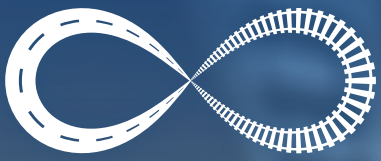

CETRA 2018

5th International Conference on Road and Rail Infrastructure
17–19 May 2018, Zadar, Croatia

Road and Rail Infrastructure V

Stjepan Lakušić – EDITOR

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RAIL INFRASTRUCTURE CHARGES IN THE V4 COUNTRIES

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Abstract

Existing EU legislation requires a degree of separation between infrastructure managers who run railway networks, and railway undertakings which run the train services, with the aim of ensuring fair and equal treatment of all railway undertakings. Full independence of charging and capacity allocation is required, as these are seen as key to ensuring equal access [1]. The basic principles of railway infrastructure and services charges are defined in Directive 2012/34/EU of the European Parliament and the Council of 21 November 2012 that established a single European railway area. Services to be supplied to railway undertakings are divided into (I) minimum access package, (II) access including track access, (III) additional services, and (IV) ancillary services. Each member state establishes a charging framework, therefore the models of railway infrastructure charges are different in each country. In EU countries a different methodology is used for the internal design of the rail charging system. This paper deals with the rail infrastructure charges from two aspects in Slovakia, the Czech Republic, Poland and Hungary. Firstly, we compare the model of the railway infrastructure charging system from the point of view of influencing factors such as train kilometres, gross tonne kilometres, passenger kilometres, time coefficient, environmental coefficients etc. Secondly, our research focused on the impact of different charges on the fees for rail passenger trains. Many studies compare the rail infrastructure fees absolutely without taking into account national disparities. For the realization of a relevant comparison, we re-calculated rail infrastructure fees in each country by a coefficient reflecting gross domestic product at purchasing power parity.

1 Introduction

A substantial part of railway infrastructure in the V4 countries is currently and is likely to remain a natural monopoly, therefore it is needed to specify fair and non-discriminatory rules of railway infrastructure capacity allocation and charges [2, 3]. Despite the fact that the basic principles of railway infrastructure and services charges are defined in Directive 2012/34/EU, infrastructure managers make decisions about train path allocation, including the definition and the assessment of availability, the allocation of individual train paths, and infrastructure charging, including determination and collection of the charges.
The theme of rail infrastructure charges is discussed and described in some scientific articles. Research from Benedetto at al. deals with European rail regulatory bodies and shows that they could take a more proactive role in shaping track access charges, given their importance in respect to efficient use of the network, and maintaining non-discriminatory access, [4].
No universal model of access charges has been defined, [5]. Bugarinovic et al. described a model for the access charges principle selection based on the analytic network process. Their model presents the objectives of identified stakeholders through established criteria from three different perspectives: government influence, railway market environment, and efficiency of network use. [6] Sternad et al. presented an organizational and economic model based on European policies for local railway systems. For their economic model they used

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an econometric approach to estimate the cost function and marginal costs in regional lines, which constitute the basis for railway charges, [7].
A detailed and serious cost calculation is a precondition for a competitive offer of railway traffic services in the future. This task does not only concern Train Operating Companies, but also Infrastructure Managers when transferring infrastructure costs into track access charges. Track Access Charges must be calculated on a much more detailed level in order to cover the goals defined by the cost-by-cause principle and non-discriminatory access to railway infrastructure, [8]. For Calvo at al. rail infrastructure charges should reflect the quality of the infrastructure manager's service. Train running charges recover track-related costs and can help to develop a charging system that meets these requirements, [9]. Different problems can arise when applying maintenance and renewal costs to railway undertakings. With regard to transferring costs, problems are related to cost recovery, the relationship between track charges and the costs they intend to recover, and the level of the service the infrastructure manager gives the railway operator, [10].
Rail infrastructure charges can be different for main and local lines. Abramovic et al. analysed railway infrastructure charge fees on local passenger lines in Croatia. They investigated how principals and fee amounts influenced the train running service on local passenger lines. The fee amount is the direct expenditure for railway undertaking and directly determines the ultimate ticket fare. Therefore, they compared revenue with the cost of the minimum access package to establish the appropriate sustainable connection both for railway undertaking and for the infrastructure manager, [11].
The literature review showed that authors researched the issue of railway infrastructure charges from different points of view. Some authors researched the model and principle of rail infrastructure charges, compared the influence of European rail regulatory bodies to the national rail infrastructure capacity allocation and charges, or described the rail infrastructure charges in their country. In our opinion, analysis and comparison of rail infrastructure charges between neighbouring countries is needed. This is because these charges can be one of the tools to optimise the use of railway networks on the one hand, and can contribute to the competitiveness of international railway transport compared to road transport on the other hand.

2 Comparison the rail infrastructure charges system in the V4 countries

In this chapter we analyse rail infrastructure charges in the V4 countries by Network Statement of each country, and compare the model of the railway infrastructure charging system from the point of view of influencing factors. We compare only basic charges without discounts, which an infrastructure manager can provide to specific trains or services.

2.1 Poland

The infrastructure manager in Poland is PKP (Polskie Linie Kolejowe S.A.). PLK provides services minimum access to railway infrastructure, access to service facilities and other services. Minimum access to railway infrastructure comprises:
- handling of application for capacity allocation,
- enabling the use of the railway infrastructure, including track points and junctions within an allocated capacity,
- train control, including signalling and providing of information on train movement,
- providing information required to implement or operate the service for which capacity has been allocated,
- access to electrical supply equipment for traction current, where available, [12].

The basic fee for minimum access to railway infrastructure is different for passenger and freight trains and for electrified and non-electrified lines. Railway lines on which overhead

line equipment is not available are divided into four categories, and railway lines on which overhead line equipment is available are divided into five categories. Table 1 shows the prices for passenger transport for trains with selected total gross weight, [13].

Table 1 Unit rates of the basic fee for minimum access to railway infrastructure for passenger trains in PLN

Total gross weight of train (M) in tonnes	Railway line category								
	Non electrified				Electrified				
	1	2	3	4	1	2	3	4	5
M<60	1.99	2.97	4.01	5.70	2.40	3.43	4.55	6.41	7.80
120≥M<180	2.49	3.52	4.64	6.50	2.91	3.99	5.19	7.22	8.76
240≥M<300	3.22	4.32	5.55	7.64	3.64	4.80	6.10	8.37	10.13
420≥M<480	4.15	5.35	6.71	9.11	4.58	5.84	7.28	9.86	11.90
540≥M<600	4.87	6.14	7.61	10.25	5.30	6.64	8.19	11.01	13.26
780≥M<840	6.10	7.50	9.16	12.19	6.55	8.01	9.75	12.97	15.59
900≥M	6.94	8.43	10.20	13.51	7.39	8.94	10.80	14.30	17.18

As can we see in Table 1, fees for passenger trains depend on train kilometres, line category and total gross weight of a train. Fees for freight transport are constructed analogous to passenger transport with smaller differences, as non-electrified lines are divided to three categories, unit rates are different and fees are different up to 3000 tonnes.
The reservation fee is charged from applications for failure to use the assigned infrastructure capacity if the applicant fails to indicate the railway undertaking which should use the assigned infrastructure capacity, or if the railway undertaking indicated by the applicant fails to agree with PKP for use of infrastructure capacity. It amounts to 100 % of the basic fee for the planned journey, but not less than PLN 1000. The fee for parking a train vehicle for no less than two hours is calculated as a product of the time of parking and the unit rate amounting to: 1.48 [PLN/hour of parking/track]. The fee for preparing a case study of a train timetable is determined as a product of the time dedicated to preparation of a case study of a train timetable and the unit rate amounting to: 57.92 (PLN/hour), [13].

2.2 Hungary

In Hungary two companies manage the national railway network: Magyar Államvasutak Zártkörűen Működő Részvénytársaság (MAV Zrt) and Győr-Sopron-Ebenfurti Vasút Zártkörűen Működő Részvénytársaság (GYSEV Zrt). Activities related to the handling of applications for railway network capacity and running of trains may be linked with basic services to four components: ensuring the train path, the train kilometre-based part of running of trains, gross ton kilometre-based part of running of trains and use of overhead contact wire. The amount to be paid for the use of handling of the application for rail network capacity shall be charged on the basis of actually performed train kilometres. The amount to be paid by MAV Zrt. is 8 HUF per train km and by GYSEV Zrt. 12 HUF per train km, [14].
The amount to be paid for the running of trains consists of a train kilometre–based part and a gross ton kilometre-based part. Consequently it shall be charged on the basis of the actual performed train km and gross ton km. The basis of determination of the distance is the chargeable kilometre in every case. Fees are different by line section category (three categories) and type of train, [14]. Mav Zrt. different fees for:
- passenger trains,
- standard freight trains,
- special freight trains– Záhony freight trains, Single wagon trains, Corridor trains,
- locomotive trains.

Table 2 Charging elements of running of train – train km in HUF

Trains	Line section category I		Line section category II		Line section category III	
	Mav.	GYSEV	Mav	GYSEV	Mav	GYSEV
Passenger trains	344	310	341	280	128	215
Standard of freight trains	373	299	382	270	205	163
Special freight trains – Single wagon load	371	210	343	-	185	93
Locomotive trains	385	310	380	280	375	215

GYSEV Zrt different fees for the same line section categories and train categories as MAV Zrt. without special freight trains – Záhony freight trains and corridor trains. Table 2 compares the selected charging elements of running of train – train km of MAV Zrt and GYSEV Zrt. [14] Charging fees of running of trains – gross ton km are different from the train categories of MAV Zrt (Záhony freight trains and Single wagon trains – 0.21, Corridor trains – 0.24 and other trains – 0.25 HUF per gross ton km). GYSEV Zrt have a uniform rate – 0.24 HUF per gross ton km, [14]. In Hungary's railway network rail operators must pay fees for the use of catenaries, by station category (fees are different for passenger and freight trains) and supplementary services. The charging elements and fees are listed in the current Network Statement.

2.3 Czech Republic

The infrastructure manager in the Czech Republic is SŽDC – Správa železniční dopravní cesty. SŽDC ensures activities related to the operation of national and regional rail networks owned by the state. SŽDC provides prices including economically justified costs directly spent on operating railway transport, allocating infrastructure capacity including timetable preparation, infrastructure for usage for the train ride, i.e. ensuring rail operation (operation control), and rail operability (infrastructure maintenance and repairs). The price for infrastructure capacity allocation is dependent on the system being used for dealing with the requirement and the number of required framework paths. SŽDC use the following pricing model to calculate the price for infrastructure capacity use for rides of trains, according to [15]:

$$C = L \cdot Z \cdot K \cdot P_x \cdot S_1 \cdot S_2 \tag{1}$$

Where:
Z – price for infrastructure capacity use for rides of train,
L – length of rides of trains,
K – line category
Z – basic price (21.50 CZK per train km),
P – product factor,
S1 – S2 – special factors.

The railway network of SŽDC is divided to four categories. Product factors reflect segments of railway transport (such as passenger transport, freight transport non-specific, combined transport etc.). Special factor S1 reflects the gross ton weight of the train and is the same for passenger and railway trains. Special factors S2 reflects equipment of ETCS level 2 and higher on the driving vehicle. The fees are listed in Annex C of the current Network Statement.

2.4 Slovak Republic

The infrastructure manager of the Slovak Republic is ŽSR –Železnice Slovenskej republiky. Railway operators must pay infrastructure manager charges according to the Decree of the Railway Regulatory Authority No. 3/2010. This decree sets out the maximum charges for access to railway infrastructure in the extent of a Minimum access package and Track access to service facilities. Charges for the minimum access package are different by line category and include:

- charges for ordering and allocation of capacity (depend on train km),
- charges for traffic management and organization (depend on train km),
- charges for provision of rail infrastructure serviceability (depend on gross tonne-km) [16].

Charges for track access to services facilities include:

- charge for the use of electrical supply equipment for traction current – dependent on the length of utilized electrified track sections in kilometres and total gross train mass in tonnes,
- charge for the use of passenger stations, their buildings and facilities – dependent on Category of transport point for passenger trains and number of train stoppages in the transport points of a particular category related to passenger trains according to issued timetable,
- charge for the access to marshalling yards, train formation facilities and freight terminals owned or managed by a regulated subject – dependent on category of transport point for freight trains and the number of train accessions according to a particular transport point category for freight trains [16].

The system of railway charging as well as the charges of particular services are the same from January 2011 in contrast to other V4 countries where the charges change by the timetable change.

2.5 Differences in the rail infrastructure charges of the V4 countries

Based on the principle of rail infrastructure charges in the V4 countries described in their national Network Statement, we can identify the following differences:

- each country uses two basic factors dependent on charges of minimum access to railway infrastructure – train km and gross tonne km,
- some countries use specific charges for the use of electrical supply equipment (Slovak Republic, Hungary),
- in Poland, Hungary and the Czech Republic charges are different by passenger and freight transport,
- use of catenaries depends on electric train km in Hungary and on gross tonne-km in the Slovak Republic (the Czech republic and Poland do not use this charge),
- in Hungary and the Czech Republic charges are different by type of train,
- in Poland and Hungary charges include a fee for parking train vehicles,
- only in Poland are charges different for electrified and non-electrified lines, but other countries include electrified lines in the first line category,
- in the Czech Republic charges take into account equipment of ETCS level 2 and higher on the driving vehicle,
- but in common among the V4 countries is the nonexistence of a coefficient that takes into account environmental factors (e.g. in Austria charges take into account types of locomotives which are differentiated into three categories by ecological parameters).

In view of the fact that the charges in the V4 countries are different because they reflect national disparities we will compare the charges using the model passenger train in the next chapter.

3 Modelling the railway infrastructure charges of the V4 countries for rail passenger trains

We modelled the railway infrastructure charges for passenger trains with these parameters: gross weight train is 600 tonnes, locomotives does not include equipment of ETCS level 2, train running is calculated in the first category line (electrified), the number of train stoppages in the transport points depends on relation length proportionally and train stoppages in the "A" or first category stations (transport points). Figure 1 shows the total charges for rail passenger trains depending on distance.

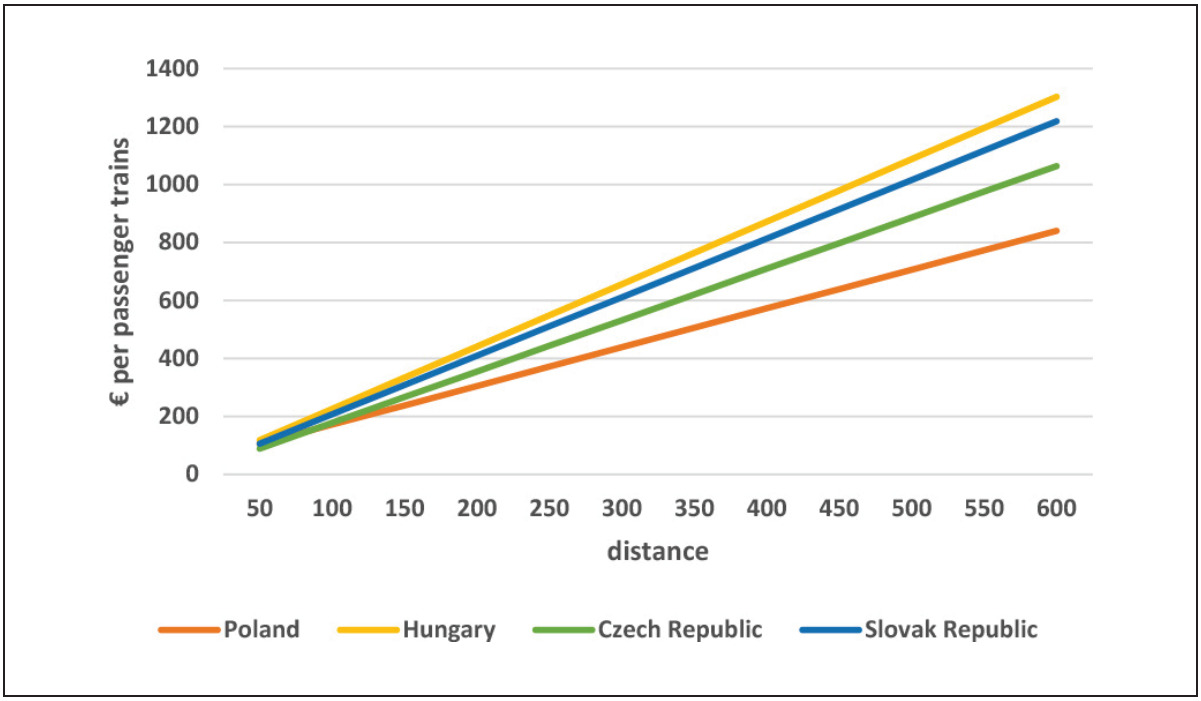

Figure 1 Comparison the rail infrastructure charges for passenger trains in the V4 countries

We took into account only basic charges because additional and ancillary charges are very different and depend on agreement between the infrastructure manager and rail undertaking. For this situation fees were calculated in euros using the current exchange rate by the European Central Bank.

4 Conclusion

The system of rail infrastructure charges is different in each country. The differences are not only in the fees for using railway infrastructure but also in the items of charging and the method of charging. Despite the fact that European countries should implement Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area, individual countries can create their own models of railway access charges. The result is not only different charging systems but also different approaches including environmental aspect, taking into account different quality of infrastructure manager services, quality of rail undertakings vehicles and so on. It would be advisable to create a unified model of railway access charges which would allow adapting national disparities for example, by using a different coefficient.

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