



**MINISTRY OF TRANSPORT, INFORMATION TECHNOLOGY AND  
COMMUNICATIONS**

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**Approved by:**

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**UPDATED NATIONAL IMPLEMENTATION PLAN for the technical  
specification for interoperability relating to the ‘control-command and  
signalling’ subsystem of the rail system in the European Union**

..... 2021 [date]

**Sofia**

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### ABBREVIATIONS

ABBREVIATION	Name in full
<b>ERTMS</b>	European Rail Traffic Management System
<b>ETCS</b>	European Traffic Control System
<b>GSM-R</b>	Global system for mobile communications - Railway
<b>ECTF</b>	European Clean Transport Facility
<b>CCS</b>	Control-command and signalling
<b>Directive 2008/57/EC</b>	Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community
<b>Directive 2016/797/EC</b>	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
<b>Regulation No 57</b>	Regulation No 57 of 9 June 2004 on achieving the interoperability of the national railway system with the rail system within the European Union
<b>Commission Regulation (EU) 2016/919</b>	Commission Regulation (EU) 2016/919 on the technical specification for interoperability relating to the ‘control-command and signalling’ subsystems of the rail system in the European Union
<b>Regulation (EU) No 1302/2014</b>	Commission Regulation (EU) No 1302/2014 of 18 November 2014 concerning a technical specification for interoperability relating to the ‘rolling stock - locomotives and passenger rolling stock’ subsystem of the rail system in the European Union
<b>Regulation (EU) No 1299/2014</b>	Commission Regulation (EU) No 1299/2014 of 18 November 2014 on the technical specifications for interoperability relating to the ‘infrastructure’ subsystem of the rail system in the European Union
<b>Regulation (EU) No 1300/2013</b>	Regulation (EU) No 1300/2013 of the European Parliament and of the Council of 17 December 2013 on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006
<b>Regulation (EU) No 1303/2013</b>	Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006
<b>Regulation (EU) No 1315/2013</b>	Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU
<b>Regulation (EU) No 1316/2013</b>	Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting

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<b>ABBREVIATION</b>	<b>Name in full</b>
	Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010
<b>NRIC</b>	National Railway Infrastructure Company
<b>GDV</b>	Scheduled timetable of trains
<b>TFEU</b>	Treaty on the Functioning of the European Union
<b>ERA/EUROPEAN UNION AGENCY FOR RAILWAYS</b>	<u>European Railway Agency</u> , in accordance with Regulation (EC) No 881/2004 of the European Parliament and of the Council of 29 April 2004 establishing a European railway agency, <u>European Union Agency for Railways</u> , in accordance with Regulation (EU) 2016/796 of the European Parliament and of the Council of 11 May 2016 on the European Union Agency for Railways and repealing Regulation (EC) No 881/2004
<b>EC</b>	European Commission
<b>EU</b>	European Union
<b>ZZhT</b>	Railway Transport Act
<b>ZIHU</b>	Integration of Persons with Disabilities Act
<b>IAZhA</b>	‘Railway Administration’ Executive Agency
<b>ICTS</b>	Information and communication technologies and systems
<b>ITS</b>	Integrated Transport Strategy for the period up to 2030
<b>MTITC</b>	Ministry of Transport, Information Technology and Communications
<b>OPT</b>	Operational Programme ‘Transport’ 2007-2013
<b>OPTTI</b>	Operational Programme ‘Transport and Transport Infrastructure’ 2014-2020
<b>PTS</b>	Transport Connectivity Programme 2021-2027
<b>CEF</b>	Connecting Europe Facility
<b>NIP</b>	National implementation plan
<b>BP</b>	Block post
<b>IC</b>	Interoperability Constituents
<b>TSI(s)</b>	Technical Specification(s) for Interoperability
<b>UDVK</b>	Train Traffic and Capacity Management Unit at NRIC

## PREAMBLE

In 2017, Bulgaria's National implementation plan (NIP) for the technical specification for interoperability was approved in accordance with **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** (Commission Regulation (EU) 2016/919).

In Bulgaria, the provisions of 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 were transposed in Regulation No 57 in provisions applicable as from 16 June 2019.

The latest consolidated version of Commission Regulation (EU) 2016/919 has been in force since 16 March 2020, amended subsequently by Commission Implementing Regulation (EU) 2019/776 of 16 May 2019, Commission Implementing Regulation (EU) 2020/387 of 9 March 2020 and Commission Implementing Regulation (EU) 2020/420 of 16 March 2020.

**According to Commission Regulation (EU) 2016/919, national implementation plans shall run over a period of at least 15 years and shall be updated regularly, at least every five years.**

In 2020, new deadlines for the deployment of the European Rail Traffic Management System (ERTMS) were approved for the Plovdiv-Burgas and Sofia-Elin Pelin lines. According to Article 3(4) of Commission Implementing Regulation (EU) 2017/6 of 5 January 2017 on the European Rail Traffic Management System European deployment plan, '[If a postponement is granted,] the Member State shall make the necessary amendments to its national implementation plan as referred to in point 7.4.4 of the Annex to Commission Regulation (EU) 2016/919 within one month of granting that postponement.'

The National Plan approved in 2017 therefore needs to be updated.

**TSIs** are the specifications to be met by each subsystem or part thereof, in order to comply with essential requirements and ensure interoperability of the rail system.

The control-command and signalling subsystem has been deployed in the European rail system for more than 20 years.

In accordance with the consolidated version of **Commission Regulation (EU) 2016/919**, the control-command and signalling subsystem includes the following parts:

1. Class A train protection system (ETCS);
2. Class A voice radio communication (GSM-R Voice);
3. Class A data radio communication (GSM-R Data);
4. Train detection system (axle counters).

## **1. INTRODUCTION**

The present updated plan is a new version of the National Implementation Plan for the Technical Specification for Interoperability relating to the Control-Command and Signalling Subsystem (NIP-CCS) of 2017; it is applicable for the period 2021-2032 and complies with section 7 of the Annex to Commission Regulation (EU) 2016/919.

The TSI applies to all new, upgraded or renewed ‘trackside control-command and signalling’ and ‘on-board control-command and signalling’ subsystems of the rail system as defined in points 2.3 and 2.4 of Annex II to Directive (EU) 2016/797.

Commission Regulation (EU) 2016/919, a recast of the Technical Specification for Interoperability relating to Control-Command and Signalling (TSI CCS), was drafted by the European Union Agency for Railways (ERA), which, pursuant to Article 12 of Regulation (EC) No 881/2004 of the European Parliament and of the Council, has the aim of ensuring that the TSIs are adapted to technical progress and market trends and to the social requirements and proposing to the Commission the amendments to the TSIs which it considers necessary; Commission Regulation (EU) 2016/919 entered into force on 5 July 2016; the latest version dates from March 2020.

This updated NIP takes into account the strategic objectives set out in the Strategy for the implementation of the Technical Specifications for Interoperability for the conventional rail system of the Republic of Bulgaria.

## 2. OBJECTIVE

### Main objective

The main objective of the present plan is to establish pre-conditions for ensuring a high level of safety of trans-European conventional rail system transport operations and a high level of safety of the freight and passengers carried, service staff, technical equipment, the environment and the population located in the area of these transport operations. The control-command and signalling subsystem occupies a key position in ensuring the safety of trans-European conventional rail system transport operations.

Section 7 of the TSI Control-Command and Signalling for conventional rail subsystems covers the process and methods for transition from a Class B national system to an interoperable Class A system. At the same time, it lays down mandatory rules for GSM-R as well as the implementation of ETCS systems.

Article 7.4.4 of the Annex to Commission Regulation (EU) 2016/919 sets out the principles for establishing the national plans for the deployment of ERTMS. The main objective of the national plan should be to deploy the system on the core network and then on other lines. Deployment of ERTMS on a larger scale in accordance with the operational needs of the national rail network is the ultimate objective.

The national implementation plans shall first and foremost define the following parameters:

1. Target lines - identification of national lines designated for the deployment of ERTMS;
2. Technical requirements - definition of the essential technical requirements of the implementation, e.g. GSM-R Voice/Data, the applicable ETCS level and joint operation with the national Class B system;
3. Implementation and planning strategy - a proposal for an implementation plan, including procedures and a work schedule;
4. Transition strategy - the strategy for the transition from national Class B systems, both trackside and on-board traction rolling stock, to Class A systems;
5. Potential restrictions - an overview of potential factors that could influence the progress of implementation;

The updated National Implementation Plan reflects the EU guidelines aimed at ensuring the harmonisation of national procedures for the implementation of the ERTMS system.

The updating at European level of the plan for EU guidelines and the national implementation plans should reflect the actual progress on ERTMS deployment in each Member State and across the European rail network.

As part of this cycle, in 2020, the Bulgarian Ministry of Transport, Information Technology and Communications and the National Railway Infrastructure Company prepared documentation for the

approval of the notification and justifications for the delays recorded in the deployment of ERTMS on the Plovdiv-Burgas and Sofia-Elin Pelin routes as well as details of the corrective actions undertaken.

The material which Bulgaria submitted to the European Commission was considered sufficient and compliant with the requirements of Commission Implementing Regulation (EU) 2017/6 of 5 January 2017 on the European Rail Traffic Management System European deployment plan. Under Article 3(4) of the Regulation, the Commission granted a postponement; the Member State should therefore make the necessary amendments to its national implementation plan as referred to in point 7.4.4 of the Annex to Commission Regulation (EU) 2016/919.

**Specific objectives of the updated national plan:**

**First specific objective** - Establishing pre-conditions for ensuring that CCS equipment installed on board rolling stock owned by Bulgarian rail carriers is technically and operationally compatible with the trackside control-command and signalling equipment of the trans-European conventional rail system.

**Second specific objective** - Establishing pre-conditions for ensuring that the trackside CCS equipment is technically and operationally compatible with the on-board equipment of the rolling stock of European and national carriers that have access to the national railway infrastructure, including eliminating differences in the trackside signalling of railway administrations of the EU Member States.

**Third specific objective** - Coordinating with the implementation of other railway infrastructure and rolling stock TSIs and bringing deadlines into line with the new ones authorised by the European Commission.



### 3. RATIONALE

Identification of the national railway lines included in Bulgaria's National Plan for the deployment of ERTMS continues to follow the Bulgarian railway infrastructure development plans in accordance with the following main strategic documents drawn up at European and national level.

#### 3.1. EUROPEAN AND NATIONAL POLICIES

European legislation sets out a series of requirements with regard to the implementation of ERTMS:

- All new, upgraded or renewed systems related to the control-command and signalling subsystem (trackside and on-board) fall within the scope of the TSI CCS, i.e. equipment with ETCS and GSM-R is mandatory. This requirement applies to Bulgaria's main lines and other parts of the railway system.
- In addition, ERTMS deployment is mandatory for existing lines and systems on the TEN-T network. The deadline set for the TEN-T core network is 2030 and for the comprehensive network - 2050.

For TEN-T core network corridors, Member States are obliged to deploy ERTMS at the latest by the dates set in the ERTMS European deployment plan.

#### **Guidelines for the development of the trans-European transport network**

The development of an efficient trans-European transport network (TEN-T) is a key component of the Lisbon Strategy for competitiveness and increasing the number of jobs in Europe. For Europe to realise its economic and social potential, it is vital that it builds missing connections and eliminates bottlenecks on its infrastructure and ensures the future sustainability of the transport network.

Given the growing traffic between Member States, which is expected to increase in the coming years, the investments necessary for the modernisation and development of an adequate TEN-T, corresponding to increased needs at EU level, will amount to EUR 550 billion for the period 2010-2030, of which some EUR 215 billion are for priority axes and projects. Given the scale of the investments, it is extremely important to prioritise the projects in close cooperation with Member State governments so as to guarantee effective cooperation at European level.

#### **Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU**

This Regulation lays down the guidelines for the development of a trans-European transport network comprising a dual-layer structure consisting of the comprehensive network and of the core network, the latter being established on the basis of the comprehensive network. It identifies projects of common interest and specifies the requirements to be complied with for the management of the infrastructure of the trans-European transport network.

The core network, consisting of the most important international connections and nodes, is to be implemented by 2030 and the comprehensive network, ensuring full coverage of EU territory and

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access to all regions, is to be completed by 2050. The two layers cover all types of transport: road, railway, air, maritime and inland waterway transport, as well as intermodal terminals. The core network will be implemented using a corridor approach, with nine corridors as the basis for co-ordinated development of the infrastructure.

**Map of the Trans-European Rail Network in the Republic of Bulgaria**



The TEN-T **Core Network** in Bulgaria comprises the following axes:

- Vidin-Sofia-Kulata;
- Dragoman (Serbian border)-Sofia-Plovdiv-Burgas/Svilengrad (Turkish/Greek border);
- Sofia-Radomir-Gyueshevo (border with North Macedonia);
- Sofia-Mezdra-Gorna Oryahovitsa;
- Ruse-Stara Zagora-Dimitrovgrad.

Alongside the core network axes, the following TEN-T **Comprehensive Network** axes have been identified in Bulgaria:

- Ruse-Varna;
- Gorna Oryahovitsa-Varna;
- Karnobat-Sindel.

**Regulation (EU) No 913/2010 concerning the European rail network for competitive freight  
(in force as from 9 November 2010)**

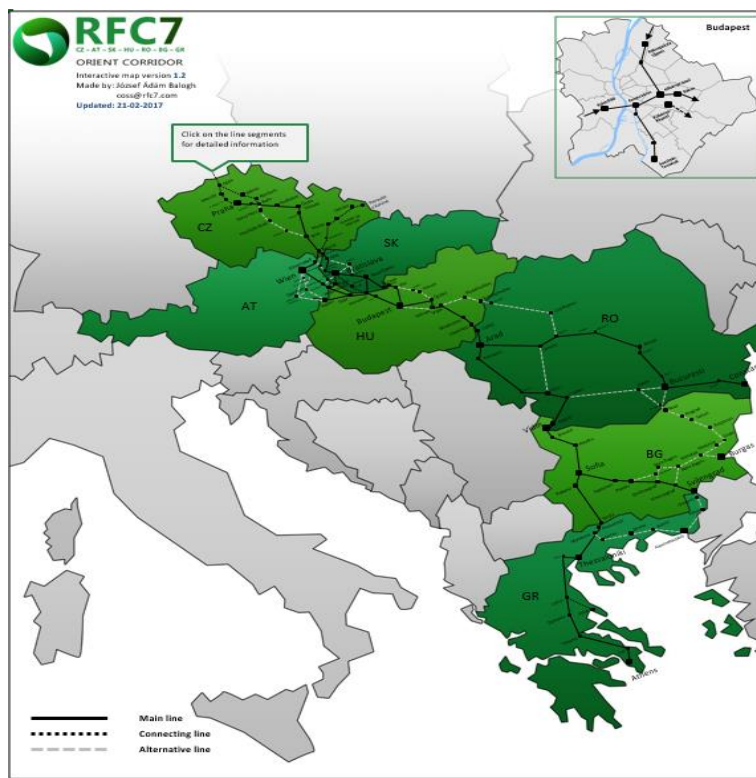
The Regulation is aimed at establishing international rail corridors on which freight trains can run under good conditions and easily pass from one national network to another.

The Regulation provides for cooperation and coordination between Member States and the corresponding infrastructure managers and, where necessary, between Member States and European third countries. It places emphasis on creating additional administrative simplifications for railway operators such as the Corridor One-Stop Shop (C-OSS).

The document defines nine initial rail freight corridors. Bulgaria is crossed by the route of the Orient/East-Med freight corridor: Prague-Vienna/Bratislava-Budapest-Arad-Bucharest-Constanța/Vidin-Sofia-Thessaloniki-Athens.

In the negotiations on the trans-European transport network, the route of the corridor in Bulgaria was supplemented with the Sofia-Plovdiv-Burgas/Svilengrad-Turkish border axis. Since the beginning of 2015, an alternative route has been added on Bulgarian territory (Ruse-Sindel-Karnobat-Nova Zagora-Simeonovgrad-Svilengrad) for trains running on this corridor.

**Map of the Orient/East-Med freight corridor**



In 2014 Slovenia began consultations with Austria, Croatia, Bulgaria and Serbia on the possibility of creating a new ‘Alpine/Western Balkans’ rail freight corridor to be added to the nine freight corridors originally defined in Regulation (EU) No 913/2010. This corridor follows the route Salzburg-Vilach-Ljubljana-Zagreb/Veles/Linz-Graz-Maribor-Zagreb-Vincovci-Tovarnik-Croatian/Serbian border-Belgrade-Serbian/Bulgarian border-Sofia-Svilengrad-Bulgarian/Turkish border.

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The countries concerned supported the initiative and, on 22 March 2018, the European Commission adopted an Implementing Decision on establishing a competitive Alpine-Western Balkan rail freight corridor. In line with Regulation (EU) No 913/2010, this corridor should be operational within two years of being integrated into the rail network for competitive freight.

The official opening of the corridor was postponed as a result of the COVID-19 pandemic crisis; it is now expected to take place on 1 July 2021, when the Slovenian Presidency of the Council of the EU begins. Although the corridor has not been put into service officially, trains have been running on it since 13 December 2019.

**Map of the Alpine-Western Balkan freight corridor**



**EUROPEAN RAIL TRAFFIC MANAGEMENT SYSTEM (ERTMS) EUROPEAN DEPLOYMENT PLAN**

The European Union supports the deployment of a wide ETCS and GSM-R network on the corridors of the trans-European transport network (ETCS-Net). This will ensure continuity of signalling and information services and thus afford considerable benefits for railway network users by virtue of radical technological change.

With a view to defining the timetable for the deployment of ERTMS on the TEN-T Core Network corridors, Commission Implementing Regulation (EU) 2017/6 on the European Rail Traffic Management System European deployment plan was adopted in 2017.

Establishing deadlines for the deployment of ERTMS on the TEN-T core network corridors will give all railway operators a clearer picture of ETCS availability throughout the European network, allowing them to more accurately plan investments in providing on-board ERTMS equipment.

Under the Commission Decision of 22 July 2009 amending Decision 2006/679/EC, all new locomotives and multiple units ordered after **1 January 2012** or scheduled to be put into service after **1 January 2015** are to be equipped with on-board ERTMS equipment. This requirement does not apply to new shunting locomotives or to other new locomotives and multiple units if they are planned to be used exclusively in national service.

In accordance with the consolidated version of Commission Regulation (EU) 2016/919 in force at the time when the updated plan was being drafted:

#### **7.4.2.1. New vehicles**

*1. In order to be placed on the market in accordance with Article 21 of Directive (EU) 2016/797, new vehicles, including vehicles authorised in conformity to a type shall be equipped with ETCS in accordance with Annex A of this TSI and shall comply with set of specifications #2 or #3 referred to in Table A 2 of Annex A.*

*2. The requirement to be equipped with ETCS does not apply to:*

*1) new mobile railway infrastructure construction and maintenance equipment;*

*2) new shunting locomotives;*

*3) other new vehicles not intended for operating on high-speed lines;*

*a) if they are intended exclusively for national service operated outside the corridors defined in point Annex I of Implementing Regulation (EU) 2017/6 and outside the lines ensuring the connections to the main European ports, marshalling yards, freight terminals and freight transport areas defined in Article 2(1) of Implementing Regulation (EU) 2017/6; or*

*b) if they are intended for off-TEN cross-border service, i.e., service until the first station in the neighbouring country or to the first station where there are connections further in the neighbouring country utilising only lines outside of the TEN.*

*3. All vehicle type authorisations granted based on conformity to set of specifications #1 referred to in Table A 2 of Annex A of this TSI shall not remain valid for authorising new vehicles in conformity to those vehicle types (without prejudice to the application of 7.4.2.3). All vehicles already authorised according to those vehicle types are not affected.*

Article 13 *Transitional provisions* of this Regulation, provides that 'Member States may only in duly justified cases permit applicants not to apply Section 7.4.2.1 of the Annex pursuant to Article 7(1)(a) of Directive 2016/797/EC for projects for which the possibility to apply section 7.4.2.3 of the Annex exists or has expired.'

### **ERTMS WORK PLANS**

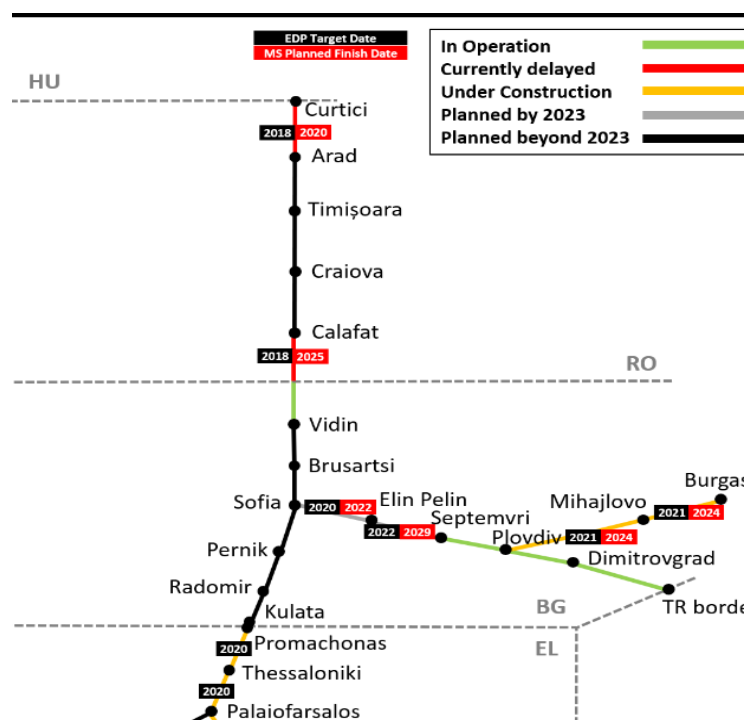
Pursuant to Article 47 of Regulation (EU) 1315/2013 of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network, two work plans

for ERTMS were developed in close cooperation between the consultants and the Member States and representatives of the stakeholders.

The main focus in the process of discussing both ERTMS Work Plans was on drawing up a single realistic and binding European ERTMS deployment plan to replace the existing 2009 deployment plan.

The second work plan prepared by European ERTMS Coordinator Karel Vinck was approved in December 2016 and sets out specific time horizons for the deployment of ERTMS on the TEN-T Core Network corridors. The plan reviews the main principles that should underpin the new deployment plan and presents three scenarios outlining the economic benefits of ERTMS deployment.

### The Orient/East-Med corridor in Bulgaria



In 2020, Matthias Ruete, European ERTMS Coordinator since January 2019, published his **First work plan**.

The new plan comprises three parts.

The first part of the work plan gives an overview of the current deployment of ERTMS as regards both trackside and on-board equipment, supplemented by an overview of the situation outside Europe. The plan contains a business analysis of the benefits of ERTMS deployment and outlines existing funding opportunities. It also pinpoints the main barriers to ERTMS deployment.

The second part focuses on the envisaged next steps, as regards both infrastructure and rolling stock. The plan addresses the challenges of the future development of ERTMS, including the planned revision of the CCS subsystem TSI in 2022.

The third part of the plan presents the conclusions of the European ERTMS Coordinator. Lastly, in the plan, European ERTMS Coordinator Matthias Ruete calls for a European strategy for the decommissioning of Class B systems.

### **Strategy and national plan for the deployment of ERTMS in Bulgaria**

In 2012, the Minister for Transport, Information Technology and Communications approved the Strategy and national plan for the deployment of the European Rail Traffic Management System (ERTMS) in the Republic of Bulgaria.

The strategy defines the priority axes and hence the railway lines/sections of the rail infrastructure of the Republic of Bulgaria, on which ERTMS should be deployed.

The following aspects were taken into account when determining the priority axes: Bulgaria's possibilities for securing financial resources for the short- and mid-term implementation of the plan, the level of preparation and the plans for implementation of the investment projects for modernisation and rehabilitation of the railway network, problems related to the implementation of investment projects in the country, traffic forecasts, etc.

#### ***Priority axes of overriding European interest:***

The Vidin-Sofia-Kulata axis;

The Serbian border-Kalotina-Sofia-Plovdiv-Svilengrad-Kapicule (Turkish border) axis;

The Plovdiv-Karnobat-Burgas axis.

#### ***Priority axes of general European interest:***

The Radomir-Gyueshevo, Mezdra-Gorna Oryahovitsa and Karnobat-Sindel railway lines;

The Ruse-Gorna Oryahovitsa-Stara Zagora-Dimitrovgrad axis;

The Ruse-Kaspichan-Sindel-Varna axis.

#### ***Priority axes of national interest:***

The Sofia-Karlovo-Zimnitsa axis;

The Gorna Oryahovitsa-Kaspichan railway line.

### **Integrated Transport Strategy for the period up to 2030**

The Integrated Transport Strategy for the period up to 2030 is a comprehensive plan for the sustainable development of the transport system of the Republic of Bulgaria and a framework for investments in transport.

The document complies with the requirements for the scope, structure and content of a comprehensive transport plan and complies with the applicable thematic prerequisites for European Structural and Investment Funds (ESIF) for the period 2014-2020, undertaken as a commitment in the Partnership Agreement with the Republic of Bulgaria.

The strategy defines the Republic of Bulgaria’s contribution to the Single European Transport Area, in accordance with the general priorities under Article 10 of Regulation (EU) No 1315/2013 of the European Parliament and of the Council, including priorities for investments in the core and comprehensive TEN-T network and in secondary connectivity.

### **3.2. EUROPEAN REGULATORY FRAMEWORK**

The European framework of the Strategy provides for the creation of an interoperable rail backbone across Europe (‘ETCS-Net’) enabling the development of new and improved quality rail services that can ultimately heighten the competitive profile of rail transport notably in those market segments of major growth potential - e.g. international freight transport.

- 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;
- Commission Directive 2013/9/EU of 11 March 2013 amending Annex III to Directive 2008/57/EC of the European Parliament and of the Council on the interoperability of the rail system within the Community;
- Commission Regulation (EU) 2016/919 on the technical specification for interoperability relating to the ‘control-command and signalling’ subsystems of the rail system in the European Union;
- Commission Implementing Regulation (EU) 2017/6 on the European Rail Traffic Management System European deployment plan.

### **3.3. NATIONAL LEGAL FRAMEWORK**

The main legislative acts with a direct bearing on the resolution of issues related to the realisation of the strategy are:

- the Railway Transport Act [ZZhT],
- the Spatial Development Act [ZUT],
- the Act on Technical Requirements for Products [ZTIP],
- the Occupational Health and Safety Act [ZZBUT] etc.

**A number of important issues are regulated in some regulations of national significance such as:**

- Regulation No 3 on the structure of electrical installations and electricity lines of the Ministry of Energy and Energy Resources,



- Regulation No 4 on railway level crossings of the Ministry of Transport and the Ministry of Internal Affairs,
- Regulation No 2 on fireproof construction - technical standards of the Ministry of Regional Development and Public Works and the Ministry of Internal Affairs,
- Regulation No 69 on the signs and signals for occupational safety and fire protection of the Ministry of Labour and Social Policy and the Ministry of Internal Affairs etc.,
- Regulation No 55 on the design and construction of railway lines, railway stations, railway level crossings and other rail infrastructure components,
- Regulation No 57 of 9 June 2004 on ensuring interoperability of the national network with the rail system within the European Union,
- Regulation No 58 on the rules for technical operation, movement of trains and railway signalling.

#### **3.4. NATIONAL IMPLEMENTATION PLAN - METHOD FOR DRAFTING and updating:**

The National Implementation Plan was drawn up in compliance with item 7.4.4. ‘National Implementation Plans’ of Commission Regulation (EU) 2016/919.

Experts from the Railway Administration Executive Agency [IAZhA], the Ministry of Transport, Information Technology and Communications [MTITC] and the National Railway Infrastructure Company [NRIC] worked on the updated National Implementation Plan. Railway undertakings notified the details of their plans to acquire new and upgrade existing rolling stock.

The updated National Implementation Plan is linked to the Strategy for implementation of the TSIs for the conventional rail system in the Republic of Bulgaria (2013-2030), approved by the Minister for Transport, Information Technology and Communications in September 2013, and more specifically Annex No 6 thereof, the ‘Strategy for the implementation of TSI CCS (control-command and signalling) of the trans-European rail system’, in respect of the TSI adopted by Commission Decision 2012/88/EU of 25 January 2012 on the technical specification for interoperability relating to the control-command and signalling subsystems of the trans-European rail system.

## 4. CURRENT SITUATION

This section reviews the existing situation and current status of railway infrastructure and railway vehicles (locomotives and multiple units) as at December 2020 and only in respect of the opportunity and readiness for deployment of the ERTMS as a whole and by separate/main system components.

**The main components of the system are as follows:**

**GSM-R** - a radio system based on a GSM standard which uses different frequencies assigned to railways, with a number of additional specific functions. This radio system is used for exchanging information (voice communication and data) between track and train.

ETCS and GSM-R are computer-based systems with more rapid technological evolution and with potentially shorter life expectancy in comparison with traditional signalling and telecommunication systems and devices. This creates a need for a proactive deployment strategy to avoid potential system obsolescence before satisfactory implementation maturity is reached.

**ETML (European Traffic Management Layer)** is a rail traffic management application designed to optimise train movement by means of 'intelligent' interpretation of timetables and real train movement data. It includes enhanced traffic planning and management in real time.

### 4.1. CURRENT STATUS OF THE CCS SUBSYSTEM AS AT 2020

As at March 2021, the rail infrastructure manager, NRIC, manages 298 stations, 17 block posts (BP) and 395 stops; of these, 285 stations, 9 BPs and 395 stops are open for passenger traffic.

As a phased process, in the implementation of projects already implemented and pending implementation by NRIC as included in the Operational Programme 'Transport and Transport Infrastructure' 2014-2020, the Connecting Europe Facility - Transport Sector 2014-2020 and projects already implemented under the Operational Programme 'Transport' 2007-2013, the requirements of the TSI CCS are to be respected when constructing new or upgrading or renewing existing stations.

### 4.2. CURRENT STATUS OF SYSTEMS INSTALLED ON LINES AND ROLLING STOCK

#### TRACKSIDE SYSTEMS

In accordance with the Annexes to the Technical Specification for Interoperability relating to control-command and signalling (CCS), the existing Class A and Class B systems are:

#### Train Protection System (ALS)

##### Sections with ALS in operation:

- The Elin Pelin-Belovo and Orizovo-Stara Zagora (Plovdiv side) sections are equipped with an

EBICAB-700 (TSI CCS Annex B) - JZG 703 level 0 automatic locomotive signalling system, manufactured by Ericsson;

- Plovdiv Railway Node including the section Plovdiv-Plovdiv Yard (East)-Trakia and Skutare is equipped with ETCS Level 1 - Version 1.2.0/1999 ALTRACS BDZ;
- The Septemvri-Plovdiv and Krumovo-Svilengrad sections are equipped with ERTMS (ETCS Level 1 - Version 2.3.0d and GSM-R Voice). The section from Dunav Most 2 (Vidin) to the Vidin passenger line station (length 16.314 km) is currently being put into service in accordance with the requirements of Regulation No 57. ETCS Level 1 - Version 2.3.0d, and field equipment has been built.

Sections where ALS operation has been discontinued on account of construction activities and the forthcoming construction of Class A systems:

- In the Poduyane-Elin Pelin and Skutare-Orsovo sections, operation of EBICAB-700 (TSI CCS Annex B) — JZG 703 level 0, manufactured by Ericsson, has been suspended because of construction activities;
- In the Stara Zagora-Burgas section, ETCS Level 1 — Version 1.2.0/1999 ALTRACS BDZ has been suspended because of construction activities.

#### **Voice radio communication (Train Dispatching Radio [VDRV] and GSM-R).**

- Sections with VDRV and GSM-R in operation:
- VDRV is an analogue radio communication link with a frequency range of 450 MHz covering 1 769 km (all main lines) of the railway network.
- The Sofia-Svilengrad line has been fitted with a GSM-R digital radio communication system. On the Sofia-Plovdiv section, both the GSM-R and the VDRV systems are in operation. To permit renovation of a technical building at Poduyane station and modernisation of the Sofia-Elin Pelin section, VDRV operation will be interrupted on the section between Sofia station and Elin Pelin station until 9:00 on 19 August 2021.
- The main railway lines - equipped with train radio, analogue, frequency 450 MHz (TSI CCS Annex B Bulgarian radio system) - 1 950 km.

An automatic train speed adjustment system (ALS – Automatic Locomotive Signalling) is currently in place only on the Sofia-Septemvri railway axis. An ALS system, type JZG703, by Ericsson, Sweden, based on a 12-bit balise (track inductor), entered into operation on the Sofia-Plovdiv section in 1985.

The Stara Zagora-Burgas section and Plovdiv rail node are equipped with an ETCS Level 1 system, commercial name ALTRACS BDZ. The system is supplied by Alcatel, Austria; the project is financed under the PHARE Programme. The ALTRACS BDZ system is version 1.2.0/1998. The system was dismantled by NRIC in 2017.

**The above Ericsson JZG703 and ALTRACS BDZ ALS systems have exhausted the economic and technical resources of the installed equipment.**

As at 2021, ERTMS deployment has been completed on the following railway sections:

- Plovdiv-Svilengrad-Turkish border – ETCS Level 1 (version 2.3.0d) and GSM-R;
- Septemvri-Plovdiv – ETCS Level 1 (version 2.3.0d) and GSM-R;
- Sofia-Septemvri – GSM-R;
- Dunav Most 2 (Vidin)-Vidin passenger line station - ETCS Level 1 (Version 2.3.0d).

In accordance with Regulation No 57 of 9 June 2004 on achieving the interoperability of the national railway system with the rail system within the European Union, the following authorisations for putting control-command and signalling subsystems into service have been issued:

Authorisation for putting a new 'control-command and signalling' structural subsystem into service on the Plovdiv-Svilengrad-Turkish/Greek borders section on railway line No 1 'Serbian border-Kalotina West-Sofia-Plovdiv-Dimitrovgrad-Svilengrad-Turkish border' - BG/63/2018/0001 dated 14.09.2018;

Authorisation for putting into service an upgraded control-command and signalling subsystem for the following elements: 'train detection system' and 'train protection system' for the Septemvri-Plovdiv section and 'radio communication' for the Sofia-Plovdiv section for the project 'Design and construction of signalling systems on the Septemvri-Plovdiv section and telecommunications Sofia-Plovdiv' - BG/63/2019/0001 dated 04.12.2019.

The status of the remaining projects related to the deployment of ERTMS is as follows:

- **Plovdiv-Burgas railway line** - two technical assistance projects related to ERTMS elements have been drawn up, namely 'Technical assistance for the deployment of optical cable on the Plovdiv-Burgas line' and 'Technical assistance for the deployment of additional computer centralisation on the Karnobat-Burgas section'. The scope of the technical assistance projects covers the replacement of the existing ALS with ETCS, installation of optical cable, GSM-R and 28 computer centralisation units, and all the security system activities are included in the scope of the project 'Rehabilitation of Plovdiv-Burgas railway line, Phase 2' being carried out with funding from the OP 'Transport and Transport Infrastructure' 2014-2020. The project is expected to be completed by the end of the current programming period.
- **Vidin-Sofia railway line** - the project 'Technical assistance for modernisation of the Vidin-Sofia railway line' has been drawn up and finalised. Construction on the Vidin-Mezdra/Ruska Byala section is scheduled to be implemented by 2023. At present, under the Connecting Europe Facility (CEF) for Transport, the project 'Technical assistance to prepare the modernisation of the Mezdra-Medkovets section' has been approved and is being implemented. The project should be carried out by the end of 2023.**ETCS Level 1 + GSM-R has been specified, but it may be Level 2.**

- **Sofia-Plovdiv railway line** – A project 'Technical assistance for the modernisation of the Sofia-Plovdiv railway line' has been developed. On the Sofia Plovdiv axis, the following projects are being and have been implemented: 1) 'Modernisation of the Sofia-Elin Pelin railway section', funded under the Connecting Europe Facility (CEF) 2014-2020 and scheduled to be completed by the end of 2022; 2) Modernisation of the Sofia-Plovdiv railway line: Elin Pelin-Kostenets section, funded under OP TTI 2014-2020. Part of the project activities will not be carried out under the Operational Programme up to the end of 2023 and will be included under the Transport Connectivity Programme 2021-2027. 3) 'Modernisation of the Kostenets-Septemvri rail section', funded under the Connecting Europe Facility (CEF) 2014-2020 and scheduled to be completed by the end of 2022. 4) 'Modernisation of the Septemvri-Plovdiv rail section - part of the trans-European transport network', funded under the OPT 2007-2013, was completed in 2015.
  
- **Sofia-Dragoman-Serbian border railway line** - the modernisation of the Sofia-Dragoman-Serbian border railway line is divided into three sections:
  - from Sofia Central Station to Voluyak station;
  - from Voluyak station to Dragoman station;
  - from Dragoman station to the Serbian border.

For the Sofia Central Station-Voluyak station section, two contracts are being implemented. A contract for 'Design and construction for the modernisation of track development of Sofia Central Station and the section from Sofia Central Station to Voluyak for project ref. 2014-BG-TMC-0133-W - Development of Sofia railway node: Sofia-Voluyak section' and a contract for 'Design and construction of signalling and telecommunications systems and European Train Control System (ERTMS) for project ref. 2014-BG-TMC-0133-W - Development of Sofia railway node: Sofia-Voluyak section'.

The construction works on the section are scheduled to be completed by 2024.

For the Voluyak station-Dragoman station section, three contracts are being implemented. A contract for 'Design and Construction of the European Train Control System (ERTMS) for the project 'Modernisation of the Sofia-Dragoman-Serbian border railway line', Voluyak-Dragoman section. A contract for 'Modernisation of the Sofia-Dragoman-Serbian border railway line, Voluyak-Dragoman section' by lot - Lot No 1: 'Design of rail track, contact line system, equipment, construction and designer's supervision of the Voluyak-Petarch section'. A contract for 'Modernisation of the Sofia-Dragoman-Serbian border railway line, Voluyak-Dragoman section' by lot - Lot No 2: 'Construction of rail track, contact line system, equipment on the Petarch-Dragoman section; design, construction and designer's supervision of signalling and telecommunications systems on the Voluyak-Dragoman section'.

Construction works on the section are scheduled to be completed by 2024/2025.

Construction of ETCS Level 1 + GSM-R (for voice communication) is specified.

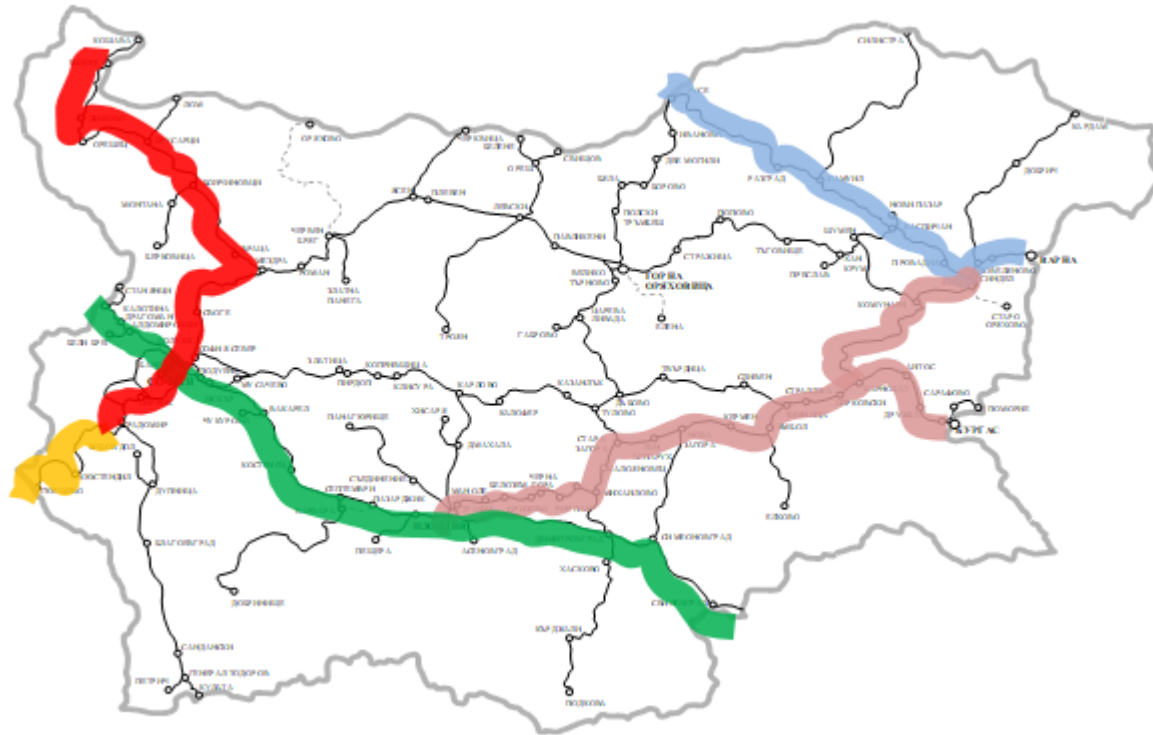
The modernisation, including ERTMS deployment, of the Dragoman-Serbian border section is scheduled to be implemented using financial resources from the next programming period 2023-2027. **ETCS Level 1 + GSM-R has been specified.**

- **Sofia-Pernik-Radomir railway line** - a project 'Technical assistance for the modernisation of the Sofia-Pernik-Radomir railway line', including the construction of ERTMS on the whole line, is being developed. Construction activities are planned, with funding from the Transport Connectivity Programme 2021-2027.
- **Radomir-Gyueshevo railway line** - the conceptual design for the project 'Technical assistance for the modernisation of the Radomir-Gyueshevo railway line' has been developed and completed. The technical project, including the deployment of ERTMS Level 1 along the entire line, is pending. Construction is envisaged for the period after 2027.
- **Ruse-Varna railway line** - a project 'Technical assistance for restoration of the design parameters of the Ruse-Varna railway line' has been developed and completed. Projects for ERTMS/ETCS deployment outside the scope of planned rail infrastructure projects are envisaged under the Transport Connectivity Programme 2021-2027. One such project concerns the Ruse-Kaspichan railway line. **ETCS Level 1 + GSM-R has been specified.**
- **Karnobat-Sindel railway line** - a project 'Double-tracking and electrification on the Karnobat-Sindel railway line' has been developed. The project design has been completed and the site is at an advanced stage of construction along the track; activities have been frozen for the time being due to lack of financial resources. The completion of the equipment on the Karnobat-Sindel railway line is planned under the Transport Connectivity Programme 2021-2027 **ETCS Level 1 + GSM-R has been specified.**

For technical and financial assessment purposes in the deployment of ERTMS under all the above projects it has been assumed that the ETCS level deployed will be kept as Level 1, in the technical assistance projects drawn up, as well as for the construction contracts which are currently being carried out or which are due to be signed.

The following map shows the railway axes covered by the above ERTMS deployment projects.

**Main railway axes covered by ERTMS deployment projects**



**Vidin-Sofia-Radomir - ETCS Level 1 or 2 and GSM-R**

**Kalotina-Sofia-Plovdiv-Svilengrad-Kapikule - ETCS Level 1 and GSM-R**

**Plovdiv-Karnobat-Burgas/Sindel - ETCS Level 1 and GSM-R**

**Ruse-Varna - ETCS Level 1 and GSM-R**

**Radomir-Gyueshevo - ETCS Level 1 and GSM-R**

**ROLLING STOCK SYSTEMS USED FOR TRANSPORT IN BULGARIA:**

**Tractive rolling stock (locomotives and multiple units) of the railway carrier 'BDZh-Patnicheski prevozi' EOOD ('BDZh-PP' EOOD) [Bulgarian State Railways - Passenger Services EOOD]:**

Over 70 % of the locomotive fleet used by the railway carrier BDZh-PP is more than 30 years old, a significant proportion being already more than 40 years old and significantly depreciated.

In the period since the adoption of the National Implementation Plan for the TSI CCS in 2017, BDZh-PP has faced the constant problem of a shortage of sound locomotives. This forced BDZh-PP to hire, for its operating activities, appropriate locomotives with remaining useful lifetime that were owned by BDZh-TP [Bulgarian State Railways - Freight Services] and, as from 2020, to hire them from private carriers too.

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Because of this situation, the following specific priorities arise for the company: investment of funds for major repairs laid down in the company’s business plan and phased decommissioning of certain series of tractive rolling stock that are more than 35-40 years old and fully depreciated.

As at December 2020, the number of BDZh-PP tractive rolling stock units equipped with ERTMS/ETCS is as follows:

- ETCS Level 1 version 2.3.0d (ALTRAC 6413 on-board equipment) - **1 unit** (locomotive No 46-211)
- ETCS system Level 1 version 1.2.0 - 37 units

**On-board ETCS and GSM-R equipment for tractive rolling stock**

Currently, the status of BDZh-PP’s fleet of main line electric and diesel locomotives and electric and diesel multiple units with regard to Automatic Locomotive Signalling equipment is as follows:

	Tractive rolling stock	Available fleet	Equipped with ETCS version 1.2.0	Equipped with ETCS Level 1, version 2.3.0 d
1.	electric locomotives series 43, 44 and 45	92 units	26 units	-
2.	electric locomotives series 46 200	18 units	11 units	1 unit
3.	diesel locomotives series 07	13 units	-	-
4.	electrical multiple units series 30/31	25 units	-	-
5.	diesel multiple units series 10	25 units	-	-
Total:			37 units	1 unit

**Traction rolling stock of the railway carrier ‘BDZh - Tovarni prevozi’ EOOD (‘BDZh TP’ EOOD) [Bulgarian State Railways - Freight]:**

**The locomotive fleet of ‘BDZh-TP’ EOOD** consists mainly of series 06.000, 07.000, 55.000, 44.000, 45.000 and 46.000 diesel and electric train locomotives and series 52.000 and 61.000 diesel and electric shunting locomotives.

The locomotives owned by ‘BDZh TP’ EOOD, equipped with the automatic locomotive signalling (ALS) system ALTRACS-BDZh, ETCS – Level 1 is installed on 19 series 46.000 electric locomotives.

As at December 2020, BDZh-TP owned no rolling stock equipped with ETCS.



### **Available on-board equipment of tractive rolling stock owned by other railway undertakings**

The private freight railway undertakings do not have rolling stock which has functioning **ETCS and GSM-R** equipment available on-board.

One exception is 'Rail Cargo Carrier-Bulgaria' EOOD, which uses for its operations SIEMENS ES64 U2 electric locomotives equipped with ETCS Level 2, including the following: Indusi80 modified for V4, with also a continuous locomotive signalling system – linear type LZB with integrated train auto-stop system – PZB I 80 (PZB 90 system) for V5.

'Rail Cargo Carrier - Bulgaria' EOOD operates 'Rail Cargo Group' - Austria's international freight trains on the territory of the Republic of Bulgaria. The Siemens ES64 U2 locomotives – 44 units, leased by 'Rail Cargo Carrier – Bulgaria' EOOD for the operation of these trains, are owned by ÖBB Produktion GmbH-Austria; they enter Bulgarian territory with trains from Romania and exit by returning on the same route. Usually, one locomotive entering Bulgaria serves two trains.

Currently, 2-3 locomotives are used each day and an average of 18-22 locomotives each month.

## **5. STRATEGY OF THE NATIONAL IMPLEMENTATION PLAN FOR THE TSI CCS**

This updated NIP is consistent with the previous version and is compliant with the strategic objectives formulated in the 'Strategy for the implementation of the Technical Specifications for Interoperability for the conventional rail system of the Republic of Bulgaria' approved by the Minister for Transport, Information Technology and Communications in September 2013 and in particular Annex No 6 'Strategy for implementation of TSI Control-Command and Signalling (CCS) of the trans-European rail system', the TSI adopted by Commission Decision 2012/88/EU of 25 January 2012 on the technical specification for interoperability relating to the control-command and signalling subsystems of the trans-European rail system; it is also in line with the Integrated Transport Strategy up to 2030.

### **DEVELOPMENT OF A MIGRATION STRATEGY**

The following need to be defined on the basis of this National Implementation Plan:

- A migration strategy identifying the conditions for the transition of existing infrastructure and rolling stock subsystems to the respective ERTMS level without infringing safety requirements.
- Possible limitations, which may affect the implementation of the plan for deployment of the TSI Control-Command and Signalling (CCS).

### **Infrastructure and railway vehicle subsystems to which the migration strategy should be applied**

An ETCS Level 1 system should be installed instead of the Class B signalling system (EBICAB 700) installed on the Sofia-Septemvri and Plovdiv-Stara Zagora sections.

During the migration phase in which the Class B system will be replaced by a unified Class A system, the engineering structures will be managed in compliance with safety and interoperability requirements. This is the responsibility of the National Railway Infrastructure Company [NRIC] in cooperation with the supplier of the respective system, in accordance with the TSI Control-Command and Signalling for the trans-European high-speed and conventional rail systems.

The ETCS L1 version 1.2.0 (ALTRACS) dismantled on the Stara Zagora-Burgas section is to be replaced by ETCS Level 1 version 2.0.3d.

### **Rolling stock renewal strategy of:**

**BDZh-PP** - After analysis of the volume of traffic covered by the public service contract and the Scheduled Timetable of trains, prospects for the development of the railway infrastructure in the period 2016-2022 and related possibilities for the development of passenger traffic, the following categories of trains are envisaged for passenger services:

1. Suburban passenger trains operating up to 50 km.

2. Regional passenger and fast trains operating up to 200 km.
3. Fast and express daily trains — for services of more than 200 km.
4. Night and international trains.

**BDZh-TP EOOD** is part of the ‘Holding BDZh’ EAD Group. The investment programme of the ‘Holding BDZh’ EAD Group’s Restructuring and development plan for the period 2015-2020 (drawn up in March 2015) **does not provide for** cash flows for the delivery and fitting of on-board ETCS equipment for locomotives.

The investment programme for the period 2016-2022 envisages cash flows for the modernisation of 19 locomotives and overhaul of 42 locomotives. The locomotive fleet necessary for operation is 95 units; with reconditioning of 61 locomotives (i.e. 64%) the technical safety of the operational fleet will be increased.

The upgrade and modernisation of the rolling stock is essential for the operation of long-distance transport. Currently, this transport is effected only using conventional rolling stock (locomotives with coaches). BDZh-PP has been experiencing a serious shortage of locomotives suitable for servicing the Scheduled Timetable of trains as well as of passenger coaches meeting European standards for quality, comfort and safety.

Locomotives that have undergone capital repair or been upgraded or new ones will be equipped with MESA double channel radio stations (i.e. GSM-R Voice)

The new rolling stock will be used exclusively for suburban transport services on the busiest and modernised sections of the railway network – Line I (Sofia-Plovdiv-Svilengrad) and Line VIII (Plovdiv-Burgas).

One of the long-term measures set by BDZh-PP to ensure the servicing of the Scheduled Timetable and improve the quality of the service offered is the acquisition and supply of new rolling stock, which should be equipped with **on-board equipment for the ETCS system, Level 2, and the GSM-R system.**

## **MIGRATION STRATEGY**

When developing the migration strategy for the transition of the existing infrastructure and railway vehicle subsystems to the respective ERTMS level, the priorities set in the updated national plan shall be followed.

The project ‘Reconstruction and electrification of the Plovdiv-Svilengrad-Turkish border railway line’ initiated the formation of the core ERTMS system and the work to deploy ERTMS on the Sofia-Septemvri and Plovdiv-Stara Zagora-Burgas railway line will upgrade the existing Class B train control system to Class A.

### **Train protection:**

The deployment and use of the on-board control-command and signalling subsystems with regard to the train protection of railway vehicles being operated or intended to be operated on sections of the national railway infrastructure of the Republic of Bulgaria should be compatible with the installed part along the railway line.

**The existing fleet of locomotives and multiple units should be upgraded to use ETCS and GSM-R. ETCS Level 2 will be applied to ensure flexibility in the use of rolling stock.**

**For the upgrading or delivery of new rolling stock intended to be used on lines equipped with ETCS trackside equipment, it will be mandatory to have on-board ETCS Level 2 and GSM-R Voice equipment.**

As from 2027, when, according to the plans and projects, trackside equipment will be available on the Sofia-Plovdiv-Burgas and Plovdiv-Svilengrad sections, the railway infrastructure manager NRIC will be able to apply a system to incentivise railway undertakings to use rolling stock equipped with a train protection system.

In accordance with Article 32(4) of Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area, infrastructure charges for the use of railway corridors which are specified in Commission Regulation (EU) 2016/919 may be differentiated to give incentives to equip trains with ETCS [equipment].

### **Communication:**

The transition from the old analogue system to a new digital system, such as GSM-R, makes it necessary to ensure an uninterrupted operational and transport process mode with regard to train traffic on the railway axes on which both systems will be available. This will be achieved by supplying the tractive rolling stock with dual mode on-board communications equipment.

### **Train detection systems:**

On lines equipped with ERTMS (ETCS and GSM-R) it is envisaged to install train detection equipment compliant with the TSI CCS in force at the time of design.

### **Possible limitations:**

When deploying the ERTMS, problems limiting the implementation of the plan may arise in relation to:

- securing funding for projects which have already been planned;

- securing funding for the replacement of Class B signalling systems with Class A signalling systems;
- securing new rolling stock equipped with ERTMS/ETCS Level 2;
- planning and carrying out specific training programmes for specific target groups among staff in a timely manner.

## 5.1. SCOPE OF THE PLAN

The scope of the NIP - consistent with the scope and requirements of the TSI CCS - covers the conventional rail system of the Republic of Bulgaria. At present, there are no plans in Bulgaria to develop high-speed lines equipped for regular speeds of 250 km/h or more.

### 5.1.1. Geographical scope

The National Implementation Plan is applicable to the trans-European rail system, i.e. the trans-European conventional rail system, as defined in Annex I 'Elements of the Union rail system' of Directive (EU) 2016/797 (Railway Interoperability Directive).

The geographical scope of this TSI corresponds to the network of the whole rail system, which includes the trans-European conventional rail system network as described in Annex I, point 1 of Directive (EU) 2016/797.

#### **Future infrastructure:**

Lines that are to be upgraded or reconstructed should be equipped with ERTMS. On the basis of information from the Integrated Transport Strategy, mainly up to 2020, modernisation has been carried out and is planned on the West-East axis: **Serbian border-Turkish border/Port of Burgas.**

#### *Lines for deployment of ERTMS up to 2024*

- ETCS Level 1 – Voluyak-Sofia-Elin Pelin;
- ETCS Level 1 – Elin Pelin-Kostenets-Septemvri;
- ETCS Level 1 – Plovdiv-Karnobat-Burgas
- ETCS Level 1 or 2 – Ruse-Kaspichan.

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<b>ONGOING EU-FUNDED PROJECTS</b>							
	Phase	Programme	Project	Period of execution		Amount (ex VAT) - BGN	ETCS included in scope
				From	To		
1	Construction phase	OPTTI 2014-2020	Rehabilitation of the Plovdiv-Burgas line, Phase 2	2016	2022	675 092 693	YES
2	Construction phase	OPTTI 2014-2020 2021-2027	Modernisation of the Sofia-Plovdiv line: Elin Pelin-Kostenets section	2016	2027	1 084 999 272	NO
3	Design and construction phase	CEF [Connecting Europe Facility]	Modernisation of the Sofia-Elin Pelin section	2015	2022	132 966 320	YES
4	Construction phase	CEF NF [National Fund]	Modernisation of the Kostenets-Septemvri section	2016	2022	300 251 198	NO
5	Construction phase	CEF NF	Development of Sofia railway node: Sofia-Voluyak railway section	2016	2024	203 819 092	YES
	Construction phase	CEF NF	Development of Plovdiv railway node	2017	2023/2024	202 383 879	YES
7	Design and construction phase	OPTTI 2014-2020	Reconstruction of Karnobat station complex	2016	2022	5 400 942	not applicable
8	Design and construction phase	OPTTI 2014-2020	Reconstruction of Poduyane, Iskar and Kasichene station complexes	2016	2021	6 255 893	not applicable

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9	Design and construction phase	OPTTI 2014-2020	Reconstruction of Stara Zagora and Nova Zagora station complexes	2016	2022	16 519 339	not applicable
10	Preparation phase	OPTTI	Technical assistance for the preparation of the project 'Modernisation of the line Sofia-Pernik-Radomir-Gyueshevo-Macedonian border'	2015	2022	22 666 570	not applicable
11	Construction phase	OPTTI 2014-2020	Modernisation of the Sofia-Dragoman-Serbian border line, Voluyak-Dragoman section	2021	2024/2025	472 148 064	YES
12	Design and construction phase	OPTTI 2014-2020	Restoration, repair and modernisation of Varna and Razgrad traction substations, construction of Ruse traction substation and deployment of remote control and signalling - SCADA	2020	2023	28 549 885	not applicable
13	Preparation phase	OPTTI 2014-2020	Technical assistance for development of the Ruse, Varna and Gorna Oryahovitsa nodes	2020	2023	10 590 946	not applicable
14	Design and construction phase	CEF NF	Modernisation of Vratsa and Pernik traction substations	2020	2022	28 048 829	not applicable
15	Preparation phase	CEF NF	Technical assistance for the project 'Double tracking of sections of the Plovdiv-Svilengrad-Turkish border line'	2020	2023	20 529 688	not applicable

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16	Preparation phase	CEF NF	Technical assistance for preparation of the project 'Modernisation of the Vidin-Sofia line: Mezdra-Medkovets section'	2020	2023	11 291 221	not applicable
17	Preparation phase	CEF NF NF	Burgas airport access route from the Orient/East-Med Corridor Studies on the link from the railway infrastructure to Burgas airport	2020	2023	4 009 451	not applicable
18	Preparation phase	CEF	Technical assistance for preparation of the project 'Modernisation of the Dragoman-Serbian border section'	2020	2023	5 542 380	not applicable

**PROJECTS PLANNED FOR EU FUNDING IN THE PROGRAMMING PERIOD 2021-2027**

1	Construction phase	PTS [Transport Connectivity Programme]	Modernisation of the Sofia-Pernik-Radomir line: Sofia-Pernik section	2022	2027/2029	632 000 000	YES
2	Construction phase	PTS	Modernisation of the Sofia-Pernik-Radomir line: Pernik-Radomir section	2021	2025/2029	321 274 717	YES
3	Construction phase	PTS	Construction of railway link between Bulgaria and North Macedonia	2022	2025	65 000 000	YES
4	Design and construction phase	PTS	Modernisation of key stations and construction of new stations on the Sofia-Pernik line	2023	2027	35 000 000	not applicable
5	Design and construction phase	PTS	Modernisation of key stations and construction of new stations on the Pernik-Radomir line	2023	2027	15 000 000	not applicable
6	Construction phase	PTS	Completion of railway facilities on the Karnobat-Sindel line	2021	2027	462 000 000	YES



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7	Construction phase	PTS	Development of the Gorna Oryahovitsa node	2024	2029	125 000 000	YES
8	Construction	PTS	Development of the Ruse node	2024	2029	70 000 000	YES
9	Construction phase	PTS	Development of the Varna node	2024	2029	100 000 000	YES
10	Construction phase	PTS	Construction of a railway link to Burgas airport	2024	2027	103 199 182	YES
11	Construction phase	PTS	Construction of a railway link to Plovdiv airport	2024	2027	44 125 642	YES
12	Design and construction phase	PTS	Construction of ETCS Level 1 on the Radomir-Kulata line	2023	2027/2029	168 383 000	YES
13	Design and construction phase	PTS	Construction of ETCS Level 1 on the Ruse-Kaspichan line	2022	2027/2029	110 830 000	YES
14	Design and construction phase	PTS	Construction of ETCS on the Elin Pelin-Septemvri section	2027	2029	40 000 000	YES
15	Construction Phase	CEF-2	Modernisation of the Vidin-Sofia line: Vidin-Medkovets section	2021	2027	908 000 000	YES
16	Construction phase	CEF-2	Modernisation of the Radomir-Gyueshevo line	2023	2027	1 230 000 000	YES
17	Construction phase	CEF-2	Modernisation of the Bulgaria-Serbia railway link on the Dragoman-Serbian border section	2024	2027	468 000 000	YES
18	Design and construction phase	NRRP RRF	Reconstruction and rehabilitation of key station complexes and construction of an intermodal terminal - Gorna Oryahovitsa	2021	2025	78 664 000	not applicable

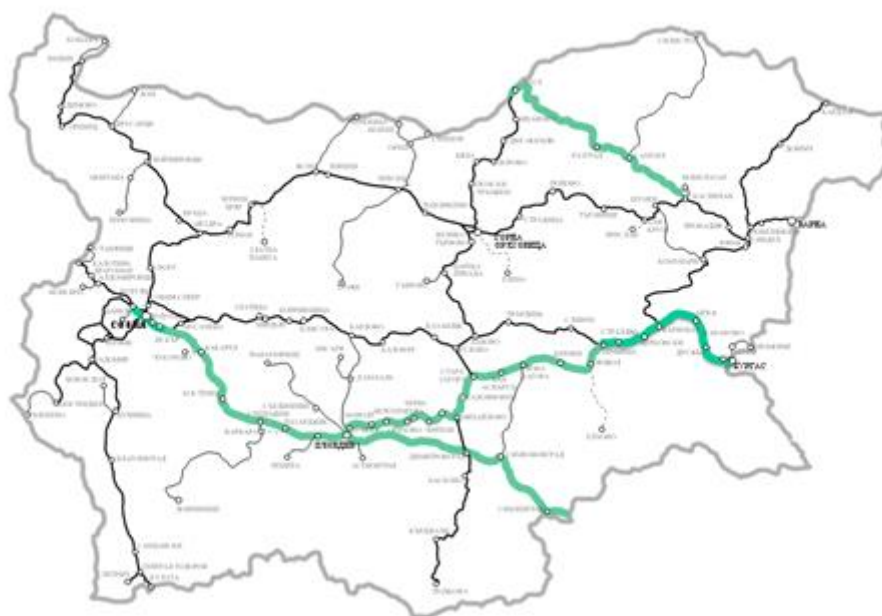
**UPDATED NATIONAL IMPLEMENTATION PLAN  
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19	Design and construction phase	NRRP RRF	Digitalisation in railway transport through modernisation of safety and energy efficiency systems on railway lines of the TEN-T core and comprehensive networks	2021	2026	266 357 055	not applicable
20	Design and construction phase	NRRP RRF	Modernisation relating to traction substations and sectioning points along the TEN-T core and comprehensive networks, with the construction of SCADA remote control and signalling	2021	2026	273 200 000	not applicable
<b>PROJECTS PLANNED FOR IMPLEMENTATION UNDER NATIONAL FUNDING AND/OR GOVERNMENT LOANS FROM IFI</b>							
1	Design and construction phase	NF or IFI loans	Construction of ETCS Level 1 on Sofia-Mezdra railway line		Up to 2030	78 000 000	YES on existing track
2	Design and construction phase	NF or IFI loans	Construction of ETCS Level 1 on the Mezdra-Gorna Oryahovitsa line		Up to 2030	116 500 000	YES on existing track
3	Design and construction phase	NF or IFI loans	Construction of ETCS Level 1 on the Gorna Oryahovitsa-Kaspichan line		Up to 2030	98 000 000	YES on existing track
4	Design and construction phase	NF or IFI loans Design and construction	Construction of ETCS Level 1 on the Kaspichan-Sindel line		Up to 2030	46 500 000	YES on existing track
5	Construction phase	NF or IFI loans	Modernisation of the Medkovets-Mezdra section	2024	2037	77 800 0000	YES
6	Construction phase	NF or IFI loans	Modernisation of the Mezdra-Stolnik section	2028	2034	1 855 000 000	YES
7	Construction phase	NF or IFI loans	Development of the Sofia node (excluding the Sofia-Voluyak section)	2022	2027	419 625 303	YES
8	Construction phase	NF or IFI loans	Development of the Plovdiv node, phase 2	2022	2027	195 000 000	YES

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9	Preparation and construction	NF or IFI loans	Modernisation of the Radomir-Kulata line	2028	2034	1 691 154 792	YES
10	Preparation and construction	NF or IFI loans	Modernisation of the Ruse-Gorna Oryahovitsa-Dimitrovgrad line	2026	2034	1 985 049 330	YES
11	Construction phase	NF or IFI loans	Modernisation and rehabilitation of the Mezdra-Gorna Oryahovitsa section	After 2030		647 663 250	YES
12	Design and construction phase	NF or IFI loans	Restoration of the design parameters of the section Gorna Oryahovitsa-Kaspichan	After 2030		466 000 000	NO
13	Construction phase	NF	Restoration of the design parameters of the Ruse-Varna line	2018	2025	749 082 890	NO

**Deployment of ERTMS in Bulgaria up to 2024**



***Lines/sections for deployment of ERTMS after 2024***

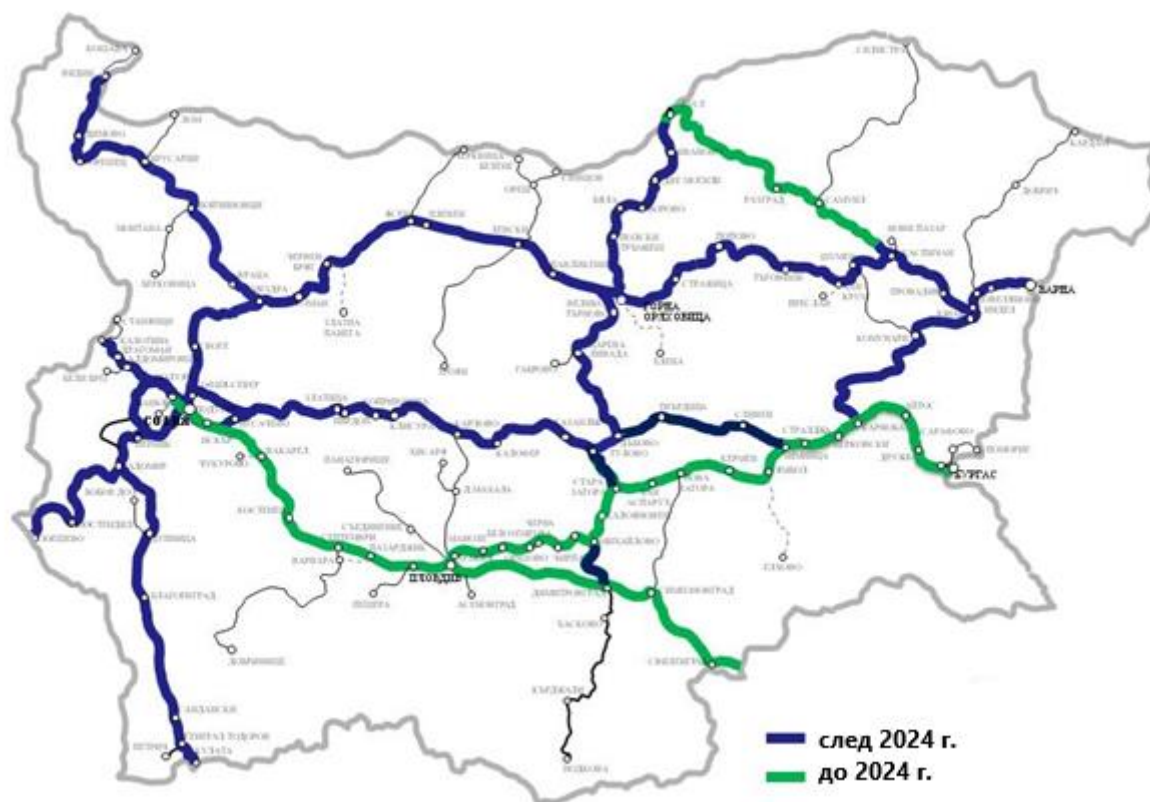
- ETCS Level 1 - Voluyak-Kalotina

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- ETCS Level 1 or 2 - Vidin-Sofia-Radomir
- ETCS Level 1 or 2 - Radomir-Kulata
- ETCS - Kaspichan-Sindel-Varna
- ETCS Level 1 - Karnobat-Sindel
- ETCS Level 1 or 2 - Radomir-Gyueshevo
- ETCS Level 1 or 2 - Mezdra-Gorna Oryahovitsa-Kaspichan
- ETCS Level 1 or 2 -Ruse-Gorna Oryahovitsa-Stara Zagora-Dimitrovgrad
- ETCS Level 1 or 2 - Sofia-Karlovo-Zimnitsa
- ETCS Level 1 - Elin Pelin-Kostenets-Septemvri
- ETCS Level 1 or 2 - Ruse-Kaspichan

**Deployment of ERTMS in Bulgaria after 2024**



Key

[blue] After 2024

[green] Before 2024

## **Future rolling stock**

To maximise the operational versatility of rolling stock, the on-board ERTMS equipment to be installed will include ETCS Level 2 and GSM-R for voice and data. The necessary number of locomotives per year, based on forecasts, will be equipped in line with a schedule applying to the whole railway network which includes the locomotives necessary for the renewal of the locomotive fleet and modernisation of the locomotives in operation.

Considering that upgrading the existing rolling stock is very costly and time-consuming, the simultaneous installation of ETCS Level 2 and GSM-R on board will minimise the time during which the available rolling stock will be out of service for outfitting.

### **5.1.2. Technical scope**

The National Implementation Plan is fully consistent with the TSI CCS laid down in the Annex of Commission Regulation (EU) 2016/919. The functional and technical specifications of the subsystems have been set in accordance with:

- Point 4.2.1. – Control-Command and Signalling safety characteristics relevant to interoperability;
- Point 4.2.2. – On-board ETCS functionality;
- Point 4.2.3. – Trackside ETCS functionality;
- Point 4.2.4. – GSM-R mobile communication functions for railways;
- Point 4.2.5. – ETCS and GSM-R air gap interfaces;
- Point 4.2.6. – On-board interfaces internal to Control-Command and Signalling;
- Point 4.2.7. – Trackside interfaces internal to Control-Command and Signalling;
- Point 4.2.8. – Key management.

The functional and technical specifications of the interfaces to other subsystems in accordance with TSI CCS are:

- ‘Infrastructure’ subsystem – implementation of the Infrastructure TSI with regard to the parameters:
  - Train detection systems (space for installation),
  - Eurobalise communication (space for installation),

- Euroloop communication (space for installation),
- Visibility of trackside Control-Command and Signalling objects.

(TSI CCS Section 4.3.3. 'Interfaces to Infrastructure Subsystem');

- 'Rolling Stock' subsystem - implementation of Rolling Stock TSI with regard to the parameters (TSI CCS Section 4.3.2. 'Interface to the Rolling Stock Subsystem');

- Compatibility with trackside train detection systems: vehicle design;
- Electromagnetic compatibility between rolling stock and Control-Command and Signalling trackside equipment;
- Train braking performance and characteristics;
- Position of Control-Command and Signalling on-board antennas;
- Isolation of on-board ETCS functionality;
- Data exchange interfaces;
- Visibility of trackside Control-Command and Signalling objects;
- Interface to data recording for regulatory purposes;
- Commands to rolling stock equipment;
- Emergency braking command;
- Construction of equipment.

## **5.2. DEFINITION OF THE STRATEGY**

With a view to achieving the main objective of the updated NIP – deploying the European Train Control System (ETCS) and decommissioning Class B systems, as well as ensuring the technical and operational compatibility of both trackside and on-board control-command and signalling subsystems in Bulgaria, the following series of activities defining the NIP strategy have been adopted:

- 1) Accelerated implementation of ERTMS/ETCS Level 1 and Level 2 in the national rail system, including:
  - trackside and on-board control-command and signalling subsystem – automatic train protection with the respective trackside and on-board equipment, GSM-R;
  - route-computer interlocking with interoperable systems for the detection of rolling stock on the station section with and without switches;
  - automatic interlocking to ensure the movement of trains in between stations;
  - monitoring system for rolling stock in motion (Checkpoint).

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- 2) Requiring the redesign of the trackside control-command and signalling subsystem incorporating Level 2 in investment projects the execution of which has not yet commenced;
- 3) In the event of modernisation and acquisition of new traction rolling stock, the installation of ETCS Level 2 and GSM-R on-board equipment must be planned. In the event of carrying out capital repair, two-channel radio stations with GSM-R Voice must be installed.
- 4) Ensuring the necessary degree of safety for the basic level control-command and signalling through the reconstruction of relay safety systems (e.g. interlocking systems) that are at or beyond the limit of their resources and their replacement with route-computer systems;
- 5) Continuing the technical policy for interoperable train detection systems, both between stations and at stations;
- 6) Assessment of the appropriateness of extending the station tracks, respectively, the distances from the input to the output signal from the main track for the same direction of movement and transition to signalling distances greater than 1 000-1 200 m for speeds up to 160 km/h;

The main activities for realisation of the main objective, sub-goals and tasks related to the implementation of the NIP include but are not limited to:

- 1) Continued effort by the Ministry of Transport, Information Technology and Communications [MTITC] and the Railway Administration Executive Agency [IAZhA] to identify appropriate units or groups of professionals within railway companies to undergo training;
- 2) Performance of tests to determine the electromagnetic compatibility of the tractive rolling stock equipment of each carrier of the railway administration of an EU member state with the trackside train detection systems operated in Bulgaria;
- 3) Delivery, in the framework of implementing investment projects, of training simulators for the drivers of tractive units for operation of the on-board equipment of the on-board control-command and signalling subsystem, including, including in the event of a failure of the latter, and of simulators for the operation of the trackside equipment of the trackside control-command and signalling subsystem for the training of the technical personnel operating this equipment, including in the event of failures and emergency situations.

Replacement of safety systems and devices taking into consideration first and foremost the national strategy for deployment of the ERTMS in the Republic of Bulgaria and the NIP, and also taking into account the following trends in this area:

- boundaries between the two large groups of systems – in stations and between stations;
- narrowing of the space for application of the specific fail-safe methods and technical devices, and the small-batch and inefficient production associated with these;
- altering the ratio between hardware and software and increasing the role of the programming component in security systems;
- introducing mobile communications in security systems, including in technical equipment for the safety of railway travel;
- interoperability and unification of train control systems in Europe.

### **5.3. DESCRIPTION OF MEASURES TAKEN TO ENSURE OPEN MARKET CONDITIONS FOR LEGACY CLASS B TRAIN PROTECTION SYSTEMS**

#### **DEPLOYMENT OF ERTMS IN BULGARIA**

The deployment of ERTMS in the Republic of Bulgaria has taken the following into consideration:

- current status of the preparation and implementation of infrastructure projects;
- current status of the preparation and implementation of investment projects for tractive railway vehicles;
- possible sources of funding for these projects;
- possibilities available to the Republic of Bulgaria to provide financial resources for the short- and mid-term implementation of these projects;
- experience related to the implementation of investment projects in Bulgaria.

A key consideration central for the deployment of ERTMS in Bulgaria is to guarantee to the maximum extent possible the realisation of commitments already undertaken by the Republic of Bulgaria for the development of the railway infrastructure at the European level.

#### **Infrastructure**

The approach selected is to implement investment projects for modernisation/reconstruction of the railway infrastructure incorporating activities for the joint installation of ETCS and GSM-R. The specifics of the implementation of these activities indicate that it is neither necessary nor technically and economically viable to separate the ETCS installation from GSM-R installation - or vice versa, when implementing a given investment project.

For assessment purposes in the selection of the best option for deployment of ETCS Level 1 or ETCS Level 2, the selected approach has been to determine the best option for each of the individual railway sections or railway lines subject to such an assessment.

In the deployment of ERTMS in Bulgaria, the following criteria will be taken into consideration:

- Results of the financial and economic analyses carried out for specific railway sections or lines;
- Technical compatibility with neighbouring railways - already existing or in an advanced stage of completion - in countries neighbouring the Republic of Bulgaria;
- The time period for the deployment of ERTMS/ETCS on neighbouring railway lines and neighbouring countries of the Republic of Bulgaria;
- Forecasts of traffic on the railway lines and sections.



## **Traction railway vehicles**

**To maximise the operational versatility of rolling stock, the on-board ERTMS equipment to be installed will include ETCS Level 2 and GSM-R for voice and data.**

### **Personnel – operating and maintenance staff:**

When planning and carrying out the necessary staff training related to ERTMS deployment, the following target groups are formed:

- signalmen and staff authorising train movements at NRIC;
- maintenance technicians at the Signalling and Telecommunications unit at NRIC;
- drivers of railway vehicles at the railway carriers;
- railway vehicle maintenance technicians at the carriers.

Each of the staff target groups defined will be trained through customised programmes, which correspond in volume and content to the specific activities and responsibilities of the staff with regard to the management, operation and maintenance of the ERTMS. The training programmes will be consistent with the educational level, age, professional experience and length of service of the respective workers and employees. The terms and duration of the qualification courses, as well as the need to organise both basic and refresher training, will be determined in detailed, mid-term ERTMS deployment plans and migration strategies adopted.

The Ministry of Transport, Information Technology and Communications, NRIC and the railway undertakings will carry out organisational actions directed at a system of planned initiatives to ensure targeted, substantiated and planned staff training, in order to transition to operational processes based on the implementation of new technologies, as follows:

- Study of the organisation of operational processes based on the trackside and locomotive equipment technologies: ETCS1/ETCS2, ETCS2/ETCS2, ETCS/ETCS1, incl. GSM-R. Similarities and differences between the operational processes followed at the moment and those based on the new technologies should be established, based on best practices from abroad and own experience.
- Identification of similarities and differences in the functional characteristics of the units affected by the change, in order to plan effective measures.
- Based on the results from the activities under items 1 and 2, the job structure of the affected units should be redefined. When outlining the new/updated job descriptions, special attention should be paid to:
  - the general requirements for holding the position,
  - the set of skills and competencies for qualitative performance of production activities.
- In compliance with the basic requirements for each specific position and the set of skills and competencies for qualitative performance of production activities, requirements will be developed,

based on which:

- staff will be recruited and selected,
- performance management (incl. performance assessment) will be carried out,
- staff training and development will be planned.

## 6. FUNDING

Funding within the EU is provided in accordance with:

**Regulation (EU) No 1300/2013<sup>1</sup>** establishing a Cohesion Fund for the purpose of strengthening the economic, social and territorial cohesion of the Union in the interests of promoting sustainable development. This Regulation establishes the tasks of the Cohesion Fund and the scope of its support with regard to the Investment for growth and jobs goal referred to in Article 89 of Regulation (EU) No 1303/2013.

**Regulation (EU) No 1303/2013 on the European funds<sup>2</sup>** - under the Cohesion Fund (CF) and the European Regional Development Fund (ERDF), Bulgaria will have EUR 1.604 billion (CF - EUR 1.144 billion and ERDF - EUR 0.460 million) for the development of transport infrastructure along the trans-European transport network. The funds will be spent under OP 'Transport and Transport Infrastructure' 2014-2020, approved on 19 December 2014. Of the total amount, **EUR 572 million** are earmarked for the development of railway infrastructure.

**Regulation (EU) No 1316/2013 of the European Parliament and of the Council establishing the Connecting Europe Facility (CEF)** - projects of common interest in the sectors of transport, telecommunications and energy infrastructure will be funded. The total funding available in the transport sector is EUR 26.2 billion, including EUR 11.3 billion transferred from the CF and spent in accordance with its rules. The funding for Bulgaria under the cohesion part of the CEF, amounting to EUR 406 million, is directed mainly to railway projects.

Funds from the State Budget are also provided for the implementation of the requirements for rolling stock. In accordance with the PSO Contract in force as from 1 January 2010, the State grants BDZh-PP capital transfers for the purchase of rolling stock under special conditions. These funds, regarded as not remotely sufficient for the purchasing of new rolling stock, are the only actual source of financial resources for BDZh-PP. The difficult financial situation and the obsolete rolling stock of BDZh-PP do not allow or offer the possibility for bank loan contracts to be concluded.

### **Funding through the Connecting Europe Facility (CEF)**

In the period 2014-2020, one of the main financial instruments for financing the development of the trans-European transport network was the Connecting Europe Facility. It was established by Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010 (Text with EEA relevance).

The Transport Connectivity Programme 2021-2027 provides for the implementation of projects for the modernisation and renewal of the railway infrastructure in terms of ERTMS deployment.

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<sup>1</sup> Regulation (EU) No 1300/2013 of the European Parliament and of the Council of 17 December 2013 on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006.

<sup>2</sup> Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006.

The funds envisaged for financing CEF transport projects in the period 2021-2027 amount to approximately EUR 38.7 billion; this includes EUR 25.8 billion from the fund budget plus EUR 11.3 billion transferred from the Cohesion Fund for CEF spending to cohesion countries, as well as EUR 1.69 billion for projects relevant for military mobility. The CEF is a centrally managed instrument, established on the principle of competitive selection of projects. The aim is to select the most mature offers offering the highest added value for the EU.

### **The allocation of funds from the CEF budget**

- Studies – **up to 50%**

- Construction activities:

- for railway and inland waterways - **up to 20%**, for activities aimed at eliminating bottlenecks - **up to 30%** and for the facilitation of border crossings - **up to 40%**

- for transport connections of ports and airports to the hinterland, activities to reduce noise in rail transport, construction of port and intermodal terminals - **up to 20%**

- Traffic management systems and services:

- ERTMS: **up to 50 %**

- for all other traffic management systems, freight transport services, construction of safe parking areas along core network routes, as well as activities to develop motorways of the sea - **up to 20%**

- Eligibility for bonus - the abovementioned percentages may be increased by **10%** for activities that contribute to synergies in cross-border transport movements and achieving targets for combating climate change or reducing greenhouse gas emissions.

### **Distribution of Cohesion Fund resources (EUR 10 billion).**

- Studies - **up to 80-85%**

- Construction activities:

- for railway and inland waterways - **up to 80-85%**

- for land border crossings - **up to 80-85%**

- travel connections at ports and airports to the hinterland, construction of port and intermodal terminals - **up to 80-85%**

- activities to reduce noise in rail transport: **up to 20 %**

- Traffic management systems and services:

- ERTMS: **up to 80-85%**

- for all other traffic management systems – **up to 80-85%**

- freight transport services, construction of safe parking areas along core network routes, as well as activities to develop motorways of the sea - **up to 20%**.

### **Funding opportunities:**

The general description of the options for EU funding for infrastructure and railway vehicles is presented in the ERTMS deployment strategy. This section presents the general guidelines with regard to the funding options.

### **Guidelines for seeking funding:**

The options for financing the modernisation and renewal of railway infrastructure in terms of ETCS development are considered in the Operational Programme for 'Transport and Transport Infrastructure' 2014-2020..

In the period 2014-2020, one of the main financial instruments for financing the development of the trans-European transport network was also the Connecting Europe Facility. It was established by Regulation (EU) No 1316/2013, which repealed Regulation (EC) No 680/2007 on the trans-European transport and energy networks. In the period 2021-2027, the Connecting Europe Facility will continue to be the main funding instrument for the trans-European transport network.

At EU level, the financing of ERTMS projects is made possible by the InvestEU programme. This Programme brings together under one roof the multitude of EU financial instruments currently available to support investment in the EU, making EU funding for investment projects in Europe simpler, more efficient and more flexible.

The Programme consists of the InvestEU Fund, the InvestEU Advisory Hub and the InvestEU Portal. It will further boost job creation and support investment and innovation in the EU. InvestEU will run between 2021 and 2027 and builds on the success of the Juncker Plan's European Fund for Strategic Investments (EFSI) by providing an EU budget guarantee to support investment and access to finance in the EU. InvestEU aims to trigger €650 billion in additional investment. The InvestEU Fund will support four policy areas: sustainable infrastructure; research, innovation and digitisation; small and medium-sized enterprises; social investment and skills. It will also be flexible, making it possible to react rapidly to changes in the market and political priorities. The InvestEU Advisory Hub will provide technical support and assistance to help with the preparation, development, structuring and implementation of projects, including capacity-building.

Options for financing railway infrastructure and railway vehicles for passenger transport from the national budget by means of capital transfers are also used. At the start of 2021, a contract was signed between the State and the NRIC for the long-term planning and financing of railway infrastructure construction, maintenance, development and operation activities. The contract was concluded for a period of five years. The provision of capital transfers to the company is effected under the terms of the contract and in accordance with the amount provided for in the annual acts on the State budget of the Republic of Bulgaria.

In 2009, a Contract on the provision of public transport services by rail on the territory of the Republic of Bulgaria was signed between the Ministry of Transport and BDZh-Patnicheski prevozi EOOD [Bulgarian State Railways - Passenger Services EOOD] which became effective on 1 January 2010 and has a term of fifteen years. The contract provides for the possibility to grant capital transfers from

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the State budget for the purchase of new passenger railway vehicles, provided that certain conditions are met. A new contract is expected to be concluded in 2025.

There are further potential financing sources associated with obtaining loans from various credit institutions.

## **7. FOLLOW-UP AND FEEDBACK**

### **7.1. LIST OF ASSETS AND COMPARISON WITH OBJECTIVES**

The creation of the National Implementation Plan (NIP) was followed up by establishing a list of assets to help in achieving sub-objectives:

- 1) Barriers and obstacles to the deployment of ETCS and the GSM-R Class A radio system are identified;
- 2) Information about users is provided;
- 3) Progress is monitored and assessed.

Under the Fourth Railway Package, ERTMS is to be deployed in line with a harmonised model developed within the EU and monitored by the European Union Agency for Railways.

### **7.2. UPDATING THE PLAN**

In order to execute the National Implementation Plan for the TSI, the following preconditions must be taken into account:

- The financial resources and deadlines for phased implementation of the TSI should be set in the annual plans drawn up in the coming years by the NRIC and the railway undertakings.
- Given the need for considerable investment for the implementation of the TSI, options for cooperation between the NRIC, railway undertakings and other stakeholders should be sought.
- As encouragement for the NRIC and the railway undertakings, options for additional resources to be provided from the European funds and the State budget should be sought.
- Should there be significant changes in the preconditions entailing modifications to the activities, terms and investments, this Plan should be updated regularly – at least every five years, as per point 7.4.4. of Commission Regulation (EU) 2016/919.

## 8. CONCLUSION

With the support of the State administration bodies, the rail infrastructure manager and railway undertakings should take a proactive approach to carrying out the NIP and deploying the ERTMS system.

This will help expedite the realisation of ERTMS deployment projects in Bulgaria, especially with regard to:

- improving the level of safety of rail transport,
- increasing the speed and capacity of lines,
- effective traffic control,
- compliance with the conditions for interoperability, in accordance with the EU Directives,
- access by the rolling stock of Bulgarian operators to the railway network of neighbouring countries,
- use of GSM-R,
- maintaining the economically important position of rail transport in transit transport.

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