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# INTERNATIONAL PASSENGER RAILWAY COMMUNICATION IN UKRAINE

**Abstract.** The longer the distance that separates Ukraine from a state – object of international passenger communication, the higher is the administrative rank of the city-terminus of this communication. In 2007, 139 international passenger trains and 76 direct carriages ran through the country. Owing to the effect of historical inertia, Ukrainian cities are predominantly connected by international passenger service with Russian cities, especially with Moscow.

**Key words:** international passenger railway communication of Ukraine, metropolization, polarization, geo-economy, geopolitics, geo-history.

## INTRODUCTION

Railway transport is the most stable in time and space among all kinds of transport because its functioning expensive transport infrastructure – railway equipment and rolling stock – is needed. It is the most inertial kind of international passenger service, for it requires not only coordination of train routes between two countries, but also the proper state of the entire necessary transport infrastructure. On the contrary, air and bus traffic do not need substantial funding, they are more mobile as far as the choice of the route is concerned unlike railway carriages, the coursing of which is strictly determined. That is why many present-day routes are the “relics” of earlier relations, formed in the preceding periods of the railway network’s development.

## STATISTICS

The research is based on public data on station-by-station traffic of international

passenger railway trains and through carriages available on the official website of AS *Ukrzaliznytsia* <http://www.uz.gov.ua> as of 10.01.2007. The author analyses international passenger trains and through carriages running according to winter schedule exclusively, and does not discuss temporary or summer passenger trains and carriages, with the exception of the characteristic of transit trains and through carriages traffic.

## THEORY AND METHODOLOGY OF RESEARCH

International passenger railway traffic is subjected to regulation within the framework of the state’s foreign policy and is also determined by political, economic, and social processes. Thus, it carries out the following functions: symbolic (the expediency of foreign relations development for the policy of the country), economic (the participation in foreign trade of the countries, particularly between the regions, in which the terminal stations of the international passenger trains and through carriages are located) and socio-communicative (the presence of such kind of communication makes possible stable international personal relations and international migration).

Alternative kinds of passenger international communication – motor and air traffic – possess both certain advantages (the speedier movement in space and time) and significant drawbacks (bigger fees, less comfort, notable restrictions in the parameters and weight of the luggage etc.). However the speed of trains is essential and it depends not only on the technical state of the rolling stock and station and railway equipment, but also on the time spent on

passport and customs control at the check points on the state border.

The *border effect* is an important factor restraining railway communication. Substantial differences in customs and technical documentation of various countries result in drastic cut in the trade between them [Kunth, 2002, p. 23]. The more strained are political and economic relations between the neighboring countries, the more expressed will the border effect be. It is the consequence of the *neighborhood effect* – with the expansion of distance between certain points, the interaction between them declines. The effect of historical inertia largely impacts the manifestation of the neighborhood effect in socio-economic relations – long-term unidirectional use of industrial objects and objects of infrastructure, determined by the need to recover of the capital spent on them [Blij&Muller, 2004, p. 272]. Capital-intensive railway construction is one of the good examples of the effect's manifestation. Thus, notwithstanding the formation of new states and the emergence and/or change of state border lines, many of the earlier train routes are still functioning.

The crossing by international passenger trains of several state borders testifies, in our opinion, to the fact of existence of strong ties between the cities-terminuses and their affected areas in different countries. To a great extent it is determined by the concentration of human and economic potential predominantly in the main cities of the country (*metropolis effect*) [Benko, 1999, p. 128], which mainly are the terminal stations of the international passenger trains' courses.

The *capital city effect* has a similar mechanism of spatial manifestation, implying the prevalence of centripetal movement towards a capital, which forms economic and political space on the subordinated territory. It is based on the centralized structure of state power. No wonder that this effect manifests itself vividly in the most

centralized countries (such were the Russian Empire and the USSR), where the bulk of the issues is dealt with in the capital. The latter had the evident prerogative to carry out international communication; besides, it sanctioned, in the case of impossibility of direct communication, the alternative functioning of separate privileged centers on the periphery of the state. This led to the emergence of a radial railway network spreading from the capital of the big state to its outskirts (*theoretical model* *toile de Legrand*) [Guigou, 1993, p. 16–20].

Among the peripheral regions of such a state, littoral southern outskirts play the most important part, as a result of *SSS<sup>1</sup> effect* (the concentration of population and economy in the regions with favorable climatic conditions) [Brunet, 1990, p. 19]. Direct railway routes are laid to connect such regions with the central regions in order to satisfy the need of the latter's (and mainly the capital's) inhabitants in sea-side holidays during summer time and also for carrying out of maritime trade.

The traffic of foreign passengers and cargo within the framework of international cooperation has a positive impact on the economic development of a certain territory in case when there is economic interaction between the administrative bodies of the states, through the territory of which traffic flows pass, and not only run through (*tunnel effect*). In the latter case one can view such trains as transit only. In this case railway lines have no significant economic impact on the territory they run through, as they serve for connecting metropolises only. The combination of tunnel effect with the metropolis effect leads to *Morvan's effect* – the emergence of a poorly developed, in the economic sense, territory, which lies between the peripheral regions of the adjoining economic centers [Brunet, 1993, pp. 121–122].

Official schedule of international passenger trains and through carriages has been systematized by railroad hauls. Then we counted the number and frequency of the

runs per week (the intensity of traffic) by each of the hauls and by railway stations.

We have singled out such types of international passenger trains and direct carriages passing through Ukraine:

- 1) passing – connecting the localities of one state and passing without stops the territory of another state;
- 2) transit – connecting the localities of different states and making stops on the territory of the third country;
- 3) of internal makeup – with one of the terminal stations in the territory of Ukraine, and the other – on the territory of another state.

In order to understand the importance of international passenger railway communication for the regions of a country, one should single out the cities, which are the terminal stations of the routes of such kinds of trains, especially in the main metropolises of the state. It will let us determine transport accessibility of these cities in the system of international relations, which facilitates their competitive advantages.

#### GENERAL TENDENCIES OF RAILWAY TRANSPORT DEVELOPMENT IN UKRAINE

Railway communication in the CIS countries is strategically important for national economies. The exploitation of one of the biggest in the world network of stations and tracks together with rolling stock, inherited by Ukraine after the break down of the USSR [Railway Statistics – Synopsis, 2009] allowed the country to increase annually the volumes of export and transit rail-freight traffic. To a large extent the fact can be explained by favorable economic situation on export markets of raw materials and prefabricated products of the CIS countries, by which the rail-freight of the country is mainly represented.

Ukraine does not fully exploit its existing potential in international passenger railway

communication, although through its territory six out of thirteen RCO railway corridors and three out of ten European transport railway corridors pass. Maximum concentration of the railway network in two diametrically located border regions, Donetsk and Lviv – respectively, 60.2 and 58.8 km per 1000 km<sup>2</sup> [Statistical yearbook of Ukraine 2009, 2010, p. 236] – is an important factor facilitating the development of international passenger transit in Ukraine.

Ukraine remains one of the world leaders in regard to the development of railway network and the volumes of passenger and cargo rail-freight traffic [Railway Statistics – Synopsis, 2009]. Nevertheless, such factors hinder further growth: depreciation of the branch's fixed assets, reduction of the operational length of public service railway tracks, and full use of the trunks' carrying capacity [Russian-Ukrainian borderland..., 2009, pp. 145–147].

High level of amortization of the exploited rolling stock inhibits the return to the pre-crisis volumes of passenger and cargo rail-freight traffic. As E.A. Petrenko notes, “by the beginning of 2010, the operating life of 83 per cent of passenger carriages, 71 per cent of freight stock, 89 per cent of main-line electric locomotives, and 92 per cent of diesel locomotives was over” in Ukraine [Petrenko, 2010, p. 53]. That is why the fleet of passenger carriages is constantly decreasing. If in 2000, 9.0 ths of passenger carriages had been exploited [Statistical yearbook of Ukraine 2007, 2008], in 2009, only 7.3 ths of them were in use, the average operating age of which constituted 26.8 years [Serhienko, 2010, pp. 39–40]. This data allow us to state that without high investments into rolling stock (in 2009 only four locomotives were purchased! [Petrenko, 2010, p. 53]), further development and normal functioning of the county's railway transport is impossible.

The present-day state of the railway transport in Ukraine directly affects its volumes of passenger traffic, internal as well as international. That is why the Ukrainian railway transport carried 426 bln people

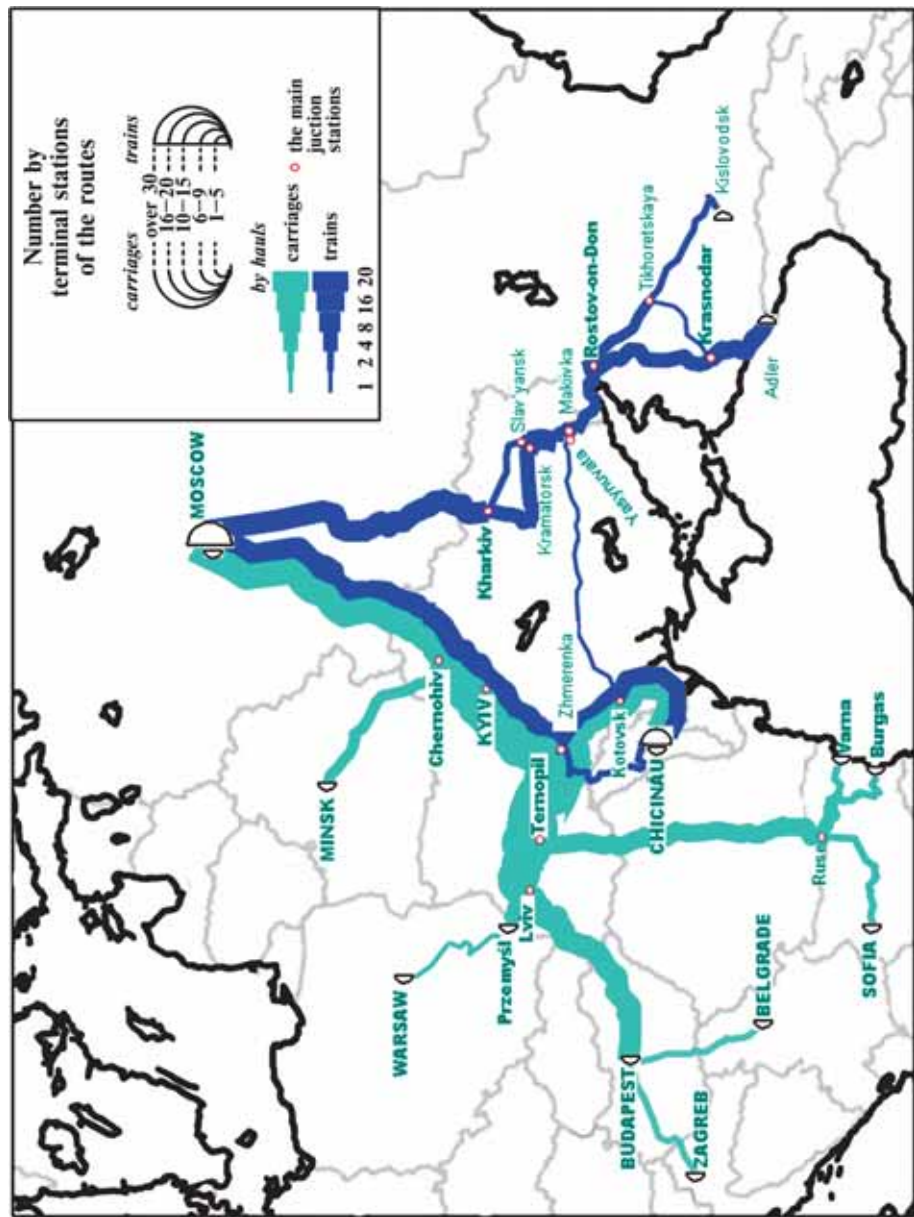


Fig. 1. Traffic of transit international passenger railway trains and direct carriages, passing through the territory of Ukraine (as of 01.01.2007)

in 2009, which only slightly exceeds the figure of 1971 (419 bln people) [Year book statistics of Ukraine 2009, 2010, p. 236; National economy of the Ukrainian SSR in 1974, 1975, p. 347]. However, the share of railway transport in long-distance passenger transportation increased during the period of Ukraine's independence from 27.5 to 47.7 per cent (calculated by [Statistical yearbook of Ukraine 2009, 2010, p. 236]). Thus, there are good reasons to say that international passenger railway communication is one of the main economic profiles of AS *Ukrzaliznytsia*. Since the end of the 1990s, railway transport of the country "makes up about 60 per cent of its freight turn-over due to (export, import, and transit) cargo traffic in direct and mixed communication" [Rail transport of Ukraine and Russia..., 2008, p. 7]. Over the period of 2000–2009, the cost of export of railway passenger service increased 4.4 times and freight transportation cost grew 2.2 times (calculated by [Dynamics of export-import services (2005–2009); Official average exchange rate of hryvnya; Rail transport of Ukraine and Russia..., 2008, pp. 43, 173]). Stable growth of these indices, together with the increase of the rate of long-distance passenger transportation, allows us to state that AS *Ukrzaliznytsia* is an export-oriented company.

Export of international passenger services in 2009 brought 280.56 bln USD (calculated by [Dynamics of export-import services (2005–2009); Rail transport of Ukraine and Russia..., 2008, pp. 43, 173]), i.e., 41.80 per cent of the total benefit gained by all kinds of passenger traffic by the Ukrainian railways (calculated by [Dynamic of export-import services (2005–2009); Official average exchange rate for UAH]).

Transit railway international communication of Ukraine is directed predominantly westward and crosses the bigger part of the country's territory. Trains mainly proceed from Russia to the countries of Central and Eastern Europe. Thus, about  $\frac{1}{3}$  of all transit freight and passengers is carried by Southwestern Railways (calculated by [Rail transport of Ukraine and Russia: development tendencies and reformation issues, 2008, pp. 162, 164].

It operates on the busiest, in terms of transit, international communication railway line of the country – Moscow–Kyiv–Zhmerynka (Fig. 1).

In 2007, 139 international passenger trains and 76 direct carriages ran through the country. Most of them were trains (89.3 per cent) and direct carriages (60.0 per cent of the total) of *internal make up*. This is precisely why we paid so much attention to them in our research.

## TYPES OF PASSENGER RAILWAY COMMUNICATION OF UKRAINE

Transit passenger trains and direct carriages cross the territory of Milovskyi raion of Luhanska oblast of Ukraine along one of the busiest trunk railways *RZhD* Moscow–Rostov-on-Don. They do not pass customs and border control in Ukraine and that is why we excluded them from the object of our research. These trains and direct carriages do not stop on the territory of Ukraine, which leads to the manifestation of the *Morvan's effect* in the regions owing to the fact that the local population and the economy are not involved into provision of services for railway communication.

The launch of one of the speedy trains on this part of the Southeastern Railway of *RZhD* on the route Moscow–Ryazan–Michurinsk–Voronezh–Likhaya–Rostov (Mineralnye Vody, Tuapse) [Coordination of rail transport..., 2002, p. 46] will reinforce its barrier function. If protective structures are built along the roadway, the latter turns into a delimitative line with strictly determined crossing points (*the border effect*). Thus, speedy railway traffic will increase the rate of transport isolation of Milovskyi raion of Luhanska oblast from the adjacent territories of the neighboring countries (*tunnel effect*). We should not forget about the discomfort caused by drastic increase of noise and light disturbances in the area along the roadway, which would lead to the emergence of "lifeless desert" on both sides of the speedy railway track, where the presence of humans and animals is minimal.

Transit international passenger trains and direct carriages, passing through the territory

of Ukraine, beyond its limits connect only the cities of Russia and Moldova (Fig. 1). Except for train No120 Adler–Chişinău<sup>2</sup>, the rest of the trains run back and forth. Altogether in 2007, four terminal stations of transit international passenger trains existed (Fig. 1). Such trains mainly run in summer (e.g., No24C Adler–Moscow and No27C Kislovodsk–Moscow), and that is ineffective use of the Ukrainian transit potential. They cross the country along its main busy trunk railways. All regional railways of AS *Ukrzaliznytsia* provide services to them (Fig. 1).

Transit international passenger direct carriages, passing through the territory of Ukraine, connected ten cities of eight states in 2007 (Fig. 1). With the exception of Burgas, Varna (Bulgaria), and Przemyśl (Poland), all the cities are the terminuses of the given type of carriages, which, in our opinion, points to the decisive role of the *capital effect* in their functioning. The makeup of direct carriages for the directions Moscow–Budapest–Belgrade/Zagreb and Moscow–Bucharest/Sofia instead of earlier regular train routes can be viewed as a geopolitical “relic” of the Soviet bloc times (see Fig. 1). In 2009–2010, such carriages had been launched from Moscow to such cities as Bar (Montenegro), Thessaloniki (Greece), and Venice (Italy). All of them run exclusively in summer, serving recreational needs of Russians (*SSS-effect*). Part of transit international passenger trains and direct carriages crosses the Carpathians. “For the Ukrainian railway transit, the one-gauge tunnel of Beskids, built as early as in 1886 in the times of Austro-Hungarian rule, is a sore spot. The issue of this tunnel’s exploitation had arisen long time ago, however *Ukrzaliznytsia* declared the start of drafting of its reconstruction only in June of 2000», planning to attract the loan of EBRD amounting to 40 bln USD for the implementation of the project [Petrenko, 2010, p. 60].

In our opinion, transit international passenger trains and direct carriages served, in the times of the Russian Empire and the USSR, the needs of the inhabitants of predominantly the capital of the state in sea-

side recreation (*SSS effect*). This is precisely why they are oriented from north to south, whereas transit international passenger direct carriages, made up beyond the limits of Ukraine, with the exception of route No51 Chişinău–Warsaw, run in the direction east – west. This policy of the railway routes makeup is a direct consequence of tsarist and the Soviet geopolitics, based on *étoile de Legrand* principle.

International railway passenger trains of internal makeup. Terminal stations of such trains’ routes within the limits of Ukraine (Fig. 2, 3) are concentrated in 20 cities, 15 of them are the capitals of administrative and territorial units of Ukraine of the first level. Consequently, the population of the larger part of the country’s territory can employ their services. With the exception of such important junction stations as Zhmerynka and Kovel, and also the resort of Berdiansk, all terminuses of international railway passenger trains of internal makeup are in the centers of interregional systems of settlement of Ukraine (*metropolis effect*).

Pronounced *macrocephaly* of Kyiv, where 30 international railway passenger trains of internal makeup are made up, is leading. Regional metropolises of the country follow the state capital in regard to this factor (Fig. 2). Such distinct hierarchy of terminal stations placement in certain cities allows us to suggest that it has been formed in accordance with the provisions of Central Place Theory. However, only four cities of the country are the terminal stations of the international railway passenger trains of internal makeup, which run westwards, whereas such trains run eastwards from 20 cities of the country (Fig. 2, 3).

Clear East – West asymmetry in the territorial structure of the international railway passenger communication of internal makeup was inherited by Ukraine from the USSR, where the connections with foreign countries had been limited and were regulated from the capital.



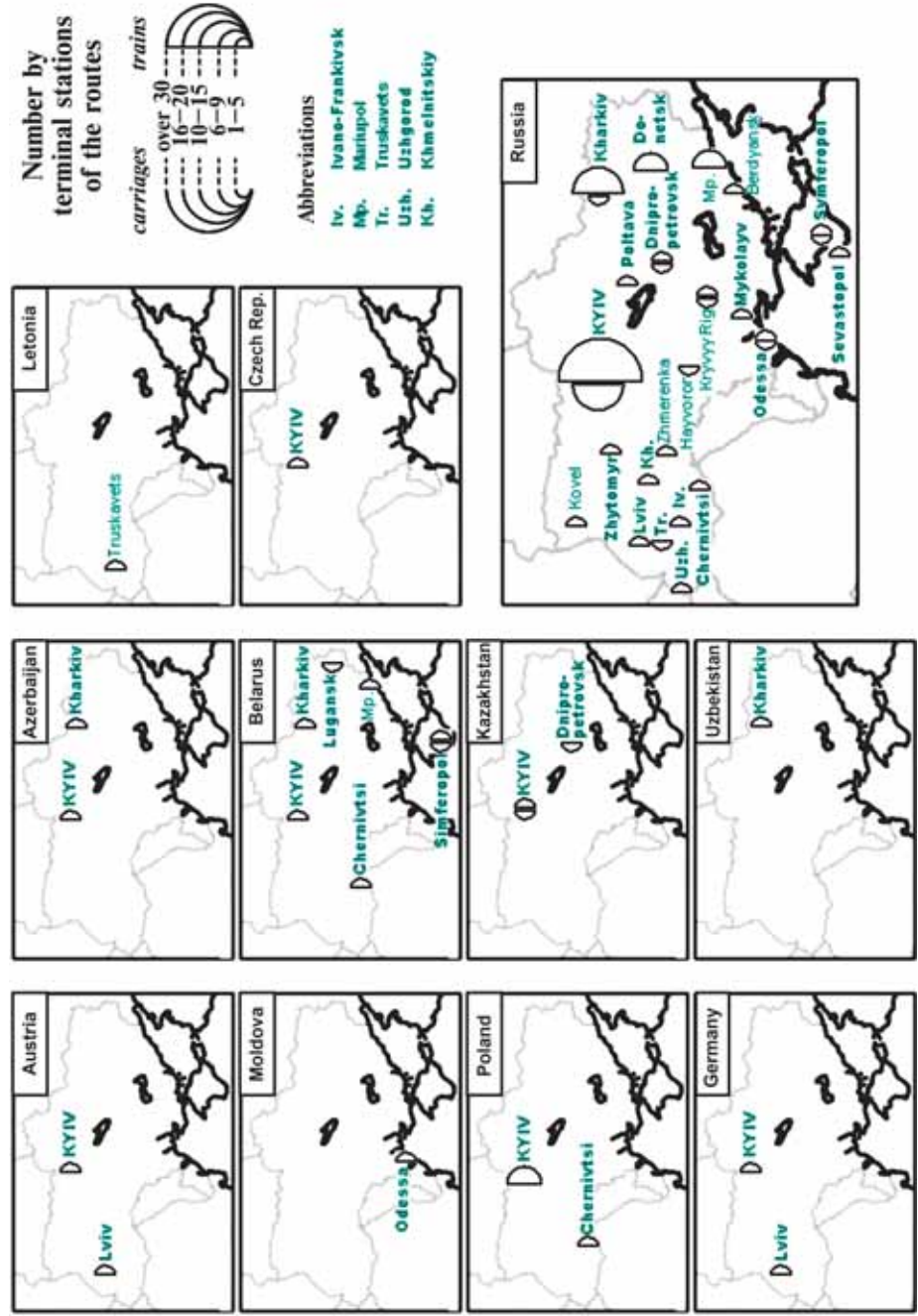


Fig. 2. Distribution by country of international passenger railway trains and direct carriages of internal makeup (as of 01.01.2007)

The dominance of the *eastward direction* international railway passenger trains of internal makeup (90 trains from 20 cities), in our opinion, is the result of the *historical inertia effect*. The existing distribution of terminal stations of international railway passenger trains of internal makeup, to a big measure, is the consequence of historical development of railway network before the WWI and partially in the period in-between the two World Wars. Here owing to the *capital effect*, by a finger's breadth lead two cities: the present-day capital of the state Kyiv (22) and Kharkiv, the capital of the Ukrainian SSR from 1918 till 1933 (19 trains). Then, predominantly the cities of the east of Ukraine follow (Fig. 2).

The analysis of the traffic of international railway passenger trains and direct carriages of internal makeup proved that eastern direction is predominant. 58.1 per cent (2007) and 51.5 per cent (2000) of their total number (calculated according to [Transport and communication of Ukraine – 2007. Statistical Proceedings, 2008, p. 167]) crossed the state land border of Ukraine with Russia. By the number of trains of internal makeup (Fig. 3), precisely this direction dominates in the international passenger railway communication of Ukraine. Inherited strategies of the unified big transcontinental railway system's formation with its center in Moscow explain the prevalence of the cities–terminuses of such trains to Russia in the present-day railway communication of Ukraine running in the eastern direction and the presence of continuous communication of this type with its ultimate biggest junction stations: Baku, Vladivostok, and Tashkent (Fig. 3).

All the cities–terminuses of the above mentioned trains in the eastern direction are the administrative centers of administrative and territorial units of the first level (with the exception of Adler and Kislovodsk in Russia, which, in our opinion, is predetermined by their status of recreation zones of the interstate significance).

63.2 per cent of the cities–terminuses of the routes of international passenger trains with one of the terminal stations located in Ukraine, are situated in Russia. Under the influence of *the historical inertia effect*, all the metropolises – the interregional centers of settlement of Ukraine – have international passenger communications predominantly with the cities in Russia. The strongest of the existing ties are with Moscow. The formation of the present-day railway network on the territory of the CIS countries in the times of the Russian Empire and the USSR explains pronounced dominance of the capitals of the aforementioned states – Moscow (37) and Saint Petersburg (11 of such trains) in the distribution of the international passenger communication in Ukraine in the eastern direction. As Fig. 3 shows, among other states of the eastward direction, Belarus (2) and Kazakhstan (3 cities) stand out.

Only 19 international passenger trains of internal makeup run westwards. They depart from four cities of Ukraine (Fig. 2, 3). As Fig. 2 shows, 10 of such trains are made up in Kyiv, four – in Odessa, three – in Lviv, and two – in Chernivtsi. Such a graded way of trains' distribution by the biggest cities of Ukraine, located nearby the western segment of its state border, is suggestive of the advantages of their location, and, to a great extent, is the result of the *effect of historical inertia and the metropolis effect*. Therefore, Kyiv and Lviv have the most multidirectional passenger communication of this type, although the biggest number of trains runs between closely situated Odessa and Chişinău.

The use of the advantages of the near-border location of the aforementioned cities allows them to have rather intensive connections with the neighboring states. Terminal stations of such trains are situated in seven cities of four states (Fig. 3). With the exception of Poland (Warsaw, Wrocław, Cracow, Przemyśl), European countries have only one such city each (Fig. 3), and all of them are the capitals.



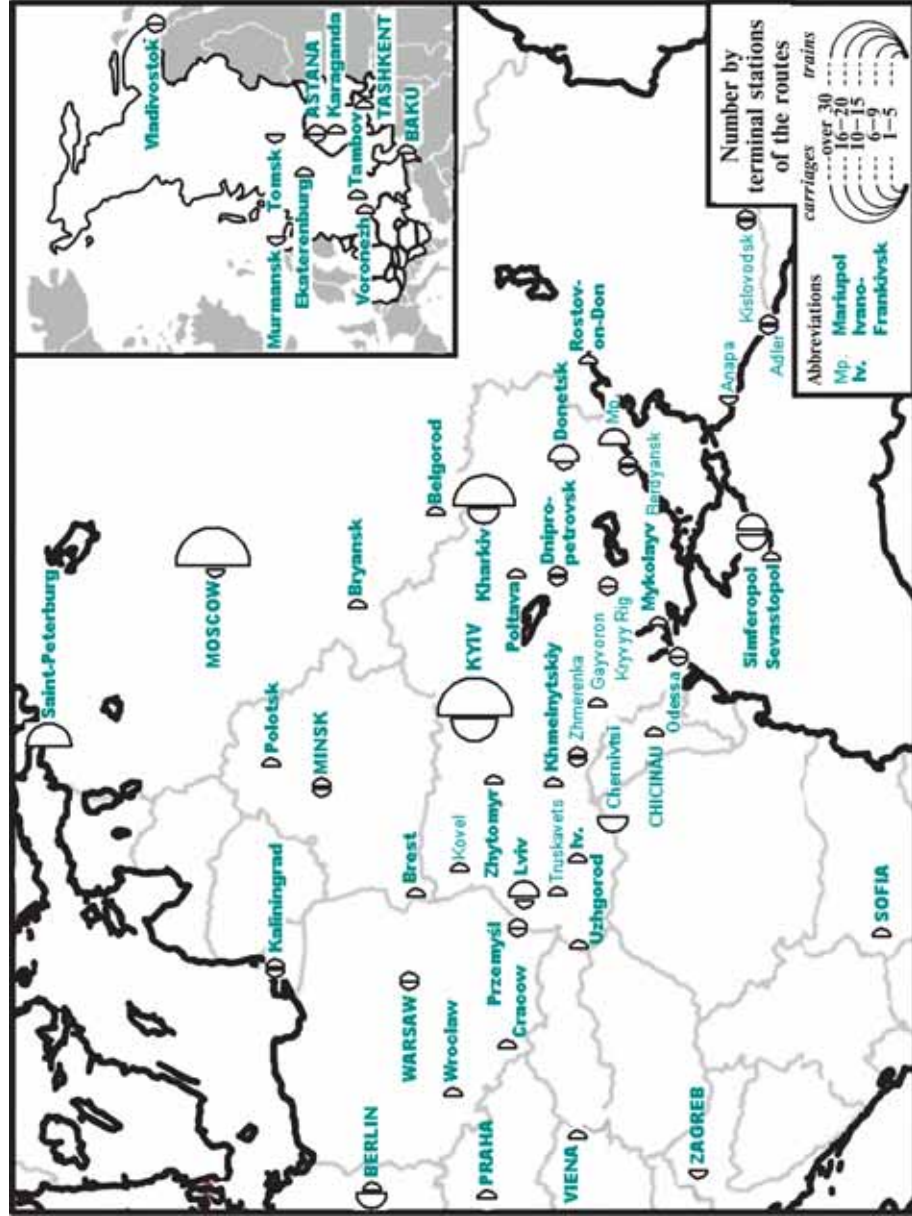


Fig. 3. Distribution by terminus of international passenger railway trains and direct carriages of internal makeup (as of 01.01.2007)

Many of today's functioning railway routes have been inherited from the times of the railway network formation in the reviewed regions in the end of the 19<sup>th</sup> – the beginning of the 20<sup>th</sup> c. in the period of existence of the Austro-Hungarian and the Russian Empires. E.g., route Chernivtsi–Przemyśl is a part of old route Chernivtsi–Lviv–Przemyśl–Cracow–Vienna, functioning with the aim of connecting the Austro-Hungarian outskirts with the capital of the Empire. Train Odessa–Chişinău, is a similar relic, running since the time of the emergence of *Odessa Railways* in the Russian Empire. In those days, regular international railway communication between the two Empires was carried out mainly along the trunk railway Saint Petersburg–Vilnius–Warsaw–Vienna and was aimed at the connection of the two capitals, and not at the creation of the susceptible transport link between the periphery parts of the states. Precisely these inherited spatial structures explain the existing irregularity in the intensity and orientation of the international passenger railway communication of Ukraine (*effect of historical inertia*).

The aforementioned facts allow us to establish the following consistent pattern: the longer the distance that separates Ukraine from a state-object of international passenger communication, the higher is the administrative rank of the city-terminus of this communication (Fig. 3).

## CONCLUSION

Ukraine is one of the world leaders as far as the level of development of railway network and the volumes of freight and passenger transportation are concerned. Depreciation of the branch's fixed assets and the reduction of the length of public service railway tracks hinder further growth.

In 2007 through Ukraine ran 139 international passenger trains and 76 direct carriages (89.3 per cent of them were trains of internal makeup and 60.0 per cent were direct carriages of internal makeup).

Passing passenger trains and direct carriages cross the territory of Milovskyi raion of Luhanska oblast without any stops along one of the busiest, in terms of passenger and freight traffic, trunk railways *RZhD* – Moscow–Rostov-on-Don, which results in the manifestation of the *Morvan's effect* in this region.

Transit international passenger railway trains, passing through the Ukrainian territory, beyond its limits, connect only the cities of Russia and Moldova. Such trains mainly run in summer along the busiest, in terms of passenger and freight traffic trunk railways, of Ukraine. Direct carriages of such kind connect mainly the capitals of the countries. Such trains and carriages are oriented from the north to the south to satisfy the needs of Russians in sea-side recreation, whereas transit international passenger railway direct carriages, going beyond the limits of Ukraine, predominantly have east-west orientation.

Terminal stations of the routes of international passenger railway trains of internal makeup within the limits of Ukraine are located in 20 cities, 15 of which are the capitals of administrative units of the first level.

Eastward orientation dominates in international passenger railway communication in Ukraine. In this direction 4.7 times more trains pass, than westwards. Only four cities of the country are the terminal stations, from which such trains depart in the western direction, whereas eastward directed trains depart from 20 Ukrainian cities. As a consequence of the effect of historical inertia, all Ukrainian metropolises have passenger railway communication mainly with Russian cities, especially with Moscow.

We have discovered the following consistent pattern of international passenger railway communication's development: the longer the distance that separates Ukraine from a state-object of international passenger communication, the higher is the administrative rank of the city-terminus of this communication. ■

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