



BOSANSKO HERCEGOVAČKA ŽELJEZNIČKA JAVNA KORPORACIJA  
БОСАНСКО ХЕРЦЕГОВАЧКА ЖЕЉЕЗНИЧКА ЈАВНА КОРПОРАЦИЈА  
BOSNIA AND HERZEGOVINA RAILWAYS PUBLIC CORPORATION



December 2009



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## LIST OF ABBREVIATIONS:

<b>BHŽJK</b>	-	Bosnia and Herzegovina Railways Public Corporation
<b>ŽFBH</b>	-	Railways of the Federation of Bosnia and Herzegovina
<b>ŽRS</b>	-	Railways of Republic of Srpska
<b>EU</b>	-	European Union
<b>TER</b>	-	Trans European railways
<b>SEETO</b>	-	South-Eastern European Transport Observatory
<b>EBRD</b>	-	European Bank for Reconstruction and Development
<b>EIB</b>	-	European Investment Bank
<b>ETCS</b>	-	European Transport Control System
<b>EE</b>	-	Electro – energetic (facilities)
<b>OCL</b>	-	Overhead Contact Line
<b>HMT</b>	-	Heavy Motor Trolley
<b>PIU</b>	-	Project Implementation Unit
<b>UIC</b>	-	International Union of Railways
<b>HŽ</b>	-	Croatian Railways



## 1. INTRODUCTION

Investment plan for railway infrastructure for the period of next five (5) years, which also includes the development prospective of some investments even for the period of 10 years, that is presented in the further text has been made pursuant to the Article 3 and the Article 8 of the Agreement on the establishment of Railways Public Corporation of Bosnia and Herzegovina (hereafter "BHŽJK"), and to the Decision of the Board of Directors of BHŽJK no. 279-6-XII/2008 on guidelines for its preparation as well as pursuant to the investment plans of railway companies in Bosnia and Herzegovina namely the Railways of Republic of Srpska – hereafter "ŽRS" and the Railways of the Federation of BiH – hereafter "ŽFBH".

One of the most significant powers of Bosnia and Herzegovina Railways Public Corporation (BHŽJK) according to the Article 3 of the Agreement of its establishment, is the harmonisation of signalling, safety, telecommunications and other systems and of the rules and criteria used on the railway network of the two Entities as well as the examination, in co-ordination with railway companies, of the international requests for efficient traffic (including interoperability) on the two railway lines that are viewed as a part of the Pan-European railway network on the branch of the Corridor Vc in Bosnia and Herzegovina. These two railway lines are the following:

- ❖ Railway line Ploče-Mostar-Sarajevo - Doboj-Slavonski Šamac-Budapest and
- ❖ Railway line Zagreb - Banja Luka-Doboj –Tuzla-Zvornik-Belgrade /Loznica/.

There are two railway companies operating on the territory of BiH, namely Railways of the Federation of BiH and Railways of Republic of Srpska, which are in their respective Entities both the infrastructure managers and railway operators for internal and international traffic.

Bosnia and Herzegovina Railways Public Corporation acts as a common representative and a coordination body in the railway sector in Bosnia and Herzegovina and, in co-operation with bodies and organisations of other countries, plans the development of railway infrastructure on corridors of Tran-European railways (hereafter "TER").

## 2. RAILWAY INFRASTRUCTURE INVESTMENTS

### 2.1 INVESTMENT FRAMEWORK

Reconstruction of railway infrastructure in Bosnia and Herzegovina has been started immediately after the end of the war.

The first phase of the reconstruction called "putting railway traffic into operation" has been finished mainly using the donor funds coming from the EU countries.

The second phase of the reconstruction, which aim is to reach the TER and the EU standards, is primarily financed from the loans of the European Bank for Reconstruction and Development (hereafter "EBRD") and the European Investment Bank (hereafter "EIB"), and the investment plans are made on the principles set forth in some of the studies that have been financed by the international community. Those studies are the following:

- Bosnia and Herzegovina Transport Master Plan \*
- Bosnia and Herzegovina Railways Marketing Study
- Transport Infrastructure Regional Study (TIRS)
- Regional Balkans Infrastructure Study (REBIS)
- Study on TER Compliant Railway Corridor Vc in Bosnia and Herzegovina
- South East Europe Core Regional Transport Network Development Plan

Investments are related to all railway lines in Bosnia and Herzegovina having a priority needs defined as such by the responsible authorities within the country but also defined in the joint investment plans for reconstruction and development made on the level of regional organisations (SEETO), organisations of South-Eastern European countries (TER) that BIH is a member of as well as in the ad hoc Agreements of interested countries. \*\*

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\* Section that relates to the Development plan is given in the ATTACHMENT 1

\*\* *Agreement on high-performance railway network signed in 2006 by 11 South-Eastern European countries including BIH.*

## 2.2. INVESTMENT REQUIREMENTS

Out of 1.030,389 kms of railway lines in Bosnia and Herzegovina 91,48% are single-track lines and 8,52% are double-track lines (in the Federation of BiH - 587,150 km or 57 %, in the Republic of Srpska - 416,338 km or 40,4 % and in the District of Brčko - 26,901 km or 2,6 %).

“Study on TER Compliant Railway Corridor Vc in Bosnia and Herzegovina“ has confirmed the existence of certain limitations in respect of the speed and safety of railway traffic, due to unfavourable geographical configuration of terrain, incomplete system of station safety– signalling devices, lack of protection of level crossings and forming of bottle necks.

In addition, there are also the operational and organisational limitations being as follows:

- Maximal train length of 550 m,
- Maximal speed of 70 km/h,
- Change of locomotives in transition to a non-electrified sections,
- Lack of communication,
- Maintenance, etc...

Due to the above limitation factors, required investing in railway infrastructure has to be done according to the plans and in the long run. The planning has also to cover faster return of capital though the full exploration of infrastructure capacity and a larger number of train operators.

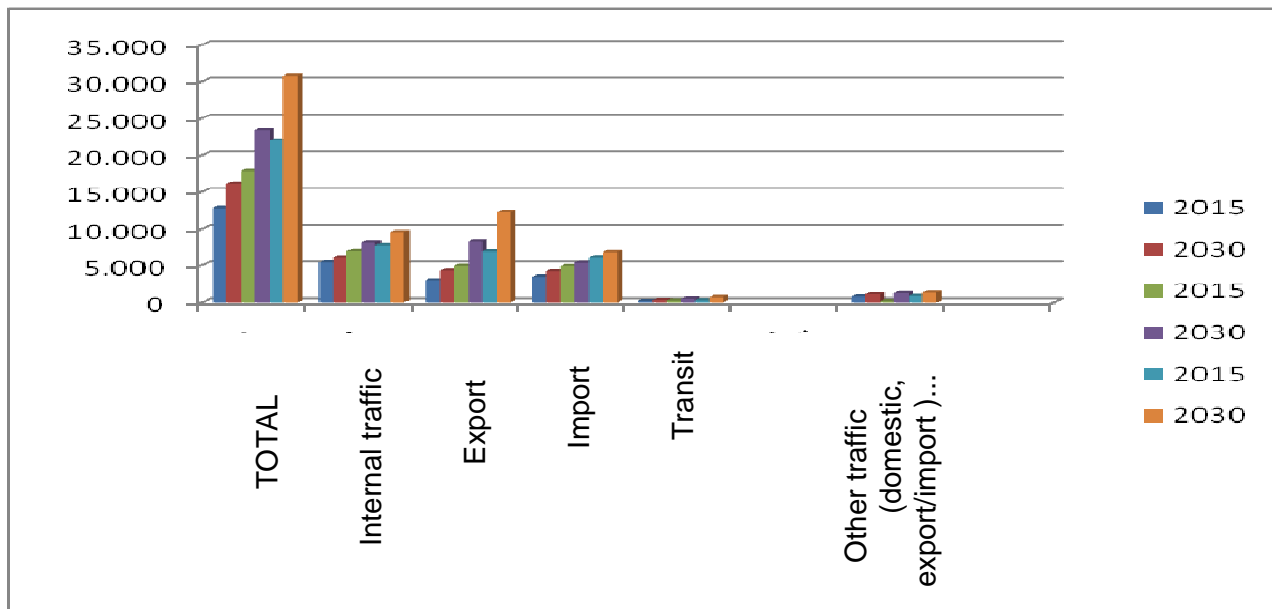
### 2.3. Freight transport forecast

According to the results of an in depth market research and of defining middle and long term development prospective, the significant increase of railway freight transport volume of in BiH up to 2015 and 2030 is to be expected.

Railway traffic demand, based on the investments and the results of development of mining, industry, forestry and agriculture in Bosnia and Herzegovina shall increase dynamically according to all scenarios:

Traffic type	LOW 2015	LOW 2030	MIDDLE 2015	MIDDLE 2030	HIGH 2015	HIGH 2030
<b>TOTAL</b>	12.850	16.125	17.819	23.433	21.952	30.754
Of which:						
Internal	5.416	6.121	6.966	8.095	7.728	9.570
Export	2.973	4.341	4.893	8.241	6.921	12.319
Import	3.482	4.223	4.882	5.344	6.146	6.832
Transit	200	350	250	500	300	700
Other traffic (domestic, export/import) unchangeable in depth	779	1.090	173	1.253	857	1.333
<b>Traffic volume along the Corridor covered by the Study</b>						
<b>Corridor Vc</b>	8.959	11.836	12.884	12.884	15.856	23.324
<b>Parallel to Corridor X</b>	7.780	9.366	11.499	15.009	14.565	21.178

*Resource:* - " Study on TER Compliant Railway Corridor Vc in Bosnia and Herzegovina " - ŽFBH and ŽRS



Characteristics of the freight traffic in the forecasted period are the following:

- It can be stated with high level of certainty that the domestic traffic shall be increased in the forecasted period; however, the level of the increase shall still be lower than for the whole railway traffic. Portion of domestic traffic in the whole railway traffic shall, slightly, be reduced.
- Export shall be increased for more than the average for the whole railway traffic, since BiH shall additionally increase its exporting opportunities.
- The most important groups of goods shall be the iron, non-metals and bauxite and coal (lignite, coal for coking, coke); aluminium oxide and hydrated aluminium oxide; metal products.
- Railway lines on the Corridor Vc and the railway line Novi Grad - Zvornik (parallel to Corridor X) are the railway lines in BiH which are currently the most overloaded railways lines and this shall continue over the forecasted period. In particular, the railway traffic volume along the Corridor Vc and along the railway line Novi Grad – Zvornik shall be more increased than the railway traffic volume in total.



### 3. GOALS

This Investment plan represents the continuation in the implementation of goals from the previous period:

- To provide key studies and to verify future vision of railways in Bosnia and Herzegovina for the purpose of protection of space for future development of corridors.
- To secure sources of financing for completion of projects which implementation started with funds from the loans of the EBRD and the EIB.
- To eliminate bottle necks and complete the signalling system.
- To continue with the reconstruction of the lines in order to reach higher speeds, all in accordance to the Trans European Railway (TER) Standards and the EU standards. \*
- To harmonise the railway infrastructure development plans on the corridors in BiH, with the development plans of the countries from the region (SEETO) and the development plans of the South-East Europe countries (TER).
- With reconstruction and development of railway infrastructure to create conditions for railway traffic so the same to be in accordance to the standards of the Pan-European corridors and the EU directives (tasks of the transport sector in the process of accession to EU).
- To open the new investment cycle of reconstruction and modernisation of the remaining parts of the corridor Vc and the parallel to corridor X,
- To complete the process of electrification of the railway network in Bosnia and Herzegovina: electrification of Tuzla knot and of the railway lines Doboj – Zvornik and Brčko – Banovići and the reconstruction of electrification system on Una line,
- To revive the international passengers' traffic through the implementation of "Talgo" project
- To implement the project of information and communication technology on major rail routes of BiH railway network
- To carry out the preparation activities for the construction of the railway line Čapljina – Nikšić as being a part of Adriatic-Ionian major rail route,
- To carry out the preparation activities for the construction of the railway line B.Brod/Brod – Modriča
- To create conditions, in cooperation with Croatian Railways and railway companies ŽRS and ŽFBIH, for more intensive exploration of Una line

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• *Middle TER standards are presented in the Attachment 2*

#### 4. LIST OF PROJECTS AND COST ESTIMATE OF THE INVESTMENTS FOR THE PERIOD 2010 - 2014 (2020)

No.	PROJECT DESCRIPTION	Cost estimate in mil. €			Deadline
		Total	FBiH	RS	
1	2	3	4	5	6
<b>4.1</b>	<b>STUDIES</b>				
1.	Route study of the Corridor V <sub>C</sub> in Bosnia and Herzegovina (406 km): B. Šamac / Šamac – Doboj – Sarajevo – Mostar – Čapljina *	1,00	0,60	0,40	2014
2.	Route study of the line parallel to Corridor X (307 km): Dobrljin – Banja Luka – Doboj – Tuzla – Zvornik*	1,00	0,60	0,40	2014
3.	Signalling and traffic remote control study on the railway lines in BiH *	0,60	0,36	0,24	2014
4.	Telecommunications study on the railway network in BiH BiH *	0,40	0,24	0,16	2014
5.	GSM – R (railway telecommunication system) and ETCS (European transport control system) study	2,00	1,20	0,80	2014
	<b>Total</b>	<b>5,00</b>	<b>3,00</b>	<b>2,00</b>	
<b>4.2</b>	<b>NEW RAILWAY LINES</b>				
1.	Provision of studies and other required documents on the economic and social justification of the construction of new railway lines in BiH				
1.1	• Čapljina – granica BiH / Montenegro - Nikšić	1,00	0,60	0,40	2012
1.2	• Čapljina – Imotski - Split	1,00	1,00	--	2020
1.3	• Vareš – Banovići	1,00	1,00	--	2020
1.4	• Modriča – Bos. Brod / Brod	1,00	--	1,00	2020
1.5	• Šamac – Brčko - Bijelina	1,00	--	1,00	2020
1.6	• Banja Luka - Gradiška	1,00	---	1,00	2020
	<b>Total</b>	<b>6,00</b>	<b>2,60</b>	<b>3,40</b>	
<b>4.3</b>	<b>PRIORITY PROJECTS</b>				
<b>A</b>	<b>Corridor V<sub>C</sub></b>				
1.	Track overhaul and reconstruction of structures on the section:				

1	2	3	4	5	6
1.1	Doboj – B. Šamac / Šamac (63 km) *	42,00	--	42,00	2014
1.2	Maglaj – Doboj (single track, 25 km) *	18,00	--	18,00	2014
1.3	Zenica – Jelina (9 km) *	6,00	6,00	--	2014
1.4	Sarajevo – Podlugovi (24 km) *	17,00	17,00	--	2014
1.5	Sarajevo – Bradina (41 km) *	41,00	41,00	--	2012
1.6	Konjic – Mostar	46,00	46,00	--	2011
1.7	Mostar – Čapljina	30,00	30,00	--	2011
2.	Modernisation of signalling and interlocking system on the section:				
2.1	Konjic – Mostar	8,00	8,00	--	2011
2.2	Mostar – Čapljina	3,00	3,00	--	2011
3.	Modernisation of telecommunications system on the section: Bos. Šamac / Šamac – Doboj – Sarajevo – Mostar – Čapljina	5,50	4,50	1,00	2014
4.	Fibber optical and transmission system and telecommunication knots on the whole length of the Corridor V <sub>c</sub> Bos. Šamac / Šamac – Sarajevo – Čapljina *	30,00	25,50	4,50	2014
5.	Reconstruction of electrical-energetic facilities on the section: Bos. Šamac / Šamac – Doboj – Sarajevo – Mostar – Čapljina	9,00	6,50	2,50	2014
	<b>Total</b>	<b>255,50</b>	<b>187,50</b>	<b>68,00</b>	
<b>B</b>	<b>Parallel to Corridor X</b>				
1.	Track overhaul and reconstruction of structures on the section:				
1.1	Jošavka – Kostajnica (70 km)	46,00	--	46,00	2011
1.2	Kozarac – Prijedor * (8 km)	10,00	--	10,00	2014
1.3	Completion of the line Živinice - Zvornik	15,00	6,00	9,00	2014
2.	Modernisation of signalling and interlocking system on the section: Dobrljin – Doboj- Tuzla - Zvornik	60,00	10,00	50,00	2014
3.	Modernisation of telecommunications system on the section: Dobrljin – Doboj- Tuzla - Zvornik	3,50	1,20	2,30	2014
4.	Fibber optical and transmission system and telecommunication knots on the whole length of the railway line parallel to Corridor X: Dobrljin – Doboj – Tuzla – Zvornik	20,00	4,00	16,00	2014

1	2	3	4	5	6
5.	Reconstruction of electrical-energetic facilities on the section: Dobrljin – Banja Luka - Doboj	9,00	--	9,00	2011
6.	Electrification of the railway line Doboj – Tuzla – Zvornik	50,00	10,00	40,00	2012
	<b>Total</b>	<b>213,50</b>	<b>31,20</b>	<b>182,30</b>	
<b>C</b>	<b>Other railway lines in BiH</b>				
1.	Reconstruction of electrical-energetic facilities on the "Una line"	10,00	10,00	--	2012
2.	Track overhaul on the railway line Brčko – Banovići (Bos. Poljana – Živinice) *	30,00	30,00	--	2014
3.	Electrification of the railway line Brčko - Banovići	20,00	20,00	--	2012
	<b>Total</b>	<b>60,00</b>	<b>60,00</b>	<b>--</b>	
<b>D</b>	<b>Corridor V<sub>C</sub> and Parallel to Corridor X</b>				
1.	Procurement of track machinery for maintenance of tracks and overhead contact line  <ul style="list-style-type: none"> <li>• Track-alignment machine 2 pcs</li> <li>• Switch alignment tamping machine 2 pcs</li> <li>• Heavy motor trolley 3 pcs</li> <li>• Electric flash-butt welding machine 1 pcs</li> <li>• Heavy motor trolley for overhead contact line maintenance 2 pcs</li> <li>• Crane heavy motor trolley for track maintenance 2 pcs</li> <li>• Service vehicles 1+6 4 pcs</li> </ul>	25,00	15,00	10,00	
	<b>Total</b>	<b>25,00</b>	<b>15,00</b>	<b>10,00</b>	
<b>4.4</b>	<b>OTHER PROJECTS</b>				
<b>A</b>	<b>Corridor V<sub>C</sub></b>				
1.	Track overhaul and reconstruction of structures on the section: Maglaj – Jelina (64 km)	45,00	45,00	--	2017
2.	Modernisation of signalling and interlocking systems of the section: Bos. Šamac / Šamac – Doboj - Maglaj	8,00	--	8,00	2017
3.	Reconstruction of railway structures (bridges, tunnels, platforms, station buildings, supporting walls and channels) on the section: Bos. Šamac / Šamac – Doboj – Sarajevo - Čapljina	50,00	40,00	10,00	2016
	<b>Total</b>	<b>103,00</b>	<b>85,00</b>	<b>18,00</b>	

1	2	3	4	5	6
<b>B</b>	<b>Parallel to Corridor X</b>				
1.	Track overhaul and reconstruction of structures on the section:				
1.1	Banja Luka – Kozarac (50 km)	30,00	--	30,00	2019
1.2	Doboj – Tuzla (58 km)	30,00	--	30,00	2017
1.3	Prijedor – Dobrljin	29,00	--	29,00	2019
2.	Reconstruction of railway structures (bridges, tunnels, platforms, station buildings, supporting walls and channels) on the route: Banja Luka – Doboj	20,00	--	20,00	2017
3.	Rehabilitation and reconstruction of the tunnel Križeviči	15,00	-	15,00	2010
	<b>Total</b>	<b>124,00</b>	<b>--</b>	<b>124,00</b>	
	<b>TOTAL ESTIMATE OF REQUIRED INVESTMENTS FOR THE PERIOD 2010 – 2014 (2020)</b>	<b>792,00</b>	<b>384,30</b>	<b>407,70</b>	

**Note:** \*) Projects from the previous Investment plan

## 5. ELABORATION OF PROPOSED PROJECTS

### 5.1 STUDIES

State of Bosnia and Herzegovina has to have a clear strategy of the development of its road and railway infrastructure. In this purpose some of the key studies in this field have been made and those also served as a basis for preparation of this Investment plan and investment dynamic.

Studies which preparation is proposed in this Plan have to be made primarily to protect the land on the routes of future railway lines (Route studies) but also to secure unification of new technologies that shall be applied on the whole railway network in the process of modernisation of safety-signalling and telecommunications systems.

**Deadline:** It is reasonable to presume that these studies would be made by the end of 2014, and that the financing sources would be provided through donations of EU and other countries.

### 5.2 TRACK OVERHAULS

First on the list of priorities are the track overhauls. Track overhauls do not only increase speeds but also the capacity of the lines. Increase of the lines capacity enables introducing larger number of trains, which is highly required knowing that for the level of the economic growth, as it is now, railways become a limitation factor.

Needs for track overhauls in BiH also derive from the lack of time cycle of track overhauls as such. Majority of railway lines in Bosnia and Herzegovina have not been overhauled for almost 30 years. Track overhauling creates conditions to maintain the designed line parameters which is not possible in the existing conditions.

Increase of train speed is also the international obligation of our country being a signatory of a numerous common projects with South-Eastern and Central European countries which foresee the network of high-speed railway lines that also includes railway lines on our main corridors.

Track overhauls are usually accompanied by modernisation of signalling system which also increases the level of traffic safety on the overhauled lines.

**Deadline:** Taking into consideration that the railway companies proposed a few more sections to be overhauled it is necessary to consider three deadlines for implementation.

**First deadline,** the end of 2011, would refer to those projects for which the financial means are already provided and which implementation should start next year.

**Second deadline,** would be the end of 2014, for the projects that are also listed as priority ones, but for which the financing is still not provided.

**Third deadline** would be projected for 2020 and would refer to the projects that shall be covered by this plan but shall not be on the list of priority projects.

Implementation of the above projects shall be financed by own funds of railway companies, through the loans of the European banks and the World bank and from the different TA (technical assistance) projects as well as from the loans under the favourable conditions such as the loans from the OPEC Fund and the IPA projects.

### 5.3 MODERNISATION OF SIGNALLING SYSTEM

These projects are listed as priority projects since the modern safety-signalling equipment increase the traffic safety, capacity of lines and the number of trains.

Equipment to be installed shall be unified on the whole railway network and shall be compatible to any future system upgrade such as the traffic remote control, etc.

These projects are accompanied by the track overhauls and the telecommunications modernisation, so that some sections can fully comply with the TER and EU standards.

**Deadlines:** Dynamics of modernisation shall be divided in three parts. First part – the end of 2011 for projects for which the funds exist; Second part – the end of 2014 for priority projects; Third part – 2020 for projects which are not on the priority list.

### 5.4 MODERNISATION OF TELECOMMUNICATIONS

System of telecommunications in the railway traffic is of a high relevance from the safety aspect. These systems have either been devastated during the war or are outdated.

Level of technology in telecommunications system, as it is today, is very high and we are trying to follow it as much as possible with the implementation of these projects. This primarily relates to the technology of information transmission by using the fiber optic cables, GSM-R network, ETCS systems and similar technology.

Due to the lack of funds the existing projects foreseen in the Plan are based on the classic procedure of information transmission, but the equipment to be installed shall be compatible to any future system of information transmission.

**Deadlines:** It is foreseen that the projects for which implementation the funds are provided, be finished by the end of 2012, while the other priority projects should be finished by the end of 2014.

Considering the amount of investments for transmission with optical cables it is reasonable to presume these projects to be implemented up to 2020.

Funds for implementation of these projects are provided from the loans of the EBRD and the EIB, and financing of the rest of projects shall be made from similar sources and own funds.

### 5.5 ELECTRIFICATION OF RAILWAY LINES

30% of railway lines in BiH are not electrified. Taking into account considerable damages that electro-energetic facilities and overhead contact line have suffered during the war large investments and faster electrification and rehabilitation of these facilities is needed.

Apart from the fact that electrified lines save the costs for energy, such projects are important for the whole community from the aspect of environmental protection and modernisation of signalling equipment that comes along with the electrification.

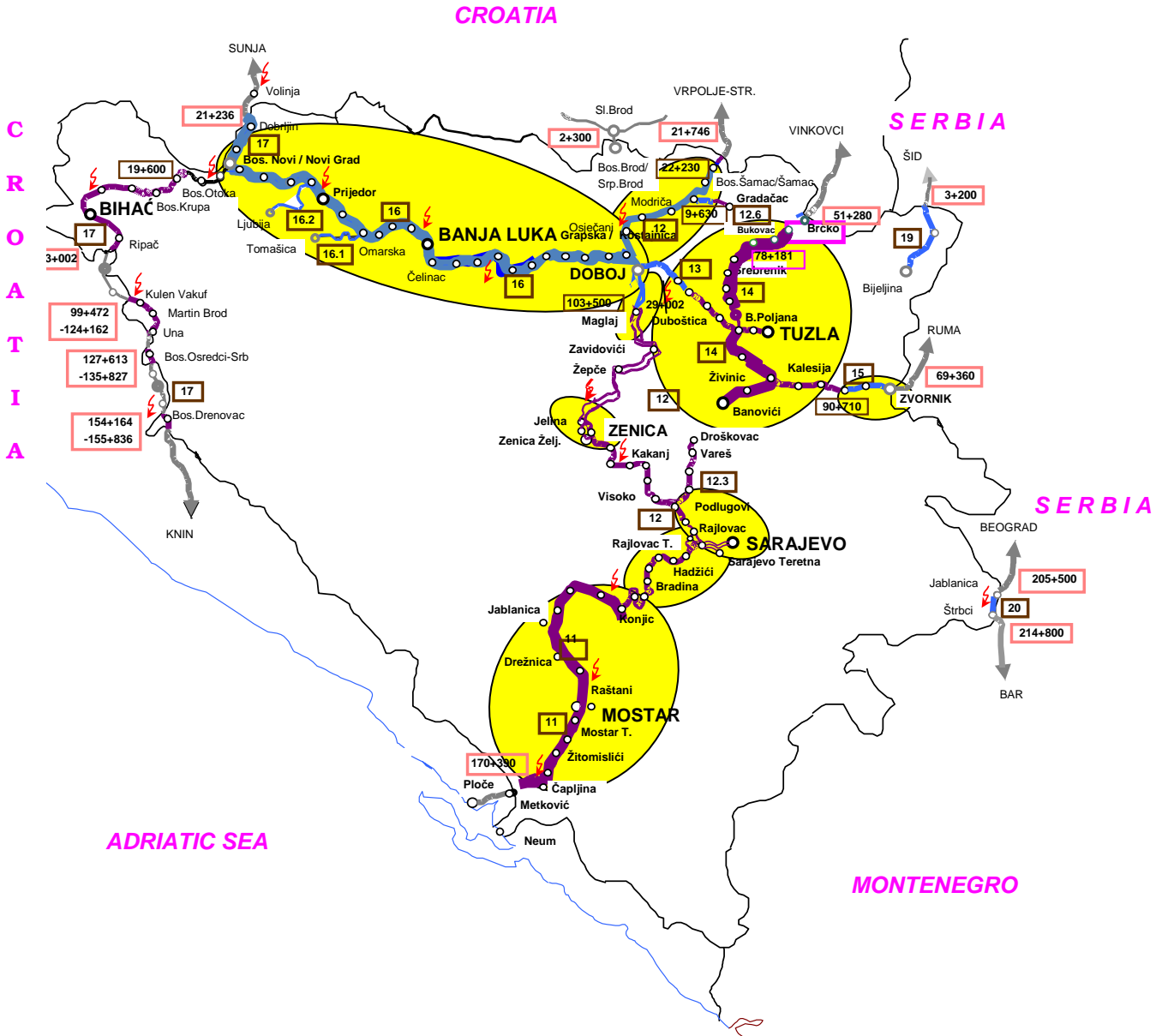
This Plan also foresees electrification of all of the remaining lines and bringing the damaged facilities and overhead contact line in function.

In the cases where the track overhauls would change the track axle due to curve alignment made for reaching higher speeds it is necessary to make alignments of the overhead contact line.

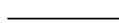


**Deadlines:** Economy crisis has stopped the preparation dynamic of these projects for implementation and obtaining favourable loan facilities, however considering the interest expressed by all of the parties interested in this project, it is presumed that the works on the electrification and rehabilitation of EE facilities would be completed by the end of 2014.





# MAP OF RAILWAY SECTIONS TO BE TRACK OVERHAULED



**SYMBOLS:**

-  Double-track line
-  Single-track line
-  Electrified line

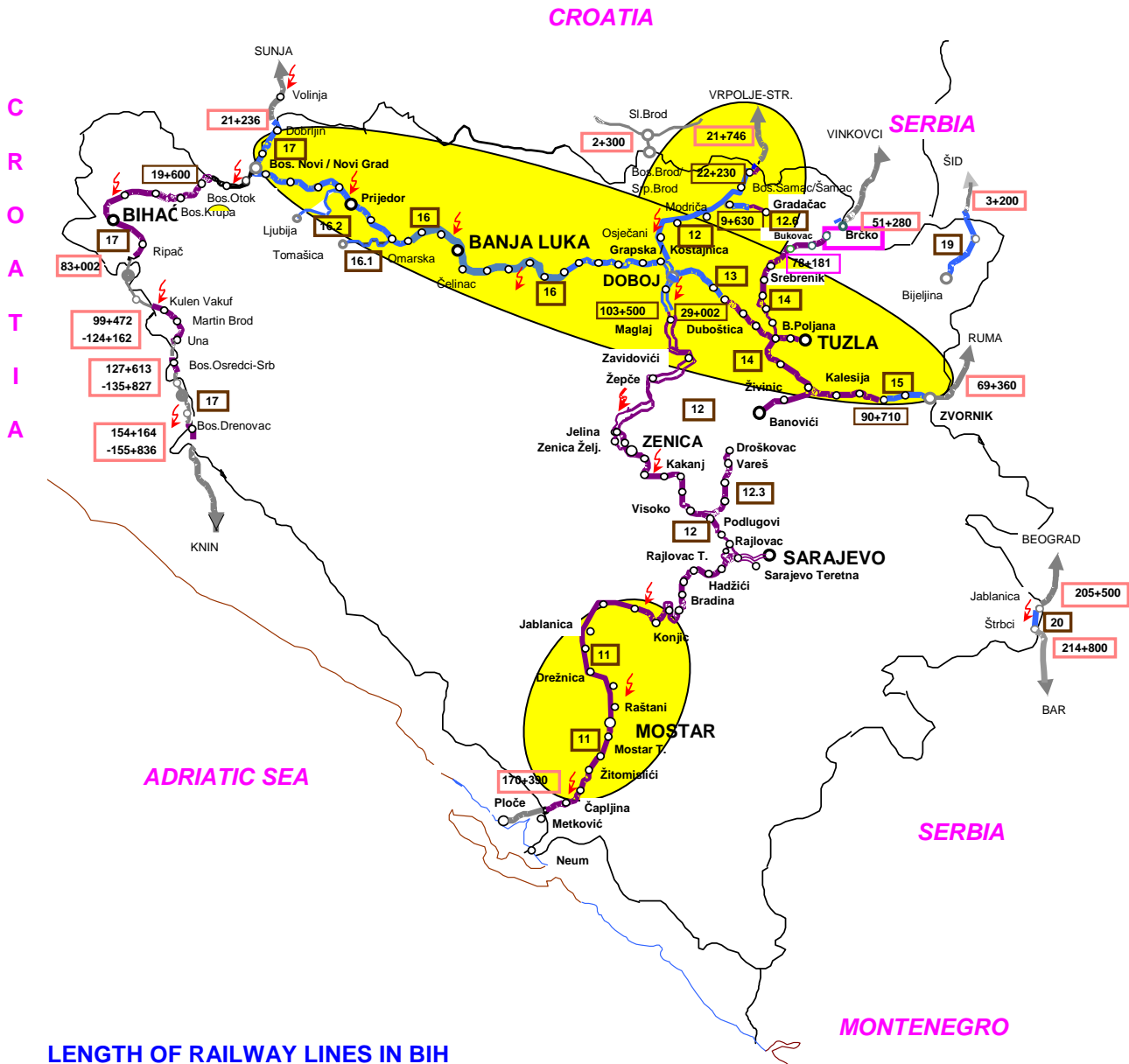
**LEGEND:**

-  RAILWAYS OF THE FEDERATION OF BIH ŽELJEZNICE
-  RAILWAYS OF REPUBLIC OF SRPSKA

-  Locations for track overhauling
- 



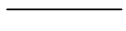


# MAP OF RAILWAY SECTIONS TO BE COVERED WITH MODERNISATION OF SIGNALLING AND INTERLOCKING SYSTEM





## LENGTH OF RAILWAY LINES IN BIH

Total in BiH	1030,389 km	
In the Federation of BiH	587,150 km	57,0%
In the Republic of Srpska	416,338 km	40,4%
In the District of Brčko	26,901 km	2,6%

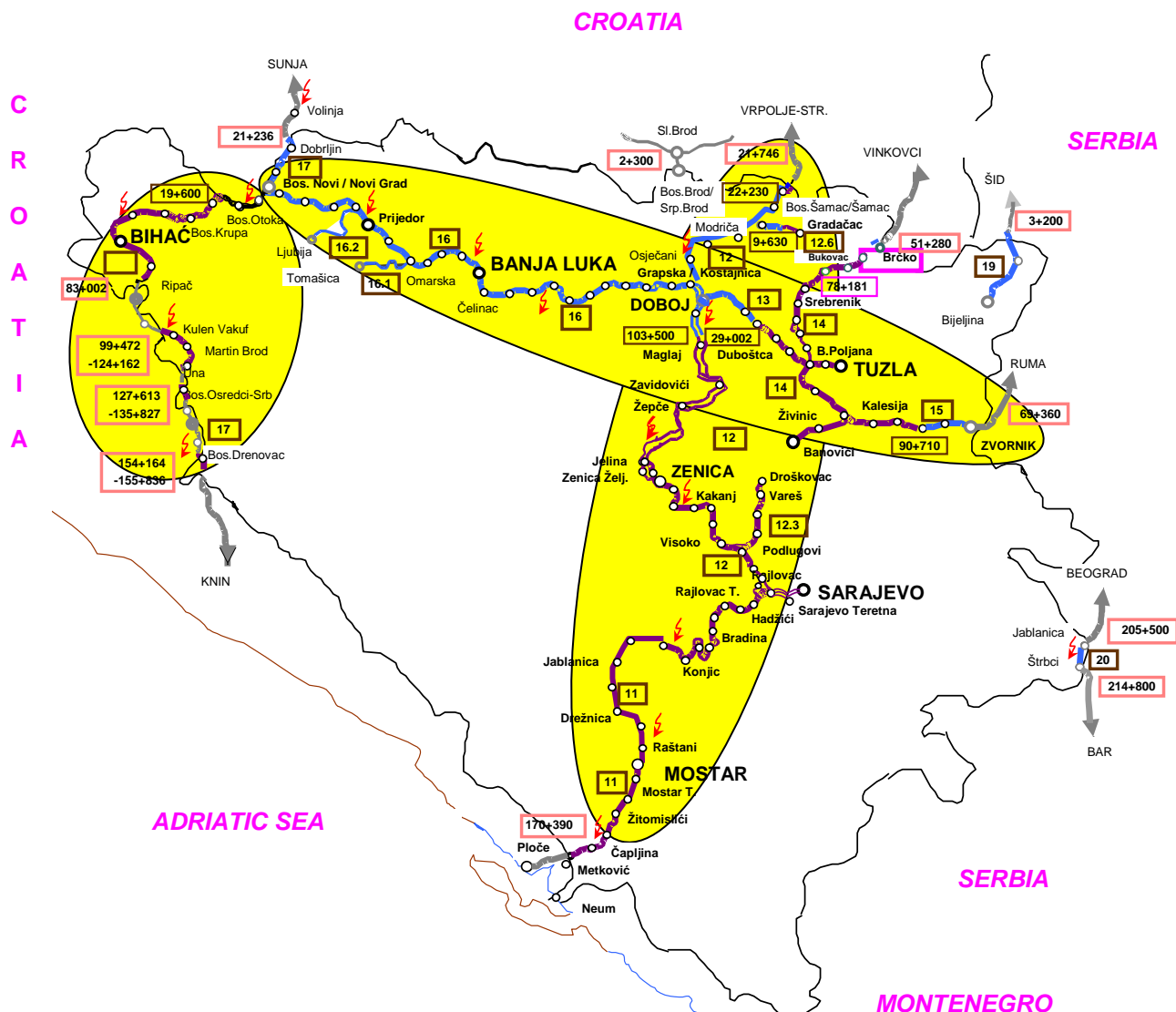
### SYMBOLS:

-  Double-track line
-  Single-track line
-  Electrified line

### LEGEND:

-  RAILWAYS OF THE FEDERATION OF BIH
-  RAILWAYS OF REPUBLIC OF SRPSKA




# M A P OF RAILWAY SECTIONS TO BE COVERED WITH MODERNISATION OF TELECOMMUNICATIONS SYSTEM, FIBER – OPTICAL, TRANSMISSION AND TELECOMMUNICATIONS KNOTS





## LENGTH OF RAILWAY LINES IN BIH

Total in BiH	1030,389 km	
In the Federation of BiH	587,150 km	57,0%
In the Republic of Srpska	416,338 km	40,4%
In the District of Brčko	26,901 km	2,6%

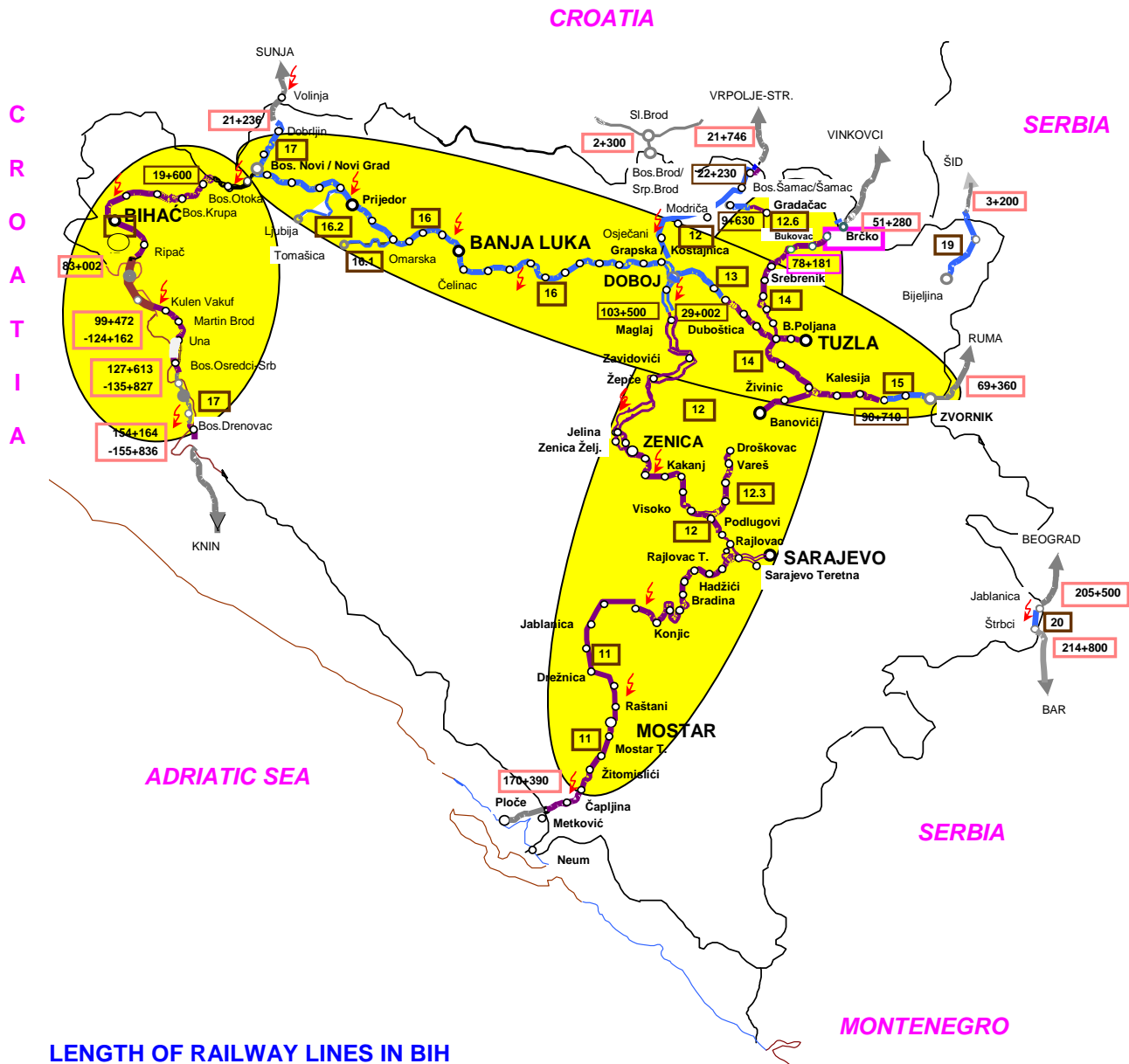
### SYMBOLS:

-  Double-track line
-  Single-track line
-  Electrified line

### LEGEND:

-  RAILWAYS OF THE FEDERATION OF BIH
-  RAILWAYS OF REPUBLIC OF SRPSKA

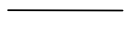


# MAP OF RAILWAY SECTIONS TO BE COVERED WITH RECONSTRUCTION OF ELECTRO-ENERGETIC FACILITIES





## LENGTH OF RAILWAY LINES IN BIH

Total in BiH	1030,389 km	
In the Federation of BiH	587,150 km	57,0%
In the Republic of Srpska	416,338 km	40,4%
In the District of Brčko	26,901 km	2,6%

### **SYMBOLS:**

-  Double-track line
-  Single-track line
-  Electrified line

### **LEGEND:**

-  RAILWAYS OF THE FEDERATION OF BIH
-  RAILWAYS OF REPUBLIC OF SRPSKA

## M A P OF NEW RAILWAY LINES



**Legend:** ——— new railway lines in BiH

- Čapljina – border BiH/Montenegro – Nikšić with branches to Neum and Dubrovnik,
- Čapljina – Imotski – Split or Knin,
- Modriča – Bos. Brod / Brod, Šamac – Brčko – Bijeljina, Banja Luka – Gradiška
- Vareš - Banovići

## **6. CONCLUSIONS**

1. Cost estimate for projects presented in this Investment plan has been made based on the information received from railway companies and companies specialised in carrying out of this kind of works.
2. Activities related to provision of required studies and documents for new lines proposed shall be carried out by the responsible ministries and should be finished by 2020.
3. Unfinished projects remained from the previous Investment plan, as well as all the other projects that have been categorised as priority ones, but have not even been started due to the lack of funds, are transferred to this Plan and are still viewed as priority projects.
4. Implementation of projects shall, as the case was up to this moment, be carried out by Bosnia and Herzegovina Railways Public Corporation through its Project Implementation Unit (PIU).

**EXCERPT FROM THE MASTER PLAN FOR BIH RAILWAY NETWORK**

(2) Middle-term plan for the Phase 2 (2006 – 2010)

Middle-term plan has to contain a considerable number of components needed for upgrading required to bring the whole railway system in function of reliable transport mode. Safe and efficient railway operations are vital for upgrading in this period all in order to attract and bring back the railway users. In that respect it shall be required from the railway system to be incorporated into a whole inter-modal system together with other transport modes such as roads, airports and ports, developing thereby inter-modal transfer capacity. Based on the above requirements for railways, it is necessary to implement the following improvements:

- Facilitate the electrification of the railway line Doboj-Tuzla – Zvornik and introduce the tilting trains, according to the requirements contained in the UIC regulations;
- Improve the state of curves on some sections aiming to increase the speeds in order to meet the UIC standards;
- Introduce the system of private freight cars;
- Develop/improve loading and unloading capacities on freight terminals;
- Establish the passengers' information system;
- Improve inter-modal connections on main stations;
- Build-up container domestic terminals;
- Develop information system in freight transport; and
- Start introducing tilting passengers' trains with light construction.

(3) Long-term plan for the Phase 3 (2011-2020)

Long-term plan aims to enhance technical, operational and managerial functions of railways in BiH, thereby promoting its competitiveness to other transport modes. In doing so the emphasis should be on the preparation of the integration to Pan-European railway network, considering the following aspects and:

- Study the project of double tracking to increase the capacity of the "Corridor Vc", depending on demand;
- Facilitate the electrification of the section Doboj-Tuzla-Zvornik Novi;



- Study the project of construction of the tunnel between Blažuj and Konjic including the double track;
- Seeking measures to increase the trains' speed and meet the UIC regulation related to traffic operations on the international corridors; and
- Improve fundamentally the state of curves on selected sections to increase speeds.

In order to shorten the time foreseen for designing, the process of introducing tilting trains and the project of construction of the tunnel between Blažuj and Konjic aiming to enhance railway corridors should be studied from the aspect of engineering and economical feasibility,.

## MIDDLE TER STANDARDS

Comparative Table with TER Standards and Parameters versus AGC and AGTC			
Infrastructure parameters	AGC European Agreement on Main International Railway Lines	AGTC European Agreement on Important International Combined Transport Lines and Related Installations	TER Standards and Parameters
Vehicle loading gauge	UIC/B	UIC/B	UIC/B
Minimum distance between track centres	(4.0m)	(4.0m)	(4.0m)
Nominal minimum speed	(160km/ h)	100 km/h; 120 km/h. For wag. (<=100km/h: 22.5t) (<=120km/ h: 20t)	(120 Km/h)
Authorized mass per axle Locomotives	<= 200km/h: 22.5t at a speed of 200km/h (AGC only)		<=(200 km/h): 22,5 t
Railcars and rail motor sets	<= 300km/h: 17t at a speed of 160km/h		
Carriages	16 t.		
Wagons	<=100km/h: 20t at a speed of 100km/h, <=120km/h: 20t at a speed of 120km/h, <=140km/h: 18t at a speed of 140km/h.	<=100km/h: 20t at a speed of 100km/h, <=120km/h: 20t at a speed of 120km/h, <=140km/h: 18t at a speed of 140km/h.	<=120 km/h: 20 t ; <=140 km/h: 18 t
Authorized mass per linear metre	8t	8t	8t
Maximum gradient	35mm/m		
Minimum platform length in principal stations	400m (AGC only).		250 m
Minimum useful siding length	750m.	750m.	500 m
Capacity bottlenecks on railway lines	never, "seldom", "occasionally", "often", or "always" (AGC only)		
Level crossings	The AGC aims at a progressive elimination of existing level crossings.		
Test train (bridge design)			UIC 71

UNECE TER Project Central office , Budapest May 2003



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BOSANSKO HERCEGOVAČKA ŽELJEZNIČKA JAVNA KORPORACIJA  
БОСАНСКО ХЕРЦЕГОВАЧКА ЖЕЉЕЗНИЧКА ЈАВНА КОРПОРАЦИЈА  
BOSNIA AND HERZEGOVINA RAILWAYS PUBLIC CORPORATION

No: 317 – 4 – XII / 09  
Sarajevo, 28.12.2009.

Pursuant to the article 22.2.9. and 24 of the Statute and the article 29 of the Operating procedure of the Board of Directors, the Board of Directors of Bosnia and Herzegovina Railways Public Corporation, on the session held on 28.12.2009, made the

## **DECISION**

on the adoption of the Investment plan  
for railway infrastructure  
in BiH in the period 2010-2014  
with the development prospective up to 2020

### **I**

Investment plan for railway infrastructure in BiH in the period 2010-2014 with the development prospective up to 2020 is adopted.

### **II**

Investment plan for railway infrastructure in BiH in the period 2010-2014 with the development prospective up to 2020 is attached to this Decision.

### **III**

Decision is put into force on the day when it has been made, and shall be applied from 01.01.2010.

**President of Board of Directors  
Izet Mehinagić**



**BHŽJK - БХЖЖК**

**BOSANSKO HERCEGOVAČKA ŽELJEZNIČKA JAVNA KORPORACIJA**  
**БОСАНСКО ХЕРЦЕГОВАЧКА ЖЕЉЕЗНИЧКА ЈАВНА КОРПОРАЦИЈА**  
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