SPATIAL DIFFERENCES IN PUBLIC TRANSPORT ACCESSIBILITY OF DISTRICT CENTRES IN THE PREŠOV REGION, SLOVAKIA

Przestrzenne zróżnicowanie dostępności transportu publicznego w kraju preszowskim (Słowacja)

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Abstract: The issue of public transport accessibility of localities and regions is one of the key research themes of transport geography. The EU defines public transport as one of the services of "general economic interest", which means that its organization should be based on the principles of solidarity and equal access for all citizens of the state and its regions. The study of transport accessibility of 13 district centres in the peripheral and economically underdeveloped Prešov administrative region (Slovakia) from the municipalities of their immediate hinterlands expressed by the number of direct bus and train connections is aimed at identifying the spatial differentiation of individual intraregional accessibilities. The realization of the research pursues the objective,to point out by the comparison of the theoretical and real values of direct transport connections, to the possible existence of discrepancies in the public transport services of individual municipalities in relation to their higher hierarchical district's centre.

1. Introduction

The issue of public transport accessibility for localities and regions (Bruinsma, Rietveld, 1998; Guzik, 2012; Rosiki et al., 2017) has been among the key research themes of transport geography for several decades, as documented also in *Prace Komisji Geografii Komunikacji PTG* where the topic (*"in sensu stricto"*) of transport accessibility and transport links has been the key one for the analytical studies of M. Kozanecka (1996, 2000), S. Dziadek (1998), J. Wendt (2000), and V. Székely (2004). During the years, the political-economic atmosphere and priorities of society, as well as political decisions with a significant impact on the spatial organization of society and transport systems, has changed. We are also witnesses of the change of methods and interpretation explanations used in order to achieve greater clarity of scientific outcomes (despite a growing sophistication), but the basic "philosophy" of research has remained the same – the identification of transport nodes and quantitative comparison of their transport accessibility depending on the specific geographical environment.

The main objective of the study is to find the answer to the question, whether the regional public transport provision (functional organization) in the individual districts of the Prešov administrative region (NUTS 3) adequately fulfils the function the service of "general economic interest". We use the analysis of the existence and frequency of direct public transport (train and bus) connections between LAU 1 centres (district towns) of the Prešov administrative region and municipalities situated in their immediate hinterlands for the achieving of this primary objective. District towns provide the higher-level services for the urban and rural municipalities in their surroundings, and, together with them, forming official LAU 1 territorial units (districts) which (more or less) represent functional regions.

As a result of the difference between the human place of permanent living and his/her place of work that triggered the centrally managed processes of urbanization and industrialization of Slovakia during the 20th century, public transport played an important role in ensuring failure-free production by the organized transfers of employees. The dominance of public transport in supporting personal mobility was also amplified by the relatively low level of motorization. The ownership of a private car was a visible demonstration of owner's higher solvency for many years of socialism.

Despite the significant changes in society and its spatial organization, which, among other things, are also manifested in the increased mobility of the population and increased car ownership (Faith, 2008),

public transport still plays a significant role in Slovakia. According to the EU definition of public transport as one of the services of "general economic interest"; its organization should be based on the principles of solidarity and equal access for all inhabitants of the state and its regions. The realization of the research aims at pointing to the possible existence of discrepancies in the public transport services of individual municipalities in relation to their higher hierarchical district's centre.

2. Theoretical background

Living, work, school, shopping and entertainment. Activities that accompany the life of a person are usually carried out in different places, the achievement of which requires the passing of a certain distance and, usually the use of some mode of transport. Despite the increasing motorization rate in Slovakia (over the period 1990-2016, the average motorization rate has increased more than doubled: from 166 to 390 passenger cars per 1,000 inhabitants), public transport plays a major role in achieving the objectives of human activities in localities and regions. Its absence, respectively insufficient level of this public service (the limited transport interconnection of isolated settlements in peripheral territories) can lead to processes of socio-spatial exclusion of the affected population (Horňák, Rochovská, 2014).

Achieving the spatial destinations of a person's life activities and their interconnection by public transport, can be either direct or with interchanges. Interchanges represent not only more effort for passengers (additional repositioning of passengers during their journeys, possible handling of (heavy) luggage or baby stroller) but also the potential risk of threatening the scheduled program (Horňák et al., 2013; Székely, Michniak, 2018). Therefore, taking into account that all moving people have to get to the target place *"in a cheap, efficient and safe manner"* (Musselwhite, Haddad, 2010), then the issue of direct transport connections becomes (in the context of *"primary mobility needs"*) very current especially for people with limited opportunities for flexible behaviour (low-income people, individuals with small children, people with disabilities) and with respect to people with a reduced ability to adapt to unexpectedly changed situations (elderly people).

The analysis of the existence of direct transport connections of localities and regions by public transport, which is considered one of the basic indicators of their transport accessibility, is a natural subject of scientific interest in Slovakia (e.g. Székely, 2004; 2006; Michniak, 2008; Horňák et al., 2013; Horňák, Pšenka, 2013; Székely and Michniak, 2018). The interest terri-

tory of the Prešov administrative region has already been examined in terms of direct transport links between its district towns and other district towns in Slovakia based on data from 2003 (Székely, 2006), and, using the time comparison, also based on data from 2017 (Székely, Michniak, 2018). The aim of these studies was to present the transport accessibility of hierarchically higher settlements in the context of the transport system of Slovakia (interregional accessibility).

The current study of transport accessibility of the district centres of the Prešov administrative region from the municipalities of their immediate hinterlands has substantially different objectives. It is focused on the spatial differentiation of the intraregional transport accessibility (from opportunities' rather than from travel behaviour's point of view) of district centres (which provide specific functions for the population of their administratively determined hinterlands). In the context of the studies of J. Farrington and C. Farrington (2005), A. Delbosc and G. Currie (2011), M. Horňák and A. Rochovská (2014), and V. Jaroš (2017) we are trying to point to the dangers of the identified transport exclusion, and, consequently, potential social exclusion of the inhabitants of the peripheral rural localities. Thus, the basic idea of the research corresponds with the above-mentioned

need to meet the demand of municipalities for public transport as one of "general economic interest" services. On the other hand, as noted by M. Šťastná and A. Vaishar (2017), the sufficient frequency of transport connections, can not only contribute significantly to the spatial stability of the population of marginalized territories, but also attract the interest of tourists for their visits. The impact of tourists is perceived very closely with their (mainly uncritical) positive support for progressive socio-economic development of the concerned localities.

3. Studied territory

The peripherally located (in relation to Bratislava – the capital of Slovakia) Prešov administrative region (NUTS 3) from North-Eastern Slovakia consists of 13 smaller spatial units – districts (LAU1) (Fig. 1). Its relative geographical position, official statistical data about the performance of the regional economy (low GDP/capita and high rate of unemployment), and also the subjectively not very positive perception of business vitality of the Prešov region from the side of potential investors have contributed to its generally presented image as one of the most problematic (underdeveloped) territories in Slovakia.
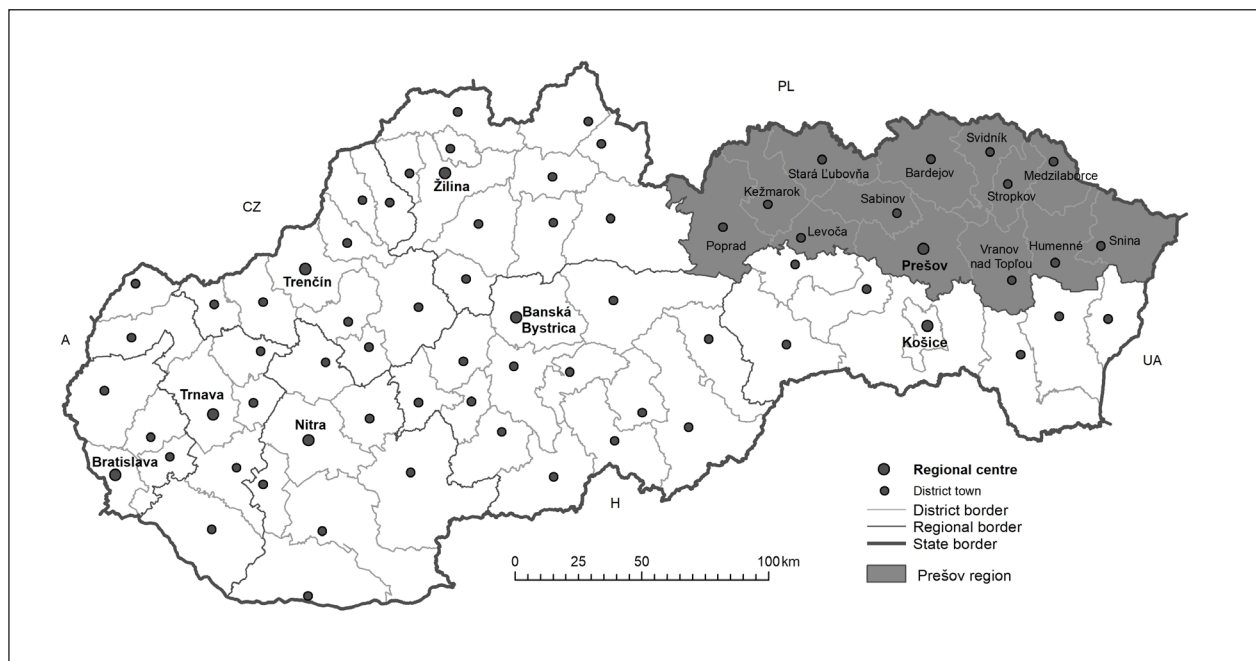

Fig.1. Geographical position of Prešov administrative region and its districts in Slovakia.

Source: Own elaboration.

Districts and their urban centres, which are defined as nodes in the public transport networks in the Prešov region, do not have the same size – except for Poprad and Prešov, which have the status of regional centres,all district centres are small towns with a size from 6,000 to 35,000 inhabitants (Tab.1). As far as their area, the number of municipalities and the population are concerned, the districts are very different from each other. While in the largest Prešov district, there live more than 173 thousand inhabitants in 91 municipalities, in the Medzilaborce district, which consists of only 23 municipalities (about 1/4 in comparison with the largest district), live only slightly more than 12 thousand inhabitants (representing less than 7% share of Prešov district´s population). The extreme disparities between these districts (LAU1) are based predominantly on the differences between their district centres where the over-majority of the population lives (51.7% and 54.9% respectively). The population size of the individual municipalities is, besides their geographical location, an important factor, particularly influencing the frequency of direct transport connections with their district centres. According to M. Marada and V. Květoň (2010), if we emphasize the economic efficiency of public transport, it would be reasonable to assume that smaller municipalities would also have a lower level of public transport service measured by the frequency of their direct connection to the district centre. On the other hand, public transport as a service of general economic interest which is financially supported by the state (including regional and local authorities) in order to comply with the principles of solidarity and equal access for all inhabitants of the designated administrative territories (LAU1), can, and does not generally respect the economic criteria of its efficient functioning.

Tab.1. The basic characteristics of studied territories.

District	Number of municipalities	Number of inhabitants in the district (2016)	Average size of municipality (except district towns)	Number of inhabitants in the district centre (2016)
Bardejov (BJ)	86	77,742	530	32,699
Humenné (HN)	62	62,845	478	33,660
Kežmarok (KK)	41	73,756	1,430	16,562
Levoča (LE)	33	33,553	586	14,800
Medzilaborce (ML)	23	12,119	248	6,654
Poprad (PP)	29	104,596	1,887	51,750
Prešov (PO)	91	173,457	932	89,618
Sabinov (SB)	43	59,694	1,119	12,709
Snina (SV)	34	36,945	513	20,031
Stará Ľubovňa (SL)	44	53,617	867	16,333
Stropkov (SP)	43	20,644	238	10,669
Svidník (SK)	68	32,845	323	11,206
Vranov nad Topľou (VT)	68	80,497	863	22,682

Source: own elaboration based on the data obtained from of Štatistický úrad Slovenskej republiky.

4. Methods and Data

The decisive role for the spatial analysis of the differentiation of transport accessibility of the territory of the Prešov administrative region was the identification of the existence itself and consequently also the frequency of direct transport connections of 652 municipalities with their district centres in both directions. This means that the interconnection frequency of the 1304 (two-way) connections of the district centres with the municipalities that form the LAU1 administrative units was monitored.

The data provided by the www.cp.sk portal was used to create a database of direct public transport connections. The simple and basic existence and calculated frequency of direct transport connections between two municipalities of a different hierarchical level were detected for a working day (Wednesday, April 25, 2018) within 24 hours (0.01 – 24.00). The time of the departure of a train or bus from the departure municipality was decisive; the time of arrival of the already registered connection to the target station was irrelevant for us from the point of view of the study objective.

The numbers of bus and train connections were recorded separately. Since there were usually more spatially unevenly distributed transport stops on the territory of individual municipalities, the decisive criterion for registration of the interconnection of the municipality with its hierarchically higher administrative centre was the interconnection of at least two transport stops on the bounded territories of the interconnected municipalities (the central and/or peripheral positions of bus/train stop were equivalent). As a result of the adopted methodological approach, it was necessary in some cases to correct the automatically generated connections and thus to prevent the multiple registration of one transport connection (cases where one connection had more stops in the given municipality or in both, or passed through the municipality during their route more than once). In the case of the connection of Prešov – as the centre of the administrative region – with some of the surrounding municipalities (part of which were in the past an integral part of the administratively defined city of Prešov), a significant part of passenger transport is provided by the transport company of Prešov (buses and trolleybuses). Therefore, these connections were added to the existing train and (local) bus connections. The created database in the form of a matrix was subsequently used for various calculations, construction of graphs and cartographic expression of existing transport relations in the monitored area.

The identified spatial differentiation of the direct transport connections of the municipalities with their hierarchically higher district administrative centres raised the question of the adequacy of the interconnection frequency. Is the number of connections adequate, or rather undersized, or vice versa, oversized? To answer this question, we used the methodology applied by M. Horňák et al. (2013) for the analysis of the transport links between the towns of Slovakia. The methodology, based on the theory of interaction models, confronts the real values of interconnection to their calculated theoretical values, which are derived from the size (number of inhabitants) of interconnected municipalities and the distance between them.

For each municipality in the 13 districts (LAU1) the value of the theoretical interaction V_{ij} was calculated, resulting from the relationship:

$$V_{ij} = M_i.M_j/d_{ij},$$

where M_i and M_j represent the masses (population numbers – 2011 census results) of two municipalities (one of which is an administrative centre of LAU1) in mutual interaction, and d_{ij} represents the road distance between them (the internal database of the Institute of Geography, SAS). For each district, the sum of all interactions (number of connections) was then calculated, and for each municipality (except for the district centre), a percentage share was determined for each municipality by the sum of all interactions within the district:

$$T_i = V_{ij}/V_o.100,$$

where T_i is the weighted theoretical value of the interaction between the municipality and its district centre, and V_o represents the sum of all V_{ij} within the given district.

This theoretical value was compared with the real weight of the interaction between the municipality and its district administrative centre. Real interaction is the number of all registered direct connections (bus, rail, or public transport – both-way) between the municipality and its district administrative centre. The real weight of the interaction then represents the percentage that the municipality shares in all interactions within the district, that is, the sum of all direct transport connections within the bounded territory of the district:

$$R_i = S_{ij}/S_o.100,$$

where R_i is the weighted value of real interaction between a given municipality and a district centre, S_{ij} represents the total number of direct connections between a given municipality and a district centre,

and S_o represents the sum of all S_{ij} within that district.

As a result, it was possible for each municipality to determine to what extent the real interactions between municipalities and their district centres correspond to the theoretically predicted values of interactions:

$$X_{RT} = R_i/T_i,$$

where X_{RT} is the ratio between the real and theoretical value of the interaction between the given municipality and its district centre. We can divide the values of the X_{RT} into three groups with the following interpretation (Horňák et al., 2013):

- X_{RT} values of less than 0.75 indicate that real interaction is undersized (there are less direct connections between the municipality and its district centre that would correspond to the theoretical value of the interaction derived from the population of the interconnected municipalities and the distance between them);

- X_{RT} values in the range 0.751 – 1.25 indicate that real interaction corresponds to the theoretical interaction;
- X_{RT} values greater than 1.25 indicate that real interaction is oversized when compared to the theoretical one.

5. Results

The primary results of the research focused on the spatial differentiation of the transport accessibility of the municipalities of the 13 districts (LAU1) of the Prešov administrative region obtained by identifying the number of registered direct transport connections between municipalities and district centres are presented in table 2. Due to the differences in area and population sizes of the compared territories, there are more than 13-fold differences in absolute values (from 388 to 5225). However, a comparison of relative indicators (each of which has a specific informative value)offers better interpretative opportunities.

Tab.2. The relationship between the number of registered direct transport connections and relevant characteristics of studied territories.

District	Area in km²	Number of registered direct transport connections between district's municipalities and district centre (indicator A)	Number of registered direct transport connections / km²(indicator B)	Number of registered direct transport connections / municipality (indicator C)	Number of registered direct transport connections / 100 inhabitants of average size of municipality (except district towns) (indicator D)
Bardejov	936.17	2437	2.60	28.67	5.41
Humenné	754.24	2082	2.76	34.13	7.14
Kežmarok	630.00	1773	2.81	44.33	3.10
Levoča	421.00	864	2.05	27.00	4.61
Medzilaborce	427.25	388	0.91	17.64	7.11
Poprad	1105.38	1578	1.43	56.36	2.99
Prešov	933.68	5225	5.60	58.06	6.23
Sabinov	545.45	1172	2.15	27.90	2.49
Snina	804.74	734	0.91	22.24	4.34
StaráĽubovňa	707.87	1151	1.63	26.77	3.09
Stropkov	388.98	1039	2.67	24.74	10.39
Svidník	549.78	1373	2.50	20.49	6.34
VranovnadTopľou	769.47	2619	3.40	39.09	4.53

Source: own elaboration based on the data obtained from of Štatistický Úrad Slovenskej republiky and *Cestovné Poriadky*.

A different number of inhabitants living in unequally sized municipalities is the basis for understanding the differences in the number of registered direct transport connections per municipality. The indicator C reaches the highest values in the Prešov district (58 connections per municipality) and Poprad district (56 connections per municipality). These district centres meet specific functions in the regional structure of the Prešov administrative region. Prešov is the political, economic and cultural centre of the region, and Poprad, located on the main traffic arteries of Slovakia, fulfils an important transport function. In these two districts, up to 75% of municipalities (Fig. 2) resp. 85% of the population (Fig. 3) has more than 20 direct connections with its district centre. The number of direct connections of the municipality with the district centre above the average (more than 40) has been identified in the Kežmarok district, whose administrative centre does not reach the significance

of Prešov and Poprad. Its character is closer to the middle-sized districts (Bardejov, Humenné, Sabinov, StaráĽubovňa, Vranovnad Topľou), which with the values of 26 to 40 connections per municipality form the most numerous and most characteristic group of the districts of the Prešov region. This group also includes the smaller district of Levoča, whose municipalities benefit from the traffic-geographic position of its centre, which is located on the main transport route between Poprad and Prešov.

In these districts, the share of municipalities with more than 20 direct connections with their district centres ranges from 40 to 60% (Fig.2), and the share of the population with at least 20 available connections to/from the district centre reaches 70-80% (Fig. 3). An exception is the Stará Ľubovňa district (60%), consisting of a smaller number of relatively large municipalities, and thus the existence of several peripherally located municipalities with insufficient
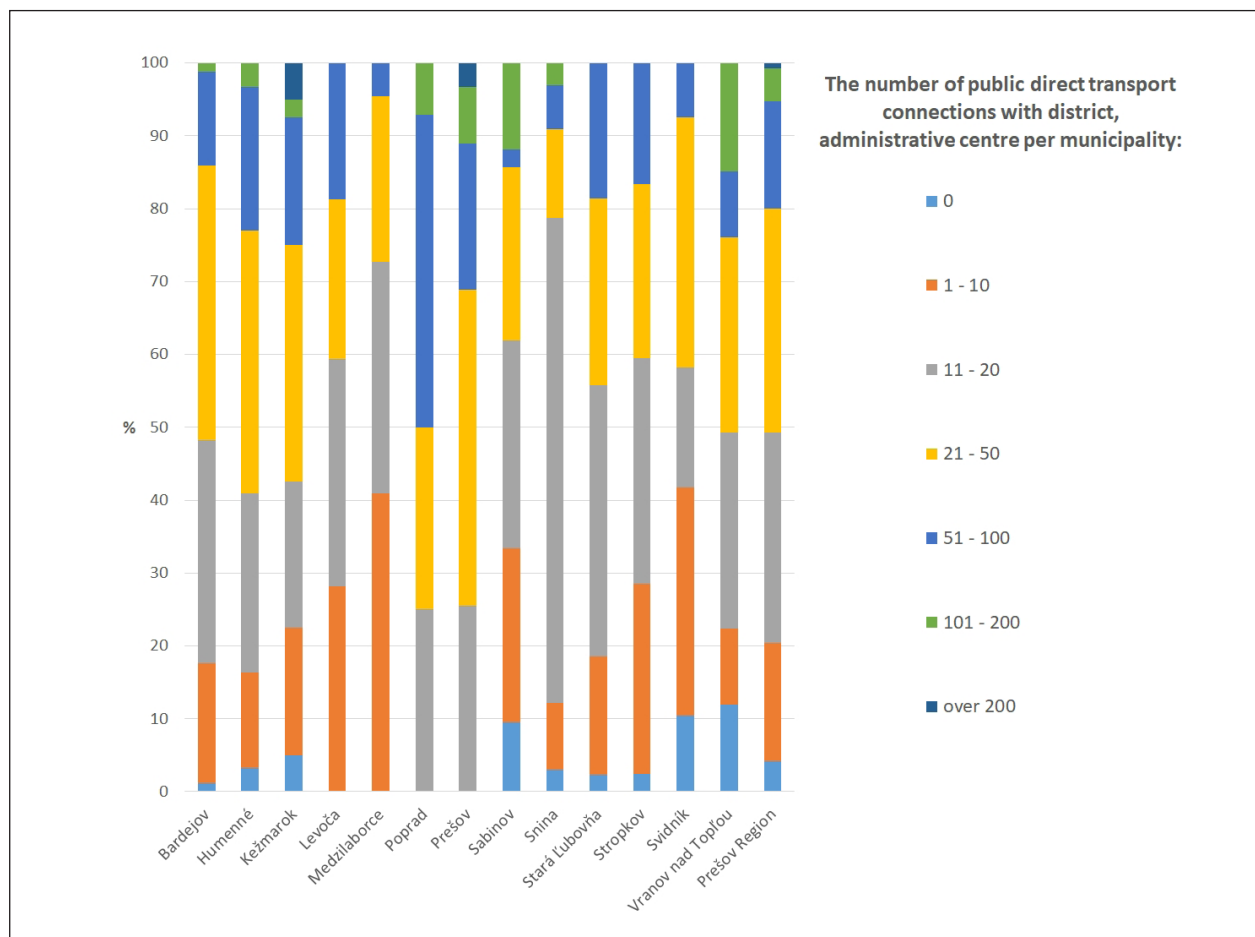

Fig. 2. Shares of municipalities according to the number of direct public transport connections with district (administrative) centre per municipality.

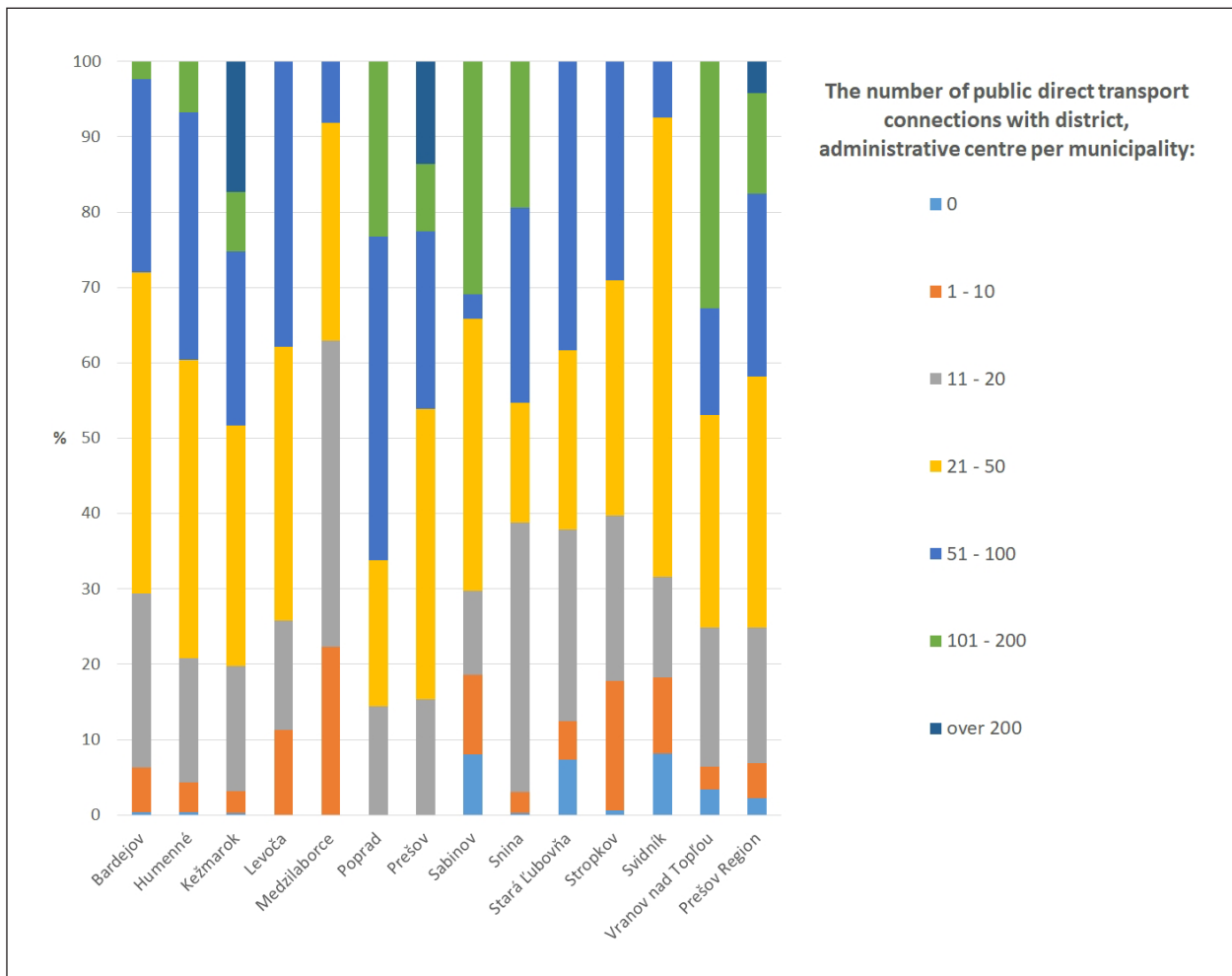Source: Own elaboration based on the data obtained from https://cp.hnonline.sk.

Fig. 3. Shares of the population according to the number of direct public transport connections with district (administrative) centre per municipality.

Source: Own elaboration based on the data obtained from https://cp.hnonline.sk.

transport services significantly reduces the value of this indicator.

The third group consists of districts in which the municipalities have, on average, at least direct connections (up to 25). These are relatively small districts (with a population of up to 40 thousand). All these districts (Snina, Svidník, Stropkov, Medzilaborce) have a similar character. Besides the peripheral location, there is also a significant natural factor. These districts are located in the Eastern Carpathians (the Ondavská vrchovina Upland, the Laborecká vrchovina Upland, the Bukovské vrchy Mts.) and the configuration of the relief limits the possibilities of transport routes. In this group of districts, there are more than 20 direct connections to/from the district centre only in the case of 20 – 40% of municipalities, respectively. 40 – 60% of the population (except the Svidník district (70%), where, in opposition to the above-mentioned district of Stará Ľubovňa, we see the opposite effect of the influence of a relatively large number of municipalities with the small number of inhabitants).

After describing the primary results, the question of the adequacy of the municipality connection to their district centres comes to the centre of our interest. Figure 4 shows the shares of municipalities in districts according to the individual categories of the X_{RT} indicator values. In all districts, municipalities, where real interaction with the district centre is oversized compared to the theoretical value of the interaction clearly dominate. It results from the fact that respecting the public transport as one of the main services of "general economic interest" is the reason why the organization of transport is not always strictly driven by market rules and economic rationality, and it rather complies with the principles of solidarity and equal access for all residents living in studied LAU1 territories. The argument stems from the confrontational finding that in some small and intraperipheral municipalities the theoretical value of the interaction should correspond to a critically small amount or no transport connection to the district centre, but this commonly does not apply in the real transport orga-

nization. The differences between the districts then arise, in particular, from the number of municipalities in the district, which are undersized in terms of real transport interactions. In this respect, the worst situation is in the Medzilaborce district (over 40% of municipalities with an undersized value of real interaction) and Vranov nad Topľou district (about 34%). There is a large group of districts (Sabinov, Svidník, Bardejov, Stará Ľubovňa, Kežmarok and Stropkov), where the number of municipalities with undersized

real interaction ranges between 26 – 28%. The best situation is in the districts of Levoča, Snina, Prešov, Humenné and Poprad (18 – 22%).

The differentiation of transport accessibility results at a LAU1 level is usually very general in terms of the comfort of local residents. Let us therefore now focus on the transport accessibility at the level of municipalities and try to create a different typological classification of LAU1 territories based on the indicator of the number of direct transport connec-
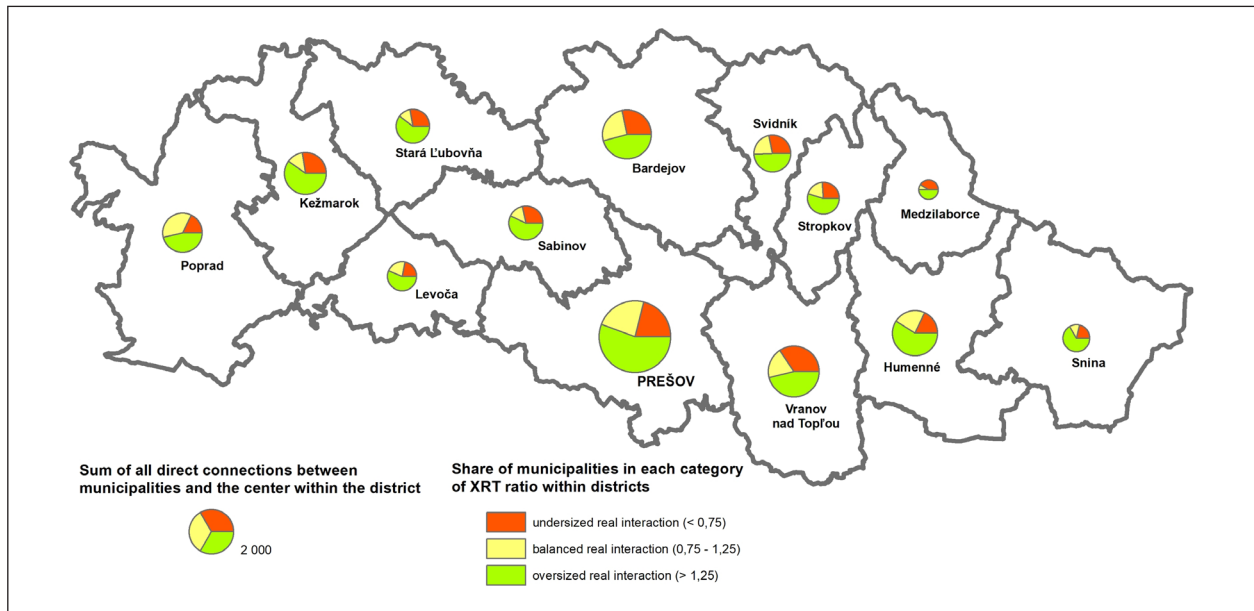

Fig. 4. Shares of municipalities on the territories of LAU1 according to the relationship of the theoretical and real values: direct transport connections between individual rural and urban municipalities and their district´s centres (XRT).

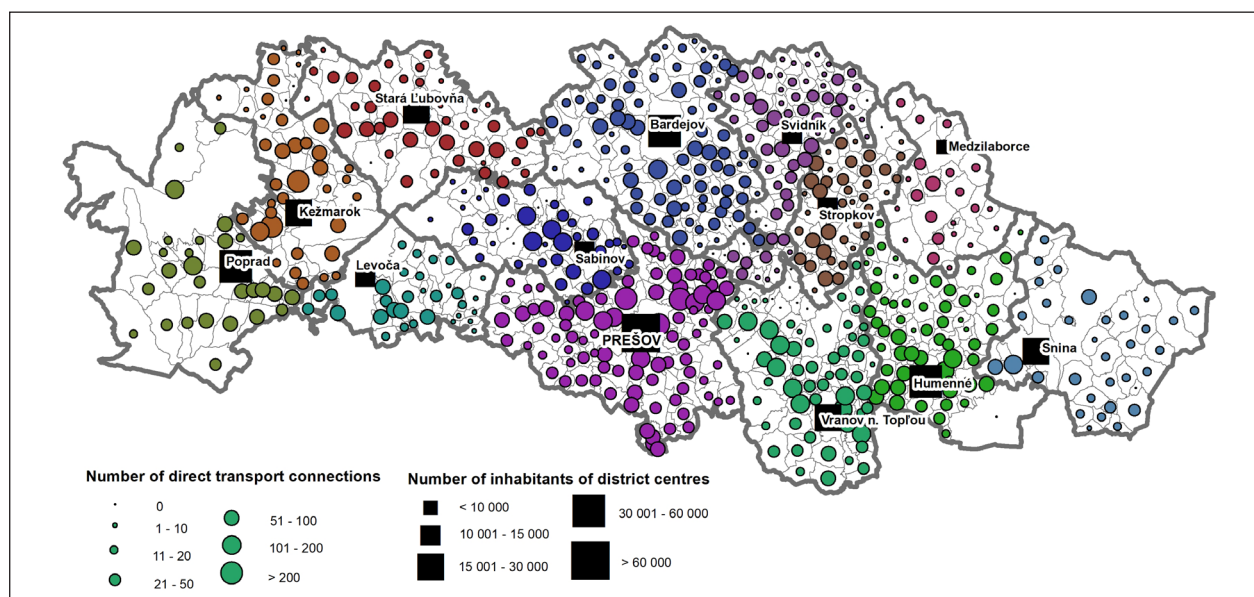Source: Own elaboration based on the data obtained from https://cp.hnonline.sk.

Fig. 5. Number of direct transport connections between individual rural and urban municipalities and their district´s centres.

Source: Own elaboration based on the data obtained from https://cp.hnonline.sk.

tions of individual municipalities with their districts centres. We start from figure 5, which shows in detail the results of the monitoring of direct transport connections on individual district territories.

The character of the Prešov district emerges mainly from the fact that its centre is the centre of the whole administrative region too. Therefore, the transport connections that the significance of which goes beyond the district level are concentrated in the city of Prešov. Several major transport lines are present here, and most of the municipalities benefit from the position on these routes. The peripheral effect is not very pronounced in this district. A similar situation is in the Poprad district, which includes the High Tatras, prominent mountain range and an important centre of tourism. The impact of the attractive mountainous area is manifested by the different settlement structure, a lower number of main transport arteries and, in particular, by the concentration of temporary visitors together with their impact on higher demands for personal transport. As a consequence of this situation, there is a general interest of local governances to strengthen public transport (more frequent connections) in the direction to the district centre as the main crossroad for visiting the High Tatras.

The second type is represented by districts, where one transport artery plays a dominant role, and from which the municipalities located in its vicinity benefit. Municipalities located outside these routes have, in most cases, significantly less direct connections to the district centre. Districts in the area between Poprad and Prešov (Kežmarok, Levoča, Stará Ľubovňa, Sabinov) have such a character. Besides that, the existence of secondary centres, which are also functionally binding municipalities in their immediate surroundings in terms of public transport (Spišská Stará Ves in Kežmarok district, Podolínec in Stará Ľubovňa district, Lipany in Sabinov district, and Spišské Podhradie in Levoča district), play a significant role, too.

The third type is represented by districts that are to some extent interconnected. One group consists of the districts of Bardejov, Svidník and Stropkov. Transport routes and thus the number of connections determine the connection to Prešov as well as the routes between the centres of these districts. The municipalities located in the vicinity of these routes have the most direct connections to their district centres. Less interconnected are municipalities located in peripheral mountainous areas in the north of these districts, and in the south-west of Bardejov district in the Čergov Mts., respectively. In the Svidník district the number of direct connections of some municipalities is also influenced by the eccentric lo-

cation of the town of Giraltovce, which has become a significant interchange node in reaching the more distant district centre.

A similar situation is also observed in the districts of Vranov nad Topľou, and Humenné. Here one of the decisive factors is the existence of the railway line from Prešov, which passes through both district centres. The municipalities located on the railway have more direct connections with their district centres. A more peripheral character can be observed again in the case of municipalities whose cadastral territories reach the mountain ranges (the Slanské vrchy Mts. in the western part of Vranov nad Topľou district, the Laborecká vrchovina Upland in the northern part of the Humenné district). In the district of Vranov nad Topľou, similar to the case of Giraltovce, the presence of the secondary centre – Hanušovce nad Topľou, binding in terms of direct transport connections some municipalities in the northern part of the district, also appears.

The last type is represented by the districts of Snina and Medzilaborce. These are districts with a distinct peripheral position. The municipalities are mostly located in the valleys of individual mountain ranges and therefore not located on major transport routes. An increased number of direct connections could be observed only in the case of municipalities located on the Humenné – Medzilaborce and Humenné – Stakčín railway lines. In the case of the Medzilaborce district, this line of transport, with regard to the location of the district centre, forms the axis of the whole territory. In the district of Snina, the centre is situated asymmetrically, and only a small number of municipalities have access to the railway.

These interesting results have been obtained by comparing the theoretical and real values of direct transport connections between municipalities and their district centres by identifying spatial differentiation based on the X_{RT} index value (Fig. 6). By its application we find that municipalities in the vicinity of district centres are undersized from the view of direct transport connection between them in many cases. This situation follows the principles of the organization of public transport, where the same connection serves municipalities distant from the district's centre as well as the municipalities in their vicinity. Thus more peripheral municipalities have the same (or very similar) number of connections as municipalities with a more favourable geographical location, which is in contradiction to the theoretical assumption of a decrease in the direct connections of individual municipalities with increasing distances from the district's centre.
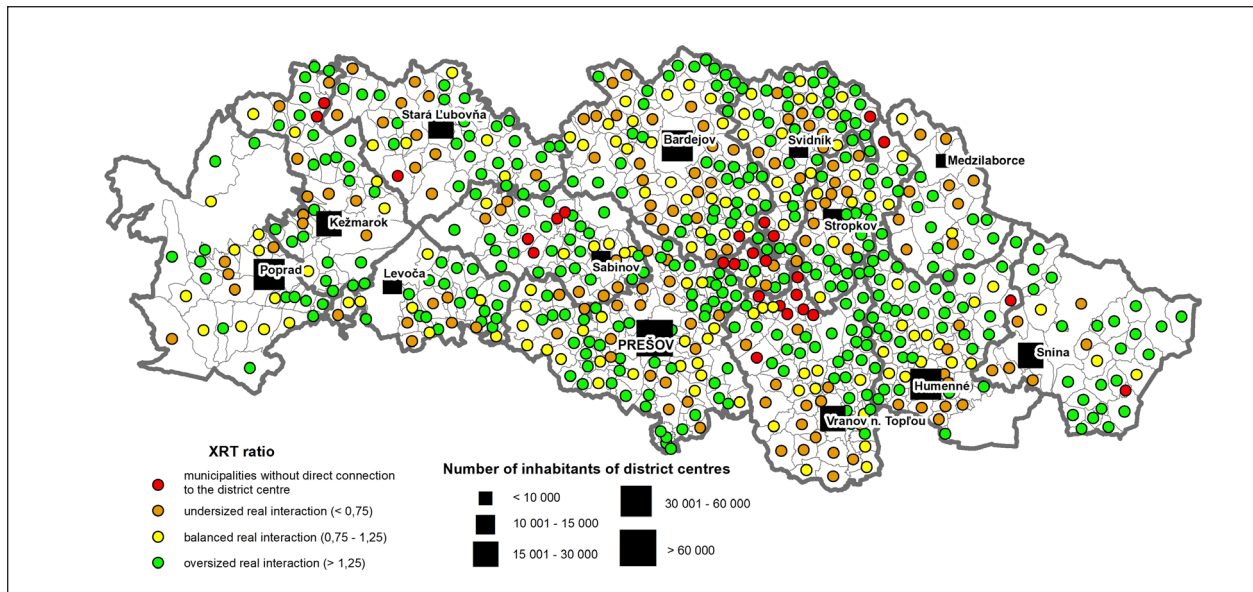
Fig. 6. Public transport adequacy of individual municipalities according to the relationship of the theoretical and real values: direct transport connections between individual rural and urban municipalities and their district´s centres (XRT).

Source: Own elaboration based on the data obtained from https://cp.hnonline.sk.

The results of the research strengthen the concept of public transport as a service of the "general economic interest", which would (in a strictly economic sense) have somewhat favoured smaller and more distant municipalities, irrespective of economic profitability. On the other hand, larger municipalities located near district centres could theoretically be disadvantaged – but this does not mean that the real values of direct connections indicate something like this and public transport is sufficient in such localities, too.

The analysis also points to the existence of several territories which are inadequately interconnected with their district centres because of the fact that several municipalities have no direct connections or amount of connections is undersized. This is most evident in the area between the districts of Bardejov, Svidník, Stropkov and Vranov nad Topľou, i.e. in the vicinity (surroundings) of the secondary transport centres Giraltovce and Hanušovce nad Topľou. This is an area that has undergone several changes in administrative boundaries, and therefore district boundaries apparently fail to respect the natural and historically conditional integration of these municipalities. We have observed a similar situation in the Zamagurie region (at the intersection of the Kežmarok and StaráĽubovňa districts) where several municipalities do not have enough direct connections to their own administrative centres and they are more accessible by public transport with the functionally less important Spišská Stará Ves. The impact of secondary centres within districts is also reflected in the case of

Podolínec (district of the Stará Ľubovňa) and Lipany (district of the Sabinov). Undersized real interactions with the district centres are also observed in some smaller municipalities, located in the peripheral mountainous areas of the Svidník district, the Stropkov district, the Medzilaborce district, the Humenné district and the Snina district. In these cases, direct connections to administrative centres are replaced by connections to the nearest, but from the district transport organization point of view "only" secondary transport node.

6. Discussion

Partial empirical analysis of the regional public transport organization should be briefly confronted with the theoretical background of the studied problem. M. Marada and V. Květoň (2010) point to objective and subjective factors that affect the level of interconnection of individual municipalities by public transport. Objective factors, which are determined mainly by the economic criteria aimed at the efficiency of transport connections, include the demographic size of the municipality and the character of the settlement structure, respectively the geographical locations of the interconnected municipalities in relation to the main transport arteries. Hypothetically, it is assumed that the larger and hierarchically more important municipalityis, and the higher the spatial concentration of settlements, respectively a position identical to the main transport arteryare, the more numerous and more spatially diverse is the existence and fre-

quency of public transport connections. In the case of depopulation trends and the subsequent decline of potential clients in selected territories, or in the case of construction of new, higher-quality transport arteries, by-passing the territory, processes of "circular cumulative causation" (Myrdal, 1957) with a negative impact on the territory have started. The final outcome of their influences is the worsening of the public transport accessibility of the area and a reduction of the quality of life of the inhabitants from the affected territories.

Among the subjective factors, according to M. Marada and V. Květoň (2010), the most important is the behaviour (in the form of financial subsidies) of public (and private) entities that, due to their irreplaceable authority, have the decisive role for the organization (preferred directions and frequency of connections) of public transport. However, their decisions should be based on the knowledge about the existence of (dis)accordance between demand and the supply of public transport, taking into account that the population transport habits and behaviour (choice process between public bus/train transport and individual car transport) do not always reflect economic rationality.

The results of empirical research about spatially differentiated public transport accessibility in the Prešov administrative region are clearly (in the light of applied empirical normative criteria) in coexistence with both theoretical assumptions, and the EU policy which focused on spatial justice and solidarity. With regard to the spatial selective behaviour of the inhabitants, which is based on the possibilities of their spatial mobility (commuting to work and schools) determined by the public transport organization, the results also show the non-rational delimitation of the district boundaries, and respectively, the discrepancy between the functional and the administrative regions.

7. Conclusion

The quantitative analysis of the public transport system within the Prešov administrative region pointed to differences between districts. The number of direct connections between district towns and municipalities of their surroundings is influenced mainly by the size of administrative centres and the relative geographical location of individual districts (in the context of the whole transport system of Slovakia). The analysis of the adequacy of the frequency of the direct public transport connections, resulting from the population size of the district centres and individual municipalities as well as from the distance between them, has shown the relative advantage of the smaller, more peripherally located municipali-

ties. This confirms the indispensable role of public transport as a service of "general economic interest" in terms of the sustainability of the functioning of districts as functional regions.

The importance of public transport in Slovakia has not decreased. Public transport is the subject of many considerations that seek its optimal form (Integrated Transport Models) to provide economically rational care for population mobility. Rational arguments are confronted with the populist views of some politicians, promoting free-of-charge travelling for selected population groups. In 2014, a governmental decision introduced in Slovakia free (zerofare) railway public transport for children, students and pensioners from all EU countries. What impact could this decision have on the transport behaviour of the inhabitants of the Prešov administrative region, as not all district towns are accessible by rail (Székely, Michniak, 2018)? This is one of the questions that hastriggered a whole series of other issues concerned with, in particular, spatial justice and the transport exclusion of part of the population. We investigated the fact that in the Prešov administrative region bus transport plays a decisive role in public transport, providing more than 92% of all direct connections between municipalities and their district centres. The role of the politically preferred railway transport for the satisfaction of the basic transport needs of local people is therefore considerably smaller – in some cases, on the transport routes, which also have a railway line, bus transport dominates. Changes in its regional organization may affect both the growth of local motorization rate as well as new investment projects and/or the current government's declared effort to strengthen social policy in the form of the introduction of thesame free (zero-fare) bus service in selected cases as well.

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