HŽ INFRASTRUKTURA

TTR
For Smart Capacity Management

Capacity Strategy TT 2027

Croatian Railways Infrastructure

Version 1

July 2025.

Content

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.

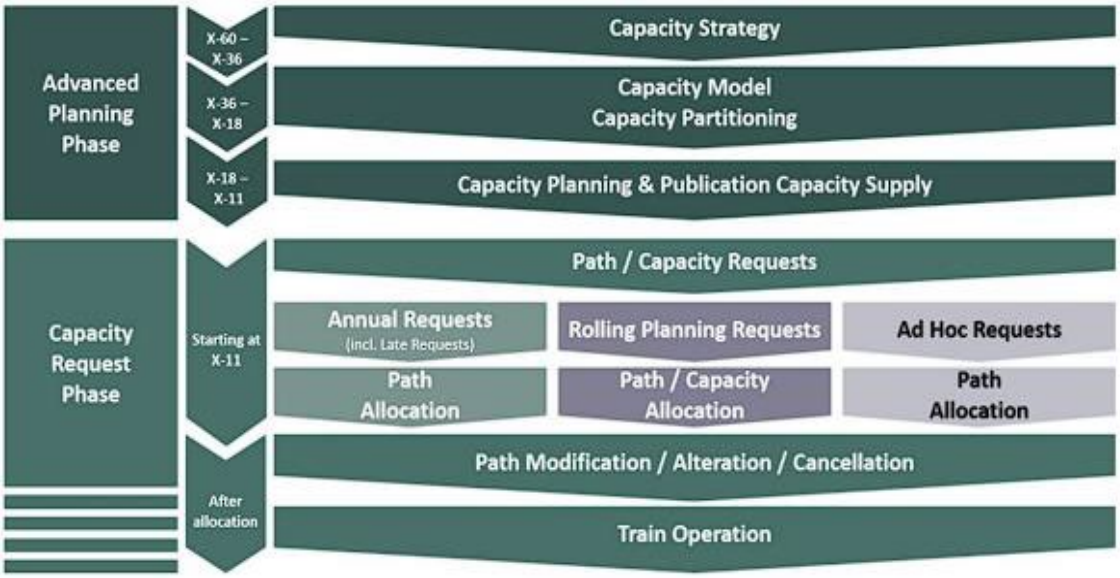

Figure 1. TTR Process (Source: RNE)

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 Infrastructure network with 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 Infrastructure 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
- M304 State border – Metković – Ploče
- M501 State border- Čakovec – Kotoriba – State border
- M502 Velika Gorica – Sisak – Novska
- M602 Škrljevo – Bakar
- M604 Oštarije – Knin – Split
- M601 Vinkovci - Vukovar

0.2 List of involved Infrastructure Managers

Overwiev of all involved Infrastructure Managers:

Involved Infrastructure Manager	Abbreviation of IM
Slovenske železnice – Infrastruktura, d.o.o.	SŽI
MAV Zrt., GYSEV Zrt., KTI-VPE Nkft.	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 2027

This chapter aims to describe the expected available positive capacity and 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 2026 and have an impact of the annual timetable 2027, are the following;

1.1.1 Reconstruction of the existing track and construction of the second track on line M 201, the section Dugo Selo - Vrbovec

The project includes works on the construction of the second track and the reconstruction of the existing track from Dugo Selo to Vrbovec.

On the subsection from Dugo Selo to Vrbovec, work has been intensified. The lower track structure has been fully completed, construction works on two underpasses have been completed, and the track grid has been laid on certain parts of the route. The completion of the entire project is planned for the second half of 2026, when work on the left (northern) side of the Dugo Selo is expected to be finished. As part of this project, the complete reconstruction of the Dugo Selo railway station will be carried out.

Works on the section of the international railway M201 between the railway stations Vrbovec and Križevci have been fully completed. On this line, the reconstruction of the existing railway and the construction of a second track have been carried out. Signalling and safety devices are also fully functional.

Figure 3. Reconstruction of the existing track and construction of the second track on the section Dugo Selo – Vrbovec

1.1.2 Reconstruction of the existing track and construction of the second track on line M 201, 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 state 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. The following works are planned to be completed by the end of 2026[1]:

- reconstruction of 3 stations: Križevci, Lepavina and Koprivnica
- construction of the new station Novo Drnje
- reconstruction of 4 stops: Majurec, Vojakovački Kloštar, Carevdar, and Sokolovac
- construction of the new stop Peteranec and the 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

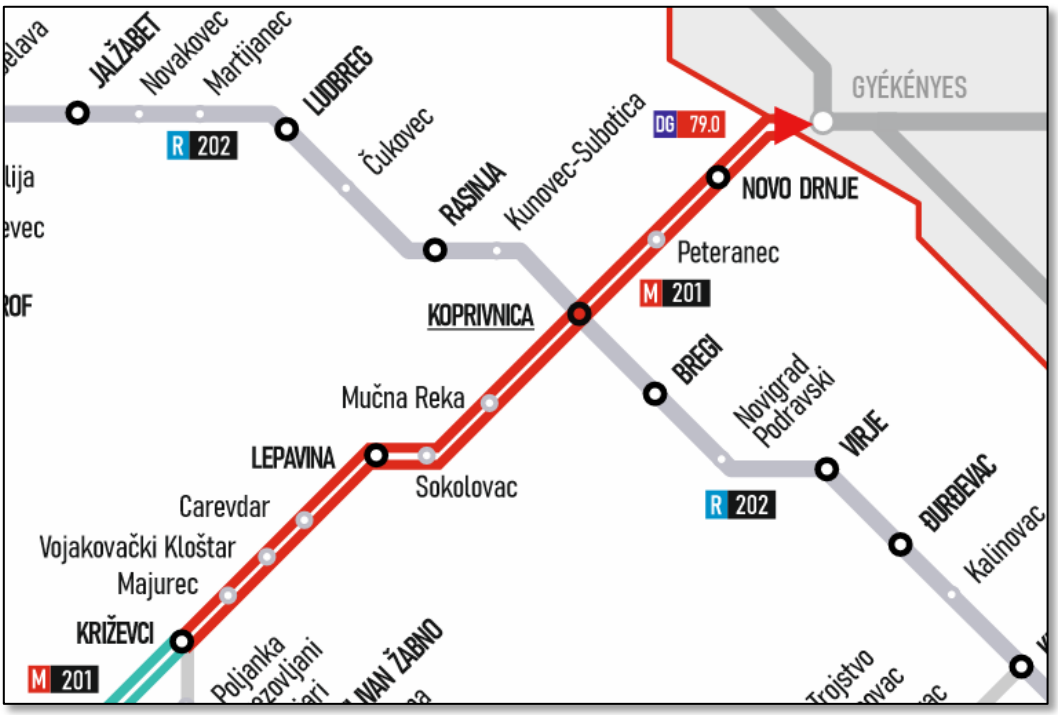

Figure 1. Reconstruction of the existing track and construction of the second track on the section Križevci – Koprivnica – State border

[1] The signalling and safety devices between the official stations Križevci and Lepavina will not be fully functional for the 2026/2027 annual timetable.

The list of projects with a positive impact on the infrastructure at the start of 2027 the annual timetable, is given in the following table.

Network Segment / Station	Description	Rough Quantifications of the effect	Project approved by the IM's management	Financing secured
M102 Zagreb Glavni kol. - Dugo Selo	Construction of the 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
M102 Dugo Selo station	Upgrading and modernising of the station, new platforms and railway switches	Increasing the number of passengers and freight trains in suburban/regional traffic and better integration of the railway into the public transport system of the city of Zagreb	Yes	Yes
M201 Dugo Selo – Vrbovec	Reconstruction of the existing and construction of a second track on the line section	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 Križevci station	Upgrading and modernising of the station	Constructing new platforms, underpass construction	Yes	Yes
M201 Lepavina station	Upgrading and modernising of the station	Constructing new platforms, installation of new railway switches	Yes	Yes
M201 Mučna Reka	Railway station will be converted 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	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	Capacity increase, journey time reduction and improvement of journey quality,	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

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 2. Criteria for clustering of TCRs and deadlines for IMs

2.1 Principles for TCR Planning

Big infrastructure projects on the HŽ Infrastructure railway network 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, high, medium and minor 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
M101 Zagreb Glavni kol.	Renewal of the rail tracks and replacement of the switches in Zagreb GK railway station	February 2026 – December 2027	Speed restriction	Possible one or more individual track closure	Yes	Yes
M102 Zagreb Glavni kol. – Dugo Selo	Future stop Sesvetska Sela	November 2024 – June 2026	The construction of the underpass/ speed restriction	Closures are planned in the intervals from 48 to 72 hours	Yes	Yes
M103 Dugo Selo - Novska	Upgrade, renewal, construction of a second track and construction of a new double-track line	November 2025 – December 2030	Occasional weekend closures lasting for up to 72 hours as well as occasional closures longer than 72 hours (3 to 7 days)	Daily 8 hours closures, Weekend closured (12, 72 hours or longer up to 3 to 7 days	Yes	Yes
M103 Sesvete	Replacement of the existing switched	January 2026 – June 2026	Speed restriction	Speed restriction, possible one track closure	Yes	Yes
M104 Novska – Tovarnik	Works on enhanced maintenance	January 2023 – December 2025	Daily closures of the line	Speed restriction, one track closure	Yes	Yes
M104 Slavonski Brod - Sibinj	Renewal of the line section Sibinj - Okučani	January 2026 – December 2026	Daily closures of the line 6 to 8 hours, possible closures up to 72 hours	Speed restriction	Yes	Yes
M104 Andrijevci - Garčin	Enhanced maintenance works on the left track	June 2025 – December 2026	Left track permanent closure of one track of the double-track line for several months	Permanent closure of the left track	Yes	Yes
M104 Strizivojna Vrpolje - Andrijevci	Enhanced maintenance works on the right track	June 2025 – December 2026	Right track permanent closure of one track of the double-track line for several months.	Permanent closure of the right track	Yes	Yes
M104 Tovarnik	Adaptation works of the railway border crossing for the implementation of the Schengen	February 2025 – September 2026	Planned temporary line closures lasting up to 8 hours, speed restriction	Works are performed only in the station area	Yes	Yes
M402 Zagreb Ranžirni kolodvor	Replacement of the switches in the marshalling yard	January 2026 – December 2026	Permanent 72-hour track closures of individual tracks	The possibility of using detours within the station (freight traffic)	Yes	No
M201 Dugo Selo - Križevci	Reconstruction of the existing and construction of a second track	December 2019 – December 2026	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
M201 Križevci - Koprivnica – state border	Reconstruction of the existing and construction of a second track on the line section	June 2020 – December 2026	Daily closures (Monday-Saturday) (8 hours closure in interval from 6:00 to 4:00 pm) and	Speed restriction, one track closure, passenger traffic is replaced by	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
			occasional closures at weekends for up to 72 hours.	buses. Possible closures on the neighbouring section		
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
M202 Ogulin - Moravice	Works on the substructure of the track on the line	February 2023 – June 2026	3 weekend closures lasting up to 36 hours; periodical daily closures for 6 to 8 hours	Speed restriction, passenger traffic is replaced by buses	Yes	Yes
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
M203 Škrljevo - Rijeka	Replacement of the rail track and the sleepers	February 2026 – December 2026	3 to 4 hours for several days track closures, during daylight	Speed restriction, passenger traffic is replaced by buses	Yes	Yes
M304 Metković	Adaptation works of railway border crossing for the implementation of the Schengen	September 2024 – March 2026	Planned temporary line closures lasting up to 8 hours, speed restriction	Works are performed only in the station area.	Yes	Yes,
M502-2 Line section Sisak Caprag - Novska	Installation of signalling and telecommunication devices	March 2025 – December 2026	Speed restriction	Daily closure of the line for at least 6 hours,	Yes	Yes
M502-2 Velika Gorica – Sisak Caprag	Replacement of the power supply system	October 2024 – March 2026	No speed restriction	Switching off the safety and signalling devices in 6 stations on the line section.	Yes	Yes
M602 Škrljevo - Bakar	Replacement of the rail track and the sleepers	January 2026 – December 2026	No speed restriction	2 to 3 hours for several days track closures, during daylight	Yes	Yes
M604 Oštarije – Knin - Split	Modernisation and renewal of the line - works on reconstruction of stations and tracks, replacement of switches	September 2024 – June 2026	Speed restriction	Daily closures from 6 to 8 hours possible permanent line closures at weekends	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
				lasting for 36 hours		
M606 Knin – Zadar	Complete restoration of the open line Knin - Škabrnje	October 2024 – October 2028.	Speed restriction	Daily closures) for 6 to 8 hours and possible closures for up to 72 hours	Yes	Yes

Figure 3. 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 2024 timetable, taking into account the increase in available capacity with regard to the works that will be completed by the 2027 timetable.

Expected traffic flows at the common border points between HŽ Infrastructura 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	2	5
	Gyekenyes - Koprivnica	4	0	18	10
	Magyarboly – Beli Manastir	2	12	10	4
SERBIA / IŽS	Šid - Tovarnik[2]	6	2	26	10
	Bogojevo – Erdut[2]	0	6	8	4
BOSNIA AND HERZEGOVINA / ŽRS/ŽFBH	Dobrljin – Volinja[2]	4	0	8	2
	Bos. Šamac – Slavonski Šamac[2]	2	0	12	4
	Brčko – Drenovci[2]	0	2	6	2
	Čapljina – Metković[2]	4	0	18	8

Figure 4. Available capacity at the border sections

[2] 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 2024 timetable, taking into account the increase in available capacity concerning the works that will be completed by the 2027 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	48	8	12
M103	Dugo Selo - Novska	6	36	22	10	8
M104	Novska - Vinkovci	6	30	22	8	10
M104	Vinkovci - Tovarnik	2	10	20	2	8
M201	Dugo Selo - Križevci	12	42	26	6	10
M201	Križevci - Koprivnica	12	28	26	6	10
M202	Zagreb Glavni kol. - Karlovac	8	24	32	10	10
M202	Karlovac - Ogulin	8	10	32	10	8
M202	Ogulin - Rijeka	2	20	32	30	8
M203	Rijeka - Šapjane	8	14	8	2	6
M304	Metković - Ploče	2	0	18	2	8
M501	Čakovec - Kotoriba	0	24	10	2	6
M502	Velika Gorica – Sisak Caprag	2	34	12	4	10
M602	Škrljevo - Bakar	0	0	8	10	4
M604	Oštarije – Knin	6	0	2	6	4
M604	Knin - Perković	6	8	2	8	4
M604	Perković – Kaštel Stari	6	12	2	8	4
M604	Kaštel Stari - Split	6	34	2	8	4
M601	Vinkovci - Vukovar	0	6	20	4	2

Figure 5. Estimated available capacities at the main lines

4. Validation

This capacity strategy was published in July 2025 and is valid for the annual timetable period 2027.

The English version will be available on the RNE website.