



PROGRESS REPORT 2020

REPORTING PERIOD: July 20th, 2020 – December 31st, 2020

Contract number:	EIB-MNE-RIOM-SER-SL-2019-A1	
Country:	Montenegro	
	Contractor:	Contracting Authority:
Name:	KPMG d.o.o. Beograd	Railway Infrastructure of Montenegro JSC (RIoM)
Contact person:	Mr. Aleksandar Bučić Project Director	Ms. Lucija Filipović Project Coordinator
Project Team Leader (Key Expert):	Mr. Vasko Vassilev, PhD, CMC vasko.vassilev@gmail.com Cell: +381 60 205 52 82	



Table of Contents

1. PROJECT SYNOPSIS	3
2. WORK UNDERTAKEN	4
2.1. Report on the first month period.....	4
2.2. Inception report.....	4
2.3. Asset Management Strategy Report.....	4
2.4. Proposal for an Asset Management System	5
2.5. Management Re-structuring Proposal and Business Process Revision	5
3. ACHIEVED RESULTS/OUTPUTS	5
3.1. Asset Management Strategy Report.....	5
3.2. Proposal for an Asset Management System	7
3.3. Management Re-structuring Proposal and Business Process Revision	9
4. RESOURCES ENGAGED	9
4.1. EXPERT’S SELECTION AND RECRUITMENT	9
5. COOPERATION IN PROJECT IMPLEMENTATION	9
5.1. The Kick-off meeting.....	9
5.2. Other meetings	9
6. ACTIONS PLANNED FOR THE 2021	10
6.1. ASSET MANAGEMENT STRATEGY REPORT	10
6.2. PROPOSAL FOR AN ASSET MANAGEMENT SYSTEM	11
6.3. MANAGEMENT RE-STRUCTURING PROPOSAL AND BUSINESS PROCESS REVISION	11
6.4. IDENTIFICATION OF AITS REQUIREMENTS; TECHNICAL SPECIFICATIONS AND TENDER DOCUMENTS FOR PROCUREMENT OF HARDWARE AND SOFTWARE	11



1. PROJECT SYNOPSIS

- Project name:** Support to the development of an Asset Management System and Asset Information System in the railway sector, Montenegro Contract# EIB-MNE-RIOM-SER-SL-2019-A1
- Project location:** Montenegro
- Duration:** 10 months
- Beneficiary:** Railway Infrastructure of Montenegro JSC (RIoM)
- Key Stakeholders:** European Investment Bank, line Ministry of MNE and RIoM.
- Project overall Objective:** The overall objective of the project is to facilitate the potential for economic growth in the country and in the region by enhancing railway infrastructure development and maintenance in Montenegro and Increasing the competitiveness and level of service of railway transport in Montenegro, thereby increasing the potential for a transport modal shift from road to rail.
- Project purpose:** The purpose of this contract is to provide necessary support to project beneficiaries that will be in particular aimed to design an AMS and AIS tailored to the identified needs of ŽICG, including:
- proposed adjustments to management structure and/or business procedures;
 - proposed related changes to staffing requirements and their training;
 - preparation of hardware and software requirements.
- Key results:**
- Result 1:** development of an efficient asset management strategy and system designed following internationally accepted standards and practices:
- Asset Management Strategy Report
 - Proposal for an Asset Management System
- Result 2:** Analysis of ŽICG’s management structure, business processes and human resources capacity:
- Management Re-structuring Proposal and Business Process Revision
- Result 3:** Identification of qualitative and quantitative requirements for a complementary Asset Information System:
- Technical Specifications and Tender Documents for procurement of hardware and software
 - Endorsed Tender Evaluation Report



2. WORK UNDERTAKEN

2.1. REPORT ON THE FIRST MONTH PERIOD

The project team started work to achieve the results described in the project summary. A report was prepared for the actions taken during the first month of the project, which was submitted to the beneficiary on 01.09.2020. This report includes the actions taken to define the problem situation, study the documents provided by the beneficiary and perform GAP analysis. This report was supporting document to the Invoice that had been submitted by the Contractor.

2.2. INCEPTION REPORT

The team prepared an inception report and submitted it to the beneficiary on 18.09.2020. Preparation of the Inception Report was conducted in accordance with PCM and includes:

- The validation of the ToR;
- The Project Work Plan, specifying detailed activities, tasks, outputs, the timeline, and expert's working day allocation;
- All activities pertaining to results and outputs in a timetable of activities and project work plan
- Highlighting milestones;
- Project deliverables;
- Identification of the experts' positions and responsibilities within the Project Team

The work was hindered by the overall situation caused by COVID 19 pandemic, which resulted with the delay of the one month.

2.3. ASSET MANAGEMENT STRATEGY REPORT

- Preparation of Methodology based on Asset Management Excellence Model (AMEM) and detailed Questionnaire for Asset Management GAP analysis.
- Explanation of Methodology and Questionnaire to Beneficiary in order to collect the quality data in sufficient volume.
- Asset Management GAP analysis conducted, shared with Beneficiary and implemented in Asset Management Strategy and Inception Report.
- Preparation of the presentation materials and implementation of the two Workshops with ZICG (Gap Analysis and Strategic Priorities).
- Drafting of the Introductory parts of Asset Management Strategy – Overview of the railway sector restructuring process, Financial Status of the Company, Projects implemented and funds used in the previous period and Summary of the Current situation.
- Definition of strategic priorities for Asset Management Strategy, perform discussion within Project Team and Beneficiary and finalization of strategic priorities during the second Workshop.
- Participation in the process of assessment of line capacity to determine possible "critical infrastructure".
- Passenger and freight demand analysis and projection was carried out to determine the volume of future work.
- Business priorities were determined and measures for different asset type were suggested.



2.4. PROPOSAL FOR AN ASSET MANAGEMENT SYSTEM

- Assessment of the usage of Information Technology in asset management in Montenegro's Railway Administrator.
- Clarification of usage of software for asset management in Montenegro's railway infrastructure.
- Assessment of existing communication infrastructure in RIMM (Railroad Infrastructure manager of Montenegro) and proposal for possible improvement.
- Definition of key activities for future business improvement in accordance with planned traffic volume changes was carried out.
- Questionnaire preparation: for line capacity utilization, questionnaire was prepared and sent to beneficiary.
- Assessment of line capacity was carried out, to determine possible "critical infrastructure".

2.5. MANAGEMENT RE-STRUCTURING PROPOSAL AND BUSINESS PROCESS REVISION

- Development of methodology for assessment of the current management structure and business processes of ŽICG

The work was carried out using methods of system analysis and cybernetic approach to the business systems. It is based on a simplified model of a business system, according to which an enterprise represents a unity between four elements, namely objectives, functions and mechanisms for functioning and management, integrated unity between production and management structures and resources. Resources are labor, financial, material, informational and innovative.

- During the preparation of the preliminary analysis and evaluation of the work on the organizational restructuring carried out so far, a questionnaire is developed, structured with the aim to outline the main elements of the organization and process management. Methodology for qualitative and quantitative analysis of existing human resources

Analysis methodology is prepared observing the following:

- Situation in respect of the number and the structure of employees and HR trends.
- Estimates of anticipated technical and technological changes in respect of means of railway transport business operation, which require acquiring of specific knowledge and skills, based on comparable practice and views of the managers in the Company,
- Consideration of the organizational culture of the company and assessment of the optimal way of arranging and implementing the necessary changes intended for the development and retention of human resources.

3. ACHIEVED RESULTS/OUTPUTS

3.1. ASSET MANAGEMENT STRATEGY REPORT

- Methodology for drafting Asset Management Strategy has been prepared based on the both, the Montenegrin regulatory framework (Law on Railway and Law on Railway Safety) and international asset management standards - the ISO 55001 standard and the Publicly Available Specification 55 of the British Standardization Institution (BSI PAS 55), which are operationalized through International Infrastructure Management Manual (IIMM). All these international standards have



been incorporated into Asset Management Excellence Model (AMEM) that has 39 basic areas of asset management divided into six groups of areas – Strategy and Planning, Asset Management Decision Making, Lifecycle Delivery, Asset Information, Organization and People, Risks and Review.

- Detailed Questionnaire for Asset Management GAP analysis was developed and presented to Beneficiary, together with detailed explanation regarding the questions asked. Sufficient data was acquired from the Beneficiary, including answers to most of the questions, and references to web pages containing publicly available strategic documents and plans. Provided data were sufficient for performing the Asset Management GAP analyzes and to continue further work on the project, especially for definition of Strategic Priorities.
- Asset Management GAP analysis was conducted and scores were assigned to all six groups of asset management areas. The results showed that Railway Infrastructure of Montenegro has scores that correspond to similar companies in the region, but are somewhat lower in comparison with companies in the more developed markets (UK). GAP analysis has been implemented into Asset Management Strategy and Inception Report of the Project.
- Strategic priorities of Asset Management Strategy were drafted, shared within Project Team, discussed and finalized in order to be aligned with priorities defined by other relevant strategies – Strategy for Traffic Development and Strategy for Railway Development 2017 – 2027, as well as with best EU practice in railway asset management. Specific objectives and measures targeted to achieve strategic priorities were proposed as follows:
 - Development of railway infrastructure as an integral part of the trans-European transport network
 - To ensure compliance with regulatory requirements
 - To provide sustainable service to the customers
 - The highest standard of efficiency
 - Optimize the asset management system
 - Improve the system and the processes for asset information
 - Improve risk control and monitoring of asset management systems
 - Improve the organization and strengthen human resources for asset management
 - Continuous improvement of the quality of railway service
 - Achieve a high level of reliability
 - Achieving and maintaining a high level of safety
 - Achieving and maintaining high speeds
 - Limiting the impact of rail transport on the environment
 - To promote green building design and construction
 - To reduce energy consumption
 - To reduce carbon
 - Increasing the competitiveness of rail transport
 - To equip with appropriate technology and maintenance of the asset
 - To link asset (Infrastructure) investment decisions to service outcomes
- During the two Workshops that have been carefully prepared and implemented, GAP analysis was accepted by the Beneficiary, as well as the proposed Strategic Priorities. Active discussion was



especially valuable during the first Workshop (on GAP analysis) where important inputs were received from the Beneficiary.

- The “Critical Infrastructure” has been defined based on analysis of line capacity utilization from the data obtained from Beneficiary. “Critical Infrastructure” consists of Construction elements (Bridges and facilities, Tunnels, Superstructure and switches, Substructure, Noise barriers, Road works, Small structures, Overpasses / underpasses Pedestrian), Railway stations, Signaling system elements, Telecommunication system elements, Power supply (Catenary, Tractions sub-stations). It was determined that main infrastructure improvement should be focused on modern **SIGNALING** and traffic management system which should provide sufficient capacity on most lines, with the exception of the line segment Bijelo Polje – Podgorica.
- It was determined that there is no correlation between transport volumes and most of economic parameters, neither in passenger nor in freight transport. For the few economic parameters, where correlation was determined, corresponding P-value was very high, due to very small sample (historical horizon). Initial forecast was carried out based on total transport volume that observes railway and road transport. Further application of basic logit model on the initial results enabled a modal-split and obtained transport volumes for the railway were further used for forecasting main railway traffic indicators. It was concluded that drastic changes in passenger or freight transport should not be expected in future mid-term period.
- Business priorities were perceived through inputs and outputs for the asset management components, key steps in translating the inputs to outputs and identification of the ‘suppliers’ of the ‘inputs’ and the ‘customers’ for the outputs. The primary objective is to optimize decision on inspecting, maintaining, renewing and enhancing the infrastructure in such way that the route outputs are delivered at minimum life cycle costs. Strategic goals must be implemented through the incorporation of railways in Montenegro with the TEN-T network of European railways. In order to achieve it, it is necessary for ZICG to meet all technical norms, which are required by European directives. Not only requirements defined by EU Directive 1315/2013, but also regulations defined by technical standards for interoperability. Special attention should be dedicated to international traffic, in terms of cross-border operations. Defining optimal business processes in cross-border stations is conditioned by the level of information exchange between all participants. Thus, it is necessary to implement modern information systems, which will enable better communication, both between the Infrastructure Manager and operators, and among Infrastructure Manager and neighboring Managers. The requirements are defined by the technical specifications for interoperability for the application of telematics applications in passenger and freight transport, TAP TSI and TAF TSI.

3.2. PROPOSAL FOR AN ASSET MANAGEMENT SYSTEM

- Definition of key activities for future business improvement in accordance with planned traffic volume changes was carried out. Following was determined:
 - From the aspect of infrastructure maintenance, it is necessary to modernize the infrastructure maintenance process.
 - It is extremely important to properly define terms of maintenance actions, in order to ensure the availability of infrastructure in the long run and reduce overall costs. Skipping maintenance cycles can have devastating consequences, as costs grow exponentially, with missed maintenance cycles.



- Establishment of functioning maintenance system ensuring no section in poor/very poor condition defined through the agreement by the WB Prime Ministers in Vienna (August 2015) that is the starting point and a cornerstone for improvement of the overall rail network condition in the WB6 region.
- From the aspect of construction, the railway network of Montenegro is relatively well developed, especially having in mind the long-term plans.
- Traffic management, in conditions of increased traffic volume, can become a very important factor in the reliable functioning of the entire company; centralized management will be required in the future.
- As the volume of traffic increases, it will be necessary to raise the level of safety. In part, this will be the result of a new train control system. Level crossings must be secured by bumpers.
- For proper monitoring and management of assets, especially after the assumed implementations, it will be necessary to apply modern information system developed for railway asset management.
- For determination of the line capacity utilization, complete and detailed data were obtained. Data contains all trains, regardless the regularity, loco paths were included in the number of freight trains.
- Line capacity utilization was assessed in accordance with data obtained from beneficiary and having in mind possible increases in the number of trains. Capacity determination was carried by lines. It was determined that the main corridor, State border – Bijelo Polje – Podgorica – Bar, would require infrastructure improvement in terms of modern signaling and traffic management system. Capacity utilization on the Podgorica – Nikšić line is also close to recommended value, but with traffic management measures expected traffic volume in the future would lead to a significant decrease of this indicator. The first step in infrastructure improvement should be implementation of signaling block-system. That measure alone should provide sufficient capacity on most lines, with the exception of the line segment Bijelo Polje – Podgorica, where utilization rate could reach critical value of over 100%. In that case, traffic management measure would further decrease capacity utilization, up to the recommended value.
- During the assessment of usage of Information Technology in asset management in Montenegro's Railway Administrator the following was concluded: RIMM used as Information system for Asset management Microsoft Dynamics NAV 2009 with client server architecture and SQL server as data base. The used operational systems are Windows Server 2003, Windows Server 2008. The system operates on 2 servers (1 domain controller and 1 SQL server with 14 concurrent licenses).
- Clarification of usage of software for asset management in Montenegro's railway infrastructure identified that for asset management information system they used Modules in Dynamics NAV 2009: Inventories (Inventory Management) and Fixed Assets (Procurement and Expenditure of Fixed Assets, Depreciation Calculation ...).
- Assessment of existing communication infrastructure in RIMM (Railroad Infrastructure manager of Montenegro) and proposal for possible improvement shows the following: RIMM has local area network just in the main office. The other offices are connected via IDSL through the telephone centrals for e-mail services. In the same time RIMM has the optic cable installed in the parallel with railroad line. The optic cable is not connected with the other equipment in the offices and not used. Two possibilities were identified for possible improvement of the communication



infrastructure: Usage of existing optic cable - bus architecture and Usage of Internet service provider

3.3. MANAGEMENT RE-STRUCTURING PROPOSAL AND BUSINESS PROCESS REVISION

- Methodology and content of the study are prepared. Questionnaires through which the research will be conducted are about to be finalized and sent to the Beneficiary for further processing.

Filling questionnaires will require close cooperation with the representatives of the beneficiary. Results of processing answers of the company representatives, combined with best HR practices applicable to the company, and other project findings and elements, will be a basis for discussion at a joint meeting.

4. RESOURCES ENGAGED

4.1. EXPERT’S SELECTION AND RECRUITMENT

Consequent to the activities, the following experts from the Project Team were involved in in project activities during the 2020:

- Mr. Vasko Vassilev (Key Expert 1) - Team Leader / AMS Expert
- Mr. Plamen Petkov (Key Expert 2) - Information Technology Specialist
- Mr. Predrag Jovanovic (Key Expert 3) - Railway operations expert
- Mr. Vladimir Pavlovic (Senior NKE 1) - AMS Expert
- Ms. Tijana Pavlovic (NKE 2) – HR Expert

5. COOPERATION IN PROJECT IMPLEMENTATION

5.1. THE KICK-OFF MEETING

After consultations with the Beneficiaries regarding the date for the organization of the Kick-off Meeting, the Project Team began with the logistical arrangements for the organization of the meeting. In consultation with the relevant stakeholders, the Project Team prepared a Kick-off Meeting Agenda, which was disseminated to all the participants two days before the meeting. Kick-off meeting is considered as a commencement date of the project.

The Project’s Kick-Off Meeting was held on July 20th, 2020 via Zoom application. The meeting was attended by

Beneficiary representatives, Project Team and KPMG backstopping team.

5.2. OTHER MEETINGS

Date	Subject	Meeting Agenda	Attendance
June 27, 2020	Initial Coordination Meeting, Zoom Meeting, ID 441 802 2434	-Identification of relevant Stakeholders -Communication and Visibility Plan -Responsible Bodies and Project Manager (Beneficiary) -Forming of Project Working Groups (ZICG)	Railway Infrastructure of Montenegro JSC (RIoM); KPMG Team



		-Questionnaire – Asset Management GAP Analysis -Project’s Organisational Structure	
July 31, 2020	Coordination Meeting on Asset Management Questionnaire, Zoom Meeting, ID: 441 802 2434	-Clarifying elements of the AM Questionnaire	Railway Infrastructure of Montenegro JSC (RIoM); KPMG Team
October 7, 2020	Asset Management Workshop – GAP Analysis	- GAP Analysis methodological basis - Presentation of key findings by Asset Management groups - Discussion on the Connecta report and its conclusions to be implemented in the Asset Management Strategy - Discussion regarding the Rulebook on Railway Infrastructure Registry - Further steps in Asset Management Strategy preparation-outline of measures and Action Plan	Railway Infrastructure of Montenegro JSC (RIoM); KPMG Team Ministry of Transport and Maritime Affairs (MTMA)
December 04, 2020	Workshop on Asset Management Strategy and Business processes	- proposal for the content of the strategy, - strategic priorities, goals and measures for realization in the management of the assets, - analysis and planning of the main directions for business development, - preliminary assessment for reliability of information flows and information management	Railway Infrastructure of Montenegro JSC (RIoM); KPMG Team
December 21, 2020	Meeting on Traffic volume and IT data Questionnaire	Describe the details of the required data, so that beneficiary can completely prepare and forward them.	Railway Infrastructure of Montenegro JSC (RIoM); KPMG Team

6. ACTIONS PLANNED FOR THE 2021

6.1. ASSET MANAGEMENT STRATEGY REPORT

In order to finalize Asset Management Strategy, following activities will be conducted:

- To define concrete needs for signaling and traffic management system improvements to optimize capacity and meet future demands. It should be done through analysis of the main functions of traffic management. Through this activity traffic management functional requirements will be defined. - **31.01.2021.**



- Business process reform in terms of train control, infrastructure maintenance and infrastructure upgrading will be finished in accordance with determined lack of capacity on considered lines. As a result of this activity, we should expect final determination of the main business processes. Beside adjustments of current business processes, potential new processes may arise from defined requirements. - **10.02.2021.**
- Drafting proposal of Action Plan – **15.02.2021.**
- Organization of additional Workshop in order to finalize and confirm the Action Plan, - **28.02.2021.**

6.2. PROPOSAL FOR AN ASSET MANAGEMENT SYSTEM

- Assessment of the existing regulations in terms of business operations, as well as relations between railway infrastructure manager and all the other actors within the railway sector. As a result, a detailed analysis of the existing regulations that directly define the way of operational functioning should be expected. In addition, the regulations that affect the relations of beneficiary with all other subjects in the railway transport market will be analyzed. The analysis may lead to proposals for changes of certain regulations, in order to enable the application of newly defined business processes, in accordance with legal regulations. - **15.02.2021.**
- Development of architecture of Asset information management system (AIMS) – **20.03.2021**
- Development of guidelines for Graphic User Interface (GUI) of AIMS – **31.03.2021.**

6.3. MANAGEMENT RE-STRUCTURING PROPOSAL AND BUSINESS PROCESS REVISION

- Final Management Restructuring Proposal and Business Process Revision should be carried out. Within this activity, necessary steps and their execution order will be defined, to provide safe business process transition and to ensure business continuity. - **10.03.2021.**

6.4. IDENTIFICATION OF AIMS REQUIREMENTS; TECHNICAL SPECIFICATIONS AND TENDER DOCUMENTS FOR PROCUREMENT OF HARDWARE AND SOFTWARE

- Review necessity for development of plans for asset data acquisition and update in terms of Reliability, Availability, Maintainability and Safety requirements. The introduction of a reliable RAMS standard is a prerequisite for the implementation of the envisaged measures. The main result of this activity will be the harmonization of all proposed changes in the business processes with the requirements of the RAMS railway standardization, which should enable a more favorable position of ZICG when applying for credits and loans. - **31.03.2021.**
- Development of functional specification for AIMS - **20.03.2021.**
- Development of technical specification of AIMS – **31.03.2021.**
- Preparation and modification of Tender Documents in accordance with EBRD's Standard Tender Documents Procurement Goods and Related Services or the World Bank's standard tender documents for the Supply and Installation of Information Systems. - **30.04.2021.**