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MINISTRSTVO ZA INFRASTRUKTURO

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**National implementation plan for the technical specification
for interoperability relating to the
'control-command and signalling' structural subsystem** (NIP
TSI CCS)

Ljubljana, June 2020

Version 1.2

List of changes

Version date	Author(s)	Version	Chapter No	Description of change
January 2018	Slovenian Infrastructure Agency (DRSI), DRI, Slovenian Railways (SŽ), Public Agency of the Republic of Slovenia for Railway Transport (AŽP)	1.0	///	Date of first publication
September 2019	Slovenian Railways (SŽ), Public Agency of the Republic of Slovenia for Railway Transport (AŽP)	1.1	- Chapter 2.1 (Technical migration strategy) has been updated with an exception that applies to new rolling stock. - The entire document has been aligned with the currently applicable laws.	Second edition
June 2020	Slovenian Infrastructure Agency (DRSI), Slovenian Railways (SŽ), Public Agency of the Republic of Slovenia for Railway Transport (AŽP)	1.2	- Chapter 1 (General and context description) has been updated with corridors - Chapter 2.1 (Technical migration strategy) and Chapter 4.2 (Date of decommissioning of class B systems), the year of decommissioning of RTLs has been changed to 2022 - Chapter 2.1 (Technical migration strategy) and Chapter 4.3 (Equipment of vehicles with ERTMS), the year of installation of GSM-R devices in vehicles operated by SŽ-PP and SŽ-TP has been changed to 2021. - Chapter 2.1 (Technical migration strategy) has been updated with an exception that applies to new rolling stock.	Third edition

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Abbreviations

EU	European Union
MZI	Ministry of Infrastructure
RS	Republic of Slovenia
TSI	Technical specifications for interoperability
RFC	Rail Freight Corridor
SŽ-TP	Slovenian Railways - Freight Transport
SŽ-PP	Slovenian Railways - Passenger Transport
TSI CCS	Technical specification for interoperability relating to the 'control-command and signalling' subsystem
ATS	Automatic Train Stop - Indusi I60 (class B system)
RTL	Radio transmission link (class B system)
VHF	VHF radio connection (class B system)
STM	Specific Transmission Module
PRI	Public railway infrastructure
TEN-T	Trans-European Transport Network
ETCS	European Train Control System (class A system)
ERTMS	European Rail Traffic Management System
GSM-R	Global System for Mobile Communications - Railway (class A system)
ZZeP	Railway Transport Act
ZVZeP	Railway Safety Act
SŽ	Slovenian Railways
SV	Signalling and safety device
TK	Telecommunications device

Abstract/Introduction

Pursuant to 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 (OJ L 138, 26.5.2016, p. 44), interoperability means the ability of a rail system to allow the safe and uninterrupted movement of trains which accomplish the required levels of performance.

In order to achieve these goals, EU Member States must carry out the measures necessary for achieving an optimal level of technical harmonisation of the railway system within the Community with a view to improving and developing international rail transport services.

The TSI regulations require the Member States to adopt NIPs for the implementation of individual TSIs.

The Republic of Slovenia has drawn up the National implementation plan for the technical specification for interoperability relating to the 'control-command and signalling' structural subsystem (NIP TSI CCS) 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 (OJ L 158, 15.6.2016, p. 1, OJ L 279, 15.10.2016, p. 94), as amended by Commission Implementing Regulation (EU) 2019/776 (OJ L 139, 27.5.2019, p. 108) (hereinafter 'TSI CCS').

Approved

Under Article 6 [sic] TSI CCS, each Member State is to forward its national implementation plan for technical specifications for interoperability to the other Member States and the Commission.

The NIP TSI CCS has been drawn up by the bodies responsible for the Slovenian railway system pursuant to the Railway Safety Act - ZVZelP (*Uradni List RS* (UL RS; Official Gazette of the Republic of Slovenia) No 30/18).

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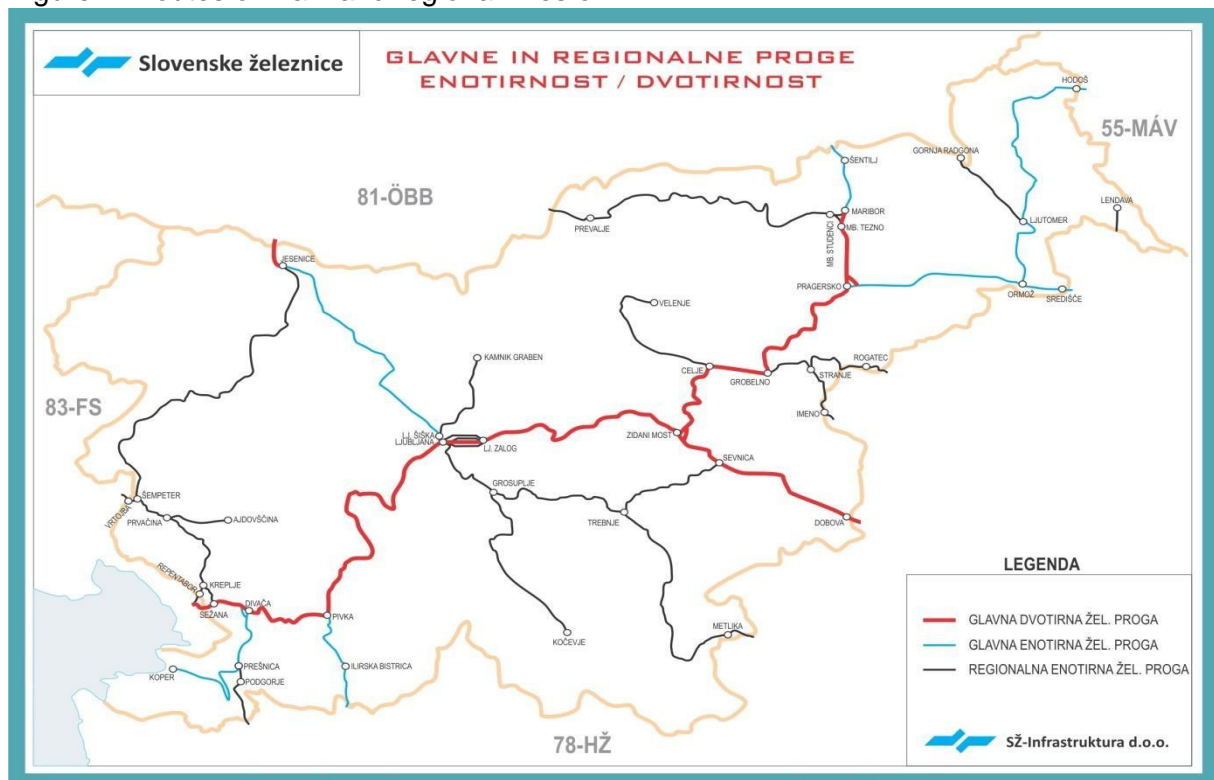
1. General and context description

Public railway infrastructure (PRI) means structures and installations required for the unhindered running of public rail transport and the associated plots of land which serve their intended use. PRI is a state-owned built public good used in the manner and under the conditions laid down in the ZZelP and in the regulations issued thereunder.

The PRI manager in Slovenia, designated pursuant to the Railway Transport Act - ZZelP - official consolidated version No 8 (UL RS Nos 99/2015 and 30/18) and the Slovenian Railway Company Act - ZDSŽ-A (UL RS Nos 106/2010, 43/11, ZUJF, 40/12 and 30/18) is Slovenske železnice - Infrastruktura, d.o.o.

The Slovenian railway network is laid down in the Decree on line categories (UL RS Nos 4/09, 5/09 – corr., 62/11, 66/12, 12/13 and 30/18). The lines may be categorised as main or regional, depending on traffic volume, economic significance and connecting role. 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 (OJ L No 348, 20.12.2013, p. 1), amended by Commission Delegated Regulation (EU) No 473/2014 of 17 January 2014 (OJ L No 136, 9.5.2014, p. 10), Commission Delegated Regulation (EU) 2016/758 of 4 February 2016 (OJ L 126, 14.5.2016, p. 3), Commission Delegated Regulation (EU) 2017/849 of 7 December 2016 (OJ L 1281, 19.5.2017, p. 1) and Commission Delegated Regulation (EU) 2019/254 of 9 November 2018 (OJ L 43, 14.2.2019, p. 1; hereinafter 'TEN-T Regulation'), draws a distinction between core and comprehensive TEN-T networks. From the point of view of the TEN-T Regulation, the regional lines in Slovenia belong to 'other networks', which do not form part of the TEN; nevertheless, conditions for interoperability are to be established in accordance with the TSI.

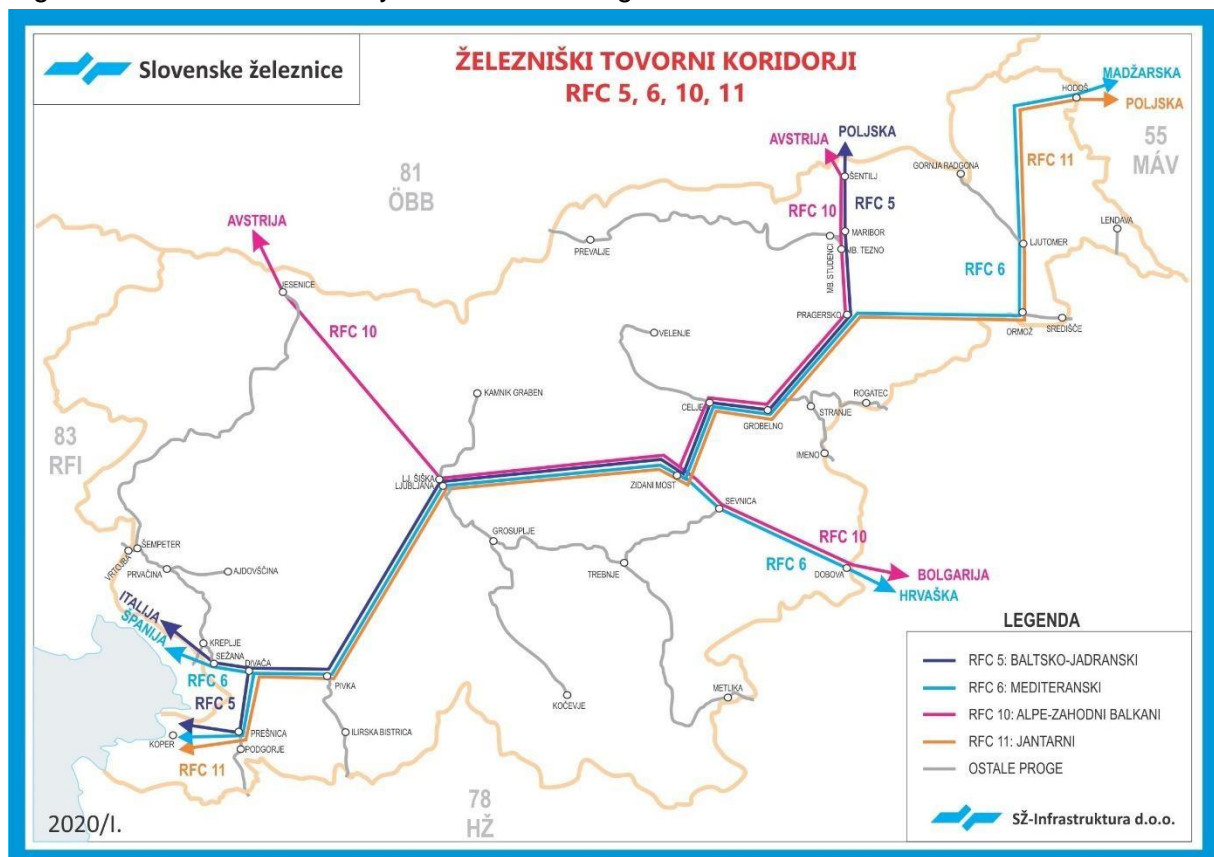
Figure 1: Routes of main and regional lines on PRI



Four rail freight corridors (RFCs) cross Slovenia:

- the Baltic-Adriatic Corridor (RFC 5): Gdynia-Katowice-Ostrava/Žilina-Bratislava/Vienna/Klagenfurt-Udine-Venice/Trieste/Bologna/Ravenna/Graz-Maribor-Ljubljana-Koper/Trieste.
- the Mediterranean Corridor (RFC 6): Almería-Valencia/Madrid-Zaragoza/Barcelona-Marseille-Lyon-Turin-Milan-Verona-Padua/Venice-Trieste/Koper-Ljubljana-Budapest-Zahony (Hungarian-Ukrainian border)
- the Alpine-Western Balkan Corridor (RFC 10): Salzburg-Villach-Ljubljana-Wels/Linz-Graz-Maribor-Zagreb-Vinkovci/Vukovar-Tovarnik-Belgrade-Sofia-Svilengrad (Bulgarian-Turkish border);
- the Amber Corridor (RFC 11): Koper-Ljubljana-Zalaszentivan-Sopron/Csorna-(Hungarian-Serbian border)-Kelebia-Budapest-Komárom-Leopoldov/Rajka-Bratislava-Žilina-Katowice/Kraków-Warsaw/Łuków-Terespol-(Polish-Belarusian border).

Figure 2: International railway corridors crossing Slovenia



1.1 Current equipment of lines and vehicles

This section presents the current situation as regards the equipment of the lines and vehicles with train protection and voice communication systems. The relevant data is contained in the manager's Network Statement and other acts.

Table 1: Current equipment of the lines and stations of the core TEN-T network

No of line	National line designation	Indusi I60	RTL	SSDs	Remote control	Type of TCD
10	state border-Dobova-Zidani Most	YES	YES	relay	NO	digital
	Zidani Most-Ljubljana	YES	YES	relay	NO	Digital
11	Ljubljana Zalog-Kajuhova turnout; P3	YES	YES	relay	NO	Digital
12	Ljubljana Zalog-Ljubljana; P4	YES	YES	relay and combined	NO	Digital
13	Ljubljana Zalog-Ljubljana; P5	YES	YES	combined	NO	Digital
14	Zidani Most junction	YES	YES	relay	NO	Digital
30	Zidani most-Pragersko	YES	YES	relay	NO	Digital
	Pragersko-Šentilj-state border	YES	YES	relay	NO	Digital
40	Pragersko-Ormož	YES	NO	electronic	YES	Digital
41	Ormož-Hodoš-state border	YES	NO	electronic	YES	Digital
45	Pragersko junction	YES	YES	relay	NO	digital
50	Ljubljana-Sežana-state border	YES	YES	electronic relay: Brezovica, Logatec	YES	Digital
51	Divača junction	YES	YES	electronic	NO	digital
60	Divača-Prešnica turnout	YES	YES	electronic	YES	digital
62	Prešnica turnout-Koper	YES	YES	electronic	YES	digital

Table 2: Current equipment of the lines and stations of the comprehensive TEN-T network

No of line	National line designation	Indusi I60	RTL	SSDs	Remote control	Type of TCD
20	Ljubljana-Jesenice-state border	YES	YES	relay	YES	digital
44	Ormož-Središče-state border	YES	NO	electronic	NO	digital
64	Pivka-Ilirska Bistrica-state border	YES	NO	relay Ilirska Bistrica	NO	digital

Table 3: Current equipment of the regional lines and stations - other network

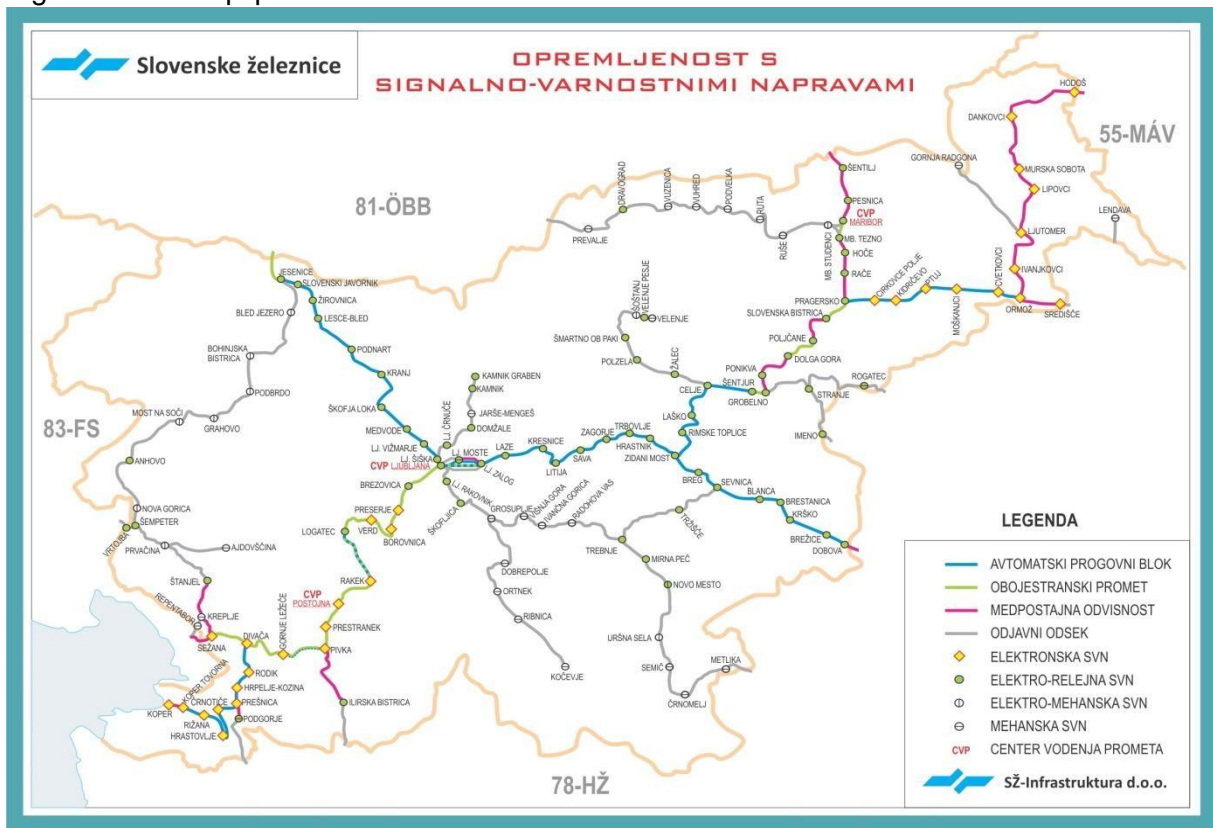
No of line	National line designation	Indusi I60	RTL	SSDs	Remote control	Type of TCD
21	Ljubljana Šiška-Kamnik Graben	Kamnik YES, Jarše NO (no SSD), Črnuče Domžale no outbound signal and 500Hz	NO	relay Kamnik, relay NPI Črnuče Domžale Jarše: older	NO	digital/analogue
31	Celje-Velenje	NO	NO	relay Šmartno ob Paki, relay TELA: Žalec, Polzela Šoštanj:	NO	digital/analogue

				electromechanical, Velenje: mechanical + ROSP		
32	state border-Rogatec-Grobelno	NO (ATSs at some level crossings with control signals)	NO	relay Stranje relay TELA Imeno older SSDs: Rogatec	NO	digital/analogue
33	state border-Imeno-Stranje	NO	NO	relay	NO	digital/analogue
34	Maribor-Prevalje-state border	NO	NO	older Studenci: electromechanical + ROSP Ruše: mechanical + ROSP Dravograd: relay	NO	digital/analogue
35	Maribor Tezno junction-Maribor-Studenci	YES (outbound signal from Maribor, no ATS at Studenci)	YES	older (electromechanical SSD + ROSP)	NO	digital/analogue
42	Ljutomer-Gornja Radgona	NO	NO	older	NO	digital/analogue
43	state border-Lendava	NO	NO	mechanical + ROSP	NO	digital/analogue
61	Prešnica turnout-Podgorje-state border	NO	NO	combined relay Podgorje electronic Prešnica + absolute block signalling	NO	digital/analogue
70	Jesenice-Sežana	NO, Štanjel YES	NO	electromechanical Lake Bled: electromechanical + ROSP Anhovo, Štanjel: relay Kreplje turnout: older	NO	digital/analogue
71	Šempeter pri Gorici turnout-Vrtojba-state border	NO	NO	relay	NO	digital/analogue
72	Prvačina-Ajdovščina	NO	NO	combined	NO	digital/analogue
73	Kreplje turnout-Repentabor-state border	NO	NO	older	NO	digital/analogue
80	state border-Metlika-Ljubljana	YES, only inbound signals and pre-signals (No 500Hz and outbound signal)	NO	mechanical + ROSP older: Semič, Uršna Sela combined relay electromechanical: Novo Mesto relay relay NPI Škofljica	NO	digital/analogue
81	Sevnica-Trebnje	NO	NO	relay Tržišče, elsewhere older electromechanical SSDs (Jelovec, Mokronog, Mirna)	NO	digital/analogue
82	Grosuplje-Kočevje	NO, at implementation stage - ATS equipped	NO	older (tender out to purchase new SSDs)	NO	digital/analogue

The figures below show lines and stations across Slovenia equipped with:

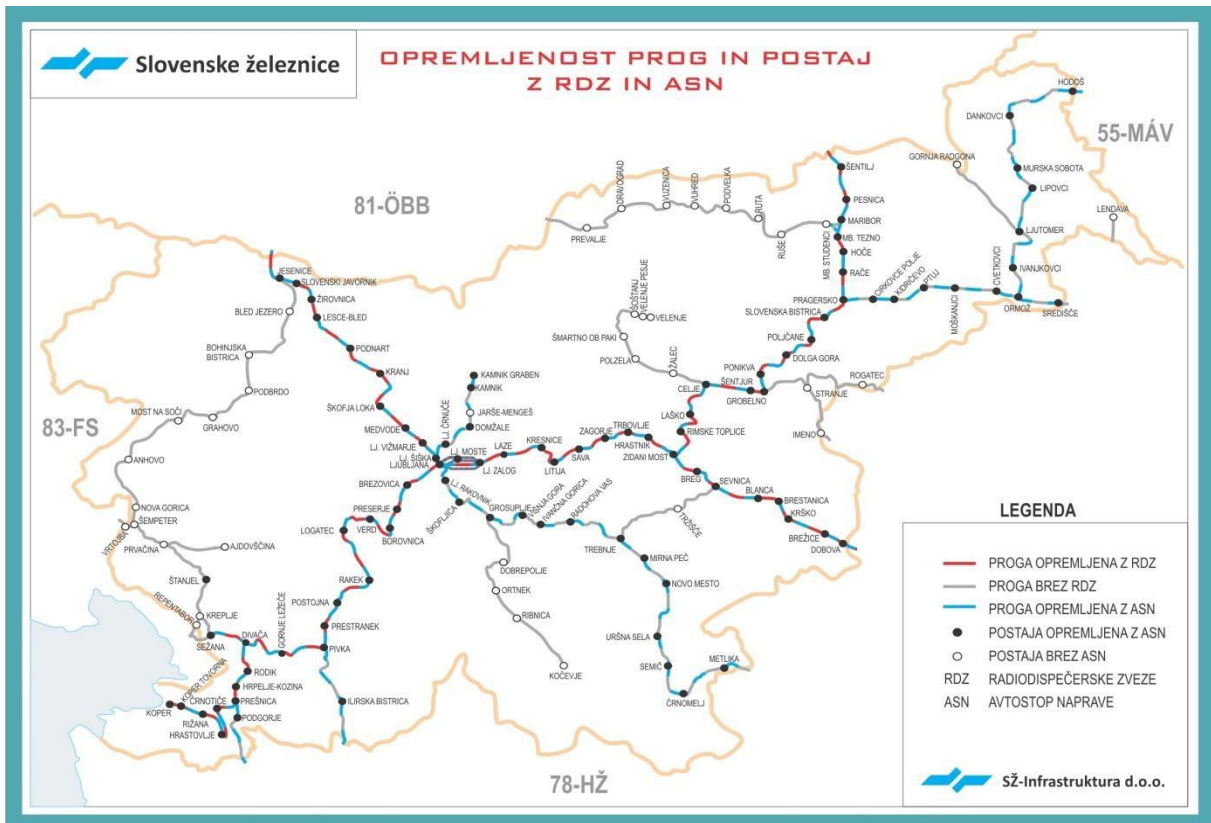
- SSDs,
- RTLs and ATSs (Indusi I60),
- ETCS,
- GSM-R.

Figure 3: SSD equipment level



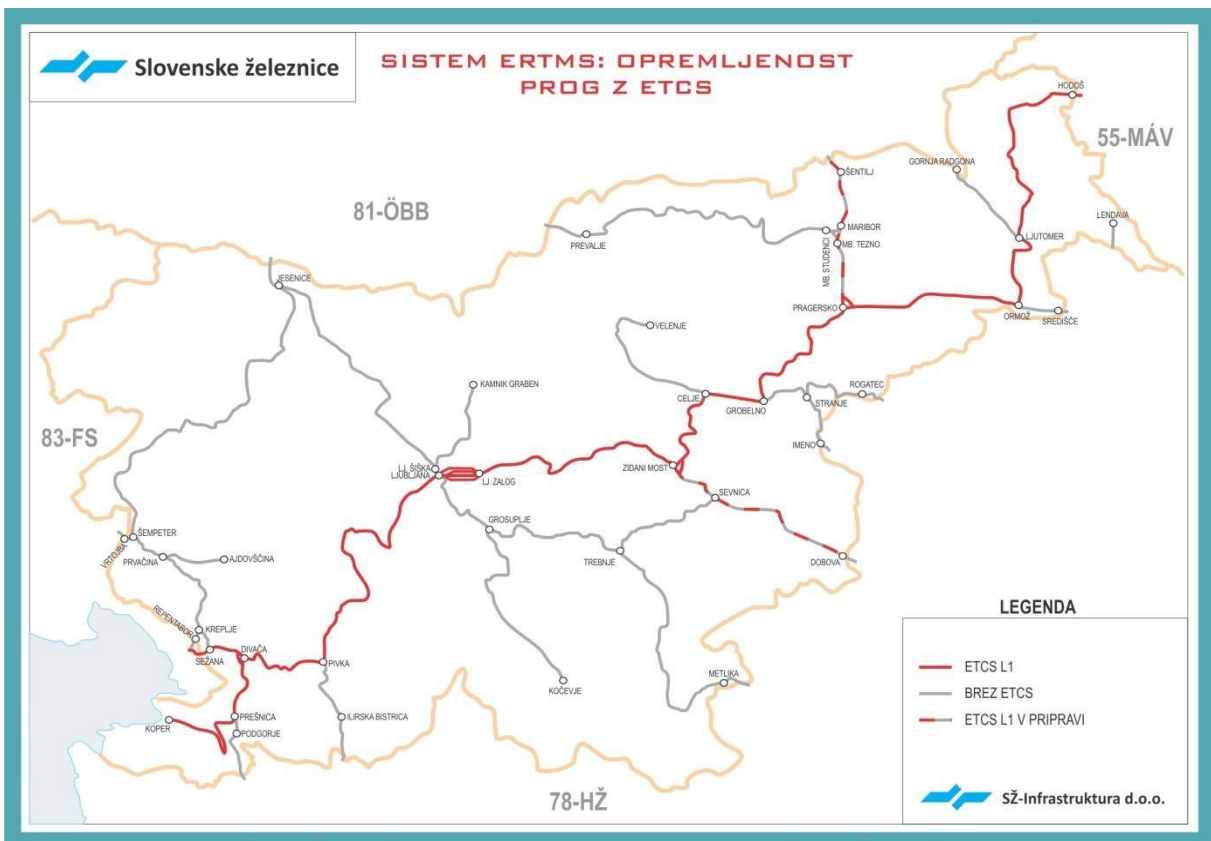
Source: 2020 Network Statement, SŽ - Infrastruktura, d.o.o., Ljubljana, December 2019

Figure 4: Lines and stations in Slovenia equipped with RTLs and ATSS



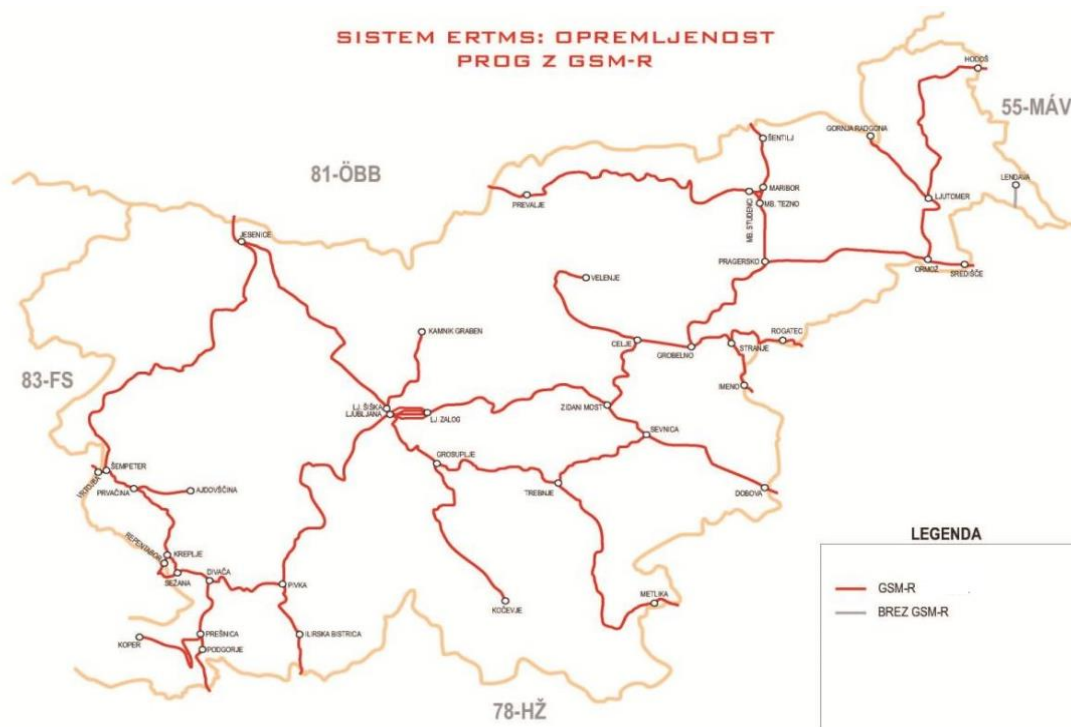
Source: 2020 Network Statement, SŽ - Infrastruktura, d.o.o., Ljubljana, December 2019

Figure 5: Lines equipped with ETCS



Source: 2020 Network Statement, SŽ - Infrastruktura, d.o.o., Ljubljana, December 2019

Figure 6: Lines equipped with GSM-R



Source: 2019 Network Statement, SŽ - Infrastruktura, d.o.o., Ljubljana, December 2018

The GSM-R system used on the entire PRI (except line R43 state border-Lendava) was installed and verified for the purpose of voice communication and the transmission of text messages. It was deployed in 2017.

Table 4: Equipment of vehicles operated by SŽ-PP and SŽ-TP with B system security devices on TEN-T network lines

Vehicle	No of vehicles	No of devices per vehicle	No of B system devices	Notes
541	32	1	32	
363	38	1	38	
342	8	1	8	
312	30	2	60	
311	5	2	10	
310	3	2	6	
813	1	2	2	Ormož-Središče-state border
664	1	1	1	Ormož-Središče-state

				border
Total	118	/	157	

Table 5: Equipment of vehicles operated by SŽ-PP and SŽ-TP with B system security devices on regional lines - other network

Vehicle	No of vehicles	No of devices per vehicle	No of B system devices
642	21	1	21
643	21	1	21
644	10	1	10
661	2	1	2
664	20	1	20
711	6	2	12
713	25	2	50
732	3	1	3
813	38	2	76
Total	146	/	215

2. Technical and financial migration strategies

2.1 Technical migration strategy

The aim of the ERTMS European Deployment Plan is to ensure that locomotives and other railway vehicles equipped with ERTMS can gradually have access to an increasing number of lines, stations, terminals and marshalling yards without needing class B systems in addition to ERTMS.

This does not mean that the current class B systems must be removed from the lines; however, by the date laid down in the implementation plan, locomotives and other railway vehicles equipped with ERTMS must be given access to lines included in the deployment plan without requiring those vehicles to be equipped with a class B system.

Slovenia has opted for ETCS L1 with in-fill functionality (version 2.3.0d, baseline 2) on its section of the D corridor, i.e. from the state border with Italy (including the Sežana station and the Koper-Divača leg) to the state border with Hungary (including the Hodoš station). The reasons for installing L1 included the speed of implementation, and the instability of specifications for, and technological immaturity of, ETCS L2. Moreover, installation of ETCS L2 would have entailed the upgrading of the old relay-based SSDs, which would incur massive costs and, due to limited funds for the installation of ETCS, delay its implementation.

In view of the current state of the infrastructure, experience obtained from past implementation of ERTMS/ETCS in Slovenia, the National railway infrastructure development programme, and the Transport Development Strategy of Slovenia, it was decided that ETCS L1 with in-fill functionality (balise infill, baseline 3) would be installed on the section of RFC 6 running from the state border with Croatia via Dobova to Zidani Most and on sections Pragersko-Maribor and Maribor-Šentilj-state border with Austria of RFC 5.

As ETCS cannot be simultaneously installed in all trains and since the entire network cannot migrate from class B systems to new class A systems at once, a transition period where both systems (class A and class B) coexist on vehicles and/or on the lines, and overlap, is inevitable.

Migration can take the following form:

- both systems active; class B (ATS, RTL, VHF, etc.) and class A systems (ETCS and GSM-R) or
- introduction of STMs enabling vehicles equipped with class A systems to be used on class B infrastructure or
- operational train traffic control.

It is therefore vital that some class B systems (on a specific number of tracks) are retained at the stations Sežana, Ljubljana, Celje, Maribor, Maribor Tezno, Sevnica, Hrpelje Kozina, Jesenice, Pivka and Ormož, and on the sections Grobelno-Celje and Divača-Sežana, where trains use feeder lines, and at the stations Koper, Ljubljana Zalog and Maribor Tezno, where trains are shunted, until 2031, when all class B systems (Indusi I60) are to be decommissioned (including feeder lines).

Due to the costs of maintenance of both class B and class A systems, the class B systems RTL and Indusi I60 are set to be decommissioned by 2022 and 2025 respectively. By that time the entire core network in Slovenia will have been equipped with ERTMS.

The TEN-T Regulation defines the line state border-Sežana-Divača-Ljubljana-Zidani Most-Dobova-state border as 'high-speed rail (planned)'. The economic feasibility study of a new railway connection between Divača and Zidani Most via Ljubljana (by JV PNZ d.o.o., Ljubljana, and Vössing GmbH; September 2013) has shown that the geographical, environmental and urbanist restrictions and the cost of investment would render the project unfeasible.

Table 6: Introduction of ETCS and GSM-R on the core TEN-T network in Slovenia and decommissioning of class B systems

No of line	Line/Section	ERTMS		Year of decommissioning of class B systems	
		ETCS	GSM-R	Indusi I60	RTL
10	state border-Dobova-Zidani Most	2020	2017	by 2025	2022
	Zidani Most-Ljubljana	2017	2017	by 2025	2022
11	Ljubljana Zalog-Kajuhova turnout; P3	2017	2017	by 2025	2022
12	Ljubljana Zalog-Ljubljana; P4	2017	2017	by 2025	2022
13	Lj. Zalog-Ljubljana; P5	2017	2017	by 2025	2022
14	Zidani Most junction	2017	2017	by 2025	2022

No of line	Line/Section	ERTMS		Year of decommissioning of class B systems	
		ETCS	GSM-R	Indusi I60	RTL
30	Zidani most-Pragersko	2017	2017	by 2025	2022
	Pragersko-Šentilj-state border	by 2023	2017	by 2025	2022
40	Pragersko-Ormož	2017	2017	by 2025	/
41	Ormož-Hodoš-state border	2017	2017	by 2025	/
45	Pragersko junction	2017	2017	by 2025	2022
50	Ljubljana-Sežana-state border	2017	2017	by 2025	2022
51	Divača junction	2017	2017	by 2025	2022
60	Divača-Prešnica turnout	2017	2017	by 2025	2022
62	Prešnica turnout-Koper	2017	2017	by 2025	2022
no No	Divača-Koper; 2nd track	by 2025	by 2025	/	/

Key: '/' indicates absence of class B systems on the line.

The due date for decommissioning class B systems across the entire network is 2022 for RTL and 2031 for Indusi I60. By that time the comprehensive network in Slovenia will have been partly equipped with ERTMS.

Table 7: Introduction of ETCS and GSM-R on the comprehensive TEN-T network and decommissioning of class B systems

No of line	Line/Section	ERTMS		Year of decommissioning of class B systems	
		ETCS	GSM-R	Indusi I60	RTL
20	Ljubljana-Jesenice-state border	by 2024	2017	by 2031	2022
44	Ormož-Središče-state border	after 2050	2017	by 2031	/
64	Pivka-Ilirska Bistrica-state border	by 2031	2017	by 2031	/
no No	state border-Sežana-Divača-Ljubljana-Zidani Most-Dobova-state border - plan for a high-speed line	not planned	not planned	/	/

Key: '/' indicates absence of class B systems on the line.

There are very few class B systems on regional lines. The lack of class B systems means that the maximum train speed is restricted to 100 km/h; however, higher speeds are prevented by other track elements, such as the superstructure and the substructure. In view of the actual needs higher speeds are not even required, so from the point of view of maintenance and traffic management it would be sensible to remove the existing systems altogether, as the line capacities can accommodate operational train traffic control.

Table 8: Introduction of ETCS and GSM-R on regional lines in Slovenia and decommissioning of class B systems

No of line	Line/Section	ERTMS		Year of decommissioning of class B systems	
		ETCS	GSM-R	Indusi I60	RTL
21	Ljubljana Šiška-Kamnik Graben	after 2050	2017	by 2031	/
31	Celje-Velenje	after 2050	2017	/	/
32	state border-Rogatec-Grobelno	after 2050	2017	/	/
33	state border-Imeno-Stranje	after 2050	2017	/	/
34	Maribor-Prevalje-state border	after 2050	2017	/	/
35	Maribor Tezno junction-Maribor-Studenci	after 2050	2017	by 2031	2022
42	Ljutomer-Gornja Radgona	after 2050	2017	/	/
43	state border-Lendava	after 2050	not equipped	/	/
61	Prešnica turnout-Podgorje-state border	after 2050	2017	/	/
70	Jesenice-Sežana	after 2050	2017	by 2031	/
71	Šempeter pri Gorici turnout-Vrtojba-state border	after 2050	2017	/	/
72	Prvačina-Ajdovščina	after 2050	2017	/	/
73	Kreplje turnout-Repentabor-state border	after 2050	2017	/	/
80	state border-Metlika-Ljubljana	after 2050	2017	by 2031	/
81	Sevnica-Trebnje	after 2050	2017	/	/

82	Grosuplje-Kočevje	after 2050	2017	by 2031	/
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Key: '/' indicates absence of class B systems on the line.

Table 9: Equipment of vehicles operated by SŽ-PP and SŽ-TP with ERTMS

Vehicle	No of vehicles	No of devices per vehicle	No of devices	Year of installation of ETCS	Year of installation of GSM-R
541	32	1	32	2023	2021
363	38	1	38	2023	2021
342	8	1	8	2023	2021
312	30	2	60	2023	2021
311	5	2	10	2023	2021
310	3	2	6	2023	2021
813	1	2	2	2023	2021
664	1	1	1	2023	2021
Total	118	/	157		

In accordance with paragraph 2 of point 7.4.3 of TSI CCS Slovenia wishes to exercise the right to an exception for new rolling stock. Within the first three years of being granted a marketing authorisation in Slovenia, but until 31 December 2022 at the latest, new rolling stock need not be equipped with ETCS equipment in accordance with Annex A to TSI CCS, provided that the rolling stock is used only in domestic transport and on sections shorter than 150 km. New rolling stock operating on sections longer than 150 km must be equipped with ETCS devices. After 31 December 2022, all new rolling stock that has been cleared for marketing in Slovenia after this change must be equipped with ETCS devices in accordance with Annex A TSI CCS.

2.2 Financial migration strategy

The PRI in Slovenia between the state border with Italy and the station Sežana, including the Koper Port-Divača section, to the state border with Hungary and the station Hodoš was upgraded with ERTMS/ETCS L1 (v. 2.3.0d) as part of the 'Development of ERTMS/ETCS on Corridor D infrastructure' project, which began in 2007. The length of the corridor is 410 km or 333.25 km of double-track equivalent.

The total value (before VAT) of the investment comprising design, a pilot project, works, costs of the notified body, inspection, training, release for operation, etc. was EUR 117 841.68 per kilometre of double-track.

In October 2017 the firm DRI upravljanje investicij, d.o.o. produced a cost-benefit analysis of the introduction of ETCS and decommissioning of class B systems. The analysis showed that it would make no sense to introduce ETCS on regional lines before 2050.

Table 10: Cost of installation of ETCS on the core TEN-T network in Slovenia

No	Line	Construction length	Double-track	Single-track	Equivalent double-track length	Cost of installation of ETCS
10	state border-Dobova-Zidani Most	50.9	50.9		50.9	5 998 141
30	Pragersko-Šentilj-state border	37.9	70	18.8	28.5	3 358 487
	Total	88.5	8.458	18.8	79.4	9 356 628

Table 11: Cost of installation of ETCS on the comprehensive TEN-T network

No	Line	Construction length	Double-track	Single-track	Equivalent double-track length	Cost of installation of ETCS
20	Ljubljana-Jesenice-state border	70.898	8.458	62.440	39.678	4 675 722
44	Ormož-Središče-state border	11.615		11.615	5.8075	684 365
64	Pivka-Ilirska Bistrica-state border	24.405		24.405	12.2025	1 437 963
	Total	106.918	8.458	98.460	57.688	6 798 050

Table 12: Cost of equipping vehicles operated by SŽ-PP and SŽ-TP with ERTMS on the core and comprehensive TEN-T networks

Vehicle	No of vehicles	No of devices per vehicle	No of devices	Cost of installing ERTMS in vehicles
541	32	1	32	9 600 000
363	38	1	38	11 400 000
342	8	1	8	2 400 000
312	30	2	60	18 000 000
311	5	2	10	3 000 000
310	3	2	6	1 800 000
813	1	2	2	600 000
664	1	1	1	300 000
Total	118	/	157	47 100 000

3. Availability of Specific Transmission Modules

Requirements for STMs, which enable a class A on-board system to operate on infrastructure equipped with class B systems, are the responsibility of each Member State. Slovenia has no plans to develop an STM.

4. Planning

4.1 Date for deployment of ERTMS on different tracks of the network

The GSM-R system used on the entire PRI (except line R43 state border-Lendava) was installed and verified for the purpose of voice communication and the transfer of text messages. It was deployed in 2017.

The project 'Development of ERTMS/ETCS on Corridor D infrastructure', which began in 2007 and was co-financed under the TEN-T programme, was carried out as part of the modernisation of the railway network in Slovenia. The route of Corridor D largely corresponds to the route of RFC 6.

As part of the project a total of 412 km of tracks (single and double), i.e. 333.25 km of double-track equivalent, of PRI in Slovenia were upgraded with ERTMS/ETCS L1 (v. 2.3.0d). The project entitled 'Installation of ERTMS/ETCS on the lines state border-Dobova-Zidani Most and Pragersko-Maribor-Šentilj-state border', specifically the ERTMS/ETCS L1 system with in-fill functionality (baseline 3), will be completed on the section state border-Dobova-Zidani Most in 2020, and is expected to be completed on the section Pragersko-Maribor-Šentilj-state border by 2023.

Table 13: Introduction of ETCS and GSM-R on the core TEN-T network in Slovenia

No of line	Line/Section	ERTMS		TEN-T compliance
		ETCS	GSM-R	
10	state border-Dobova-Zidani Most	2020	2017	IN PART (YES, in 2020)
	Zidani Most-Ljubljana	2017	2017	YES

No of line	Line/Section	ERTMS		TEN-T compliance
		ETCS	GSM-R	
11	Ljubljana Zalog-Kajuhova turnout; P3	2017	2017	YES
12	Lj. Zalog-Ljubljana; P4	2017	2017	YES
13	Lj. Zalog-Ljubljana; P5	2017	2017	YES
14	Zidani Most junction	2017	2017	YES
30	Zidani most-Pragersko	2017	2017	YES
	Pragersko-Šentilj-state border	by 2023	2017	IN PART (YES, after 2023)
40	Pragersko-Ormož	2017	2017	YES
41	Ormož-Hodoš-state border	2017	2017	YES
45	Pragersko junction	2017	2017	YES
50	Ljubljana-Sežana-state border	2017	2017	YES
51	Divča junction	2017	2017	YES
60	Divča-Prešnica turnout	2017	2017	YES
62	Prešnica turnout-Koper	2017	2017	YES
no No	Divča-Koper; 2nd track	by 2025	by 2025	NO (YES, after 2025)

Table 14: Introduction of ETCS and GSM-R on the comprehensive TEN-T network in Slovenia

No of line	Line/Section	ERTMS		TEN-T compliance
		ETCS	GSM-R	
20	Ljubljana-Jesenice-state border	by 2024	2017	IN PART (YES, after 2024)
44	Ormož-Središče-state border	after 2050	2017	IN PART
64	Pivka-Ilirska Bistrica-state border	by 2031	2017	IN PART
no No	state border-Sežana-Divača-Ljubljana-Zidani Most-Dobova-state border - plan for a high-speed line	not planned	not planned	NO

Table 15: Introduction of ETCS and GSM-R on regional lines in Slovenia

No of line	Line/Section	ERTMS		TEN-T compliance
		ETCS	GSM-R	
21	Ljubljana Šiška-Kamnik Graben	after 2050	2017	IN PART
31	Celje-Velenje	after 2050	2017	IN PART
32	state border-Rogatec-Grobelno	after 2050	2017	IN PART
33	state border-Imeno-Stranje	after 2050	2017	IN PART
34	Maribor-Prevalje-state border	after 2050	2017	IN PART
35	Maribor Tezno junction-Maribor-Studenci	after 2050	2017	IN PART
42	Ljutomer-Gornja Radgona	after 2050	2017	IN PART
43	state border-Lendava	after 2050	not equipped	NO
61	Prešnica turnout-Podgorje-state border	after 2050	2017	IN PART
70	Jesenice-Sežana	after 2050	2017	IN PART
71	Šempeter pri Gorici turnout-Vrtojba-state border	after 2050	2017	IN PART
72	Prvačina-Ajdovščina	after 2050	2017	IN PART
73	Kreplje turnout-Repentabor-state border	after 2050	2017	IN PART
80	state border-Metlika-Ljubljana	after 2050	2017	IN PART
81	Sevnica-Trebnje	after 2050	2017	IN PART
82	Grosuplje-Kočevje	after 2050	2017	IN PART

4.2 Date of decommissioning of class B systems

In October 2017 the firm DRI upravljanje investicij, d.o.o. produced a cost-benefit analysis of the introduction of ETCS and decommissioning of class B systems. In view of the cost of maintenance of class B systems, as shown by the analysis, it would make sense to decommission class B systems (Indusi I60) in Slovenia by 2025 on the comprehensive TEN-T network and by 2031 on the regional lines.

RTL (also a class B system) should be decommissioned on the core, comprehensive and regional networks in Slovenia by 2022.

Table 16: Date for decommissioning class B systems on the core TEN-T network in Slovenia

No of line	Line/Section	Year of decommissioning of class B systems	
		Indusi I60	RTL
10	state border-Dobova-Zidani Most	by 2025	2022
	Zidani Most-Ljubljana	by 2025	2022
11	Lj. Zalog-Kajuhova turnout; P3	by 2025	2022
12	Lj. Zalog-Ljubljana; P4	by 2025	2022
13	Lj. Zalog-Ljubljana; P5	by 2025	2022
14	Zidani Most junction	by 2025	2022
30	Zidani most-Pragersko	by 2025	2022
	Pragersko-Šentilj-state border	by 2025	2022
40	Pragersko-Ormož	by 2025	/
41	Ormož-Hodoš-state border	by 2025	/
45	Pragersko junction	by 2025	2022
50	Ljubljana-Sežana-state border	by 2025	2022
51	Divača junction	by 2025	2022
60	Divača-Prešnica turnout	by 2025	2022
62	Prešnica turnout-Koper	by 2025	2022
no No	Divača-Koper; 2nd track	/	/

Key: '/' indicates absence of class B systems on the line.

Table 17: Date for decommissioning class B systems on the comprehensive TEN-T network in Slovenia

No of line	Line/Section	Year of decommissioning of class B systems	
		Indusi I60	RTL
20	Ljubljana-Jesenice-state border	by 2031	2022
44	Ormož-Središče-state border	by 2031	/
64	Pivka-Ilirska Bistrica-state border	by 2031	/
no No	state border-Sežana-Divača-Ljubljana-Zidani Most-Dobova-state border - plan for a high-speed line	/	/

Key: '/' indicates absence of class B systems on the line.

Table 18: Date for decommissioning class B systems on the regional lines in Slovenia

No of line	Line/Section	Year of decommissioning of class B systems	
		Indusi I60	RTL
21	Ljubljana Šiška-Kamnik Graben	by 2031	/
31	Celje-Velenje	/	/
32	state border-Rogatec-Grobelno	/	/
33	state border-Imeno-Stranje	/	/
34	Maribor-Prevalje-state border	/	/
35	Maribor Tezno junction-Maribor-Studenci	by 2031	2022
42	Ljutomer-Gornja Radgona	/	/
43	state border-Lendava	/	/
61	Prešnica turnout-Podgorje-state border	/	/
70	Jesenice-Sežana	by 2031	/
71	Šempeter pri Gorici turnout-Vrtojba-state border	/	/
72	Prvačina-Ajdovščina	/	/
73	Kreplje turnout-Repentabor-state border	/	/
80	state border-Metlika-Ljubljana	by 2031	/
81	Sevnica-Trebnje	/	/
82	Grosuplje-Kočevje	by 2031	/

Key: '/' indicates absence of class B systems on the line.

4.3 Vehicles equipped with ERTMS

After 2023, when the core network will have been fully equipped with ETCS, only ETCS-compatible vehicles will be able to fully benefit from the advantages of ETCS.

Table 19: Vehicles equipped with ERTMS

Vehicle	No of vehicles	No of devices per vehicle	No of devices	Year of installation of ETCS	Year of installation of GSM-R
541	32	1	32	2023	2021
363	38	1	38	2023	2021
342	8	1	8	2023	2021
312	30	2	60	2023	2021
311	5	2	10	2023	2021
310	3	2	6	2023	2021
813	1	2	2	2023	2021
664	1	1	1	2023	2021
Total	118	/	157		

4.4 Operating conditions without ERTMS

As required by Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (OJ L 343, 14.12.2012, p. 32; OJ L 53, 26.2.2013, p. 4; OJ L 67, 12.3.2015, p. 32), amended by Directive (EU) 2016/2370 of the European Parliament and of the Council of 14 December 2016 (OJ L 352, 23.12.2016, p. 1) and Commission Delegated Decision (EU) 2017/2075 of 4 September 2017 (OJ L 295, 14.11.2017, p. 69), and with a view to accelerating the installation of ETCS on board locomotives, the infrastructure manager's network statement should provide for suitable incentives through differentiation of the infrastructure charge for trains equipped with ETCS. PRI charges should be determined in a way that would provide an incentive for railway undertakings to equip their trains with ETCS.

In order to ensure an appropriate level of railway security, the following rules will apply to vehicles not equipped with ERTMS after the migration period:

- double manning required on trains without class A systems;
- top speed of 100 km/h for trains without class A systems.

5. Conclusion

The competent Slovenian authorities are actively monitoring and addressing the issue of interoperability, as they are well aware of its importance. The objective is to fulfil the requirements by transposing EU laws and monitoring implementation thereof.

This document aims to provide an outline of the railway infrastructure and vehicles operated by SŽ-PP and SŽ-TP, and give a detailed timeline for equipping both the lines and the vehicles with ETCS and GSM-R, and decommissioning class B systems. All the information about the railway infrastructure concerned is available in the register of railway infrastructure.

The NIP TSI CCS will be reviewed and updated, as appropriate, at least every five years, and the European Commission and the other Member States will be kept up-to-date on any changes concerning the development of interoperability on the Slovenian railway network.