

STRUCTURE OF ACCESS CHARGES FOR USE OF RAILWAY INFRASTRUCTURE FOR PASSENGER AND FREIGHT TRAINS

Nikola Stojadinović¹, Mirjana Bugarinović²

Charging system for use of Railway Infrastructure is one of the assumptions for introducing and opening of Rail Market and appearance of more traffic operators on it. European Union members had already introduced a charging system, but it is still early to generalize influence of Access Charges on market. Serbia is in the process of accession to the EU and issue of Access Charges will be one of the necessary conditions to apply. Therefore, recognition of the way of solving a charging system in European Countries for Serbian Railway and Serbia is important issue. How much should Structure of Access Charge be different for Passenger and Freight Trains due to the different market position and competitiveness of Passenger and Freight Traffic? In this paper will performed factors that influence on approach to choose structure for Access Charges, provide an overview and analysis how other countries in Europe choose Access Charge, and regarding that -their experiences.

Key words: infrastructure, access charges structure, passengers and freight trains

1 Introduction

Access Charges are representing Incumbents or Railway Operators payment obligation for using of Railway Infrastructure and Services given on it. It is introduced as establishing element of Railway market. On the other way it represents very important instrument for achieving objectives, as for example increasing of efficiency, decreasing of subsidies and enlargement of competitiveness of Railway Traffic etc.

Introduction of Access Charges has been regulated by EU through various directives, starting from 91/440 EEC. The Access Charges Area itself is defined by 2001/14 EC directive. Generally, all these directives are introducing certain limitation, but they are also leaving great autonomy in forming of model and structure of Access Charges.

Different conditions, in which Railways are situated, with given free choice in Access Charges selection, have produced a great number of Access Charges methodologies. Different principles, systems and structures of Access Charges are introduced and applied. If we take into consideration the structure of Access Charges itself, diversity is mostly represented in the way on which Railway Network and Train Category, meaning Passenger and Freight Trains, are treated.

¹ Nikola Stojadinović, dipl.ing., University of Belgrade, Faculty of Transport And Traffic Engineering Vojvode Stepe 305, 11000 Belgrade, Serbia, tel.: +381 11 3091 201, E-mail: nix7385@gmail.com

² Mr Mirjana Bugarinović, dipl.ing., University of Belgrade, Faculty of Transport And Traffic Engineering, Vojvode Stepe 305, 11000 Belgrade, Serbia, tel.: +381 11 3091 239, E-mail: mirab@sf.bg.ac.rs

In this paper is given short review on different ways for calculation of Charges for Passengers and Freight Trains. Perceptions of factors which are influencing on choice of Access Charges Structure are demonstrating another theme in this paper.

2 Brief review of access charges in some countries

Access Charges for using of Railway Infrastructure are applied longest in Sweden, Great Britain and Germany, so it is easy to understand that these countries have the biggest experience in this area. Most of the countries have structure of Access Charges according to directives, but: Sweden in this moment has Access Charges less than marginal costs, Germany and Poland are basing its Access Charges more on average than on marginal costs, and variation of mark-up level are from 0.5 to 10 € per driving km. For two parts tariff system the countries that have no problem with capacity and they want to develop more services categories, are determined, as for example Bulgaria and Hungary.

Therefore, there are countries with dominant Freight Traffic and great number of pan European Corridors that are passing over their territories, but with different infrastructure maintenance costs, as for example Austria and Hungary, and with implement of MC+ and FC principles of Access Charges. Application of FC charging principles is present in Baltic countries which are characteristic by dominant Transit Freight Traffic

Taking into consideration above mentioned, as well as exploitation parameters, Railway Market, geographical prevalent and National Interest of this countries we will take a short review on Access Charges application and condition of Railway Market in Germany, Austria, Belgium, France, Hungary and Latvia.

3 State of railway market in chosen countries with emphasis on access charges

3.1 Review of railway market

In order to have a view on factors which are directly influencing on choice of Access Charges Structure, it is necessary to previously compare certain exploitation parameters, Railway Market and applied principles and level of Access Charges in certain countries.

As it can be seen on the Austrian example (table 1), performance analyses shows that Railway Network is of average complexity 1,76, with dominant import and export in Freight Traffic. According to traffic volume it belongs to countries with middle capacity traffic utilization. 29 operators is working on network, LIB index for both traffic categories is high: 852 for freight and 727 for passengers, which tells us how open this market is. On the other side applied principle of MC+, with 27% level of Access Charges shows how infrastructure manager (company) still depends on state subsidies. All this together is showing how Austria wants to attract traffic on Railway, and that has more un-used capacity. These are primary factors that are influencing on the choice of principles and level of Access Charges, i.e. they are influencing on the structure of Access Charges.

Tab.1: Key performances, financial and AC figures

Country	Austria	Belgium	France	Germany	Hungary	Latvia	Serbia
Territory size (km ²)	83.871	30.528	543.965	357.030	93.030	64.598	88.361
Line km	5.386	3.560	29.289	34.122	7.420	2.236	3.809
Complexity (track km/line km)	1,76	1,7	1,8	1,88	1,13	1,52	
Total train-km (thousands)							
– for freight	48.899	14.979	134.545	203.472	17.931	16.766	4.338
– for pass.	90.407	78.306	403.565	702.710	76.564	9.440	
Average train weight gross tons (fre./pass.)	944/293	1.349/328	760/368	1.322/341	1.018/186	2.932/274	1000/?
Predominant traffic	freight export-import	freight export-import	domestic passenger	freight export-import	freight export-import	freight transit	freight transit
Intensity of use TU (000)/ line km	5.240	5.460	4.140	4.780	2.160	7.270	223
Daily number of trains per line km	75	88	52	80	50		0,13
Number of train operators (fre/pass)	21/8	6/1	9/1	318/78	9/2	3/3	2/1
IM total revenue (€/million) received by access charges from operators							
– freight	145	43,65	246	649	119,5	?	-
– pass.	180	543	2.463	3.151	318,7	?	-
Performances of AC and opening of market in some countries							
AC principle	MC+	FC-	MC+	FC-	FC	FC	?
Level of AC (%)	27	20	63	60	80	100	?
Tariff	single	single	two part	single	two part	single	?
LIB index 2007 (freight/pass.)	852/727	780/518	727/431	844/809	740/533	733/576	-/-

Beside these performances of AC it is very important to have a knowledge about structure of AC, especially for how much should AC be different for Passenger and Freight Trains, regarding different market position and concurrency of Passenger and Freight Traffic.

3.2 *Charging System*

EC Directive 2001/14 in Annex II - all services that Infrastructure Manager can give are sorted in four different categories: Minimum Access Package, Track Access to Services facilities and supply of services, Additional Services and Ancillary Services. According to capacity that is on disposal and users potential, Infrastructure Manager is combining different service groups and forms different Access Charging System. On this way Railways of Germany has developed sophisticated "Train Path Pricing System". On the other side Latvia has just Minimum Access Package which contains all services that Latvia UI is giving.

However, at all countries the Minimum Access Package is included. It exists on all Networks, for all Train Categories and thereby is subject of this paper.

3.3 *Access charges structure*

At this moment in EU countries, great number of applied methodologies and principles, systems and structures of AC is present [3]. In this chapter AC Structure for Minimum Access Package for using of Infrastructure will be considered into details for each representative country separate.

Austrian UI is counting AC on single tariff system and AC is based on Marginal Costs with mark-up (MC+). Structure of Minimum Access Package is based on three parts: AC on train passing according to Line Category, Types of Traffic and mark up which depends on type of rolling-stock, delays in timetable and bottleneck length. For two parts in formula, AC is based on train km.

It can be concluded that Austrian UI defined Structure of AC related to usage of most loaded parts (main Corridors) of network, so on this way it reduced concurrence. Accumulated operative costs and maintenance costs is solving through factor for passing through bottleneck, which is 1€ per train km in 2008. On the other side it is well known that Railways in Austria are built in heavy mountain conditions, so maintenance of high quality infrastructure increase drastically maintenance costs, so it is reasonable to introduce AC up to realized gross tonne km, as well as coefficient that depend on used rolling-stock.

Belgium UI is covering 20% of total infrastructure costs by income from AC. The principle, on which the AC is formed, is based on total reimbursement of infrastructure costs reduced for subsidy or FC-. Tariff is single and simple, and variable costs are counted per train km. In the structure of AC, by application of several different coefficients, which depends on time period of Railway Usage; type and characteristic of traffic, the problem of congestion and quality of services is solved. By additional factor, the network characteristic is comprehended too.

With this structure of AC, that is highest for the peak hour traffic flow, and with mostly costs covered by using the Infrastructure Subsidy, the state wants to stimulate Freight and specially Transit Traffic.

Railway in France is characteristic by significant Passengers Traffic and structure of AC is defined towards this kind of traffic. Very low LIB coefficient for Passenger and Freight Traffic as well as number of operators on market (table 1), signify the closeness of market. In the structure of AC this is solved by defining of two part tariff system. First part is related on Infrastructure Usage and for Infrastructure Access. It is related to railway category and type of traffic, and is not depend on time period of used Railway line. Other part is cost for reservation and it is very high - 70% from total AC level, and it depends on time period of usage of Railway line and is paid in advance, that is unstimulating for many little operators.

Germany on the other side can be opponent to France by size of network, income and volume of realized Traffic. However, what separates them is view on Market, for which Germany is actively involved, and applied AC Structure. Germany has single tariff, but AC are formed according to principle of average costs i.e. MC+. By structure is close to Belgium, but they are going further regarding the quality of services, by introducing the coefficient that depends on quality of services, given separately for Passenger and Freight Trains.

Formula contents numerous different coefficients, by which the operators that are giving more qualitative service are charged. Germans UI can afford it because it has 12 different category of Railway lines, numerous categories of Services, modern systems of costs coverage and bigger capacity, which enables users to choose what suites them most, but from the other side the possibility of this choice by itself costs. In the same time, volume of Passenger and Freight Transport allows that this structure of AC stays in this country.

Parameter of Hungary Railway Network and Market (table 1) shows that she has the lowest capacity from all represented countries, and that network complexity is drastically low (in relevant relationships and objective). Structure of AC contains the part that is related on reservation of capacity and depends on type of traffic, and part related on using of capacity, that depends on category of Railway and Trains

Latvia is typical example how States with little network are solving the problem of AC structure when they have aim to cover all the infrastructure costs by AC. The AC are counted by principle of average costs, Structure of AC is very simple and contains: unit price per train km depending on type of Traffic and Lines and realized number of train km.

4 Factors that influences on access charges structure

On the Structure of AC the surrounding is influencing and conditions in which the Infrastructure Manager is. Factors that are influencing can be measured (exploitation and finance appearance) or non-measurable (national policy, interest and influence). In this work, we are starting from assumption that measurable factors are the one that decide while forming the Structure of AC. Besides, insight factors do not influence particularly, but simultaneously on the Structure of AC. The key factors are:

- **Dominant type of traffic** (Passenger or Freight Traffic) affects differently on usage of capacity, which reflects on infrastructure costs, so this is how the Structure of AC is formed. This can be seen especially on chosen price unit (by train km or gross-ton km or together) or in number of different line categories for type of traffic they were meant to. - France has dominant Passenger Traffic and that is the reason why the AC are counted by train km, and from 12 categories line 8 is prior for Passenger Trains;

- **Intensity of network using** includes introducing various coefficients which are in the function of Line and Train Category, which can be seen on the example of Belgium. Coefficients are introduced regarding the level of operational significant of Line and Traffic intensity, and for trains according to its speed;

- **Network complexity** is factor that shows on the capacity volume that UI has on disposal, and on height of costs of infrastructure usage, so Railway Network with low complexity level as for example Hungarian, can be proud on better simplicity of Tariff formula without a lot of coefficient, but the only difference is in the unit price per train km for traffic type;

• **Maintenance of Railway Network** is connected with number and quality of different services – Latvia UI has only one standard category of services that is giving - Freight Traffic, so that is the reason why the Structure of AC is simple according to average costs.

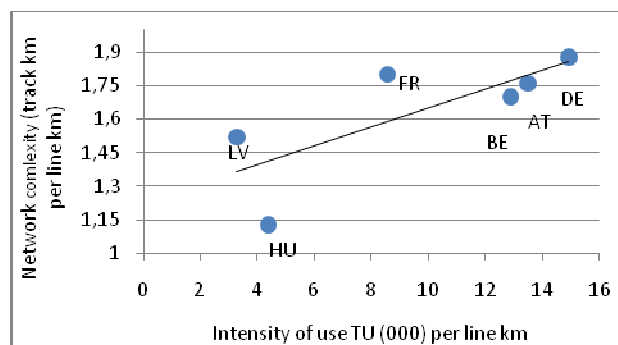


Fig 4. Network complexity average intensity of use TU

5 Instead of conclusion – Lesson Serbia

Serbia is positioned on the very beginning of Railway Reform. Today in Serbia only one enterprise is functioning in Railway Traffic, dealing with Management of Infrastructure and performing of transport - PRTE Serbian Railways and enterprise that is dealing with industrial transport for the needs of Thermo Electrical Power Station Nicola Tesla which gathered transport license. According to size, network of 3.809km belongs to medium size networks, and 14.110 passengers and 14.141 tone in 156.487 Passenger and 23.287 Freight Trains are transported annually [5]. As it might be seen number of Passenger Trains is bigger, but the income from them is very small. Regarding the Freight Traffic, transit and import-export traffic is dominant. Capacity utilization is small, but the long non-maintenance of lines is present, so the train delays are not the result of traffic organization or traffic volume

Taking into consideration characteristics of Serbian Railways and factors that are influencing on the structure of AC for Passenger and Freight Traffic, it can be recommended:

- that variable part of AC can be counted towards train km and towards gross-ton km, in one hand it could be overshoot maintenance and usage costs to users of infrastructure and in other hand optimal use of infrastructure capacity;
- if there is a wish to attract traffic and equally achieve the income from both traffic type, it is necessary to register more service categories and more categories of lines expressed through various coefficient in Structure of AC (example Belgium and Germany);
- applying simple formula with coefficients that depend on type of traffic (train categories), because of simplicity of AC calculation;
- because of great costs of Infrastructure Maintenance, the coefficient related to type of rollingstock, for one type of mark-up should be introduced (example Austria).

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