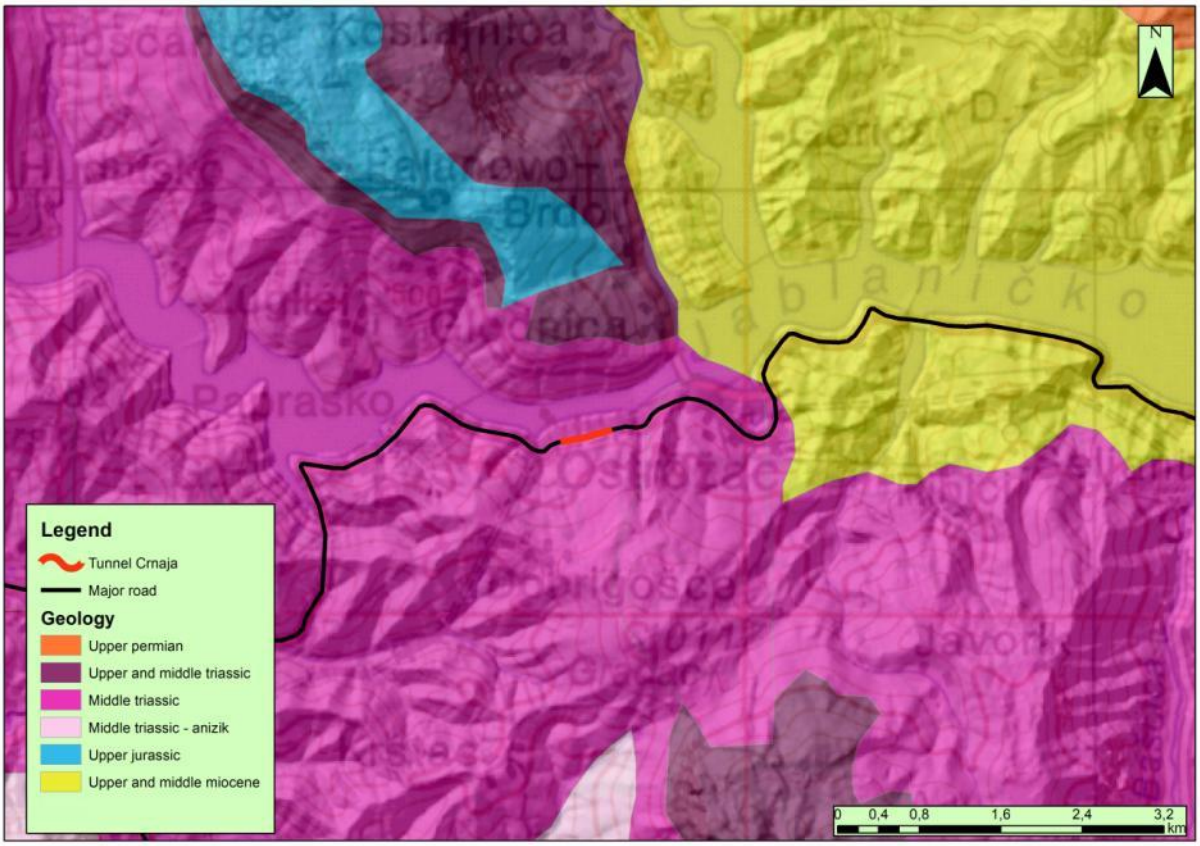
Figure 5: Geographical Map of Wider Area with the Project Location



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

The geological structure of the area of reconstruction is characterized by middle triassic sediments. The middle triassic sediments are composed from bulky and thick layered dolomites.

Figure 6: 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 changed continental climate zone, with strong influence of the Mediterranean climate.

The average multi-annual temperature for Jablanica is 11,7 °C, the warmest month is July, with an average perennial air temperature of 21,2°C and the coldest month is January when the average perennial temperature is 1,6°C.

Table 2. Average temperature and precipitation for the multi-year period (1961.-1990.)

Month	*I*	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*	*IX*	*X*	*XI*	*XII*	*Average*
Temperature (°C)	*1,6*	*3,7*	*7,3*	*11,7*	*16,2*	*19,1*	*21,2*	*20,6*	*16,8*	*12*	*7,1*	*2,7*	*11,7*
Precipitation(mm)	*177*	*171*	*167*	*161*	*107*	*104*	*64*	*101*	*101*	*184*	*342*	*365*	*170,3*

Source: Federal Hydrometeorological Institute, Sarajevo

The average rainfall measured in Jablanica, during multi-year period is 170,3 mm per month. The rainiest month is December, when the average precipitation is 365 mm. The least precipitation occurs in July, only 64 mm on average. The area of Jablanica on average receives the greatest amount of precipitation during the winter season, a total of 1222 mm, mainly in the form of rain.

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 tunnel, 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 tunnel. 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

In the immediate vicinity of the tunnel we can find the Jablanica lake. Jablanica lake is a large artificially formed lake on the Neretva river, between Konjic and Jablanica where the Neretva briefly expands into a wide valley. The lake was created in 1953 after construction of Jablanica Dam. The lake has an irregular elongated shape. Its width varies along its length. The surface area of the lake is 24 km^2, the maximum length is 30 km and the maximum width is 1.200 m.

Figure 7: Hydrographic Map of the wider area of the Project

Source: PC Roads Federation of BH

The Jablanica lake is threatened by human activities such as transport, agriculture, non-sanitary waste disposal and discharging untreated wastewaters from the housing facilities in the vicinity. The Contractor shall conduct a baseline measurement for water quality monitoring prior to the start of works.

5.5. NOISE LEVELS

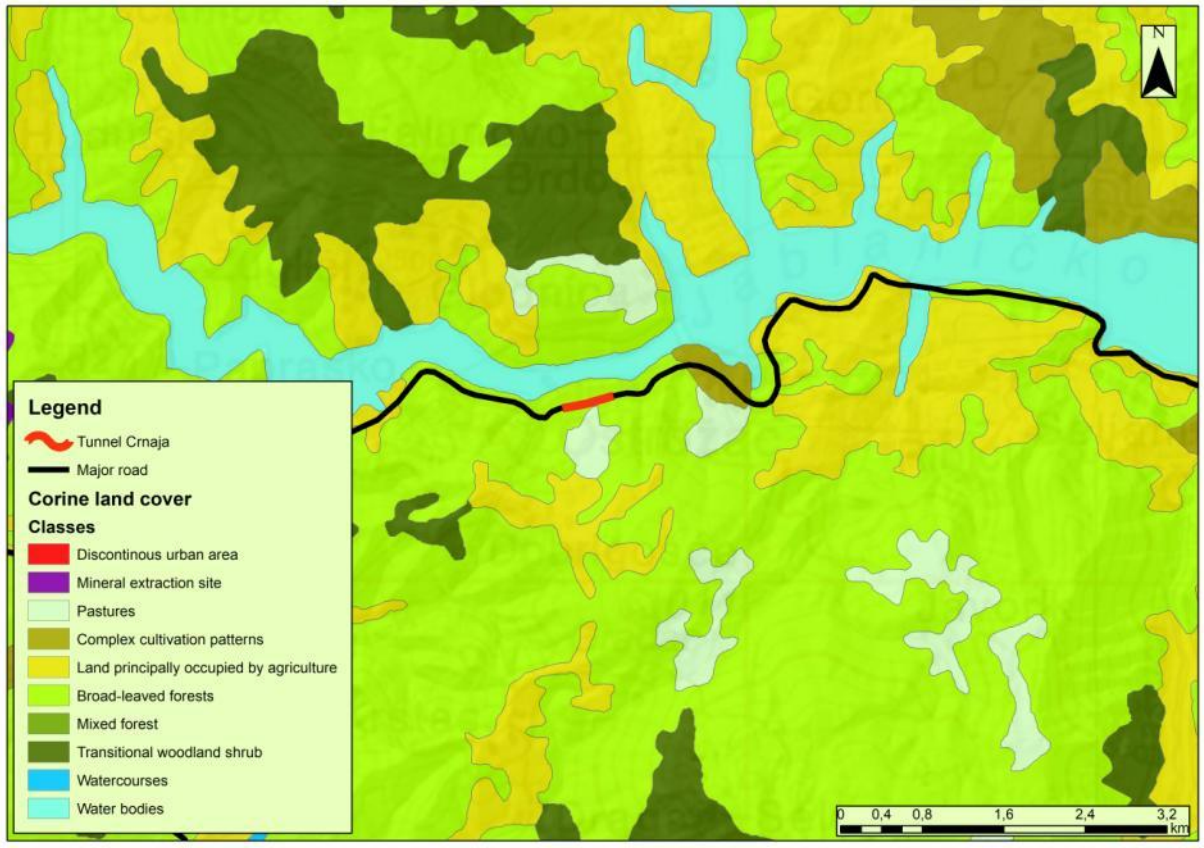
There was no monitoring of noise levels near the Project area; therefore there is no available baseline data of the impact of the noise on the environment. The largest source of noise, in general, is traffic.

In close proximity to the Project area, there are no facilities for residential purposes (houses) and business purposes (stores). 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. So we can say that 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

The dominant purpose of the surrounding area is forest, and in the immediate vicinity of the tunnel we cannot find residential or business facilities *according to the CORINE methodology*[6]. No land of high importance is located in close vicinity of the site.

Figure 8: Land use in the wider area of the project according to CORINE model



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

5.7. FLORA AND FAUNA

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 tunnel, and that almost all activities will be carried out within the existing footprint, the risk to the flora and fauna is minimal. However, considering that the works will be done near Jablanica lake, 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.

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

5.8. PROTECTED AREAS

The location of the Project is not located within a protected area according to Spatial plan of FBH. There are also no recorded archaeological findings in the observed area. The nearest planned protected area is the planed "National Park Prenj", located approximately 2.1 kilometers of air distance from the project site. The planned "National Park Prenj" will not be directly or indirectly impacted by the project due to the distance from the project site.

Figure 9: Planed protected areas in the wider area of the Project

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

5.9. POPULATION AND SETTLEMENTS

The municipality of Jablanica has a population of 10 111 people who live in the area of 301 km^2 making it one of the smallest municipalities in FBH. The population density equals 33,6 people per km^2.

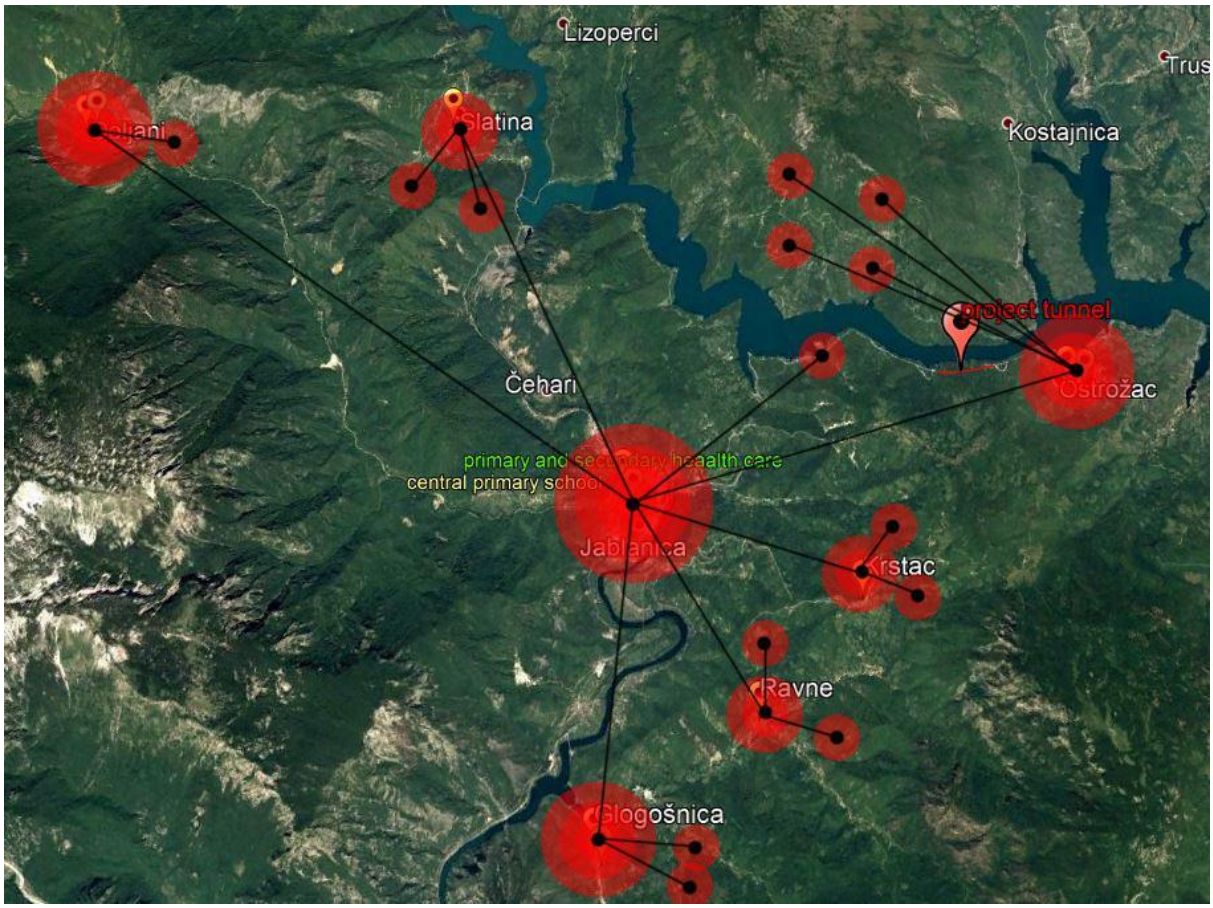
The municipality of Jablanica has one central primary school with 6 branch village schools (Ostrožac, Ravna, Slatina. Doljani, Krstac, Glogošnica) and 1 high schools. The nearest universities are in Mostar (50 km away) and Sarajevo (80 km away).

The health care system in the municipality is satisfactory and within FBH average and is based on a primary and secondary health care situated in the town Jablanica and three branch ambulates (Ostrožac, Doljani, Glogošnica).

The project tunnel is located between the settlements Ostrožac and the Settlement Donje Paparsko. The settlement Ostrožac, although gravitating towards the municipality center is a settlement center with a primary school and a local ambulant. Nevertheless, most of the local population works in Jablanica.

The settlement Donje Paprasko doesn't have educational or health facilities thus gravitating completely towards the municipality center Jablanica. The project area is uninhabited in a radius of approximately 1 kilometer and is located on the edge of the municipality boarders with the municipality Konjic.

Figure 10: Gravitation of settlements in the municipality Jablanica



Source: PC Roads Federation of BH

In the vicinity of the project site two industrial manufacturing facilities have been identified (image 11: project site area). The company Babić from Jablanica (marked A on image 11) is operating in a variety of fields ranging from trade and construction to catering. Their production facility that is located at the entrance of the tunnel from the east side produces a variety of construction products (mainly based on concrete processing). The activities of the company Euro Kamen (marked B on image 11) are based mainly on processing and trading products.

Figure 11: Project site area

Source: PC Roads Federation of BH

Based on the above said the importance of the project for local population is immense. Being situated on one of the most important main roads in FBH, the M17, the tunnel is the fastest and most adequate way for locals of the settlement Ostrožac (as well as settlements gravitating to it) to reach Jablanica the administrative center of the region for the needs of secondary education and health and Mostar the cantonal capital and administrative, educational and health center of the region.

Also it is the fastest way for locals of the western part of the municipality to reach Sarajevo, the capital and gravitational center of the country.

The project has huge importance for transit traffic too, being the fastest and most adequate connection of the eastern part of the country to Neum on the Bosnian coast of the Adriatic Sea.

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

6.1. IMPACTS DURING PRE-CONSTRUCTION

Socio-economic impacts

Land acquisition and resettlement: No permanent land acquisition or resettlement will occur in this project. The tunnel has a clearly defined existing footprint. Although the clear width of the tunnel is being expanded from 8m to 8,7m, no additional land is required to align the new tunnel width with the existing road because the existing road is already aligned with standards and is of sufficient width.

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 reconstruction of tunnel will lead to an increased emission of such gasses as SO_2, CO_2, CO, NO_X and Pb. Increased emissions of exhaust gases in tunnel especially because of the one lane traffic during reconstruction works.

Dust generation- where the most important polluters are solid particles (PM10 and PM2,5). Possible sources of dust generation include demolition works (chiseling of the existing concrete at the tunnel base and milling of the roadway structure), site preparation activities, handling of building materials such as substrate, 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: site preparation activities such as chiseling of the existing concrete at the tunnel base and milling of the roadway structure, 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 Water Quality

Possible contamination of water – Possible sources of water pollution are: demolition works, handling with hazardous substances (i.e. concrete, asphalt, chemicals and paint), inadequate waste handling, liquid and solid equipment damage which may lead to leakage of lubricants and fuel (increased blurring, input of fats and oils) etc.

Impact on Biological and Natural Resources

- Pollution of Jablanica lake and soil with hazardous substances (fuel and oils in case of spills) can harm animals living in the surrounding area.

Impact on the Protected Areas

The observed project is not situated in any of the existing protected areas. The nearest planned protected area is the planed “National Park Prenj”, located approximately 2.1 kilometers of air distance from the project site. The planned “National Park Prenj” will not be directly or indirectly impacted by the project due to the distance from the project site.

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 tunnel - increased traffic load, leading to congestion and obstruction is likely to be experienced on local roads and on major road (M17). This is especially expected during delivery of construction material to site and collection of waste from site. It is not expected that it will be necessary to completely stop traffic during the construction period. Thus, during reconstruction of the lanes there will be a one way traffic regime in power therefore the traffic flow will be decreased and standstills on the bridge and wider will be possible. This is also an important issue in the summer months where the volume of traffic on this road substantially increases for approximately 32%. This will be taken into consideration by the Federal Ministry of Traffic and Communication during the process of handing out the necessary Permit for Change of Traffic Regime during construction. The Federal Ministry has the mandate to decide whether to allow construction during summer months or not.

Worker health and safety impacts

As envisaged, the works will be conducted for the most part in one half of the tunnel while the other half will service the passing traffic at regular intervals passing one lane traffic from both directions. This arrangement may cause impacts on the health and safety of workers working in closed spaces with air emissions, risks of accidents and damages to the passing vehicles.

Population safety impacts

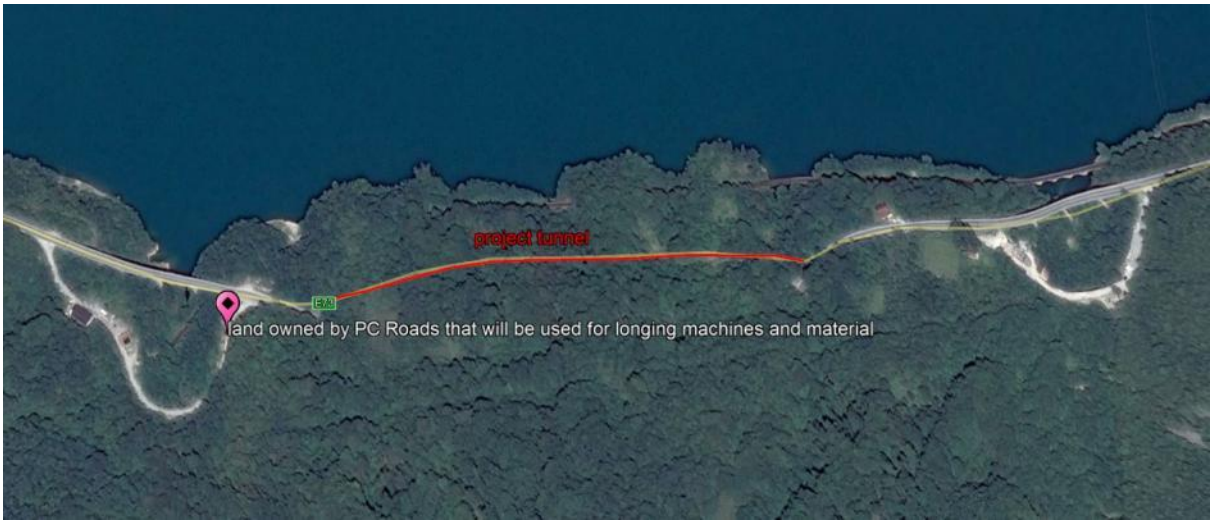
According to local practice, no working camps will be set up for the purpose of accommodation of workers. All workers will commute daily to the construction site. Thus the impact of worker’s presence on local community is minor. Furthermore, the nearest

settlement Podorašac is located 800m down the M17 in the direction of Sarajevo and the project area is uninhibited minimizing the impact local population safety.

Socio-Economic Impacts

Temporary land acquisition and damage to private property: 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 depicted on figure 12. However, if additional temporary occupation of private land is needed during construction activities, this will be agreed upon with respective land owners and compensation will be paid in accordance with provisions determined in the RPF before the land is accessed.

Figure 12: location of land owned by the invest that will used for lodging machinery and materials



Source: PC Roads Federation of BH

In case alternative traffic routes which need civil interventions would be used during construction period, the civil work would not extend the existing footprint of the existing roads. All construction works would be done on land owned by the Investor.

In case a new bypass would be built or the interventions on existing road would extend on to private land, weather temporarily or permanently, the impact on land would have to be reassessed and a separate ESMP would have to be developed by the contractor.

Access restrictions: Impacts related to road access difficulties to manufacturing facilities in the vicinity of the construction site (see figure 11) are expected to be temporary (short term) and are associated with aggravated access due to traffic congestions and heavy machinery and construction traffic as well as disposal of construction waste. The representatives of the manufacturing facilities that have been consulted during the walkover survey on 15th of September, 2017, have said that they won't mind the traffic congestions and project activities for the purpose of reconstructing the tunnel because the positive impacts of the project (safer traffic conditions, less damages to vehicles, better traffic flow) will benefit

their business long term. Furthermore, the interviewed representatives declared that they do not expect impact on commerce because of construction works on the project tunnel. However, if commerce is impacted owners of the manufacturing facilities have the right for compensation as per provisions determined in the Resettlement Policy Framework- RPF ("In case of temporary disturbance of income source compensation on a one-time basis will be paid in the amount of three average month earnings on the level of the affected activity. If the temporary disturbance of income lasts longer than three months the compensation shall be extended to compensate to cover the period of disturbance (case to case basis), but not longer than 6 months."[7])

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.
- Local businesses can be affected in means of late delivery of goods and products. The impact is short termed and low due to the existence of an alternative route.

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

Land screening: On 15th of September, 2017 social specials of the Project Implementation Team (PIT) conducted a walkover survey on the location of the Project Tunnel (Tunnel Crnaja). It has been noted that public land plots required for project activities, such as temporary storage of machines and material, are not being used in any way, neither formal nor informal, and do not require clearance.

[7] *Resettlement Policy Framework, Ecoplan Ltd., January 2016*

Figure 13 (a-d): Photographs made during the walkover survey on the 2nd of September, 2017

a) public land at the west exit of the tunnel

b) public land at the west exit of the tunnel

c) public land at the east entrance of the tunnel

d) public land at the east entrance of the tunnel

Source: PC Roads of FBH

6.3. IMPACTS DURING OPERATION AND MAINTENANCE

Since this tunnel is an already existing object no new negative environmental impacts, nor deterioration of existing negative impacts, during operation and maintenance are expected.

Socio-Economic Impacts

Impacts on traffic: Increase in speed of vehicles is expected due to the rehabilitation of the tunnel during which all technical problems, that were causing the lowering of speed of vehicles below allowed speed limit, will be resolved.

6.4. POSITIVE IMPACTS

Project implementation will contribute to better environmental and socio-economic conditions and 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:

- Tunnel improvement in the sense of constructive stability;
- Improvement of the hydro insulation;
- Lowered pressures on the Jablanica lake and its environment due to drainage water treatment (installation of grease and oil separator);
- Safer traffic conditions for drivers by improving construction elements of the pavement structure
- Increased pedestrian safety by reconstructing the pedestrian pavement on both sides of the tunnel;
- Less damages to vehicles,
- Better traffic flow.

6.5. Enhancement measures

Table 3: Enhancement measures

Impact	Improvements to be achieved	Cost Assessment (US$)		Institutional Responsibility	
		Operative	Implementation	Operative	Implementation
▪ Traffic	▪ Improved road and travel safety by improving construction elements of the pavement structure ▪ Better traffic flow; ▪ Increase of pedestrian safety by reconstructing the pedestrian pavement on both sides of the tunnel	Included in construction works	Included in supervision	Contractor	PC Roads FBH
▪ Socio-economic	▪ New job and business opportunities for local construction workers and firms; ▪ Improvement of connections of the municipality of Jablanica with commercial and trading center such as Sarajevo;	Included in construction works	Included in supervision	Contractor	PC Roads FBH
▪ Water	▪ Improvement of the protection of the Jablanica lake with designing and implementing a treatment of drainage (installation of grease and oil separator) water and regular maintenance of it; ▪ Improved and renewed hydro-isolation;	Included in construction works	Included in supervision	Contractor	PC Roads FBH
▪ Visual aesthetic and landscape	▪ Improving visual aspects of the tunnel and surrounding area.	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 4*. This chapter includes also the general provisions and mitigation measures that the contractor hired for reconstruction 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[8]:

(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)].

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

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 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 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 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.

In case the contractor would find it necessary to completely stop traffic during construction period the creation of a bypass would be unavoidable. In the event that any physical interventions are required for creating a bypass beyond the existing structures, or interventions to improve the conditions of an existing bypass, the Contractor shall prepare a separate ESMP and not start works until the ESMP is cleared by both PC Roads and World Bank. This ESMP should include worker safety analysis for the alternative with complete traffic stoppage which implies a bypass and the alternative with one way traffic throughout the construction period.

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.

Within the tendering documentation PC roads will provide a proposal of the Traffic Management Plan (TMP) which is to regulate traffic during the construction period. Within the TMP four alternative routes will be laid out for the purpose of minimizing the impact on traffic during construction period. Furthermore approximate deadlines will be given.

The bidder is to analyze and optimize the TMP and according to that optimize the deadlines.

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 PC Roads of FBIH, in line with the Decree on Construction Site Organization, Mandatory Documentation on Construction Site and Construction Work Participants.

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 4. Environmental and Social Impacts Management Plan.

7.2.2. Health and Safety

Works on the rehabilitation of the tunnel may pose health and safety risks for construction workers and visitors to the construction site. Road users and construction workers 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 of heavy machinery during the construction period.

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[9] 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.

Within the main project for the Reconstruction of Tunnel Crnaja a Study of Applied Measures for Insurance of Occupational Safety in the Main Project has been developed. The study concluded that all applicable safety measures have been

[9] *- 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

-World Bank Occupational Health and Safety Guidelines (April 30, 2007.)

- and other Recommendations and EU directives

predicted in the main project. It states that all works have been precisely defined through the technical description and the Bill of quantities. The main project defined all types of civil works and protection measures for carrying it out in lines with norms defined in the Labor Protection Law.

Furthermore, the contractor is required to develop a Study on Construction Site and Occupational Safety Measures During Construction in line with provisions of Labor protection Law (Official Gazette of SRBH 22/90) and Regulations on Occupational Safety in Construction (Official Gazette of SRBH 42/68).

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.

Specific measures for works in tunnels are provided in the Labor protection Law (Official Gazette of SRBH 22/90) and Regulations on Occupational Safety in Construction (Official Gazette of SRBH 42/68).

The Contractor is obliged to secure the construction site in accordance with the Regulations on Occupational Safety and to provide adequate equipment.

In case compliance is not met the contractor will be held responsible in accordance with Labor Protection Law.

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 TMP should be developed based on the TMP proposed in the Tendering documentation. The proposed TMP will include 4 possible alternative routes, suggested to minimize impact on traffic during the construction period.

Route1: (marked light pink on figure 14) Nević Polje-Novi Travnik-Bugojno-Gornji Vakuf-Prozor-Jablanica

This alternative route is placed on main roads in good condition, and presents the best option for heavy traffic (trucks, lories, busses, etc.) and all transit traffic from middle and western regions of Bosnia.

Route 2: (marked violet on figure 14) Čelebići- Buturović Polje-Parsovići-Prozor-Jablanica

This alternative route is placed on regional roads. The cca 30 km long section Parsovići-Prozor is a regional macadam road which would have to be leveled and evened for this purpose. This road is perceived by experts from PC roads as a good option for passenger cars which are headed from the area of Sarajevo to the area of Mostar. The length of the alternative route is 99km instead of the existing 21km through the tunnel Crnaja.

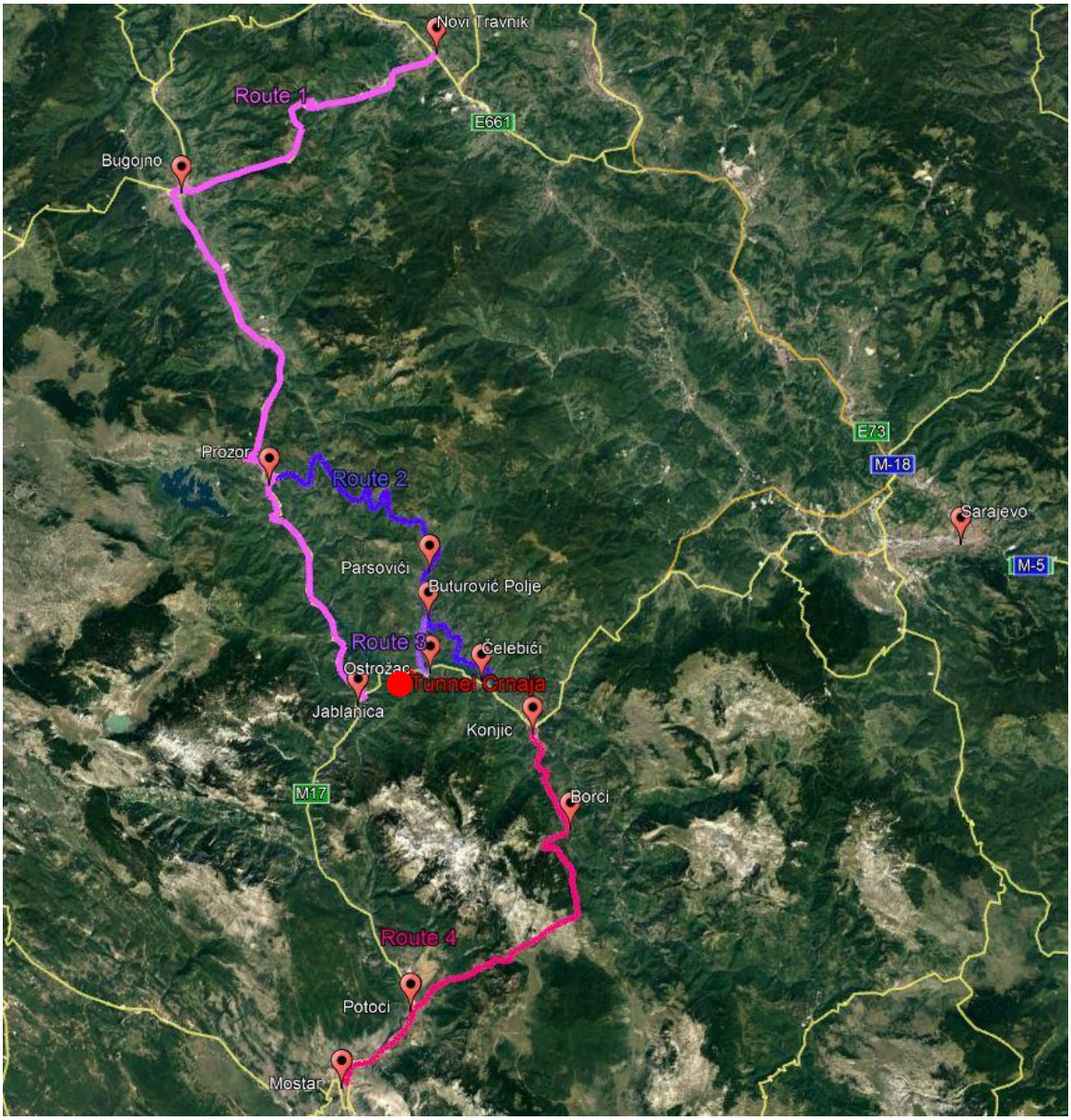
Route 3: (marked light violet on figure 14) Ostrožac-Buturović Polje-Parsovići-Prozor-Jablanica

This route is with its lengths of 88km somewhat shorter than Route 2 and presents another alternative for passenger cars traveling from Sarajevo to Mostar. However, the bridge across Neretva in Ostrožac has a low bearing capacity (up to 7,5t) which disables the crossing of heavy vehicles.

Route 4: (marked pink on figure 14) Konjic-Borci-Cesim-Rujište-Potoci-Mostar

This alternative route of 57km of length supplements for the main road M17 section Konjic-Jablanica-Potoci (length 51km). It is considered to be a good option for passenger cars.

Figure 14: 4 possible alternative routes



Source: PC Roads Federation of BH

Although it is not expected that full traffic stoppage will have to be in place during construction period the described alternative routes allow the possibility of it.

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,
    - Period of the proposed bypass/alternative road,
    - Map of the proposed bypass,
    - 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
- Plan of public transport, for example, timetable, change of timetable, disturbance and the like;
- 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.

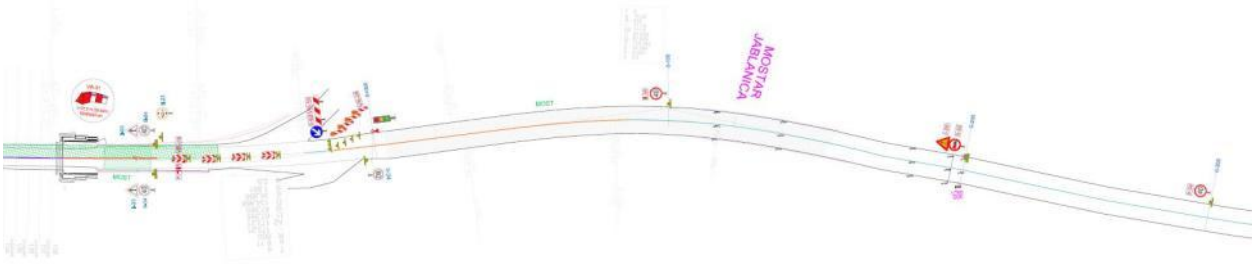
TMP should be monitored on a regular basis (responsibility of the supervision engineer) and audited to ensure effective implementation and to take into consideration any changes on construction site. All workers on construction site should get acquainted with the TMP. Road safety measures envisaged during construction include vertical and horizontal signage based on 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)) as shown in figure 15.

Vertical signage includes: warning sign signaling construction works, warning sign signaling a traffic light, sign for prohibition of overrun, speed limitations to 40 km/h, traffic light.

Figure 15: Road Safety Measures during construction on the entrance of the project tunnel from the direction of Sarajevo

Source: Main design, Trasa, 2017

Figure 16: Road Safety Measures during construction on the exit of the project tunnel from the direction of Sarajevo



Source: Main design, Trasa, 2017

In addition, the contractor shall provide, in the joint names of the employer and the Contractor insurance cover from the Start Date to the end of the Defects Liability Period I the amounts and deductibles stated in the Particular Conditions of Contract (PCC) for the following events, amongst others, which are due to the Contractor's risks: a) Loss of or damage to property in connection with the contract and b) Personal injury or death.

Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

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.

7.3. MITIGATION MEASURES IN OPERATIONAL PHASE

It is required from PC Roads FBH to undertake the instructions given in the Table 4. Environmental and Social Impacts Management Plan in operational phase.

7.4. SUMMARY OF MITIGATION MEASURES

Table 4: 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	▪ Impacts on living conditions ▪ 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	Pc Roads FBH	▪ Complianc e with national legislation

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
▪ Restrictions on land use and damages on private property	▪ Avoid private properties where possible; ▪ The Contractor will organize the construction site in collaboration and agreement with Jablanica municipality; ▪ In case occasional land occupation cannot be avoided, compensation will be provided to affected owners/users (application of RPF), as well as compensation for loss of the possibility to continue to use land 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
▪ 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 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)	Internal resources	Internal resources	Contractor + PC Roads FBH	Contractor + PC Roads FBH	
CONSTRUCTION PHASE						

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
▪ 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 an information leaflet on the construction site, local newspapers, the municipality's notice board and website and via PC Roads' website as soon as the contract is signed ▪ 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 is leading to commercial loss, implementation of RPF provisions	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Impacts on living conditions of local community	▪ Providing timely information to the citizens on any type of disruption and inconvenience; via an information leaflet on the construction site, 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 of the TMP, CSOP, ESMP	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	
▪ Temporary occupation of publicly or privately owned land plots in case of unforeseen circumstances	▪ Avoidance of temporary occupation of privately owned plots; ▪ In case avoidance is not possible, minimise size of the area used and impacts on the vegetation and implementation of RPF on temporary occupation.	Internal resources	Internal resources	PC Roads FBH+ Contractor	PC Roads FBH*	
▪ Impacts on local traffic (increase of local traffic, including heavy machinery and trucks), use of 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 Cantonal Ministry of the Interior Relations and BHAMK
▪ Air emissions: - exhaust gasses; - dust generation - Increased emissions of exhaust gases in the tunnel, especially due to one lane traffic during reconstruction works.	▪ 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 reconstruction 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	Included in construction works	Included in supervision	Contractor	Supervisory body*	

* *Supervisory body shall be a Consultant appointed by PC Roads FBH according to Federal legislative*

* *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	
	should be restricted to 20 km/h; ▪ Sand and gravel materials need to be transported in covered trucks. ▪ In case of complaints by workers, the traffic inside the tunnel needs to be minimized.					
▪ 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 reconstruction 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*	
▪ Emissions into water: - possible contamination of surface water	▪ Ensure there is an emergency plan to contain all leaks and spills that result from an accident. ▪ Prevent any repairs, handling of machinery, fuels or lubricants in areas that are not designated for such use. ▪ Proper waste disposal and separation of hazardous waste is required, as well as the engagement of authorized companies for final waste disposal; ▪ Oil and fuel collection systems to be fitted to prevent leakage; ▪ Vehicles and machines need to be regularly maintained 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	
▪ Soil degradation and emissions to soil: - soil contamination by oils, fuels and other hazardous substances	▪ 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*	
▪ Degradation of biological and ecological resources by oil, fuel and chemical spillages	▪ Prevent and control oil, fuel, and chemical spillages that can find their way to the soil, watercourses and water bodies;	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Inadequate waste handling	▪ Implementation of WMP that shall ensure environmentally sound collection of waste, its storage, transport and final disposal, and primarily reuse / recycling. ▪ 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 ▪ 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 are determined by the municipality and should be handled in the most	Included in construction works	Included in supervision	Contractor	Supervisory body*	+ local waste management operator

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	appropriate environmental manner.					
▪ 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 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 - Implementation of provisions determined in the Study of Applied Measures for Insurance of Occupational Safety in the Main Project	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ 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	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**	

* *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	
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 implemented by the competent institution
OPERATION PHASE						
▪ Problems due to lack of maintenance	▪ Regular road/tunnel maintenance works	Included in maintenance works	Internal resources	Contractor for maintenance works	PC Roads FBH	
▪ Contamination of Jablanica lake	▪ Installation of oil separators in accordance with EN ISO 858-1 and 858-2 ▪ Regular maintenance of the oil water separator	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 maintenanc	PC Roads FBH	

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
				e works		

8. ENVIRONMENTAL MONITORING PROGRAM

The table below presents monitoring plan necessary for construction site – developed in connection of 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 program 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 5: 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	Wider area of construction	Inspection	Prior to construction	Included in performance	Included in performance	Contractor	Contractor
▪ 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 provisions	Construction site	Reports from contractor	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 procedures for businesses affected by access restrictions	Construction site	Visual inspection	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
▪ Restrictions on land use and damage to the private property (agricultural plots, horizontal infrastructure,	▪ CSOP in place, ▪ Implementation of RPF provisions on compensation procedures in case occasional land use cannot be avoided,	Construction site	Visual inspection + Central Grievance Log	Prior to construction and random checks at least once a week during the	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
fences and railings) due to disposal of construction waste, work camps and parks of heavy machinery	compensation will be provided to affected owners/users ▪			construction			FBH	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 ▪ Increased emissions of exhaust gases in the tunnel, especially due to one lane traffic during reconstruction works.	▪ 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 and workers	-	500 USD/measuring	Contractor + Supervision	Authorized laboratory
▪ 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
▪ Emissions into water: - possible contamination of Jablanica lake	▪ Analysis of parameters of surface water quality: - Chemical analysis (PH, turbidity, conductivity,	In water bodies near construction downstream	Standard laboratory equipment and	As a baseline and upon order by supervisory organ or upon	-	1000 USD /measuring	Contractor + Supervision	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
	temperature, suspended particles, COD, BOD, ingredients with nitrogen) - Standard bacteriological analyses		methods of water quality monitoring	complaints by the citizens				
▪ Pollution of surface watercourses	▪ Presence of oil film in surface watercourses	In water bodies near construction site downstream	Visual inspection + Standard laboratory equipment and methods of water quality monitoring	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 water and soil due to improper waste handling	▪ CSOP in place, ▪ WMP in place	Construction site	Visual inspection, disposal records or receipts from	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
			landfills					
▪ Degradation of biological and ecological resources	▪ Survey of the site for any endemic or endangered species	In the zone of corridors of direct and indirect impacts	Field recordings and incorporation of the findings in the ESMP	As a baseline	-	-	Contractor	Authorized institution
▪ Waste 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, - Emergency Preparedness and - Response Plan	Construction site	Visual inspection	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Materials supply	▪ Implementation of CSOP (the origin of material, material approvals etc.)	Construction site	Reports	Daily	Included in performance	Included in performance	Contractor +	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
							Supervision	
▪ 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
OPERATION PHASE								
▪ Water emissions	▪ Analysis of the water quality parameters: ▪ Chemical analysis (PH, turbidity, conductivity, temperature, suspended particles, COD, BOD, ingredients with nitrogen, total fats and oils, mineral oils);	At the treated water outlet	Sampling	Once a year	Internal resources	1000 USD/sample	PC Roads FBH	Licensed laboratory

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 all 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 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 facilities management and maintenance. Regular and timely payment will be carried out in accordance with monitoring plan.

Upon design completion, the public has the right to participate directly or indirectly, with a possibility to state their interests and opinion in decision-making process.

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.

PC Roads FBH shall prepare progress reports to World Bank every six months.

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 was organized in Jablanica after the WB approved the draft of the ESMP.

The document was published and available to the public in a local language on the website of PC Roads FBH and on the website of Jablanica Municipality on 24.11.2017. Public consultations were announced on the website PC Roads FBH and on the website of Jablanica Municipality on 24.11.2017. and on 28.11.2017. in local newspapers (Dnevni Avaz). The public consultations were held on 12.12.2017. in Jablanica, and the Minutes of the Public Discussion on ESMP is an Appendix 3 of this document. Public consultations were attended by 26 interested parties.

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.

After public discussion the documents is disclosed again on the website of PC Roads of FBH.

10.2. INFORMATION DISCLOSURE

ESMP draft was 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 got 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 BHAMK (Car Association of BH) regarding temporary traffic regulation.

Schedule of works and potential changes to the schedule will also be announced 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 Jablanica 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 archived 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

The Contractor shall establish all required baseline data before the commencement of works. The Baseline – Monitoring data shall include air quality data, surface water quality data, soil quality data, survey of the site for any endangered and endemic species and other environmental issues in zone of corridors of direct and indirect impacts. 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[10], 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.

In case of full closure of tunnel and using a bypass during parts of reconstruction time, and in case that existing bypasses are selected where the Contractor is required to provide interventions on existing roads or in the event a new bypass is to be constructed, the Contractor is obliged for a timely ESMP preparation separate from this one, but satisfactory to PC Roads of FBiH and the World Bank.

[10] 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

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 acknowlgement of receipt	Description of actions undertaken	Date of solvation of grievance
				Status	Sex			

APPENDIX 3. REPORT ON PUBLIC DISCUSSION

JP CESTE FEDERACIJE BIH

JP Ceste Federacije BiH d.o.o. Sarajevo poziva sve zainteresirane subjekte, nevladine organizacije i stanovnike općine Jablanica i naselja koja gravitiraju području namjeravane rekonstrukcije tunela Crnaja, da uzmu učešće u

JAVNOJ RASPRAVI

o nacrtu **Plana upravljanja okolišem i društvenim uticajima za projekat rekonstrukcije tunela Crnaja**

koja će se održati u Jablanici, **u prostorijama općine Jablanica 12.12.2017. godine u 12.00 sati**, s ciljem davanja prijedloga i sugestija javnosti i uključivanja relevantnih pitanja u finalnu verziju dokumenta. Dokument je izrađen za potrebu Programa modernizacije magistralnih cesta u FBiH prema politikama kreditora. Nacrt dokumenta može se pronaći na službenoj stranici JP Ceste FBiH na sljedećem linku: http://jpcfbih.ba/bs/aktivnosti/modernizacija-magistralnih-cesta/38 i na web stranici općine Jablanica.

Svi zainteresirani subjekti koji nisu u mogućnosti da prisustvuju javnoj raspravi mogu svoje sugestije i komentare dostaviti do 12.12.2017. putem e-mail adrese: pimt@jpcfbih.ba.

Dnevni red:

1. Prezentacija Plana upravljanja okolišem i društvenim uticajima za projekat rekonstrukcije tunela Crnaja
2. Pitanja, diskusija, odgovori i objašnjenja

24.11.2017.

Javno preduzeće Ceste Federacije BiH društvo sa ograničenom odgovornošću, Sarajevo • ul. Terezija 54, 71000 Sarajevo, Bosna i Hercegovina • Tel. +387(33)250-370 • Faks +387(33)250-400 • Reg. br. 065-0-Reg-11-000713 od 29.3.11., Općinski sud u Sarajevu • JIB 4200339240004 • Računi 1610000028440120 - Raiffeisen Bank d.d. BiH, 1540012000213884 - Intesa Sanpaolo Banka d.d. BiH

Announcement of Public discussion in the Local Newspaper „Dnevni Avaz“ (28.11.2017.)

biznis Dnevni avaz, utorak, 28. novembar/studeni 2017. **19**

SEMBERIJA Problemi proizvođača povrća

Prerađivači nemaju dovoljno sirovina

Proizvodit ću svježe povrće za markete i velike tržne centre, kaže Jovićević

Jovićević: Jedan od najvećih proizvođača

Neophodna pomoć

Radna snaga

Udruživanje u zadruge

LJ. LJUBOJEVIĆ

Novi aparat za bolju karakterizaciju

„Alumina“ nastavila s ulaganjima

Laboratorij dobio aparat vrijedan 350.000 maraka

Za četiri godine uloženo 700.000 KM u dva laboratorija

Z. K.

Dječija robna kuća „Aksa“

Vrijedni pokloni za bebe u porodilištima

Darivali bebe u Općoj bolnici „Prim. dr. Abdulah Nakaš“ i u bolnici u Istočnom Sarajevu

Predstavnici posjetili i darivali bebe

Za 10 mjeseci ove godine

Bh. izvoz veći za 18,2 posto

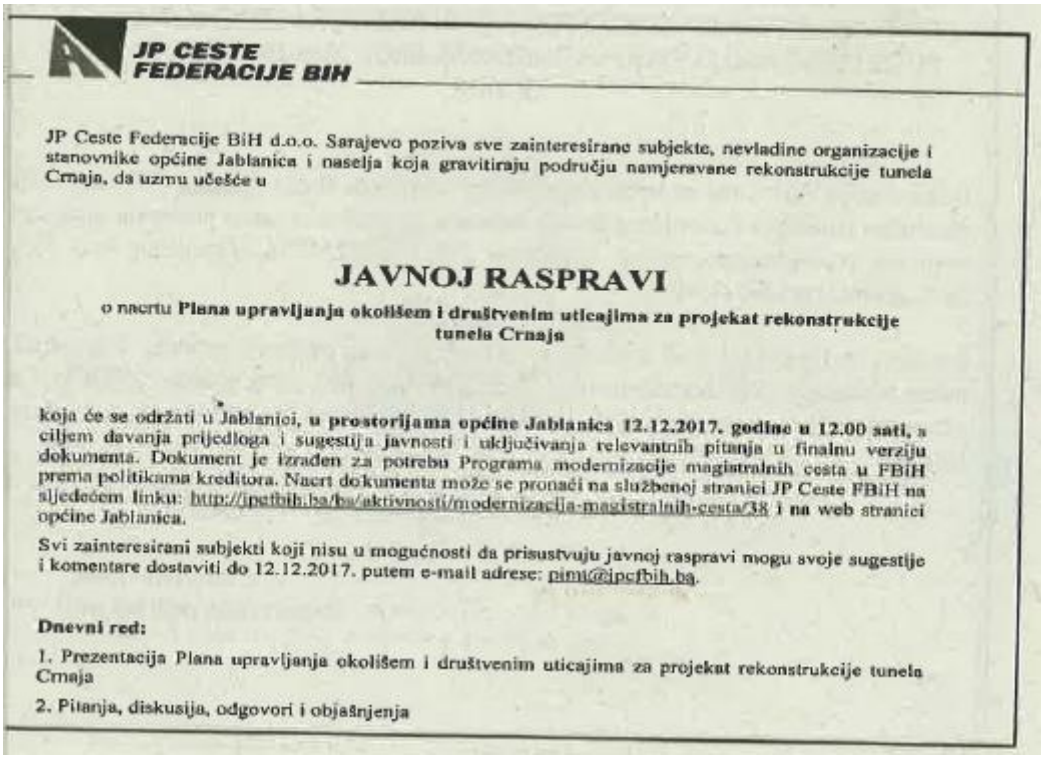
OPĆINSKI SUD BOSANSKA KRUPA

NAJAVLJUJE USPOSTAVLJANJE ZEMLJIŠNOKNJIŽNOG ULOŠKA

TELEFON BROJ:037/476-538

JP CESTE FEDERACIJE BIH

JAVNOJ RASPRAVI



JP CESTE FEDERACIJE BIH

JP Ceste Federacije BiH d.o.o. Sarajevo poziva sve zainteresirane subjekte, nevladine organizacije i stanovnike općine Jablanica i naselja koja gravitiraju području namjeravane rekonstrukcije tunela Crnaja, da uzmu učešće u

JAVNOJ RASPRAVI

o nacrtu **Plana upravljanja okolišem i društvenim uticajima za projekat rekonstrukcije tunela Crnaja**

koja će se održati u Jablanici, **u prostorijama općine Jablanica 12.12.2017. godine u 12.00 sati,** s ciljem davanja prijedloga i sugestija javnosti i uključivanja relevantnih pitanja u finalnu verziju dokumenta. Dokument je izrađen za potrebu Programa modernizacije magistralnih cesta u FBiH prema politikama kreditora. Nacrt dokumenta može se pronaći na službenoj stranici JP Ceste FBiH na sljedećem linku: http://jpcfbih.ba/ba/aktivnosti/modernizacija-magistralnih-cesta/38 i **na** web stranici općine Jablanica.

Svi zainteresirani subjekti koji nisu u mogućnosti da prisustvuju javnoj raspravi mogu svoje sugestije i komentare dostaviti do 12.12.2017. putem e-mail adrese: pimu@jpcfbih.ba.

Dnevni red:

1. Prezentacija Plana upravljanja okolišem i društvenim uticajima za projekat rekonstrukcije tunela Crnaja
2. Pitanja, diskusija, odgovori i objašnjenja

Web addresses containing the document and the Announcement of Public discussion with screenshots of the websites:

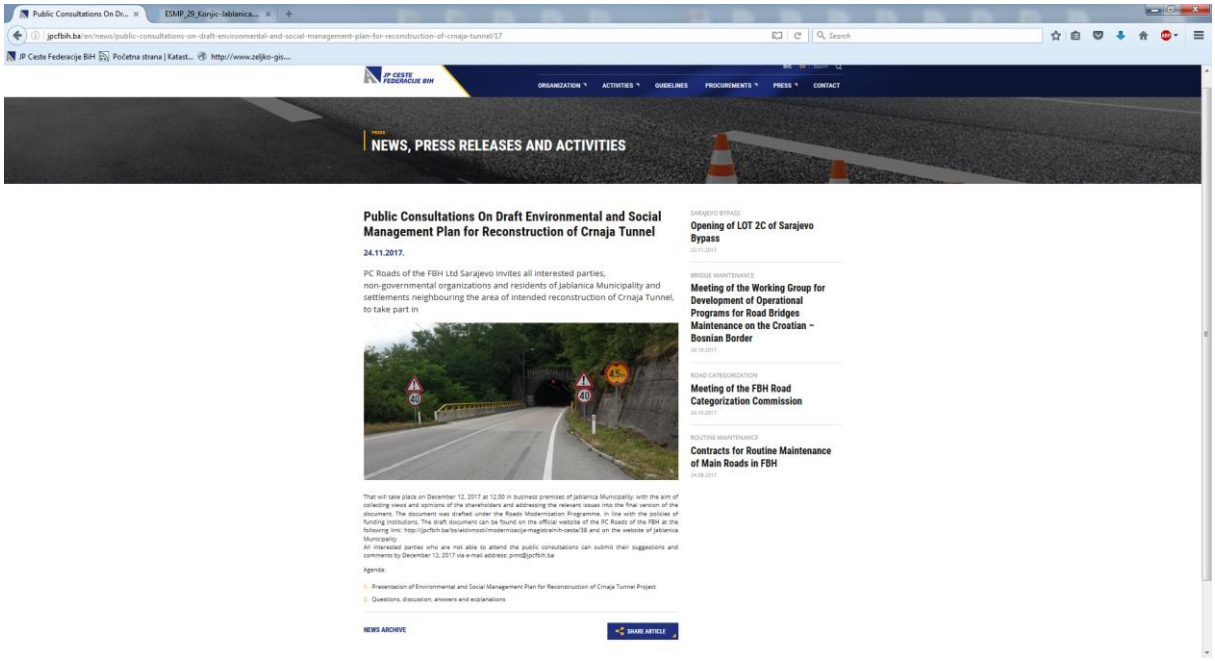
1. PC Roads of FBH website (published on November 24, 2017)

http://jpcfbih.ba/bs/novosti/javna-rasprava-o-nacrtu-plana-upravljanja-okolisem-i-drustvenim-uticajima-za-projekat-rekonstrukcije-tunela-crnaja/17 - Announcement of the Public discussion (B/H/S language)

http://jpcfbih.ba/bs/aktivnosti/modernizacija-magistralnih-cesta/38 - Document (B/H/S language)

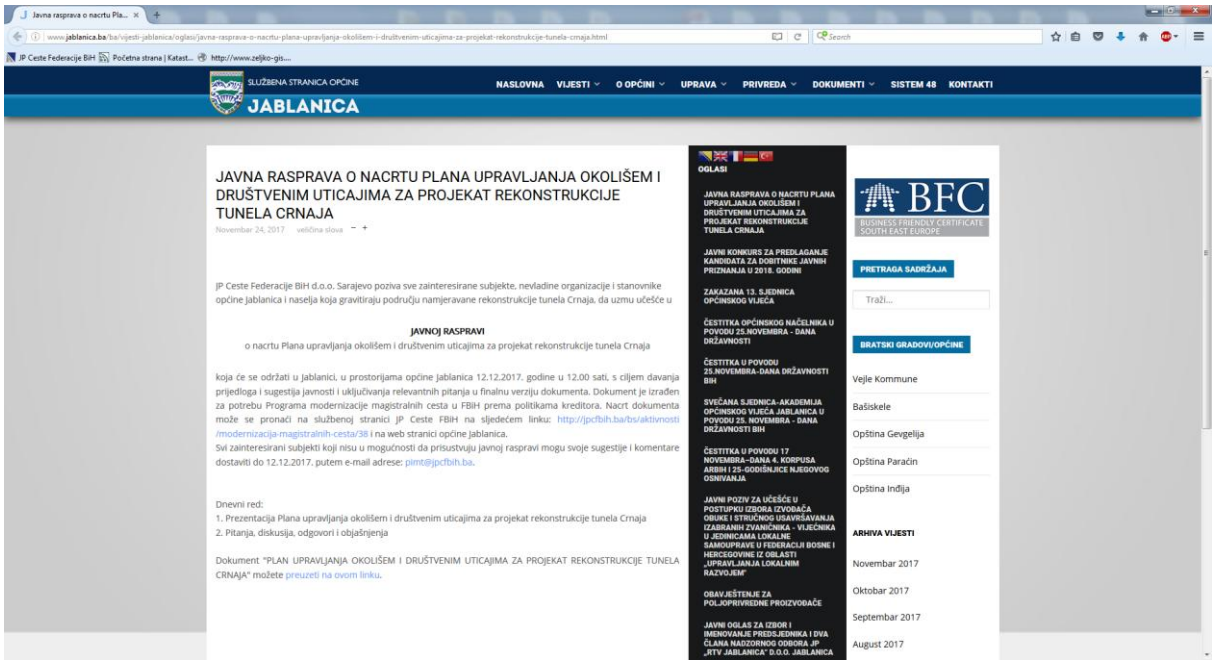
http://jpcfbih.ba/en/news/public-consultations-on-draft-environmental-and-social-management-plan-for-reconstruction-of-crnaja-tunnel/17 - Announcement of the Public discussion (English language)

http://jpcfbih.ba/en/activities/modernization-of-main-roads/38 - Document (English language)



2. Municipality of Jablanica website (published on November 24, 2017)

http://www.jablanica.ba/ba/vijesti-jablanica/oglasi/javna-rasprava-o-nacrtu-plana-upravljanja-okoli%C5%A1em-i-dru%C5%A1tvenim-uticajima-za-projekat-rekonstrukcije-tunela-crnaja.html


SLUŽBENA STRANICA OPĆINE
JABLANICA
NASLOVNA VIJESTI O OPĆINI UPRAVA PRIVREDA DOKUMENTI SISTEM 48 KONTAKTI
JAVNA RASPRAVA O NACRTU PLANA UPRAVLJANJA OKOLIŠEM I DRUŠTVENIM UTICAJIMA ZA PROJEKAT REKONSTRUKCIJE TUNELA CRNAJA
JP Ceste Federacije BIH d.o.o. Sarajevo poziva sve zainteresirane subjekte, nevladine organizacije i stanovnike općine Jablanica i naselja koja gravitiraju području namjeravane rekonstrukcije tunela Crnaja, da uzmu učešće u
JAVNOJ RASPRAVI
o nacrtu Plana upravljanja okolišem i društvenim uticajima za projekat rekonstrukcije tunela Crnaja
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1. Prezentacija Plana upravljanja okolišem i društvenim uticajima za projekat rekonstrukcije tunela Crnaja
2. Pitanja, diskusija, odgovori i objašnjenja
Dokument "PLAN UPRAVLJANJA OKOLIŠEM I DRUŠTVENIM UTICAJIMA ZA PROJEKAT REKONSTRUKCIJE TUNELA CRNAJA" možete preuzeti na ovom linku.
OGLASI
BFC
PRETRAGA SADRŽAJA
BRATSKI GRADOVI/OPĆINE
Vejle Kommune
Bašiskele
Opština Gevgelija
Opština Paraćin
Opština Inđija
ARHIVA VIJESTI
Novembar 2017
Oktobar 2017
Septembar 2017
August 2017

MINUTES of Public Consultations on the Draft Environmental and Social Management Plan of Reconstruction of Crnaja Tunnel

Held on December 12, 2017 in business premises of Jablanica Municipality at 12 am

Public consultations on the Draft Environmental and Social Management Plan of Reconstruction of Crnaja Tunnel were held with the aim of familiarizing the public with the draft of the above document.

The public consultations were organized by the Investor, PC Roads of the Federation of Bosnia and Herzegovina. The Investor's team was led by: Munir Tojaga - Project Manager, Selma Ljubijankić – PIT Member for Social Aspects and Haris Zejnić – PIT Assistant for EIA Monitoring.

A list of all participants is enclosed to these minutes.

Presentations and Discussion:

- **Selma Ljubijankić,** on behalf of the Investor PC Roads of the Federation of BiH, gave a welcoming speech, introduced the Investor's team, and gave a brief overview of the Roads Modernization Program including the above document.

- **Munir Tojaga,** Project Manager, made short presentation of the reconstruction project of Crnaja tunnel and described the scope of works and their execution.

- **Haris Zejnić** presented the document to all participants as well as the Draft Environmental and Social Management Plan of Reconstruction of Crnaja Tunnel, including goals of its provision, mitigation measures of all identified potential environmental and social impacts, monitoring plan, information disclosure, complaints mechanism, requirements regarding work commencement and other relevant information. He pointed out that this is a draft document and that all relevant comments from these public consultations will be incorporated into its final version. He also stressed that the document was revised by the World Bank's team, and upon its approval, it will become a binding document for the contracting parties in the project implementation itself.

Public consultations on the above document followed the presentation.

- **Selim Imamović**, Elektrodistribucija Mostar, pointed out that he was interested in project implementation, and suggested to Munir Tojaga to meet on the project site to solve all dilemmas. Some of the issues that need to be solved are the electrical supply for Euro kamen, the issue of the existing power substation that supply the tunnel lighting and that will continue supplying the future lighting as well, the installation of a new cable inside the tunnel and connection of power substation 35

Ostrožac with Papraska and Jablanica. He emphasized that the power supply issue couldn't have been solved through the tunnel due to the unsolved legal property relations.

- **Munir Tojaga** (PC Roads of the FBiH) suggested to find a joint solution and accepted a proposal for a site meeting. He claimed that these matters have been taken into consideration. Right side of the tunnel tube, when coming from Sarajevo, is foreseen for the power facilities (currently, the cable goes to the left). He emphasized that it was not acceptable to use the left side for that matter as it was foreseen for the drainage. He agrees that there is a risk of potential problems in the first phase of work execution when it will be necessary to work together and adapt to the new situation. It was emphasized that the works will be carried out in four phases with the traffic ongoing, where a 4m wide lane will be provided for the traffic. In addition, he adds that the project includes a new power substation as the old one cannot meet the needs.

- **Nejra Radoš,** Hidroelektrana na Neretvi, argued that it was Hidroelektrana na Neretvi who has restored the monitoring of Kukovi landslide in 2010, since when this landslide gets monitored twice a year. Since there are survey points inside Crnaja tunnel, she asks whether it was taken into account that the survey points will be destroyed and whether the reinstalling of this monitoring system is to be reconsidered or not. She adds that it is unknown to her whether a contact with PC Roads of the FBiH has been made with respect to the monitoring of Kukovi landslide.

- **Munir Tojaga (PC Roads of the FBiH)** informed that the PC Roads of the FBiH will proceed with the installation of inclinometer at the left and the right side of the tunnel. Given their installation is allowed, four boreholes of 25 - 80 m are foreseen, two at the entrance and two at the exit, and additional two in the central part of the tunnel. Inclinometers will provide accurate data on whether there is any movement in the earth crust. Data will be received every 15 days. Inclinometers are a new approach that PC Roads of the FBiH has foreseen and have already launched the pertaining bidding procedure and selected a contractor for this type of work. The foreseen observation period is 18 months, plus 2 months of zero state measurements. In terms of contact between Hidroelektrana na Naretvi and PC Roads of the FBiH regarding the monitoring of Kukovi landslide, he added that PC Roads of the FBiH contacted Hidroelektrana na Naretvi, and that the data provided did not meet the needs of the PC Roads of the FBiH.

With regard to survey points, he pointed out that they are discovered during the investigation works, but shall not be touched in this phase. In the second and third phases of construction works, these points will be eliminated but the new ones will be installed.

- Nejra Radoš suggested coordination for that part of the project so that the data would not be lost, to what **Munir Tojaga** agreed.

- **Dženan Mulahasanović,** Jablanica Municipality asked whether the PC Roads of the FBiH is considering the idea of fully bypassing Crnaja tunnel and whether there is coordination with the Ministry concerning the initiative to build a fast road to connect Jablanica to Corridor Vc.

- **Munir Tojaga** points out that there was an idea to build the bypass. However, given the outcome of investigation works, it was concluded that this wasn't possible.

- **Dženan Mulahasanović** explained that it would be necessary to connect the main and the regional road and to build a bridge which would solve the issue of main and regional road intersection and avoid suspension bridge in Ostrožac. He elaborated the issue of traffic organization during the works execution, and pointed out those new technical methods would have to be used in order to build a tunnel bypass or a bridge and to allow full relief of Kukovi landslide. He points out that Kukovi landslide should not be touched.

- **Munir Tojaga** points out those bridge variants weren't dismissed, but he notes that two bridges with spans of over 300 m should be built in this case, which would cost over BAM 40 million. He emphasizes that it would be difficult to find financial resources for such a thing. Furthermore, he stresses that the work execution period will be difficult for everyone; however each party will need to adjust. Besides, he pointed out that the last surveys of Kukovi landslide did not show any slides, and for that reason the tunnel reconstruction variant is chosen.

- **Safet Kovačević**, Jablanica Municipality asked if there is a design estimate of the duration of the works, for how long is the one-way traffic planned and how long the traffic will be fully suspended. He also asked whether the designer has made a proposal for deposition of excavated material and the amount of excavation.

- **Munir Tojaga** points out that, given the two phased works execution, it is foreseen to execute works in the winter period, from October to May, in two seasons. As for the first phase, the deadline will not be less than eight months, while the second phase is expected to last about two and a half months. As far the traffic, there won't by any full traffic suspension. The traffic will be regulated by traffic lights, and there will be a one-way traffic regime throughout the construction period. As for the disposal of the material, there are about 12,000 cubic meters of excavation which is not a large quantity. He points out that a certain location will have to be found in coordination with the Jablanica Municipality.

- **Amira Nuhić**, Jablanica Municipality, urged the Investor to notify timely about the works commencement and planned traffic regime during the execution. She asked

whether PC Roads of the FBiH has been granted a construction permit. She shares the opinion of her colleague Dženan Mulahasanović that avoiding the variant with the construction of two bridges the Jablanica municipality is getting cut back at the expense of its citizens. She expressed her wish to enter this comment of the community of Jablanica Municipality into the Minutes.

- **Munir Tojaga** explained that for each construction project, the Investor and the Contractor are obliged to inform the Municipality and the competent authorities of works commencement, pursuant to the Ordinance on Site Organization. However, when it comes to rehabilitation, law doesn't require the Investor to notify the municipality as there is no adequate construction permit. As for the construction permits, he points out that a request for a construction permit including the complete documentation has been submitted to the Federal Ministry of Spatial Planning six months ago, and that the same Ministry declared itself not responsible for this matter and forwarded this request to the Ministry of Spatial Planning and Construction of Herzegovina - Neretva Canton, which also declared itself not responsible for the matter in question.

- **Derviš Gabela**, Ostrožac Local Community raised a question regarding a clogged fountain so called „Česma šehida i poginulih boraca“. He expressed his concern that the fountain is clogged due to the asphalt deposits and asks whether the reconstruction project should take this matter into consideration.

- **Munir Tojaga** emphasized that any water that appears anywhere (under, behind or inside the tunnel) must be treated in a controlled manner and he expressed his hope that the area around the fountain will be landscaped during the works execution.

- **Amira Nuhić** asked about the project funding and whether the project is funded from the World Bank's loan, which **Selma Ljubijankić** confirmed and added that the World Bank and the European Investment Bank are jointly financing this project.

The public consultations ended at 13.00.

Photographs of participants in the Public Consultations in Jablanica (business premises of Jablanica Municipality)

List of Participants in the Public Consultations

Javna rasprava na nacrt Plana upravljanja okolišem i društvenim uticajima za projekat rekonstrukcije Tunela Crnaja

Općina Jablanica, 12.12.2017.

Spisak prisutnih

	Ime i prezime	Institucija/ nevladina organizacija/ zainteresirani građanin	e-mail adresa	Broj telefona	Potpis
1					
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