QUALITATIVE AND QUANTITATIVE INDICATORS OF RAILWAY STATIONS

Abstract. The liberalization of the rail freight market has been booming in recent years. On a pan-European scale, new freight carriers are increasing year after year. Support for the liberalization of the railway sector is mainly implemented through the so-called railway packages and one of the tools is the quantitative and qualitative indicators of the individual railway stations. The relevance of the article is mainly to propose measures for railway stations, where freight transport is declining despite the liberalized market. These are main railway stations located on regional lines and railway stations with a smaller scope of transport work. The aim of this paper will be to propose measures to support freight transport in the Slovak Republic by setting minimum requirements (standards) for railway stations depending on their performance, respecting their current technical level of railway operation.

Keywords: railway station, freight carrier, railway transport

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Introduction

Railway transport, whether passenger or freight one, should be a central part of a transport system of each developed country. The railway transport market has, however, been entered by the liberalisation through "railway packages". Among others it has led to a competition and entry of new carriers into the process of transportations. A carrier with all shares owned by the state and who - as part of the transformation process - has separated themselves from the infrastructure manager and railway undertaking operating passenger transport, still features the biggest performances even in spite of their decreasing trends. In 2018 there happened a slight decrease in transport performances in 515 thousand gross tonne-kilometres for this carrier (Železnice Slovenskej republiky, 2019). Even despite this drop the state carrier still has approximately 65 % share on performances of freight railway transport in gross tonne-kilometres. For the comparison sake in 2012 it had up to 88.24 % share on performances in gross tonne-kilometres (Gašparík, 2012).

In the view of the fact given above this article will deal with ZSSK CARGO carrier only. To determine quantitative indicators of railway stations we will study the number of wagonloads for 2018 and 2019, and to determine qualitative indicators we will study the usage of consignment notes in their electronic form. This news was introduced by the carrier on 1 January 2019 after several years of development. These indicators will be

evaluated for Žilina operation centre. There in the article we will analyse national transportations only.

1. Quantitative and qualitative indicators of railway stations

A railway station is defined as a transport control centre with a track lead intended for controlling a sequence of trains, handling passengers and cargo (Príspevateľ Wikipedie, 2005). Quantitative and qualitative indicators are divided by the kind of transport (passenger and freight transport). In each kind of transport there are some common and some distinct indicators studied. Table 1 presents some selected quantitative and qualitative indicators of railway stations for freight transport.

Table 1. Quantitative and qualitative indicators of railway stations in freight transport

Quantitative indicators	Qualitative indicators
number of submitted and issued complete wagon load in national and international transport	possibility to submit a paper consignment note
number of freight trains in 24 hours	authority to issue carriage documents
number of stabling sidings	availability team track

Žilina operation centre comprises 660 transport points in total where operations related to cargo

transportation can be performed (loading operations, commercial operations). They, however, also include stations which have certain limitations (a station not staffed with a carrier's worker, submission of national shipments only, a railway station without any technical equipment, etc.). Table 2 presents the structure of Žilina operation centre

Table 2. Structure of the Žilina operation centre (Železničná spoločnosť Cargo Slovakia, a. s., 2003)

Operation centre	Circuit of operation	Central commercial workplace	Possibility to submit a paper consignment note
Žilina	Ružomberok	Lisková	Bánovce nad Bebravou
	Trenčianska Teplá	Trenčianska Teplá	Dolný Hričov
	Žilina	Žilina	Ladce
			Liptovský Hrádok
			Lisková
			Medzibrodie nad Oravou
			Nové Mesto nad Váhom
			Púchov
			Ružomberok
			Trenčianska Teplá
			Trstená
			Žilina

The district of operation covers individual railway stations at which the railway undertaking provides its services. Figure 1 presents the number of railway stations falling under individual districts of operation.

Fig. 1. Number of railway stations in individual operating district (Železničná spoločnosť Cargo Slovakia, a. s., 2003)

The chart makes it clear that the division of railway stations is comparatively even. There between the district of operation with the highest number of railway stations and the district of operation with the smallest number of railway stations exists the difference of four stations only.

2. Comparison of the number of submitted national complete wagon load

The basic quantitative indicator is represented with the number of received and submitted wagonloads by the shipper at the given railway station.

The carrier's transport regulations define a wagonload as follows:

- goods transport of which requires at least one wagon,
- goods comprising long indivisible objects on multiple wagons,
- a rail vehicle on multiple wheels,
- empty AVV wagons and other wagons submitted for transportation with at least one consignment note.

The haulage of individual wagonloads is realised by means of handling trains which feature a different periodicity. It depends on the actual load.

Direct consigner's trains or destination-routed block trains are categorised as freight express trains (NEx) or passing-through freight trains (Pn). The category is assigned to a train on the basis of the assessment whether the load is collected per time (NEx trains) or per weight (Pn trains) (Gašparík & Šulko, 2016).

Table 3 contains statistical data for the latest 2 years and it compares the number of submitted national wagonloads in Žilina operation centre.

Table 3. Quantitative and qualitative indicators of railway stations in freight transport (internal data of the railway undertaking)

Railway station	Year 2018	Year 2019
Bytča	0	14
Bytčica	420	168
Diviaky	0	30
Dolný Hričov	0	140
Horná Štubňa	0	8
Konská pri Rajci	55	20
Krásno nad Kysucou	279	59
Lietavská Lúčka	188	110
Martin	0	249
Príbovce-Rakovo	0	29
Rajec	103	29
Sklené pri Handlovej	0	97
Turany	0	3
Varín	48	2

Vrútky	0	112
Žilina	314	105
Žilina-Teplička	15	23

Of the total number 66 railway stations recorded a wagonload submission in 2018, and 17 railway stations recorded a wagonload submission in 2019. I.e. in the last year there happened more than a twice increase in the wagonload submission. Despite a comparatively fast increasing trend of the submission there were and still are railway stations where a wagonload submission for the carrier did not occur either in 2018 or in 2019.

The loading at railway stations, where the submission did not occur, could have been negatively impacted with these selected factors:

- formation of serried trains by another carrier,
- a shift of shippers to another kind of transport,
- a low flexibility of the carrier.

If this trend was repeated in the following years, the haulage and distribution of load should be modified. Handling trains which nowadays drive with a calendar restriction should drive as necessary and should be engaged every time there is a shippers' demand.

Table 4 presents a proposal for handling trains driving as necessary in regard to not performing the loading at individual railway stations.

Table 4. Proposal for the introduction of handling trains as needed within the Žilina operation centre (Železnice Slovenskej republiky, 2019)

Handling train number	Handling train route	Note
85570	Kráľová Lehota – Lisková	as needed throughout the route
85571	Lisková – Kráľova Lehota	
85630	Púchov – Trenčianska Teplá	
85631	Trenčianska Teplá – Púchov	
85750	Trenčianska Teplá – Nové Mesto nad Váhom	
86500	Žilina – Makov	as needed in the section Čadca - Makov
86503	Makov – Žilina	as needed in the section Makov - Čadca
86550	Trstená – Lisková	as needed throughout the route
86551	Lisková – Trstená	
86560	Tvrdošín – Lisková	
86561	Lisková – Tvrdošín	
86620	Trenčianska Teplá – Horné Srnie	
86621	Horné Srnie – Trenčianska Teplá	
86630	Trenčianska Teplá – Lednické Rovné	

86631	Lednické Rovné – Trenčianska Teplá	
86670	Trenčianska Teplá – Rybany	
86671	Rybany – Trenčianska Teplá	
87551	Nové Mesto nad Váhom – Trenčianska Teplá	

In case of engaging trains as necessary the infrastructure manager does not provide a discount for the utilisation of a railway communication. It is also due to this reason why this measure is to be considered well and then based on the developing trend and economic profitability this measure is to be taken or not.

3. Rate of use of paper and electronic consignment note

With respect to digitalisation and automation of the company with emphasis put on making the transportations easier for customers, ZSSK CARGO carrier introduced the option to submit consignments using an electronic consignment note, as of 1 January 2019. With this step the shippers can create such a document from anywhere with the Internet signal coverage with no need to deliver in person. At the same time this step required an optimisation of jobs. The carrier merged workplaces of freight cash-desks into so called central commercial workplaces. Per Table 2 such workstations are dislocated in Žilina, Trenčianska Teplá and Ružomberok, as part of Žilina operation centre. The electronic communication with customers, in consideration of bigger volumes of transportations, is also performed in workplaces at other tariff points which, however, have remained separated from central commercial workplaces. The main task of central commercial workplaces lies in performing activities during the registration of transport performances in the area of the freight cash-desk, as well as the procedure to handle a consignment note before entering in the contract of carriage, during its period of validity and before its termination (Želeničná spoločnosť CARGO SLOVAKIA, a. s., 2020).

The electronic consignment note was in a testing operation already in 2018 (the testing operation started prior to 2018). The testing operation should have eliminated shortcomings so the system failures would happen to the least extent possible after running the operation for real.

The measure of introducing the electronic consignment note should, among others, contribute to the following (Želeničná spoločnosť CARGO SLOVAKIA, a. s., 2020):

- a bigger interest in transportation by this carrier,
- a higher comfort for the shipper,
- better communication between the carrier and the shipper,
- a higher satisfaction of the customer.

Figure 2 shows a graphical comparison of submission of individual wagonloads at railway stations for Žilina operation centre using a printed and electronic consignment note in 2018 and 2019.

Fig. 2. Comparison paper and electronic consignment note (internal data of the railway undertaking)

The data makes it clear that even during the testing operation in 2018 the number of wagonload submissions in electronic form of the consignment note was higher than in its printed form. Altogether there were 1,437 wagonloads submitted for Žilina operation centre in 2018, out of which 999 were submitted per the electronic consignment note, which is almost 70 %.

In 2019 out of 1,491 wagonloads submitted for Žilina operation centre in 2018 there were 1,199 wagonloads submitted per the electronic consignment note, which is almost 81 %. A year-on-year increase then fluctuates at the level of almost 11 % and it conveys the information that submitting the wagonloads per the electronic consignment note is more and more popular among the customers. Thus there is a probability that the majority of tariff points where it is still possible to submit a consignment note in its printed form will have to shift to an electronic submission of wagonloads.

Conclusion

A progressive liberalisation of railway freight transport has brought many changes, whether for shippers, the infrastructure manager or carriers. Each of these entities concerned tries to react to these changes differently. The carrier must look after the biggest satisfaction of a shipper in the competitive fight for the shipper. One of the options is to improve the quality and to make the provided services faster in higher and higher quality. And the electronic consignment note can serve for the purpose of achieving such a defined objective. At the conclusion we must highlight that each railway

undertaking should optimise transport-carriage processes and improve their quality so the customers will return back and utilise their services again.

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