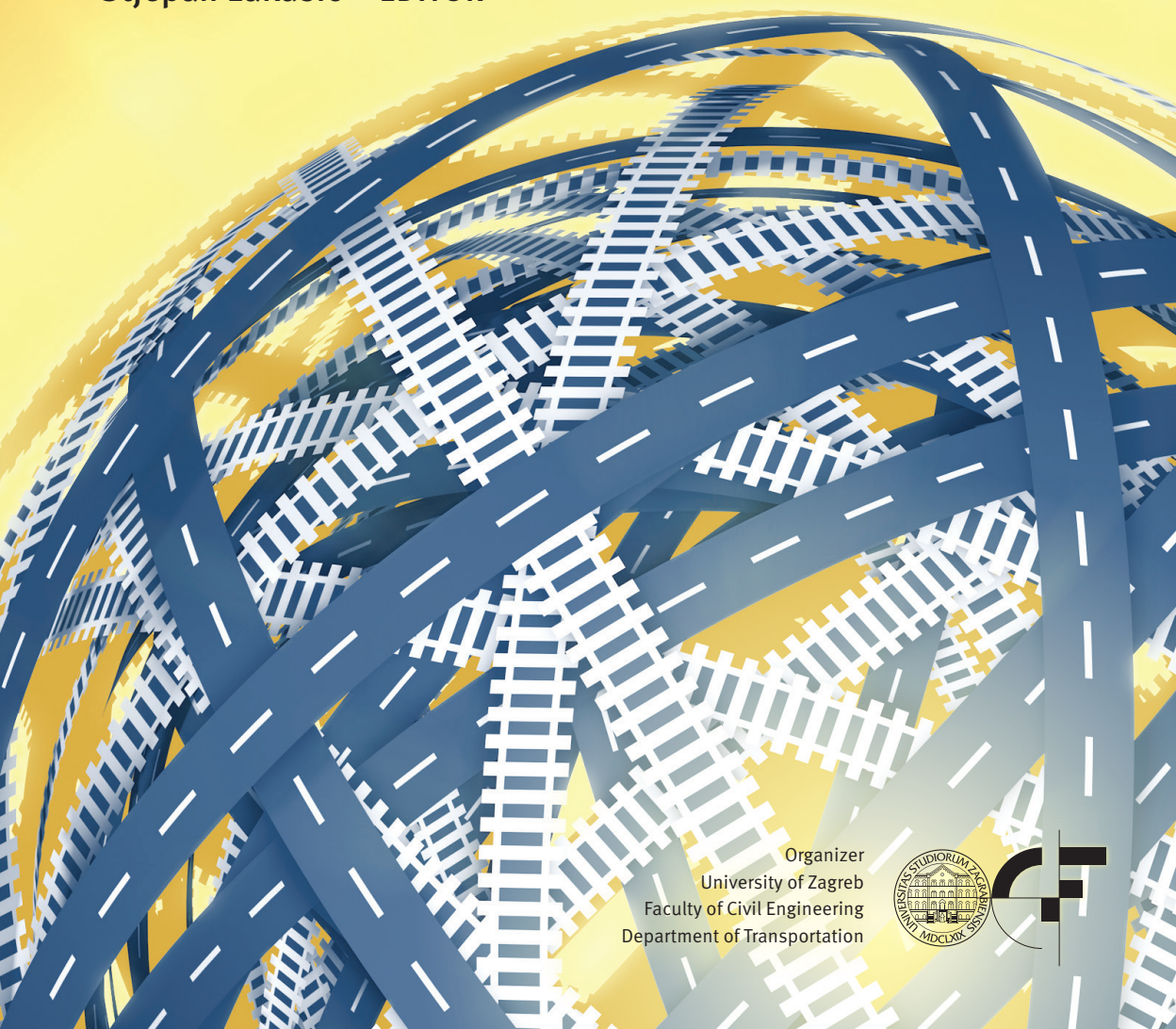
CETRA 2016

4th International Conference on Road and Rail Infrastructure
23-25 May 2016, Šibenik, Croatia

Road and Rail Infrastructure IV

Stjepan Lakušić – EDITOR



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Faculty of Civil Engineering
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CETRA2016
4th International Conference on Road and Rail Infrastructure
23–25 May 2016, Šibenik, Croatia

TITLE
Road and Rail Infrastructure IV, Proceedings of the Conference CETRA 2016

EDITED BY
Stjepan Lakušić

ISSN
1848-9850

PUBLISHED BY
Department of Transportation
Faculty of Civil Engineering
University of Zagreb
Kačićeva 26, 10000 Zagreb, Croatia

DESIGN, LAYOUT & COVER PAGE
minimum d.o.o.
Marko Uremović · Matej Korlaet

PRINTED IN ZAGREB, CROATIA BY
"Tiskara Zelina", May 2016

COPIES
400

Zagreb, May 2016.

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4th International Conference on Road and Rail Infrastructures – CETRA 2016
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CHALLENGES FOR AN INTEGRATED TIMETABLE IN AUSTRIA

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Abstract

This paper describes the challenges for implementation of an integrated timetable in the network of Austrian Railways. One strategic aim of transport policy in Austria is the realisation of an integrated timetable in the railway section. Hence, some adoptions of the existing network are necessary for achieving suitable running times between the timetable nodes of the network. Some challenges to be solved in order to reach the aim of a real integrated timetable by the year 2025, will be discussed in this paper. Of course, there are many activities focused on certain lines; however, on some lines activities needed for reaching the 2025 goal are still missing. For this reason, sections of the network of Austrian Railways where activities have to start immediately to provide sufficient service will be identified.

Keywords: integrated timetable, railway infrastructure design, railway project management, strategic railway planning

1 Introduction

In many European countries, integrated timetables for passenger traffic have been successfully introduced in the last years. The success in passenger transport can be explained by simplified timetables. Moreover, this ensures passengers that there will be a connection to any destination they are interested in. For the design of an integrated timetable it is necessary to define nodes in the network of a railway infrastructure where the frequency of passengers is high. Typically, these nodes can be found in larger cities; however, this is not always the case. Nodes in the railway network are also points where passengers want to change between different directions. Typical infrastructure design of such nodes is shown in Figure 1. Some minutes before the full hour trains from all directions are entering the node. A certain time slot is reserved for passenger exchange between trains. Finally, after some minutes all trains leave the node in all available directions. Hence, such nodes have to offer a capacity of at least so many tracks as trains want to enter. Of course, there is the opportunity to share station tracks for even two trains if they just enter the station and then turn back into the direction where they were coming from. As it can be seen in Figure 1, for example, four tracks are required for four trains wanting to enter the node. If they do not pass through the station, but they will turn back after the passenger exchange, two tracks would be also enough for realisation of an integrated timetable. If it is required to respect the arrival times, the sections before the node have to be double track sections. Otherwise, a short headway time on the entry sections might be enough to cover the boundary conditions.

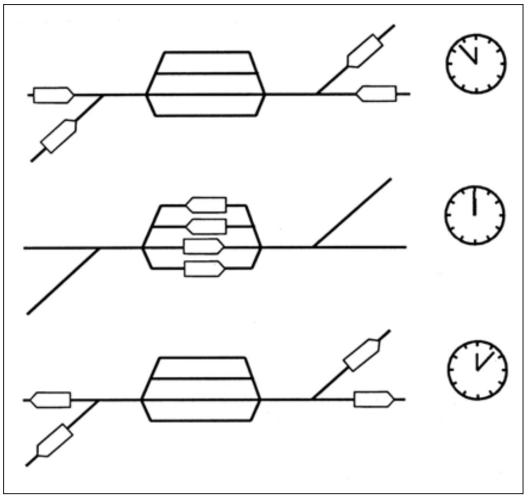

Figure 1 Basic principle of an integrated timetable

2 Realisation in Austria

2.1 Strategic Masterplan for Transport

Based upon the strategic Masterplan for Transport in Austria, the Infra Manager ÖBB Infrastruktur AG developed their target net for the year 2025. To achieve this target net, several construction measures (upgrading of existing lines, building of new lines) have been defined and considered in the budget planning.

2.2 Approach of two overlaying services

Due to the large investment into high speed lines in Austria during the last decades, the upgraded and new constructed lines offer the opportunity to provide a high speed and a conventional service in long distance relations, e.g. Vienna – Salzburg, Vienna – Graz – Klagenfurt. Both services can be synchronised only in selected nodes. To compensate for this shortcoming, the density of service can be increased by offering constant connections between the high speed and the conventional service. In Austria, the high speed service is provided by so called RailJet train sets. Conventional service in this context means the traditional InterCity train.

2.3 Ongoing projects to realize an integrated timetable till 2025

Travel times can be divided into three categories: first, they fit into the system of an integrated timetable (white). Second, travel times do not fit into the system, although activities are carried out (yellow). Third, travel times do not fit and no related activities are even planned or the implementation of those will be too late (red). Figure 3 shows the situation in the target net for the year 2025, when all ongoing measures for travel times across Austria will be finished. Since the investment strategy is well known, non fitting travel times can be either prolonged or shortened. Whereas shortening of travel times needs inevitably further investments, prolonging can be seen as the compromise, when there is no budget for related measures. Interesting is the third category; there are no activities foreseen, although those sections are quite important for passenger traffic in Austria.

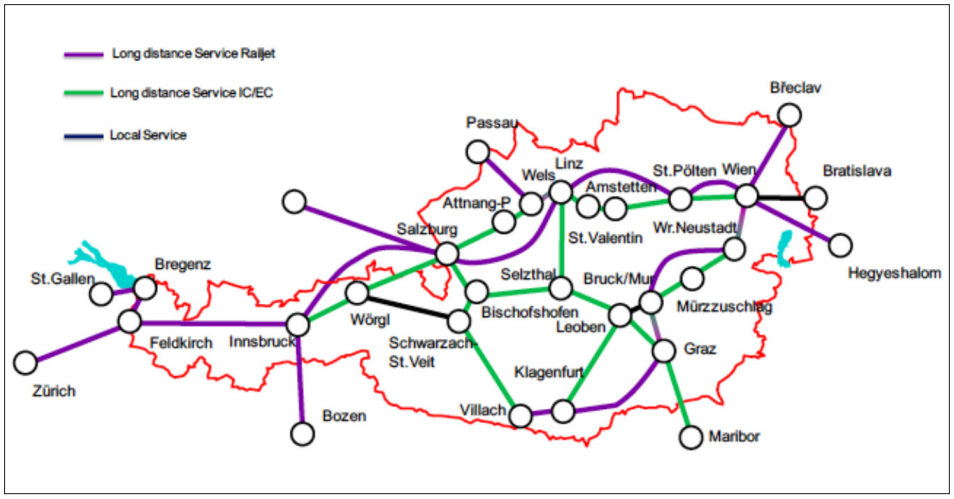

Figure 2 Services, nodes and links in the Austrian network

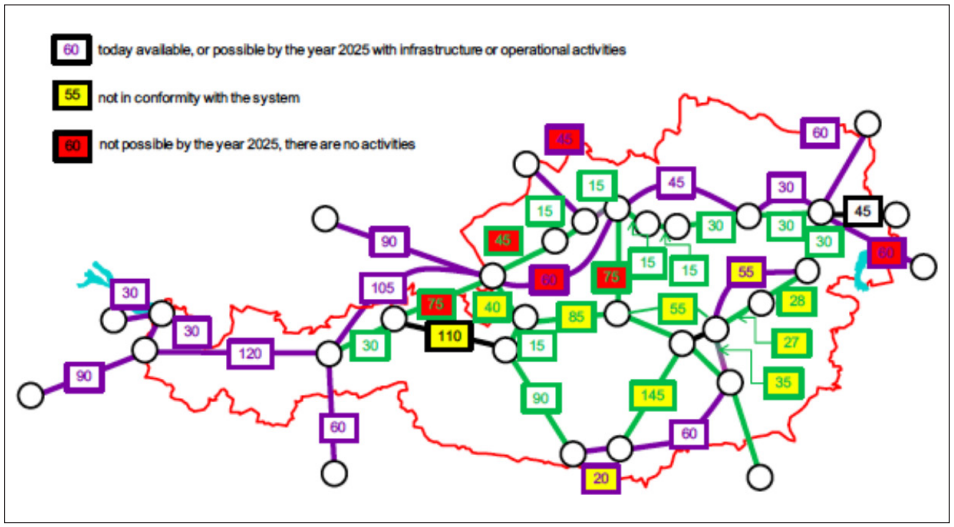

Figure 3 Edge time across Austria in the target network

2.4 Harmonisation of edges

By 2025, the new line from Vienna via Graz to Klagenfurt will be in operation; however, there will not be a reduction of running time between Bruck/Mur and Graz, although here an edge time of 30 minutes would be required. Alternatively, it can be extended up to 45 minutes and, additionally, it must be shortened between Wiener Neustadt – Graz and Graz – Klagenfurt, in order for an integrated timetable to be achieved, without extension of the overall travel time on this line. (see Figure 4). Due to the opening of two new tunnels, namely Semmering and Koralm, edge times of 45 minutes for each of them are possible for the RailJet service. Trains running from Graz in directions to Linz/Salzburg/Innsbruck shall go via Leoben, the same as today, to allow for the system to conform edge times.

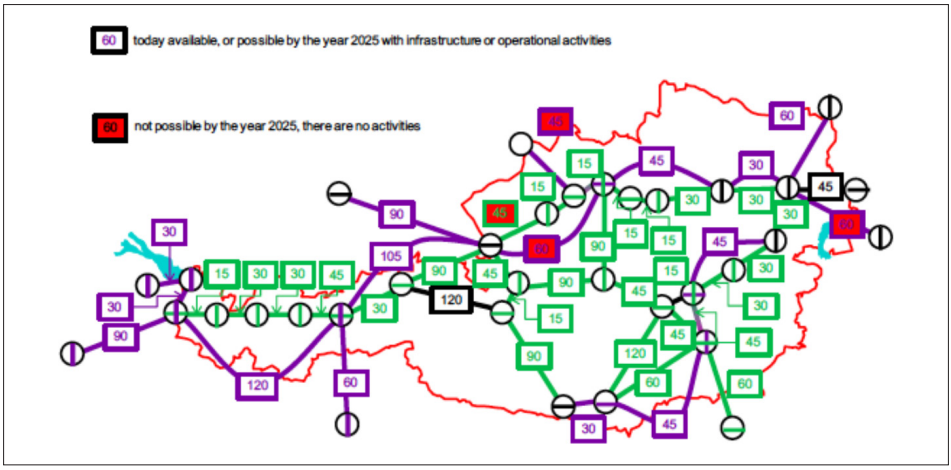

Figure 4 Harmonised edge times across Austria in the target net

2.5 Required infrastructure measures

After opening the new central station in Vienna, the starting point for timetable construction has been shifted from Salzburg to Vienna (symmetry at minute 00 and/or 30). Between Wien Hbf and Wien Meidling, there are independent routes for the west-east and north-south-traffic. To allow the application of this concept the north-south-traffic has to be moved from the existing southern line towards the so called 'Pottendorfer line', between Wien Meidling and Wiener Neustadt. The upgrade of the 'Pottendorfer line' is still going on. In Salzburg, arrival and departure times between the two services do not match since the timetable has been changed. The shortening of edge time between Linz and Salzburg down to 60 minutes for the RailJet service and down to 45 minutes between AttnangPuchheim and Salzburg for the InterCity service are urgently required, Figures 5 and 6. Otherwise, there is no integrated system at Salzburg available, which will lead to a huge change overtime, of up to 20 minutes. Additionally, it would be necessary to continue with the extension of the western line from Vienna to Salzburg, especially in the area of Salzburg, due to missing capacity for local trains. This extension will not be available by 2025, since planning has just recently started.
Another aspect is related to the density of services in the western part of Austria. If interval is shortened to 60 minutes, train crossings will take place more frequently on the single track sections across Arlberg (line from Innsbruck to Feldkirch). For nodes the possibility of parallel entering and leaving of trains has to be checked.

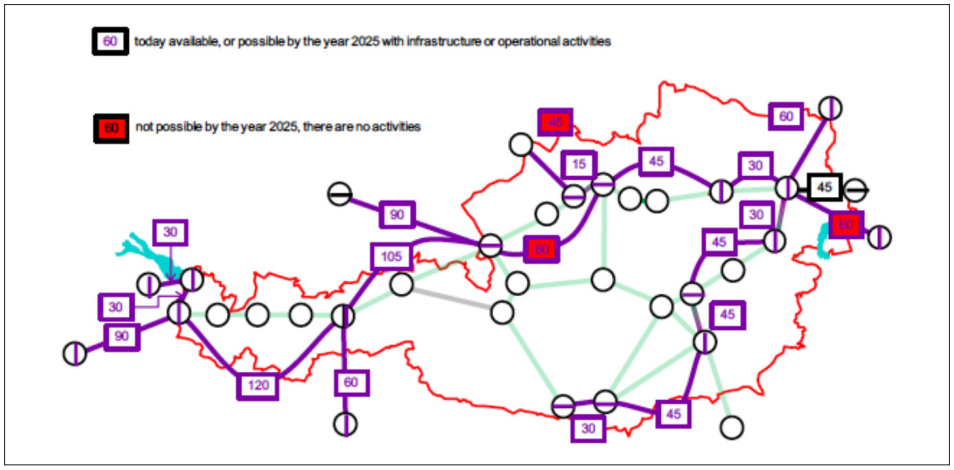

Figure 5 Edge travel times for the RailJet services

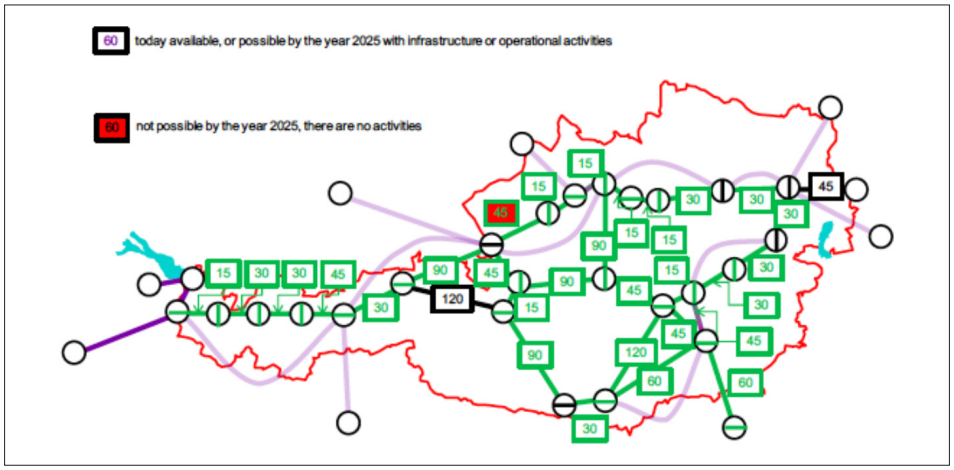

Figure 6 Edge travel times for the InterCity services

3 Conclusions

Although it is one of the major strategic aims of Austrians public transport policy, the implementation of a consistent integrated timetable by the year 2025 is not ensured. This paper has clearly shown which sections in the network of Austria need additional actions to be taken immediately for the strategic aim to be reached.

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