

## **DIRECT INTERNATIONAL PUBLIC TRANSPORT CONNECTIONS OF REGIONAL CENTRES IN SLOVAKIA**

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**Abstract:** Direct international transport connections are mostly established between main population centres and those of economic growth and indicate existence of various relationships (economic, political, and cultural). Numerous connections with many countries point to the strength of individual centres and to some extent, they reflect their competitive position. This article is devoted to the analysis of the position of regional centres in Slovakia (Bratislava, Košice, Prešov, Nitra, Žilina, Banská Bystrica, Trnava and Trenčín) on the basis of direct international public transport connections. Type of connections (train, bus, air and boat connections), intensity (number of connections a week) and the directions of connections (countries, cities) are analysed.

**Key words:** public transport, direct international transport connections, train connections, bus connections, air connections, boat connections, regional centres, competitive position, Slovakia

### **INTRODUCTION**

Research of spatial relations between various spatial units (settlements or regions) is one of the traditional fields of geographical research. It focuses on the movement of population, goods, capital, and information that takes place via transport or communication networks by various transport and communication means. The nature of spatial relationships beyond the boundaries of individual countries is special because the existence and rate of these relationships is significantly influenced by the nature of the particular boundary. In the consequence of globalization and the changing geo-political situation in Europe, the international linkages also change. After 1989, the political situation in Slovakia changed. The fact manifested in change of orientation of foreign trade, entry of foreign investments, development of tourism and increasing commuting abroad, as well as the development of transboundary cooperation in the boundary regions. New economic, social and cultural relationships between Slovakia and other countries are being formed.

International linkages can be classified into four groups according to their nature – economic, social, political, and other (Komornicki 2003), while the individual types are inter-linked. The manifestations of economic linkages are flows of goods and movement of capital, and the manifestations of social linkages are permanent or temporary migrations including tourism. Political are in form of international cooperation of local and regional self-administrations, which also include the cross-boundary cooperation. Other linkages cover the transport connections and interactions by means of information and communication technologies. Massive investments into the development of transport and communication systems support the development of international relationships and cause reduction of distances in the world where mutual dependence of individual places and regions increases.

International transport linkages can be studied from various aspects such as the trans-boundary transport infrastructure, transport of persons and goods or regular international transport connections. This study concentrates on the existing direct international public transport connections that reflect existence of international linkages of various nature. As the direct transport connections are founded as rule between the main settlement centres and those of economic growth, the direct transport connections between regional centres and foreign countries will be dealt with.

Slovakia is divided into eight administrative regions with centres in Bratislava, Košice, Prešov, Nitra, Žilina, Banská Bystrica, Trnava and Trenčín (see Figure 1). These towns are also centres of higher self-administrative units. The first seven of them are the biggest towns of Slovakia and Trenčín ranks ninth in population (following the town Martin). Regional towns are also the biggest commuting centres with at least 10 thousand commuters (Michniak 2005) and the highest number of jobs concentrates in them. Numerous public transport connection with many countries point to the strength (economic and population potential) of individual centres and to some extent they also reflect their competitive position.

The aim of this paper is to analyse the direct public transport connections of eight regional towns in Slovakia with foreign countries (type of transport connections, intensity and directions) and an attempt to identify factors determining spatial arrangement of linkages.



Figure 1. Location of individual regional centres in Slovakia

One of the premises of the research into international connections is the assumed existence of very strong transport linkages with the Czech Republic, which in turn reflect the bonds of the two countries formed before they split in 1993 (commuting to work, schools, family relationships). Intensity of these linkages is still high and so is the intensity of regular direct transport linkages.

Among those geographers who dealt with the direct transport linkages is for instance T. Komornicki (2002, 2003) who studied spatial differentiation of international socio-economic linkages in Poland. D. Seidenglanz (2005, 2006) was involved with direct international connections of Prague and Bratislava. A. Winder et al. (2001) studied transboundary public transport in urbanized areas of Europe in terms of effects of the existing barriers (natural, administrative and cultural) attributable to the frontiers. V. Székely (2004) studied direct transport connections of district towns in Slovakia. M. Halás (2005) dealt with transboundary linkages and cooperation on the example of the Slovak-Czech boundary regions.

## DIRECT INTERNATIONAL PUBLIC TRANSPORT CONNECTIONS

Direct international public transport connections between Slovakia and other countries are realized by means of railway, road, air and water transport. The data used in research of direct international transport connections by public transport (number, intensity and routes) were obtained from bus and railway schedules as of April 2007 ([www.cp.sk](http://www.cp.sk), [www.zsr.sk](http://www.zsr.sk)), the sailing itinerary of companies Slovenská plavba a prístavy, a.s. and Central Danube Region Marketing & Development GmbH, the later operating the connection between Bratislava

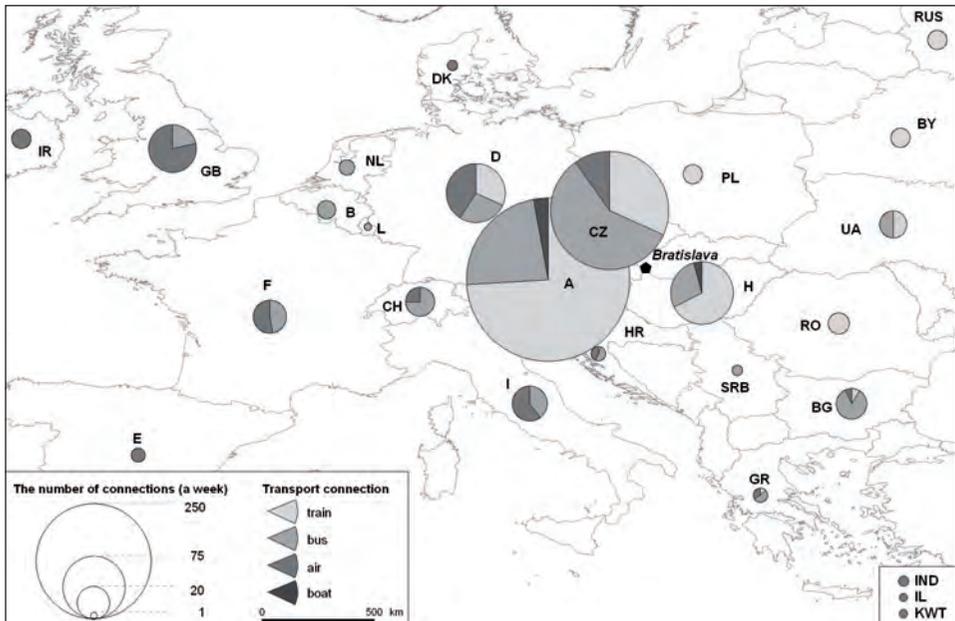


Figure 2. Direct international connections of Bratislava

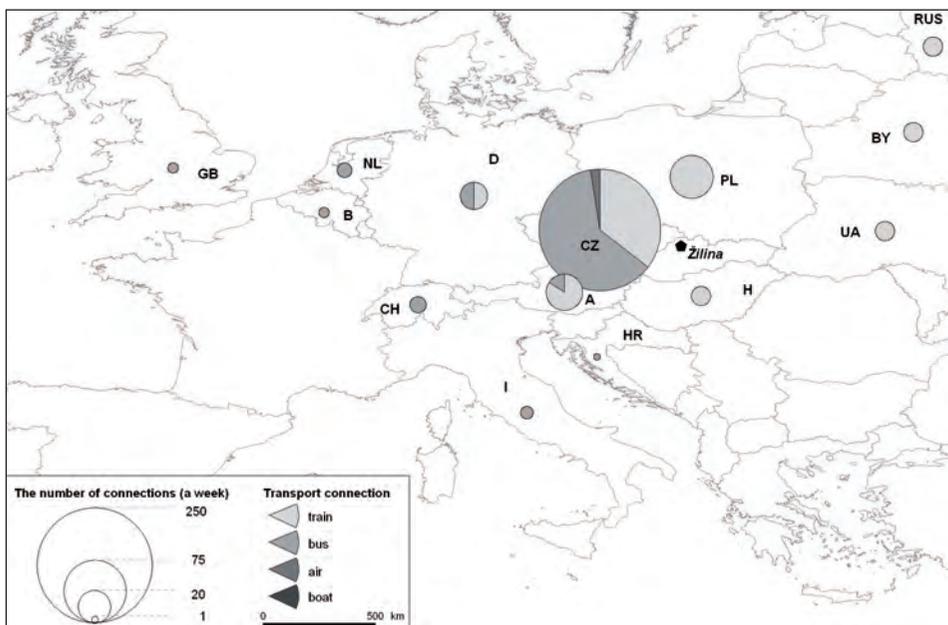


Figure 3. Direct international connections of Žilina

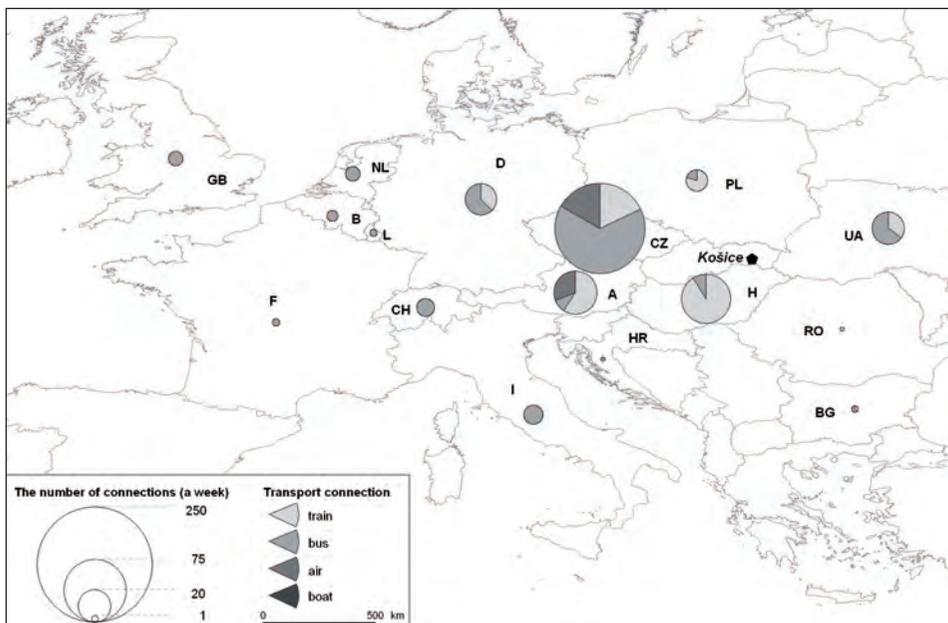


Figure 4. Direct international connections of Košice

and Vienna by boat TWIN CITY LINER, and the flight schedules of the Slovak airports for summer 2007. In case of train connections, the direct carriages to some countries were also taken into account. Two-way connections were considered only. Intensity of connections was

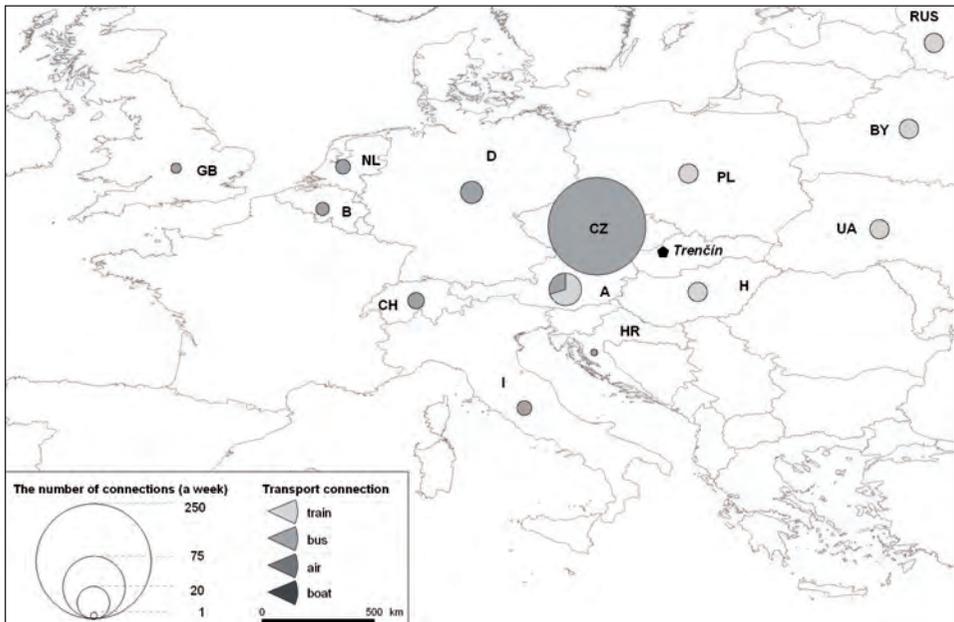


Figure 5. Direct international connections of Trenčín

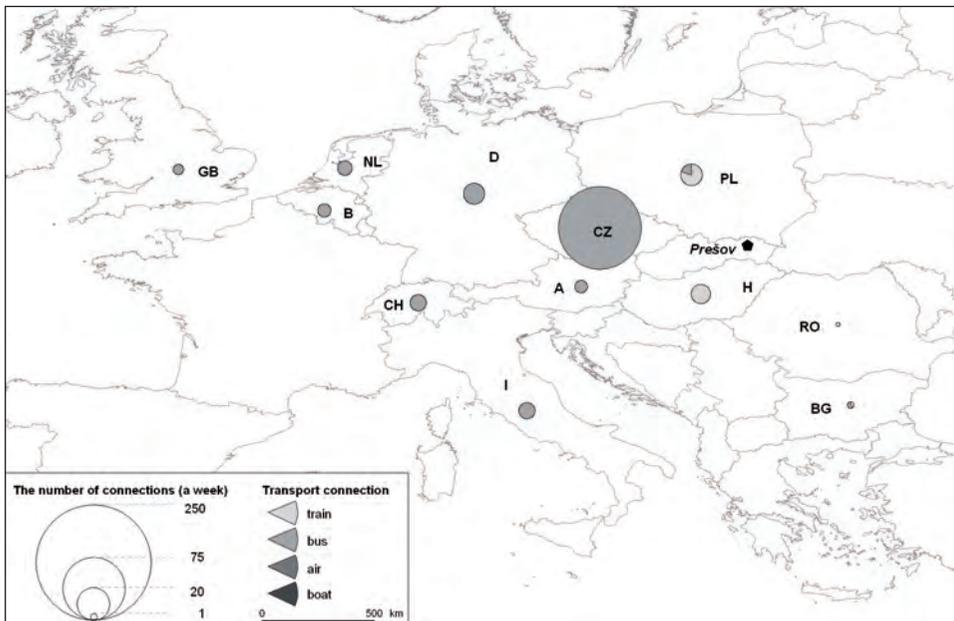


Figure 6. Direct international connections of Prešov

expressed by their number per one week. In case of seasonal connections, their number was recalculated for the period of the whole year (for instance 3 connections a week during four months = 1 connection a week during the whole year).

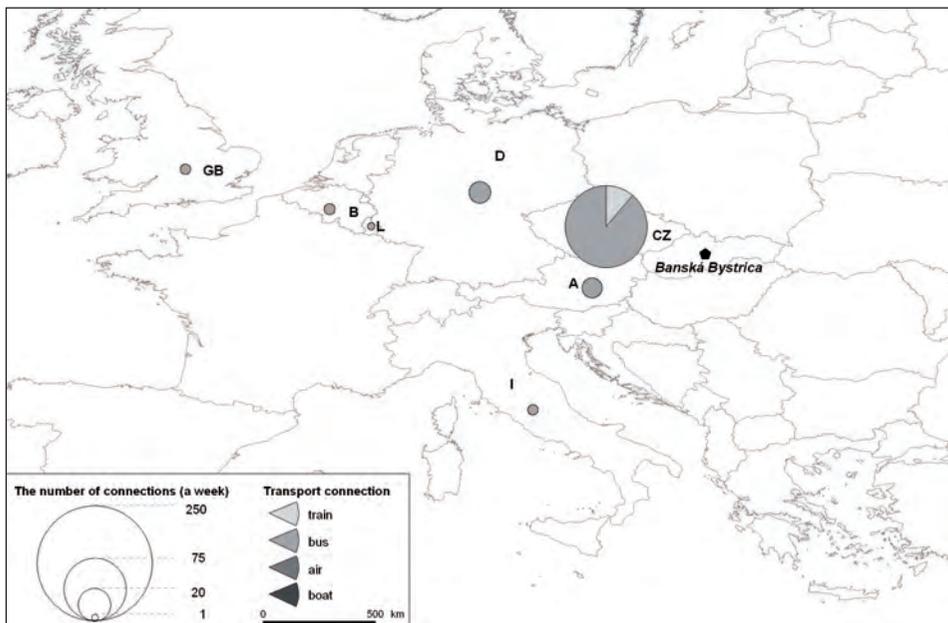


Figure 7. Direct international connections of Banská Bystrica

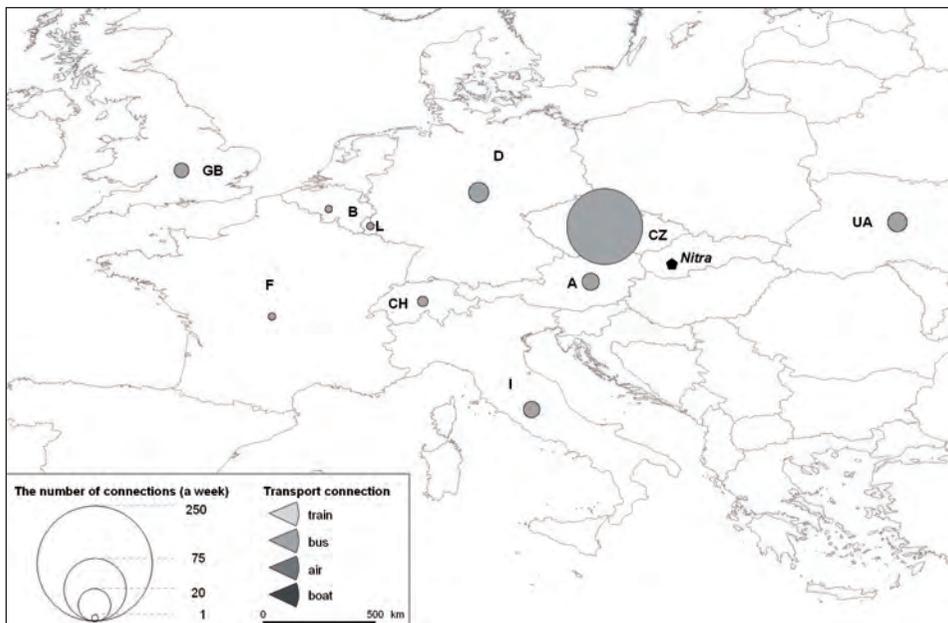


Figure 8. Direct international connections of Nitra

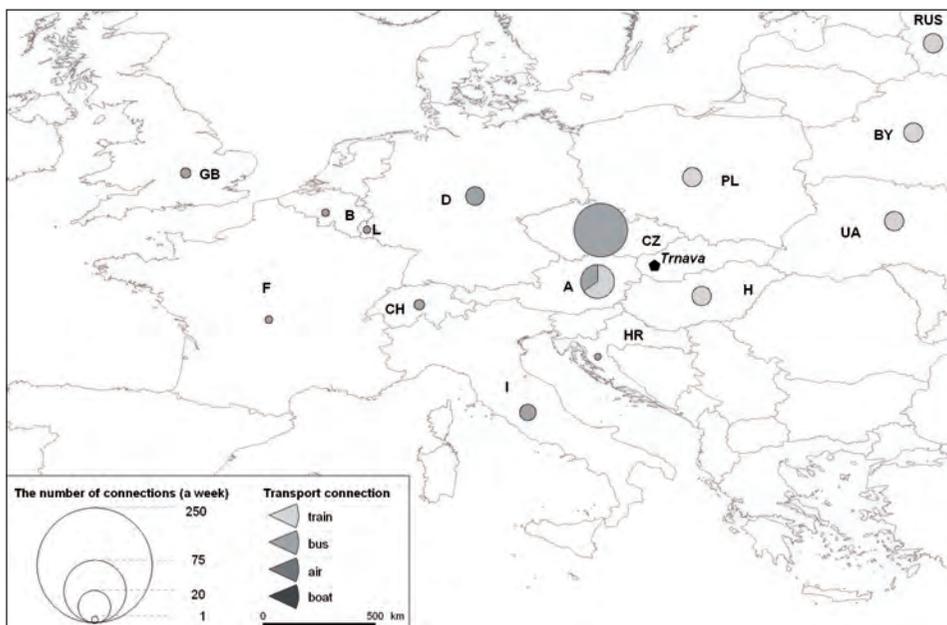


Figure 9. Direct international connections of Trnava

## TRAIN CONNECTIONS

Train connections in international transport are among the most stable ones and greatly depend on the existing transport infrastructure. There are several technical differences in construction of railways of the individual countries (different type of electrification, different security and information systems or different wheel gauge), that constitute barriers in the development of international transport and their harmonization requires large investments. Disadvantage of railway transport is its price, which in many cases exceeds that of bus transport. Therefore, there is an effort to overcome this disadvantage using various discounts compared with prices of international tariff in passenger railway transport. The Slovak railway company ZSSK provides such discounts for journeys to all neighbouring countries. Advantages of railway transport lie in its comfort above all in case of long distance travel. Importance of railway in international transport increases due to the construction of high-speed routes connecting several European countries.

Slovakia is connected with 12 European countries via direct international train connections. Table 1 summarises the number of connections from individual regional administrative centres.

The strongest position in international railway transport among the regional centres has Bratislava and it is the most important railway node in Slovakia. Bratislava was also the first town in Slovakia where the railway transport was introduced. Intensity of direct international connections is high (481 connections a week to 12 countries) and this position is caused by the vicinity of Austrian Vienna as the centre of European significance and also by the fact that Bratislava is part of the Pan-European transport corridors nos. IV and V. There are 375 connections a week between Bratislava and Vienna what represents average 53 two-way connec-

Table 1. Direct international train connections of regional towns (average number of connections a week)

	Bratislava	Trnava	Trenčín	Nitra	Žilina	Banská Bystrica	Prešov	Košice
Austria	375.0	14.0	14.0	-	21.0	-	-	21.0
Bulgaria	1.5	-	-	-	-	-	0.3	0.3
Belarus	7.0	7.0	7.0	-	7.0	-	-	-
Czech Republic	84.2	-	-	-	99.0	14.0	-	28.0
Germany	21.0	-	-	-	7.0	-	-	7.0
Greece	0.5	-	-	-	-	-	-	-
Hungary	50.2	7.0	7.0	-	7.0	-	7.0	42.3
Croatia	0.2	-	-	-	-	-	-	-
Poland	7.0	7.0	7.0	-	35.0	-	7.0	7.0
Romania	8.5	-	-	-	-	-	0.3	0.3
Russia	7.0	7.0	7.0	-	7.0	-	-	-
Ukraine	7.0	7.0	7.0	-	7.0	-	-	7.0

tions a day. In the majority of cases, they are regional trains between Bratislava and Vienna via border crossings Devínska Nová Ves–Marchegg and Petržalka–Kitsee. However, apart from them there are also two trains of the InterCity category on the track Bratislava – Košice. Moreover, there is a project for connection the two neighbouring airports by high-speed railway. Its realisation will mean further increase of connections between Bratislava and Vienna.

As far as intensity of railway connections with Bratislava is concerned, those with the Czech Republic rank second (84 connections a week) on route Bratislava–Břeclav–Brno–Prague, followed by connections with Hungary on routes Bratislava–Štúrovo–Budapest and Bratislava–Rajka–Budapest (50 connections a week) and connections with Germany (21 connections a week). In average, at least one train connection a day exists between Bratislava and Poland, Ukraine, Belarus, Russia, and Romania. Connections with Bulgaria, Greece and Croatia also exist for tourists during summer period.

Apart from Vienna and the settlements on the both routes to Vienna (Marchegg 201, Bruck a. d. Leitha 169, Kittsee 167, Parndorf 153, Gattendorf, Neudorf and Pama 148 each, Gramatneusiedl 133 Schönfeld-Lasse 68, Gänserndorf 63, Siebenbrunn-Leopoldsdorf 56, Oberweiden and Weikendorf both 49 connections a week), Bratislava is well connected by railway with towns in the Czech Republic (Břeclav 84, Brno 49, Prague 42, Kolín and Pardubice 35 Česká Třebová 28, Děčín, Lanžhot and Ústí nad Labem 21 connections), Hungary (Budapest 50, Győr 22, Rajka 22, Hegyeshalom 21 connections) and Germany (Bad Schandau, Dresden both 21 connections).

The second to the most important centre of international railway transport in Slovakia is Žilina (162 international train connections a week to 8 countries) situated on the route of two Pan-European corridors nos. V and VI. Position of Žilina is important above all for railway connections with the Czech Republic (99 a week) and Poland (35 a week) i.e. more than Bratislava. Besides, it also has direct transport connections with Austria (21 a week) and

Hungary, Ukraine, Belarus, Russia and Germany (7 connections a week each). Žilina is best connected with the settlements in the Czech Republic (Hranice na Moravě 59, Horní Lideč 50, Česká Třebová, Český Těšín, Kolín, Olomouc, Ostrava, Pardubice, Prague and Třinec 49 each, Bohumín and Jablunkov – Návsí 42 each, Valašské Meziříčí and Vsetín 33 each Karviná 28, Zábřeh na Moravě 27, Střelná 22, Havířov, Přerov, Studénka and Suchdol nad Odrou 21 each), in Poland (Zwardoń 35, Bielsko-Biala, Czechowice Dziedzice and Żywiec 21 each) and Vienna (21 connections a week). Commuters to work and universities mostly use connections with the Czech Republic.

The third most important regional town in terms of direct train connections with foreign countries is Košice (105 connections a week to 8 countries), best connected with Hungary, Czech Republic and Austria. Besides, Košice is directly connected with Poland, Ukraine, and Germany and in summer with Bulgaria and Romania. Individual settlements best connected with Košice include the Hungarian settlement Hidasnémeti (49 connections a week), situated on the border with Slovakia followed by town Miskolc (35) and other settlements on the track Košice – Miskolc (Forró-Encs, Onga and Szikszó 28 each, Aszaló, Csobád, Halmaj, Hernádszurdok, Ináncs, Méra and Novajidrány 21 each) and some on the extension of the track to Budapest (Füzesabony 28, Nyékládháza, Mezökövesd and Budapest 21 each). There are more than 20 connections a week between Košice and several towns in the Czech Republic (Česká Třebová, Kolín, Olomouc, Pardubice a Prague 28 each and Hranice na Moravě 21).

Direct international railway transport in other regional towns plays only supplementing role. Position of Trenčín and Trnava is similar. Direct railway connections from these towns via 28 international connections a week are to Austria (14 a week) and to Poland, Hungary, Ukraine, Russia and Belarus (7 a week). Banská Bystrica is directly connected only with the Czech Republic (14 connections a week). Prešov is directly connected via 7 railway connections a week with Hungary and Poland (train Krakow – Budapest) and also with Bulgaria and Romania in summer. Nitra has not direct railway connections with foreign countries in the consequence of its situation in the railway network of Slovakia.

The international railway connections of Slovakia with foreign countries are most intensive between Bratislava and Vienna. The remaining railway connections are oriented to the former socialist countries, where the connection with the Czech Republic dominates. The main long-distance route is still the track that connects several capitals of these countries (Berlin – Prague – Budapest – Bucharest). There is no direct railway connection with other western European countries with the exception of Austria and Germany.

## **BUS CONNECTIONS**

The demand for the international bus connections increased in the consequence of increased travel and tourism following the political changes in Europe in 1989. The development of bus connections is also favoured by the European motorway network, which facilitates rapid transport to a great part of the European continent. The advantage of bus transport is the fact that it can serve the greatest number of destinations compared to other transport means. Another advantage of bus transport is its lower price compared to the railway or air transport. Operators of bus lines above all the long-distance ones also try to provide a reasonable comfort (air conditioning, video, refreshments) in competition with the railway transport. Position of bus terminals in the vicinity of town centres is the additional advantage.

Direct international bus lines connect Slovakia with 17 countries of Europe. The most important node of international bus transport is Bratislava with 347 bus connections a week to 16 countries. In difference from train connections where those with Austria prevail, the highest number of Bratislava's international bus connections is with the Czech Republic, particularly to its most important centres Brno (133) and Prague (96). Almost a third of international bus connections heads from Bratislava to Austria and above all to Vienna do (115). These bus lines also provide for connection of Bratislava with Vienna's airport in Schwechat. A comparatively good connection is that of Bratislava with Hungary (Budapest, Győr, Mosonmagyaróvár 21 times a week), Germany (München and Stuttgart 10, Frankfurt am Main and Ulm 9, Augsburg 8), Bulgaria (Sofia 15) and Switzerland (St.Gallen and Zürich 12, Basel, Bern, Geneva and Lausanne 8). There is least one connection a day with Great Britain (London 9), Italy (Udine and Venezia 8), Ukraine (Uzhorod 7) and France (Lille 5, Strasbourg 4). The absenting direct bus connection of Bratislava with Poland is interesting.

Estimating by the number of international connections, the second to the most important regional town is Trenčín (204 connections to 9 countries a week), but almost 9/10 of them head to the Czech Republic (Brno 139, Prague 103). Then the connections to Germany (Frankfurt am Main and Nürnberg 5), Austria (Vienna 6), Switzerland (St.Gallen and Zürich 5), Italy, Netherlands, Belgium and Great Britain follow.

Almost identical situation is that in international bus connections of the regional town Žilina (191 connections to 9 countries a week), with the prevailing connections to the Czech Republic (Brno 108, Prague 98, and Olomouc 57) and other to Germany (Düsseldorf, Frankfurt am Main, Nürnberg 4), Switzerland (St. Gallen and Zürich 5), Austria (Vienna), Netherlands, Italy, Belgium and Great Britain.

Košice follows Žilina as far as the number of international bus connection is concerned (155 connections a week), but Košice rank second by the number of countries it is connected with (15). Approximately  $\frac{2}{3}$  of all connections head to the CR (Prague 93, Brno 90), followed by Ukraine, (13 to Uzhgorod), Germany (11), Italy (7) Switzerland (6), and Hungary, Netherlands, Great Britain (4 each).

Prešov is connected with 10 countries via 151 bus connections. The best bus connection of Prešov is that with the Czech Republic (85 % of all connections) particularly with Prague (90), Brno (79), and Olomouc (38). There is also a good connection with Germany, Switzerland, Italy and Netherlands.

Nitra ranks sixth in the international bus transport (133 connections to 10 countries) while it is the only means of direct connection of the town with other countries. Like in case of other towns, connections with the CR prevail (81 % of all connections) – Brno (100) and Prague (53). There is also a good connection with Germany, Ukraine, Austria, Italy, and Great Britain.

The last by one position in terms of number of international connections corresponds to Banská Bystrica (124 connections with seven countries). Apart from obvious prevalence of connections with the CR (90%), important bus connections of Banská Bystrica are with Germany and Austria. Trnava has the least number of direct international bus connections (only 70 a week to 10 countries). Connections with the CR prevail (77%), followed by those to Austria, Germany and Italy.

Connection with the Czech Republic, particularly Brno and Prague dominates in all bus connections of regional towns with foreign countries. Slovak commuters to work in the Czech

Table 2. Direct international bus connections of regional centres (average number of connections a week)

	Bratislava	Trnava	Trenčín	Nitra	Žilina	Banská Bystrica	Prešov	Košice
Austria	116.4	7.5	6.0	5.5	4.0	7.5	3.0	3.5
Belgium	6.3	1.0	3.3	1.0	2.0	2.3	3.3	2.3
Bulgaria	15.0	-	-	-	-	-	0.5	0.5
Czech Republic	155.0	54.0	181.0	108.0	173.0	112.0	129.0	102.0
Germany	18.0	6.5	9.3	7.5	7.0	8.8	8.3	11.8
France	12.8	1.0		1.0	-	-	-	1.0
Great Britain	9.3	2.0	2.0	4.0	2.0	2.0	2.0	4.0
Greece	2.0	-	-	-	-	-	-	-
Hungary	21.0	-	-	-	-	-	-	4.2
Croatia	2.0	0.8	0.8	-	0.8	-	-	0.3
Switzerland	12.0	2.0	5.0	2.0	5.0	-	5.0	6.0
Italy	9.2	5.0	4.0	5.0	3.0	2.0	5.0	7.0
Luxembourg	1.0	1.0	-	1.0	-	1.0	-	1.0
Netherlands	4.5	-	4.0	-	4.0	-	4.0	4.0
Poland	-	-	-	-	-	-	1.8	1.8
Ukraine	7.0	-	-	7.0	-	-	-	13.0
Serbia	2.0	-	-	-	-	-	-	-

Republic, Germany and UK use bus connections above all; commuters working in Slovakia use connections with Ukraine. Apart from that they also serve to tourists travelling to Italy, Croatia, France and UK (London). Slovakia is connected via bus lines with some places with important airports in Western Europe (Frankfurt am Main, Amsterdam, Munich). In case of some bus lines (to Sofia and Budapest) Bratislava represents the transiting point because they start from Prague.

## AIR CONNECTIONS

The significance of air has increased recently in terms of international passenger transport. The principal advantage of air transport is its velocity which was also corresponded by higher prices in past. But low-cost airlines entered the market a few years ago and compete with low prices above all in form of special offers. Disadvantages of the air transport include the situation of airports on peripheries of cities what requires use of other transport means to reach the city centres. Air transport is highly depending on the existing transport infrastructure – international airports number of which is small compared to bus or railway stations. Air companies, can very quickly respond to changes in demand for the services with either cancelled or newly introduced connections.

Slovakia has six international airports in Bratislava, Košice, Žilina, Poprad, Piešťany and Sliač. Only Piešťany lacks a regular international connection. Only three of regional towns

have air connections with foreign countries.

Position of Bratislava is dominant in air transport having regular air connection with 28 cities in 16 countries, and 143 regular flights a week. The most intensive air connection of Bratislava is with Great Britain with 34 flights including 25 flights to London; 26 flights to Germany (19 flights to Munich a week); 26 flights to Prague in the Czech Republic follow. As far as other countries are concerned, there is an important air connection with Italy (14 to Milan and Rome) France (11 connections to Paris), Ireland (7 connections to Dublin) and Netherlands (7 connections to Amsterdam). During the summer season there is air connection with Greece (Athens and Thesaloniki), Croatia (Dubrovnik and Split), Bulgaria (Bourgas and Varna), with additional destinations in Italy (Catania and Naples), and Spain (Malaga and more flights to Barcelona ). These connections serve above all to Slovak tourists. Overseas connections only comprise Amritsar in India, Tel Aviv in Israel and Kuwait. Regular flights to Amritsar (the spiritual and cultural centre of the Sikh Religion in the Indian state Punjab) are secured by the airlines owned by the British enterpriser of Indian origin. Indians living in Western Europe make use of this link while Bratislava is the transiting point. Flights to India are harmonized with flights from the Western Europe, above all from London, Birmingham, Milan and Köln. The regular connections with Moscow and Brussels were cancelled in 2007 although their reopening is considered again.

Košice has air connection only with Prague (26) and Vienna (11) and air connection to London and Dublin will be opened soon. Žilina is only connected with Prague (7 connections).

Air connections of Slovakia with Poland, Ukraine and Hungary do not exist. Above all connections of Bratislava with Poland and Ukraine would be desirable although these countries are not as attractive for Slovaks as to use the air transport for visiting them. Air connection with these countries is available from the Vienna airport. Connection of Bratislava with this airport is provided for by regular bus links.

## **BOAT TRANSPORT ON THE DANUBE RIVER**

Water transport plays only a supplementing role in the international personal transport in Slovakia. The regular boat transport is seasonal with its peak in summer months and tourists almost exclusively use it. The only international connection is on the river Danube (Pan-European Transport Corridor No. VII) between Bratislava and Vienna and Bratislava and Budapest. Boat connections between Bratislava and Vienna provide two companies by hydrofoil and high-speed catamaran with as many as 31 connections a week in summer. The once-in-a-day line between Bratislava and Budapest operates from mid-April to October. There use to exist a stop in Bratislava of the boat operating between Passau and Budapest but it was cancelled and so was the regular link between Bratislava and the Austrian Hainburg mainly used for advantageous duty-free shopping before accession of Slovakia to the EU. It now only operates as the line for organized groups.

## **CONCLUSIONS**

Regional centres in Slovakia are connected with 26 countries via four types of international public transport connections (train, bus, air and boat connections). International public trans-

port connections depend to large extent on existing transport infrastructure. Except for Bratislava, where the rail connections prevail, in other regional centres bus connections prevail. Nitra is connected with other countries only by bus transport. International air connections are possible mainly from the Bratislava airport (28 destination, 16 countries) and airports in regional centres Košice and Žilina. International boat connections in Slovakia exist only between Bratislava and Vienna, and Bratislava and Budapest and their function is only complementary especially for tourists.

Bratislava with 992 connections to other countries a week has a dominant position in the international public transport in Slovakia, which is caused by its size, function and geographical location. Bratislava has the strongest connection with Austria and its capital – Vienna (in average 61 connections daily), which is located in the 60 km distance from Bratislava.

Compared to other regional towns, Bratislava is best connected with 20 countries. Only from Bratislava is a possible public transport connection to six countries. Merely in case of three countries, other regional towns are in the best position. Position of Žilina is the best in connections to the Czech Republic and Poland and Košice is best for connections to Ukraine.

According to the intensity of international direct public transport connections, Žilina (359 connections a week), Košice (297), Trenčín (232), Prešov (158), Banská Bystrica (138) and Nitra (133) follow Bratislava. On the other side, Trnava (98) has the weakest position. The remaining regional centres are best connected with the Czech Republic and its largest centres Prague and Brno. The transport links with the Czech Republic service commuters to work and universities, and people who have social contacts with inhabitants of the Czech Republic (many of them are from the period of the common state before splitting in 1993). Within the international public transport, connections to Hungary, Germany, Poland and Great Britain also play an important role. Connections to Germany and UK serve also for the purpose of work migration.

Direct international transport connections reflect the wide spectrum of mutual relationships between Slovakia and other countries (economic, political, cultural). Position of individual regional centres also depends on population size of regional centres, quality of transport infrastructure and geographical location. All mentioned factors contribute to the best position of Bratislava. Žilina with its favourable location in the north-western part of Slovakia ranks second. As the international transport (bus) connections are mostly oriented to the Czech Republic and the EU countries situated west of Slovakia, position of Bratislava Trenčín, Žilina and Nitra lying on important transport routes leading from easterly areas of Slovakia is advantageous from the point of view of international public transport connections.

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