

Sustainable Croatian Railways in Europe

European Rail Traffic Management System – Implementation Plan

Terms of Reference

Background

The implementation of the European Rail Traffic Management System (ERTMS) is one of the essential priorities of the EU transport policy in the rail sector.

In this context, the Ministry of the Sea Transport and Infrastructure and HŽ INFRASTRUKTURA d.o.o. (HŽI) aims at implementing ERTMS as part of the infrastructure rehabilitation and modernisation programme as described in the “*National Implementation Plan for Commission Regulation (EU) 2016/919 of 27 May 2016 on the technical specification for interoperability relating to the ‘control-command and signalling’ subsystems of the rail system in the European Union. Ref. Ares (2018)18239 - 03/01/2018*”¹.

Objectives of the Assignment

Given the complex nature of the main objectives of the assignment, key actions are divided into stages as follows:

Phase One

- Provide an Implementation Plan for ERTMS in Croatia as a rehabilitation and modernisation programme achieving interoperability of the rail system;
- Establish a way forward in discussion and agreement with HŽI taking into account current and forecasted levels of traffic;

Phase Two

- Updating and revision of the National Implementation Plan for (EU) 2016/919;
- Provide ERTMS tender documentation for Design-Build Contract(s).

After completion and acceptance of Phase One, HŽI will have the option to not execute Phase Two and terminate the assignment.

Preparatory Information

The Consultant shall ensure full compliance with the EU and National Legislation, Standards and Technical Specification related to the assignment (Latest versions) e.g.:

- Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union;
- Technical Specifications for Interoperability (TSIs) (is the specification covering all structural or functional subsystems or parts thereof with the aim of fulfilling the basic requirements and achieving interoperability of the rail system.);
- Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety;
- Directive 2014/24/EU on public procurement;
- Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors.

There is currently no automatic transport management system on the network of railway lines in Croatia. The signalling system is based on mainly relay interlockings with only a few electronic Interlockings in operation. An auto-stop train protection system (INDUSI 60) is generally applied on the network.

HŽI is the Infrastructure Manager of the Croatian Network and different national and international Railway Undertakings are operating on the network and they have to be consulted during the development of the Implementation Plan.

¹See:

https://transport.ec.europa.eu/document/download/4a58d439-bea4-4d33-bdc6-2f3221de0a29_en?filename=nip-ccs-tsi-croatia-en.pdf

Administrative Provisions

Management and Reporting

The Consultant shall report directly to Mirko Franovic (Director of Sector for Development, Preparation and Implementation of Investment and EU Funds) HŽI and will work in close consultation with other members of HŽI and representatives of the World Bank Group, providing guidance and feedback to the Consultant on draft outputs.

Qualifications of the Consultant

Academic Qualifications:

The Consultant's team shall comply with the requirements under "Qualifications of the Consultants Key Staff"

Years of Experience:

Minimum of ten (10) years professional experience in project management and a very good understanding of project/programme development.

Competencies:

Prior demonstrated experience in developing programmes and tender documents for Railways and Signalling including ERTMS. Details of experience or similar assignments undertaken in the previous ten years, including a reference list of at least three assignments providing information on the name of the assignment, cost, duration, location, client, and contact details for enquiring references as relevant. The value of each assignment should not be lower than EUR 350,000.00. The assignments should be by type and quantity comparable to the activities which are the object of this REoI and which were provided in 2022 and during the nine (9) years previous to that.

Language and Other Skills:

The Consultant is expected to have capacity among its team to operate in Croatian and review Croatian language documentation as well as documentation in English.

Quality Systems:

The firm/lead firm in any consortium shall have ISO 9000 certification for Quality Systems Management.

All firms/consortium members tendering for the assignment will need to meet eligibility requirements for employment as a consultant under World Bank Group financed projects under "Guidelines on Selection and Employment of Consultants Under IBRD Loans and IDA Credits & Grants by World Bank Borrowers – January 2011 (revised July 2014)².

The Consultant's proposal shall include the following information:

- a concise summary of the manner in which the assignment will be provided (work programme and approach);
- a detailed work programme for Phase Two;
- a detailed cost breakdown for providing the Services, separating fees and expected expenses (per diem, hotel, transport, etc); and
- a list of the proposed staff who will perform the assignment and their CVs.

Qualifications of the Consultants Key Staff

The Consultant is solely responsible for drawing up the team with all the necessary skills to carry out the services as described in these requirements.

The Consultant must ensure that experts are adequately supported and equipped. In particular it must ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities.

² See:

<http://pubdocs.worldbank.org/en/894361459190142673/ProcurementConsultantHiringGuidelinesEngJuly2014.pdf>

The Consultant is expected to have capacity among its team to operate in Croatian and review Croatian language documentation as well as documentation in English.

The Consultant is expected to provide an experienced team to carry out the assignment, however it is assumed that the key staff will include at least:

- Team Leader;
- Signalling Specialist - ERTMS ETCS;
- Rolling Stock Specialist - ERTMS ETCS;
- Telecommunication Specialist - ERTMS GSM-R/FRMCS;
- Operational Specialist - TCC;
- Procurement Specialist - FIDIC Yellow Book.

The main functions and obligations of the Team Leader are:

Planning, organisation, coordination, management and control directed towards the resources (material, financial, human and informational) achieving quality and completion of the project's goals including:

- Ensuring on-time start of the project;
- Preparing periodic project progress reports;
- Establishing and maintaining appropriate interrelations and work relations with HŽI;
- Assisting the team in its effort regarding the implementation of the goals, tasks, activities and expectations upraising from the current specification.

Qualification and skills of the Team Leader and Specialist:

The minimum requirements covered by the team of experts as a whole are detailed below:

- Qualifications and skills required for the team: All team members must possess at least a master's degree or equivalent academic qualification in a field relevant for the assignment. In the absence of master's degree, bachelor's degree accompanied by additional 4 years of general professional experience on top of the minimum years required as per the category of expert will be accepted.
- General professional experience of the team: Minimum 12 years experts in fields relevant for the assignment
- Specific professional experience of the team:
- The team as a whole shall have a cumulative specific professional experience in specification/designing European Rail Traffic Management System ERTMS on at least 2 railway construction, modernisation or reconstruction projects;
- The team as a whole shall have a cumulative specific professional experience in preparation of 1 national plan/programme for implementation of ERTMS;
- The team shall have cumulative experience in 4 railway projects that includes European Train Control System (ETCS) and Global System of Mobile Communications – Railways (GSM-R) or equivalent;

Data Ownership

HŽI will own all right, title and interest, including all intellectual property rights, in and to any reports, documents, computer software (in source code and object code form), or other deliverables (whether in hard-copy, electro-magnetic, or machine-readable format) created or used under this assignment. The Consultant will submit additional soft copies of all data in interchangeable file format or common Microsoft applications as appropriate. All analyses should be replicable after completion of the assignment without requiring any additional data sources.

Language of Reports and Data

Deliverables, reports, presentations and data are required in both English and Croatian.

The draft reports and recommendations are to be presented by the Consultant at meetings with the stakeholders in Zagreb.

Following the presentations, the Consultant will be requested to revise and finalise the draft

reports.

Place of Performance of Assignment

The assignment will be mainly carried out in Croatia and from the country of residence of the Consultant's staff.

The place from where mobilised staff working on the assignment will carry out their work has to be defined in the work-plan to be submitted by the Consultant in its offer. This information should also be reflected in the Consultant's financial offer e.g. frequency of travel between Croatia and country of residence of staff and expected travel.

Milestones

Milestones		When due
Phase One: Providing ERTMS Implementation Plan		
1	Task 1.1 Legislation	Contract + 90 Days
2	Task 1.2 Infrastructure	Contract + 120 Days
3	Task 1.3 Rolling Stock	Contract + 120 Days
4	Task 1.4 Traffic Control Centres	Contract + 120 Days
5	Presentation of 1.1 to 1.4 Reports	To be agreed
6	Task 1.5 Procurement options	Contract + 150 Days
7	Presentation of 1.5 Report	To be agreed
8	Task 1.6 Strategy to optimise ERTMS implementation	Contract + 210 Days
9	Task 1.7 Recommended Overall Deployment Schedule for ERTMS in Croatia	Contract + 210 Days
10	Task 1.8 Conditions for completion of the National Implementation Plan	Contract + 210 Days
11	Task 1.9 Cost Estimate at Budget Authorisation stage.	Contract + 240 Days
12	Task 1.10 Conclusion of Phase One	Contract + 270 Days
13	Presentation of 1.6 to 1.10 Reports	To be agreed
14	HŽI decision on Phase Two	
Phase Two: Providing ERTMS Tender documentation		
15	Task 2.1 Update National Implementation Plan	Start of Phase Two + 30 Days
16	Task 2.2 Tender documentation	According to the Consultant's detailed work programme
17	Task 2.3 Cost Estimate at Bid/Tender stage	According to the Consultant's detailed work programme
18	Presentation of Tender Documentation and Cost Estimate	According to the Consultant's detailed work programme

Invoicing

1st Invoice after approval of Milestones 1 to 5.

2nd Invoice

After approval of Milestones 6 to 11.

3rd Invoice

After approval of Milestones 12 and 13.

Further Invoicing to be agreed based on the Consultant's detailed work programme for Phase Two.

Phase One

Task 1.1 – Legislation

Analysis and evaluation of legislation (European and National) to be applied to ensure full compliance with the EU and National Legislation.

The outcome/deliverables of this task:
Report summarising findings of Task 1.1.

Task 1.2 – Infrastructure

Analysis and evaluation of existing condition of the national railway infrastructure by reviewing HŽI's documentation and designs of the railway's current infrastructure line locations, interlockings, switches, level crossings, etc. and the Consultant will validate its observations with field visits as needed in coordination with HŽI.

Based on the existing infrastructure condition and forecasted levels of traffic, the Consultant shall, in discussion with HŽI, provide network simplification opportunities.

Based on the Network simplification opportunities, the requirements in the TSI and the status of the existing Infrastructure, the Consultant shall describe required work to be undertaken for ERTMS/ETCS.

This shall also include modernisation needed for connecting to ERTMS e.g. replacing relay interlockings with electronic interlockings where required or establishing connection to not signalled areas including a schedule for installation.

The transition from GSM-R to FRMCS will take place during the implementation of ERTMS in Croatia. The Consultant, therefore, shall describe considerations for the transition from GSM-R to FRMCS.

Based on the considerations for the transition, the Consultant shall describe required work to be undertaken for ERTMS/Mobile Communication including a schedule for installation.

The outcome/deliverables of this task:
Report summarising findings of Task 1.2.

Task 1.3 – Rolling Stock

In discussion with the Railway Undertakings (National and International Passenger and Freight) operating in Croatia, establish which Rolling Stock will have to be taken into consideration.

Describe required work to be undertaken for installing ERTMS in existing Rolling Stock including a schedule for installation.

The outcome/deliverables of this task:
Report summarising findings of Task 1.3.

Task 1.4 - Traffic Control Centres

Establish functions, number and location(s) of Traffic Control Centres (TCC) in discussion with HŽI.

The Consultant shall describe functions to be performed from the TCC Work Stations and proposed number of Work Stations in the TCC('s).

The Consultant shall provide schedule for TCC(s).

The outcome/deliverables of this task:
Report summarising findings of Task 1.4.

Task 1.5 – Procurement options

The Consultant shall study and propose different Procurement options including Croatian characteristics to be considered and perform Market analysis.

The Consultant shall prepare a Procurement Strategy for implementing ERTMS in discussion with HŽI by analysing and proposing different financing options. The Consultant shall draft the financing application, in co-operation with HŽI, as well as the supporting documents required. The Consultant shall assist HŽI along the appraisal stage, up to the approval of the financing.

The outcome/deliverables of this task:
Procurement Strategy.

Task 1.6 - Strategy to optimise ERTMS implementation

The Consultant shall describe technology life cycle and modularity including Human Resource for the ERTMS implementation. This description shall include:

- Creating a Network Plan for modernisation allowing efficient ERTMS;
 - E.g. Reduce the number of tracks, switches, upgrading of the existing signalling and interlockings
- Describing reduction of maintenance costs by removal of obsolete systems and minimizing use of wayside equipment;
- Describing Human Resource plan for ERTMS;
- Ensuring System integration with existing and future Intelligent Railway Systems including interlockings and external warning systems as seismological, dangers of landslides/snow, high snow deposits, etc.

The outcome/deliverables of this task:
Report summarising findings of Task 1.6

Task 1.7 – Recommended Overall Deployment Schedule for ERTMS in Croatia

Development of a strategy for the implementation of ERTMS in Croatia taking into account plans and methods for the implementation of ERTMS in neighbouring countries
The Consultant to provide recommendation for:

- Infrastructure;
- Rolling Stock;
- Human Resource.

The outcome/deliverables of this task:
Recommended Overall Deployment Schedule for ERTMS.

Task 1.8 – Conditions for completion of the National Implementation Plan

The Consultant shall provide Conditions for the completion of the National Implementation Plan for (EU) 2016/919 including:

- Analysis of installation risk due to timeframe of implementing ERTMS;
- Analysis of risk related to obtaining funding.

The outcome/deliverables of this task:
Conditions for completion of the National Implementation Plan.

Task 1.9 – Cost Estimate

The Consultant shall provide a Cost Estimate for implementing ERTMS with accuracy range for Budget Authorisation stage.

The outcome/deliverables of this task:
Report providing Cost Estimate at Budget Authorisation stage.

Task 1.10 – Conclusion of Phase One

The Consultant shall provide and present a report for Phase One containing:

- Implementation Plan for ERTMS in Croatia;

- Establish a way forward in discussion/agreement with HŽI;
- Prepare and Present findings of Phase One to involved parties.

The outcome/deliverables of this task:

Report and presentation summarising Phase One results.

Phase Two

Task 2.1 - Update National Implementation Plan

The Consultant shall update and revise the National Implementation Plan for Commission Regulation (EU) 2016/919, including a financial plan and funding sources based on the findings of Phase One.

The outcome/deliverables of this task:

Updated National Implementation Plan for Commission Regulation (EU) 2016/919.

Task 2.2 - Tender documentation

The Consultant shall prepare Tender Documentation for Design-Build Contract(s) based on the outcome of Phase One.

In view of HŽI's lack of experience in ERTMS requirements and operational implications, the Consultant shall provide training to the relevant HŽI staff on these issues during the assignment and especially when preparing the Employer's Requirements.

The task will include preparing the Employer's Requirements for the installation of the system, in accordance with TSI and adequate for a Design-Build tender/contract.

The Employer's Requirements shall take into account the need for staged implementation of installation and commissioning to minimise disruption to the operation of the railway.

On the basis of the Employer's Requirements, draft the complete set of tender documents, based on FIDIC Yellow Book conditions and in accordance with national and international procurement legislation.

The Consultant shall ensure that the Tender Documentation require the Contractor to provide full compliance with the EU and National Legislation, Standards and Technical Specification (latest versions) related to the Design-Build scope.

The Consultant shall ensure that the Tender Documentation require the Contractor to provide full compliance with the Technical Specification TS 50701 "Railway applications – Cybersecurity".

Draft Terms of Reference for the Works Supervision Services (FIDIC Engineer Role), in accordance with the national and international procurement legislation.

The outcome/deliverables of this task:

Tender Documentation for FIDIC Design-Build Contract(s), and Draft Terms of Reference for the Works Supervision Services.

Task 2.3 – Cost Estimate

The Consultant shall provide an updated Cost Estimate for implementing ERTMS with accuracy range for Bid/Tender stage.

The outcome/deliverables of this task:

Report providing Cost Estimate at Bid/Tender stage.