



Capacity Strategy TT 2026

Croatian Railways Infrastructure

Version 1
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0 Introduction

RailNetEurope (RNE) and Forum Train Europe (FTE) organisations are working together with the European Rail Freight Association (ERFA) to redesign timetabling and capacity allocation procedures - TimeTable Redesign (TTR).

With the redesign of the timetable creation process TTR, each Infrastructure Manager is expected to publish the Capacity Strategy 3 years before the timetable change (X-36). The main goal of the Capacity Strategy is to provide interested stakeholders with information on changes in capacity availability, temporary capacity restrictions (TCR - negative capacity), basic planning principles and, informatively, planned traffic flows between neighboring railway administrations.

The Capacity Strategy is the earliest TTR planning instrument, on the basis of which the Capacity Model is created. The focus of the Capacity Strategy is on the future infrastructure development and the planning principles. Already at this earlier stage international coordination is needed, as various planning approaches exist between IMs. The Capacity Strategy is the main connection between political and social requirements of citizens and the capacity planning process. The validated final Capacity strategy sets the rules for the Capacity Models and next planning steps.

The TTR process is illustrated in Figure 1.

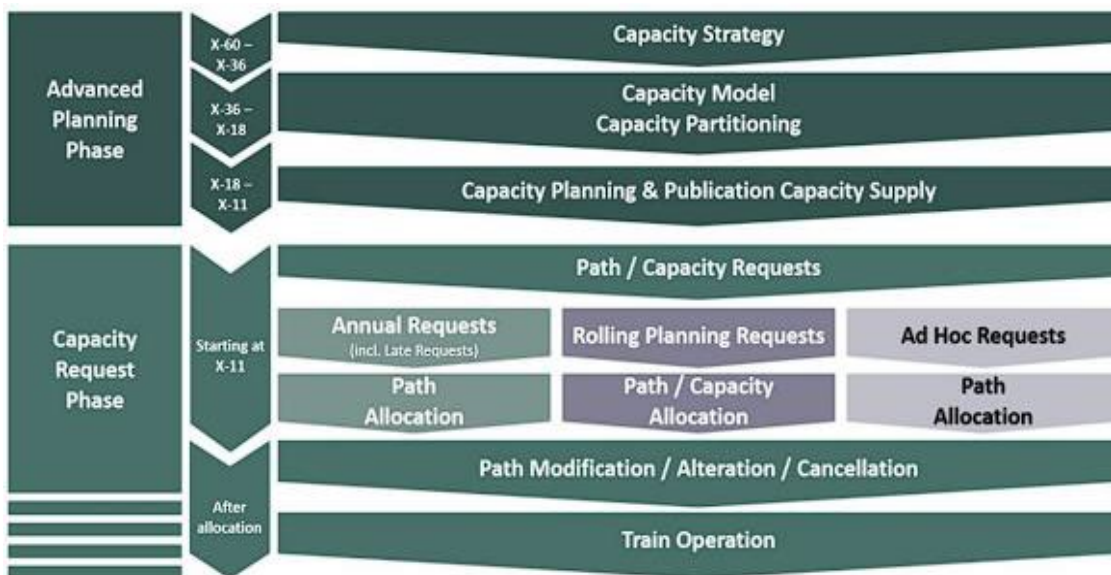


Figure 1. TTR Process (Source: RNE)

Detailed information about the TTR project is available on the following websites:

<https://rne.eu/capacity-management/ttr/>

<https://www.forumtraineurope.eu/services/ttr>

0.1 Geographical Scope

The Capacity Strategy only applies to certain lines and border crossing of international importance. Figure 2. illustrates the whole HZ Infrastruktura network with the some of the international lines which are covered by TTR in green.

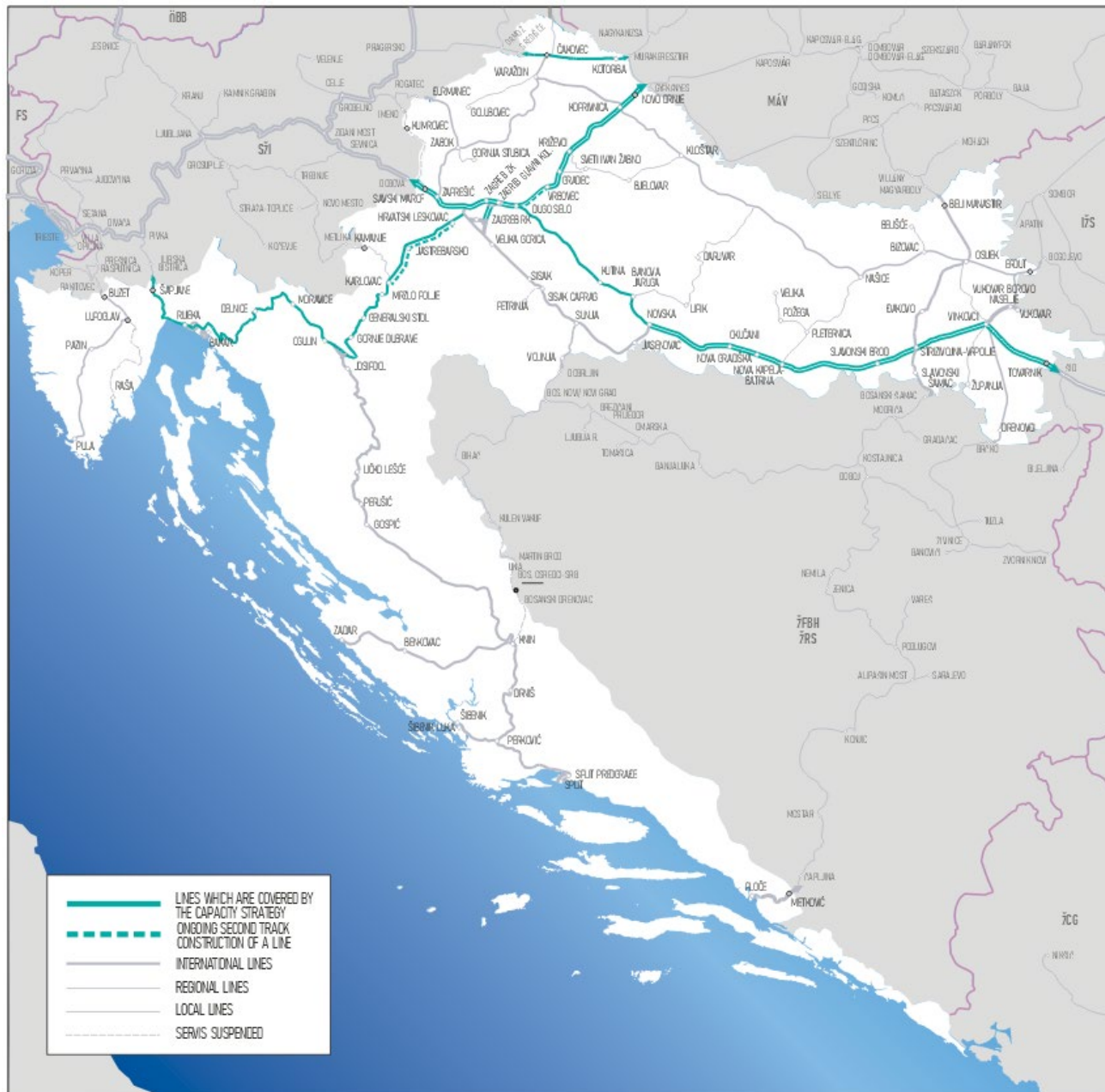


Figure 2. Railway network in Croatia with the lines covered by TTR

The railway lines involved in TTR on the HZ Infrastruktura network are:

- M101 State border - Savski Marof - Zagreb Glavni kol.
- M102 Zagreb Glavni kol. - Dugo Selo
- M103 Dugo Selo – Novska
- M104 Novska - Tovarnik - State border

- M201 State border - Koprivnica - Dugo Selo
- M202 Zagreb Glavni kol. – Rijeka
- M203 Rijeka - Šapjane - State border
- M601 Vinkovci - Vukovar

0.2 List of involved Infrastructure Managers

Overview of all involved Infrastructure Managers:

Involvement Infrastructure Manager	Abbreviation of IM
Slovenske železnice – Infrastruktura, d.o.o.	SŽI
MAV Magyar Allamvasutak Zrt.	MAV
Infrastruktura železnice Srbije a.d.	IŽS
Infrastruktura Željeznice Federacije Bosne i Hercegovine	ŽFBH
Željeznice Republike Srpske	ŽRS

1. Expected Capacity of Infrastructure in TT 2026

The aim of this chapter is to describe the expected available positive capacity and also the negative non-TCR related capacity at the start of the concerned timetable period compared with the situation at X-36.

1.1 Additional Available Capacity

The most important infrastructure project which will be, according to today-planned deadlines, finished by the end of the 2025 year and have impact of the annual timetable 2026 are the following;

1.1.1 Modernisation of the section Kustošija – Zagreb Zapadni kolodvor – Zagreb Glavni kolodvor.

As part of the Project the following works are planned:

- reconstruction of level-crossings
- track renewal
- replacement of turnouts
- rehabilitation and construction of bridges and culverts
- construction of landscaped areas for passenger access
- works on signalling and interlocking and telecommunication devices
- works on the reconstruction of the overhead contact line.

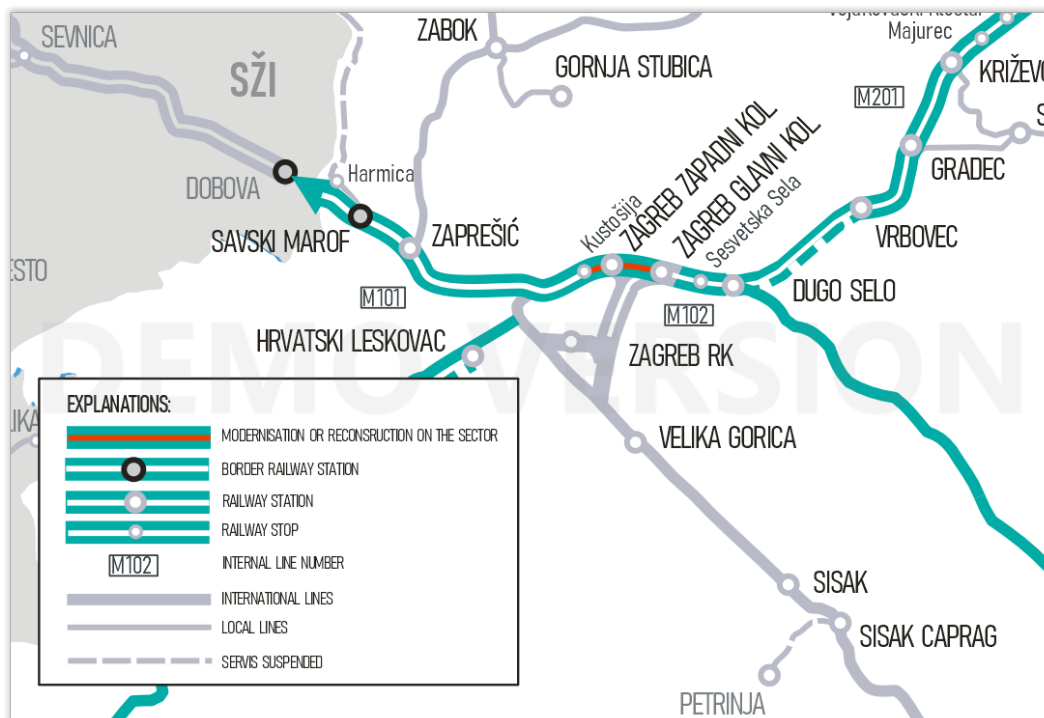


Figure 3. Modernisation of the line section Kustošija – Zagreb Glavni kolodvor

1.1.2 Reconstruction of the existing track and construction of the second track on the section Križevci – Koprivnica – state border

The project includes works on the construction of the second track and the reconstruction of the existing track from Križevci to the Hungarian border. It will be possible to reach train speeds of up to 160 km/h, with a limit of 150 km/h in Lepavina and 100 km/h in Koprivnica, since this part consists of urban areas with specific restrictions. The new double-track section will follow the existing route with the exception of the subsection Carevdar – Lepavina. By constructing new platforms, canopies, pedestrian underpasses and parking lots for cars and bicycles the Project will help facilitate easier access for reduced mobility persons. The total length of the section Križevci – Koprivnica – state border with Hungary will be reduced from 43.2 km to 42.6 km. As part of the Project, the following works are planned:

- reconstruction of 3 stations: Križevci, Lepavina and Koprivnica
- construction of the new station Novo Drnje
- reconstruction of 4 stops: Majurec, Carevdar, Vojakovački Kloštar and Sokolovac
- construction of the new stop Peteranec and conversion of the existing station Mučna Reka into a stop
- construction of 7 bridges, 1 gallery and 3 viaducts, of which 1 is a crossing for wild animals
- construction of 8 road overpasses, 3 road underpasses and 9 pedestrian underpasses
- construction of redirecting roads and parallel roads along the railway line
- works on the construction and reconstruction of the overhead contact line and other power plants such as electric traction plants, power plants and external lighting in bus stops and stations
- works on the installation of new elements and devices on the signalling and interlocking, control-command and telecommunications system.

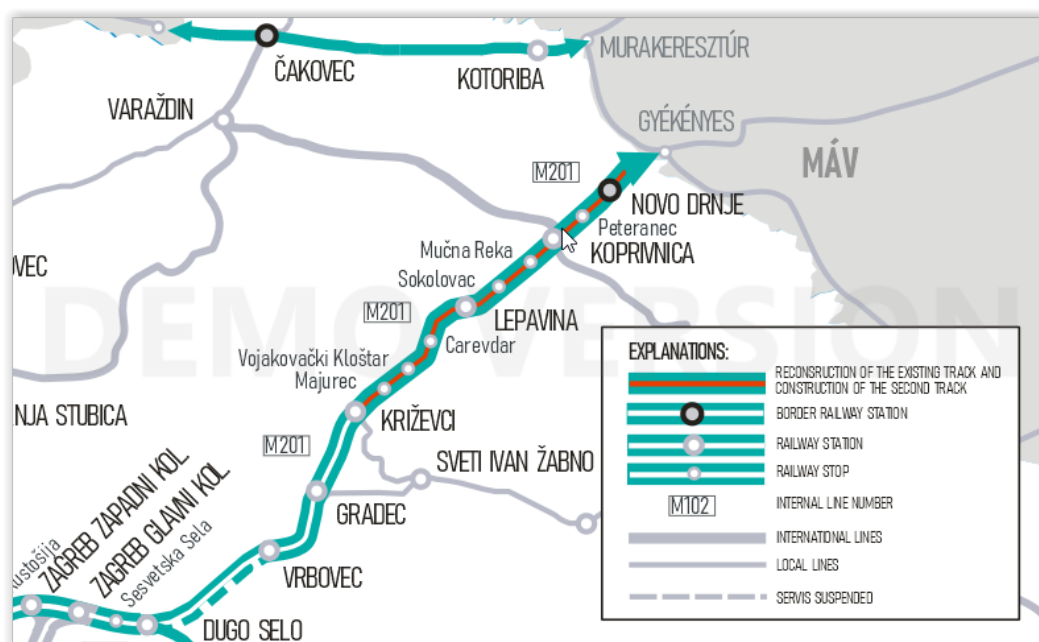


Figure 4. Reconstruction of the existing track and construction of the second track on the section Križevci – Koprivnica – state border

1.1.3 Upgrade and electrification of line Vinkovci – Vukovar

Following the implementation of the works railway line Vinkovci – Vukovar will be adapted for train speeds of a maximum of 120 km/h and the traveling time will be reduced. Electrification of the section will ensure economically and energetically more profitable and ecologically sustainable railway traffic. The section capacity will also increase and access to the Port of Vukovar will improve, which will contribute to the economic development of the local community and the recovery of the eastern part of Slavonia. As part of the works, parking spaces for cars and bicycles will also be arranged within the station and stops, easier access will be provided for reduced mobility persons, noise barriers will be constructed to protect against noise residents who live along the line, and the safety of all road users will increase following installation of a modern traffic signalization system and telecommunications and by building pedestrian underpasses.

As part of the Project, the following works are planned:

- complete reconstruction and renovation of the existing single-track railway line
- reconstruction of stations Vukovar-Borovo Naselje and Vukovar and stops Nuštar and Bršadin – Lipovača
- works on the construction, control-command, signalling and interlocking and power sub-systems.

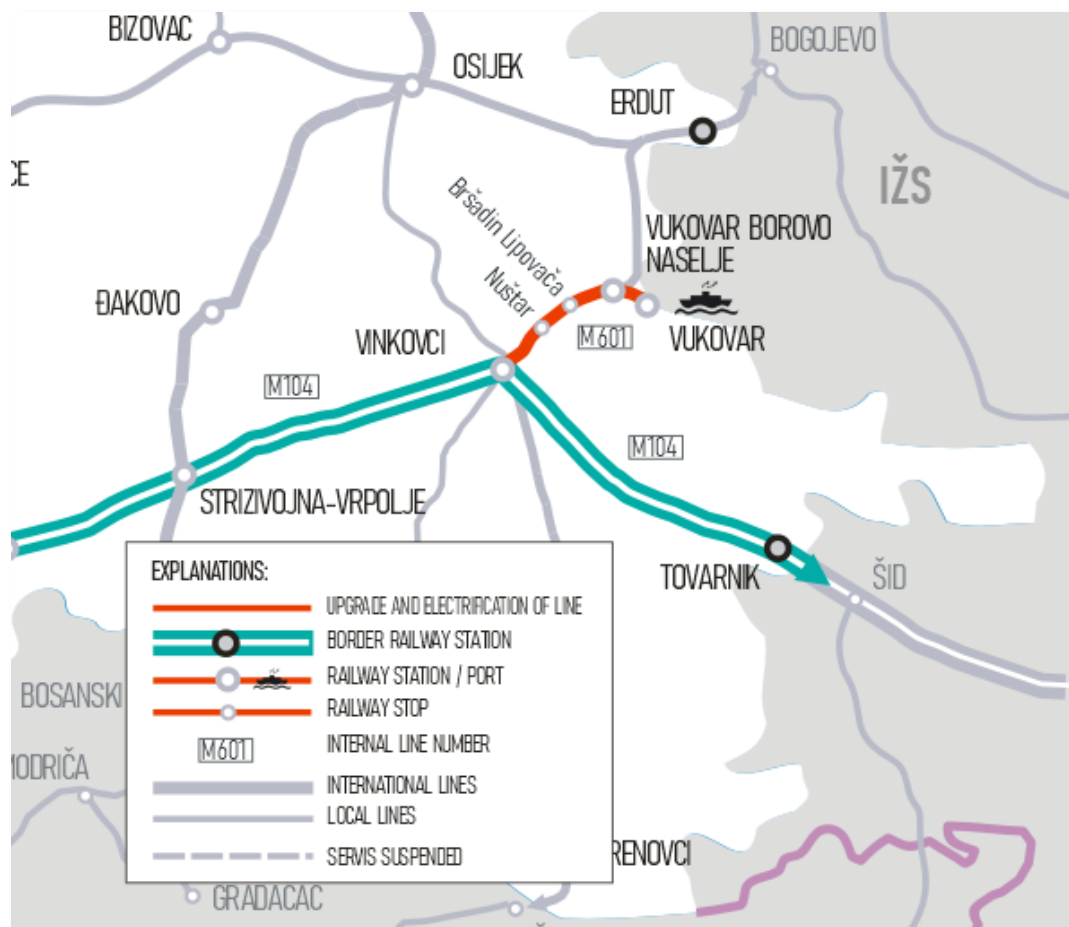


Figure 5. Upgrade and electrification of line Vinkovci – Vukovar

The list of the projects with a positive impact on the infrastructure at the start of the annual timetable 2026 is given in the following table.

Network Segment / Station	Description	Rough Quantifications of the effect	Project approved by the IM's management	Financing secured
M101 Kustošija - Zagreb Glavni kolodvor – Zagreb Zapadni kolodvor	Modernisation of the section Kustošija – Zagreb Zapadni kol. – Zagreb Glavni kol.	Speed and capacity increase, journey time reduction, improve local and regional rail passenger transport and help better integration of the railway into the public transport system of the city of Zagreb, reduce traveling time	Yes	Yes
M102 Zagreb Glavni kol. - Dugo Selo	Construction of railway stop Sesvetska Sela	Increasing the number of passengers in suburban/regional traffic, better integration of the railway into the public transport system of the city of Zagreb	Yes	Yes
M201 Dugo Selo - Vrbovec	Reconstruction of existing and construction of a second track on the line section ¹	capacity increase, journey time reduction and improvement of journey quality, passenger trains will run at the speed of up to 160 km/h.	Yes	Yes/No
M201 Križevci station	Upgrading and modernising of the station ²	constructing new platforms, underpass construction	Yes	Yes
M201 Lepavina station	Upgrading and modernising of the station ²	constructing new platforms, installation of new railway switches	Yes	Yes
M201 Mučna Reka	Railway station will convert into stop	constructing new platform,	Yes	Yes
M201 Lepavina - Koprivnica	Reconstruction of existing and construction of a second track on the line section Lepavina - Koprivnica ³	capacity increase, journey time reduction and improvement of journey quality, passenger trains will run at the speed of up to 160 km/h.	Yes	Yes
M201 Koprivnica station	Upgrading and modernising of the station	constructing new platforms, installation of new railway switches and tracks	Yes	Yes
M201 Koprivnica – Novo Drnje	Reconstruction of existing and construction of a second track on the line section Koprivnica - Novo Drnje	capacity increase, journey time reduction and improvement of journey quality, passenger trains will run at the speed of up to 160 km/h.	Yes	Yes
M201 Peteranec	Construction of the new railway stop Peteranec	Increasing the number of passengers in suburban/regional traffic	Yes	Yes
M201 Novo Drnje	Construction of the new station Novo Drnje	Increasing the number of passengers and freight trains in international and regional traffic	Yes	Yes
M201 Novo Drnje – State border	Reconstruction of existing and construction of a second track on the line section Novo Drnje - State border	capacity increase, journey time reduction and improvement of journey quality, passenger trains will run at the speed of up to 160 km/h.	Yes	Yes
M601 Vinkovci - Vukovar	Reconstruction and elektrification of the existing single-track railway line ²	capacity increase, journey time reduction, noise barriers to protect against noise	Yes	Yes
M601 Vukovar, Vukovar Borovo Naselje	Reconstruction of railway stations	parking spaces for cars and bicycles, reconstruction of existing platform	Yes	Yes

¹ There is a possibility that this section of the line will not be completed until the 2026 timetable

² Signalling equipment probably will not be finished by the start of the annual TT 2026

³ Signalling equipment for the second track will not be finished by the start of the annual TT 2026

Network Segment / Station	Description	Rough Quantifications of the effect	Project approved by the IM's management	Financing secured
M601 Nuštar, Bršadin Lipovača	Reconstruction of stops	parking spaces for cars and bicycles, reconstruction of existing platform	Yes	Yes

1.2 Reduced Available Capacity

No reductions in available capacity are planned. Due to many works on the rail network, at some international, regional and local lines passenger traffic will be replaced by buses.

2. Temporary Capacity Restriction (TCR)

Temporary capacity restrictions are necessary to keep the infrastructure and its equipment in good condition and to allow infrastructure development in accordance with market needs.

Annex VII of Directive 2012/34 has set the basic elements to be considered in order to enable the implementation of a TCR process throughout Europe.

Based on this principle Annex VII has defined criteria into which TCRs should be clustered based on their impact on traffic and set common deadlines for IMs to complete each process step for each type of TCR.

	Consecutive days	Impact on traffic (estimated traffic cancelled, rerouted or replaced by other modes of transport)	First publication deadline according to Annex VII
Major impact TCR	More than 30 consecutive days	More than 50% of the estimated traffic volume on a railway line per day	X-24
High impact TCR	More than 7 consecutive days	More than 30% of the estimated traffic volume on a railway line per day	
Medium impact TCR	7 consecutive days or less	More than 50% of the estimated traffic volume on a railway line per day	X-12
Minor impact TCR	unspecified	More than 10% of the estimated traffic volume on a railway line per day	X-4
Less than minor impact TCR	unspecified	Maximum 10% of the estimated traffic volume on a railway line per day	The IMs are recommended to comply with the Path Alteration requirements

Figure 6. Criteria for clustering of TCRs and deadlines for IMs

2.1 Principles for TCR Planning

Big infrastructure projects on the HŽ Infrastructure railway net are planned in a way to minimise their impact on infrastructure availability and they take into account traffic organisation.

The basic principle of such works is to re-route the traffic, and if there is not enough capacity to take over the volumes planned for the original path, passenger trains are replaced by buses to get more capacity for freight transport, taking care to reduce the impact on international and seasonal trains, and trains running in peak hours as much as possible.

The works on double-track lines are organised in a way that one track is kept open for traffic. A temporary timetable for such single-track transport is drawn up in this case.

Regular maintenance is carried out during brief possessions. In case there is no alternative transport route freight transport is completely stopped and passenger transport is replaced by buses with potential reductions of some lines.

Planned major and high TCRs are listed in the following table.

Network Segment	Purpose	Time of execution	Impact (total closure)/single track operation/speed restriction	Impact to passenger & freight traffic	Project approved by the IM's management	Financing secured
M102 Zagreb Glavni kol. – Zagreb Borongaj	Renewal of the railway viaduct	September 2024 – September 2025	Works on one of the tracks (alternately left – right track)	Speed restriction, one track closure	Yes	Yes
M103 Dugo Selo - Novska	Enhanced maintenance of the line	November 2024 – December 2025	Daily closures (Monday- Sunday) for 6 to 8 hours	Speed restriction, passenger traffic is replaced by buses	Yes	Yes
M104 Sibinj - Okučani	Renewal of the line section	January 2023 – December 2025	Daily closures for 6 to 8 and possible closures for up to 72 hours	Speed restriction, one track closure	Yes	Yes
M104 Andrijevci - Garčin	Works on enhanced maintenance	January 2023 – December 2025	Daily closures of the line	Speed restriction, one track closure	Yes	Yes
M104 Strizivojna Vrpolje-Andrijevci	Works on enhanced maintenance	January 2023 – December 2025	Daily closures of the line	Speed restriction, one track closure	Yes	Yes
M104 Slavonski Brod - Sibinj	Reconstruction of the bridge	April 2024 – December 2025	48 hours closure of the line (predicted in March/April 2025)	Speed restriction, one track closure	Yes	Yes
M104 Nova Gradiška - Okučani	Reconstruction of the bridge	April 2024 – December 2025	48 hours closure of the line (predicted in March/April 2025)	Speed restriction, one track closure	Yes	Yes
M102 Dugo Selo – Križevci. Subsection Dugo Selo - Vrbovec	Reconstruction of existing and construction of a second track	December 2019 – December 2025	8 hours day closure every working day, occasional closures at weekends for up to 72 hours	Speed restriction, passenger traffic is replaced by buses	Yes	Yes/No
M102 Križevci - Koprivnica	Reconstruction of existing and construction of a second track	June 2020 – June 2025	Daily closures (Monday-Saturday) (8 hours closure in interval from 6:00 to 4:00 pm) and occasional closures at weekends for up to 72 hours.	Speed restriction, one track closure, passenger traffic is replaced by buses. Possible closures on the neighbouring section	Yes	Yes
M102 Koprivnica – state border	Reconstruction of existing and construction of a second track	June 2020 – June 2025	Daily closures (Monday-Saturday) (8 hours closure in interval from 6:00 to 4:00 pm) and occasional closures at weekends for up to 72 hours.	Speed restriction, one track closure, passenger traffic is replaced by buses. Possible closures on the neighbouring section	Yes	Yes
M202 Hrvatski Leskovac - Jastrebarsko	Reconstruction of existing and construction of a second track	November 2022 – November 2027	Daily closures (Monday-Sunday) of the line. Occasional closures at weekends for up to 72 hours	Speed restriction, passenger traffic is replaced by buses	Yes	Yes
M202 Jastrebarsko - Karlovac	Reconstruction of existing and construction of a second track	November 2022 – November 2027	Daily closures (Monday-Sunday) of the line. Occasional closures at weekends for up to 72 hours	Speed restriction, passenger traffic is replaced by buses	Yes	Yes

Network Segment	Purpose	Time of execution	Impact (total closure)/single track operation/speed restriction	Impact to passenger & freight traffic	Project approved by the IM's management	Financing secured
M202 Generalski Stol – Gornje Dubrave	Renewal of the line section	February 2024 – December 2025	Monday - Friday: day closures of the line	Speed restriction, passenger traffic is replaced by buses	Yes	Yes
M202 Ogulin - Moravice	Works on substructure of the track	February 2023 – December 2024	9 weekend closures lasting up to 36 hours, periodical daily closures	Speed restriction, passenger traffic is replaced by buses	Yes	Yes
M203 Šapjane - Jurdani	Replacement of the rail track, mechanical track regulation	March 2025 – October 2025	4 hours, five days a week,	Speed restriction, passenger traffic is replaced by buses	No	No

Figure 7. List of planned Temporary Capacity Restrictions

3. Traffic Planning Principles and Traffic Flows

3.1 Traffic Planning Principles

When planning train paths, the available infrastructure capacity shall be allocated in a fair and non-discriminatory manner, taking into account the planned TCRs. After the limitations necessary for carrying out big civil engineering works have been determined, the available capacity in the capacity model will be segmented into:

- capacity for train paths in annual timetable (regular and extraordinary requests)
- capacity for ad hoc and rolling planning

Capacity allocation priorities are laid down in the Network Statement for each timetable. For border crossing sections capacity model will include pre-arranged paths for international and cross-border passenger trains, and for freight trains in the annual timetable. Capacity for ad hoc path requests will be available as remaining capacity and capacity that is result of regular trains' cancellation.

The projected traffic flows are based on the volume of the yearly 2023 timetable, taking into account the increase in available capacity with regard to the works that will be completed by the 2026 timetable.

Expected traffic flows at the common border points between HŽ Infrastruktura d.o.o. and the neighbouring Infrastructure Managers SŽI, MAV, IŽS, ŽFBH and ŽRS are given in the following table.

Remark: the offer is partially aligned with neighbouring infrastructure managers.

State / IM	Border section	Number of trains per day			
		Passenger trains		Freight trains	
		International	Regional	International	Ad hoc
SLOVENIA / SŽI	Dobova – Savski Marof	12	0	32	10
	Središće - Čakovec	0	8	12	4
	Ilirska Bistrica - Šapjane	8	2	8	4
HUNGARY / MAV	Murakheresztur - Kotoriba	0	0	10	5
	Gyekenyes - Koprivnica	10	4	28	10
	Magyarboly – Beli Manastir	2	12	10	4
SERBIA / IŽS	Šid - Tovarnik ⁴	6	2	26	10
	Bogojevo – Erdut ³	0	6	8	4
BOSNIA	Dobrljin – Volinja ³	4	0	8	2
AND HERZEGOVINA	Bos. Šamac – Slavonski Šamac ³	2	0	12	4
	Brčko – Drenovci ³	0	2	6	2
	Čapljina – Metković ³	4	0	14	4

Figure 8. Available capacity at the border sections

⁴ The offer at the border section was not harmonised with ŽRS, ŽFBH and IŽS

3.2 Traffic Flows

The projected traffic flows are based on the volume of the yearly 2023 timetable, taking into account the increase in available capacity with regard to the works that will be completed by the 2025 timetable.

The timetable concept expressed in an average number of trains per day in connection with the defined geographical scope is given in the following table.

Line number	Section	Number of trains per day				
		Passenger trains		Freight trains		
		International	Regional	International	National	Ad hoc
M101	Savski Marof – Zagreb Glavni kol.	12	86	32	2	10
M102	Zagreb Glavni kol. – Dugo Selo	18	90	46	8	12
M103	Dugo Selo - Novska	6	36	22	10	8
M104	Novska - Vinkovci	6	30	22	8	7
M201	Dugo Selo - Križevci	12	42	26	6	6
M201	Križevci - Koprivnica	12	28	26	6	6
M202	Zagreb Glavni kol. - Karlovac	8	33	40	14	10
M202	Karlovac - Ogulin	8	25	40	12	8
M202	Ogulin - Rijeka	2	20	34	34	8
M203	Rijeka - Šapjane	8	14	8	2	4
M601	Vinkovci - Vukovar	0	6	20	4	2

Figure 9. Estimated available capacities at the main lines

4. Validation

The date of the publication of this Capacity strategy is June 2024 and is valid for the annual timetable period 2025/2026.

The English version will be available on the RNE website.