

CONSIDERATIONS UPON THE RAIL TRANSPORTS IN
ROMANIA
CONSIDERAȚII ASUPRA TRANSPORTURILOR FERROVIARE DIN
ROMÂNIA

Costela IORDACHE¹, Cristina ILIESCU

Abstract: The capacity, safety and speed are attributes which give importance to the transports and railway communication lines in the national transport. The railways of our country have appeared in the mid nineteenth century and have developed very fast. The evolution of rail transport followed the stages of economic and social development of the country. The purpose of this article is to present the main stages of the railway network development, its structure and the dynamic of the railways types. Also, there are analyzed the railway density, the dynamics of goods and passenger transport, the goods transport structure and the dynamics of the rail transport. The reporting is made at the features years of the period 1938-2006 at the development regions and districts level.

Key words: railway transport, evolution, Romania

Cuvinte cheie: transporturi feroviare, evoluție, România

The capacity, safety and speed are characteristics that give importance to the railway transports communication lines in the national transportation system.

The railway network began to develop in the second half of the 19th century. There has been extended and modernized in stages, with new sectors connecting different regions of the country and Europe.

The doubling, electrification (Table 1) of railways and *endowment with locomotives and carriages* contributed to the *modernization of railway transports and to the traffic intensification*. Out of the 10,789 km of the railway network, 3,965 km have been electrified (36.8 per cent). The electrification process was slow until the mid 70's, becoming more alert afterwards; still, during the last 20 years, only 285 km were electrified (Fig. 1).

In 2006, the Centre, West and North-East region had 1,947 km of railways, accounting for 49,1 per cent of the total national electrified railways, while Bucurest-Ilfov and North-West region had the shortest ones (277 km and 314 km, respectively). At county level, it is worth mentioning Arges, Bihor, Botosani,

¹ University of Craiova, Geography Department, costelaioradache@yahoo.com

Maramures, Satu Mare, Salaj, Tulcea, Vaslui and Valcea , where this type of railway is missing. On the contrary, in Gorj county 9239 km, all the railways are electrified, and in Hunedoara 75.9 per cent.

Table 1

The evolution of functioning railways

Year	Total (km)	Of which electrified		Out of total:									
				Normal gauge railway						Narrow gauge railway		*Wide gauge railway	
		Total		One way		Two ways							
		km	%	km	%	km	%	km	%	km	%	km	%
1938	9,990	58	0.6	9,274	92.8	8,914	89.2	360	3.6	716	7.2	-	-
1950	10,853	58	0.5	10,024	92.4	9,563	88.1	461	4.3	752	6.1	77	0.4
1960	10,981	58	0.5	10,239	93.2	9,599	87.4	640	5.8	706	6.4	36	0.4
1970	11,012	494	4.5	10,341	93.9	9,231	83.8	1,110	10.1	635	5.8	36	0.3
1980	11,110	2367	21.3	10,506	94.6	8,082	72.8	2,424	21.8	559	5.0	45	0.4
1989	11,343	3654	32.2	10,871	95.8	7,922	69.8	2,949	26.0	427	3.8	45	0.4
1990	11,348	3680	32.4	10,876	95.8	7,927	72.9	2,949	27.1	427	3.8	45	0.4
2000	11,015	3950	35.9	10,958	99.5	7,993	72.9	2,965	27.1	-	-	57	0.5
2006	10,789	3965	36.8	10,731	99.5	7,722	71.6	3,009	27.9	1	-	57	0.5

(own determinations; Source: Romania's Statistical Yearbook, Bucharest, CNS, INS, 1981, p. 473, 1994, p. 573, 2003, p. 442, 2007, p. 672)

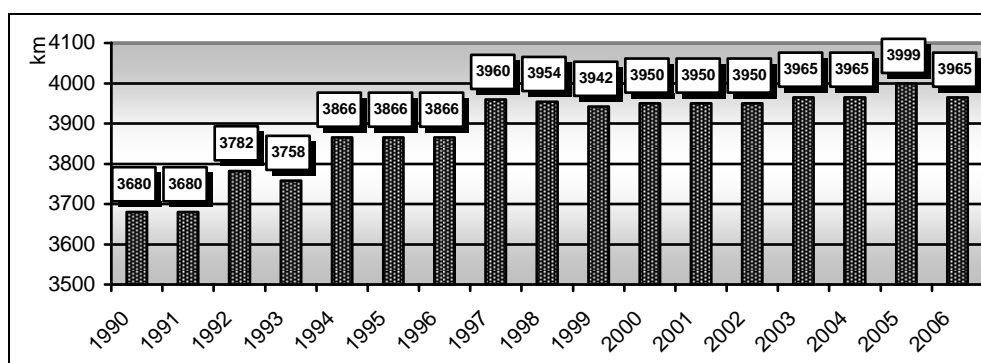


Fig. 1 Dynamics of electrified lines (1990 – 2006)

Among the electrified railways, the most important are leaving from Bucharest for Jimbolia (passing through Rosiorii de Vede, with a ramification at Filiasi towards Targu-Jiu, at Strehaia towards Motru and at Caransebes towards Resița), Curtici, Cluj-Napoca, Suceava (derivation from Buzău towards Făurei-Brăila-Galați and from Pașcani towards Târgu-Frumos-Iași) and Cosntanța (at Fetești, there is a ramification towards Țândărei-Făurei). Although shorter, the railways Mărășești – Tecuci, Suceava – Vatra Dornei – Beclean, Brașov – Sibiu – Simeria, Caracal – Drăgășani – Râmnicu Vâlcea etc. are important for traffic efficiency.

Beginning with the 30s, the railways *doubled* in the sectors with high traffic intensity (Cernavodă – Constanța, Adjud – Mărășești – Tecuci, Teiuș – Apahida,

București – Ploiești – Câmpina, Ploiești – Buzău etc.). If in 1938, double railways measured only 360 km, in 1960 they increased by 77.8 per cent, the proportion augmenting from 3.6 to 5.8 per cent. During the next decades, the length of the double railways increased from 1,100 km (10.1 per cent) in 1970 to 2,806 km (25.1 per cent) in 1985, to 2,966 km (27.1%) in 1995 and 3,010 km in 2005 (27.8 per cent). In 2006, out of the 3009 km of normal gauge railways with double ways, 616 km, accounting for 20.5 per cent, were situated in Muntenia South Region; there followed the North-East region (564 km); București-Ilfov (137 km) and Oltenia South-West regions (248 km) come last. While Botoșani, Covasna, Mureș, Satu Mare and Tulcea have no double ways, others have more than 150 km of such ways (Suceava – 180 km, Cluj – 168 km, Hunedoara – 167 km, Prahova – 152 km).

From the *gauge* (the distance between the rail inner parts – DEX, 1998, p. 327) point of view, there are *three types of railways*: normal lines (1.435 mm), narrow (760-1000 mm) and wide (1520, Russian type). The *normal gauge railways* are predominant, their proportion oscillating between a minimum of 92.4 per cent in 1950 and a maximum of 99.5 per cent beginning with 1999. Most of this type of railways are located in Timiș (799 km), Constanța (753 km), Suceava (524 km), Bihor (500 km) counties, while in Giurgiu (47 km), Dâmbovița (103 km) and Tulcea (106 km) are rather rare.

Narrow gauge railways were built at the end of the 19th century (Moldovița – Rosoa, 1988). Their length and share in the railway network continuously decreased. The longest narrow railways were the following: Turda – Abrud (93,6 km), Târgu Mureș – Lechința (90,2 km), Târgu Mureș – Sovata (75,4 km), Sibiu – Agnita (5.735 km), Vișeu de Sus – Comanu (40 km), Band – Mihăescu de Câmpie (29,6 km), Moldovița – Rososa (23,9 km), Covasna – Comandău (20 km). Most of the narrow railways were located in Transylvania, northern Bukovina and Maramureș, southern Banat. At present, some sectors have been rehabilitated and are being used for touristic purpose: Abrud – Câmpeni (12 km), Moldovița (circa 4 km), Șiclau de Jos – Șiclau de Sus (15 km).

The average density of railway network had a positive trend during the 1938-1989 period; then, after a year of stagnation, there was a slight oscillating, but decreasing tendency, at the end of the analysed period having diminished below the value in 1950 (Table 2).

Table 2

The average density evolution of the railway network (1938-2006)

Year	1938	1950	1960	1970	1980	1989	1990	1992	1994	1996	1998	2000	2002	2004	2006
Average density km/1000 km ²	42	45.7	46.2	46.4	46.8	47.8	47.8	47.9	47.7	47.8	46.2	46.2	46.2	46.4	45.3

Source: Romania's Statistical Yearbook, Bucharest, CNS, INS, 1981, p. 473, 1994, p. 573, 2003, p. 442, 2007, p. 672

The railway density depends on the natural conditions (mainly the relief and hydrographical network), as well as economic, which led to the current regional

(Fig. 2 a, b) and county (Fig. 3) differences.

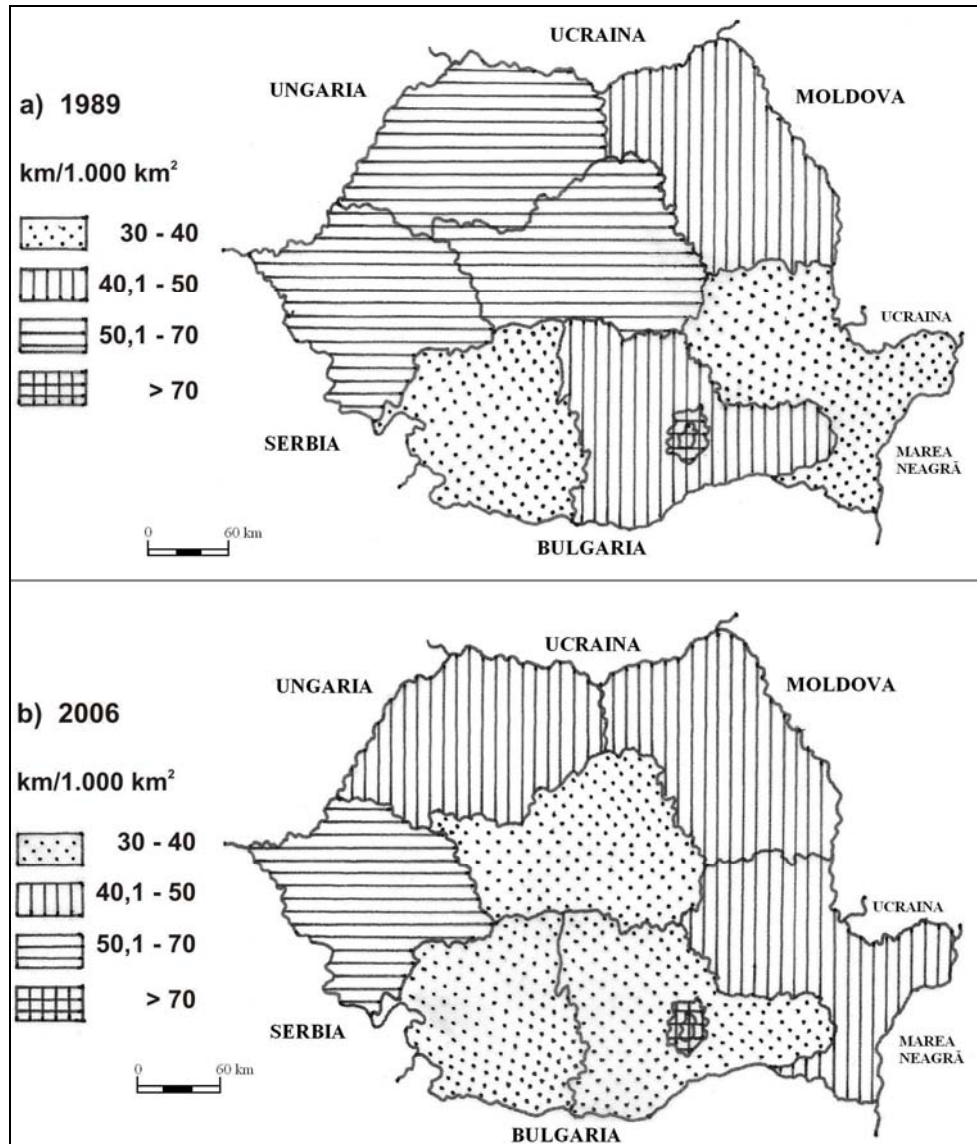


Fig. 2 Railway network density on development regions in 1989 (a) and 2006 (b)

Compared to the national average density in 2006, of 45.3 km/1000km², Oltenia South-Western Development Region comes last, with only 33.9 km/1.000 km², unlike București-Ilfov where it reached 153.2 km/1.000 km². Except for Bucharest that had 416 km of railways for 1.000 km², the extreme values oscillated between 12.5 in Tulcea and 113.7 km/1.000 km² in Ilfov. The counties with predominantly mountainous (Mehedinți – 25,1; Sibiu – 26,7; Vâlcea – 28,3 km/1.000 km²) or plain relief, which are less developed from the economic point of

view (Giurgiu – 13,3 km/1.000 km²) have low densities. Among the counties with high railway density we mention Constanța (103.9), Timiș (91.9), Brașov (67.7), Bihor și Ialomița (more than 66 km/1.000 km² each).

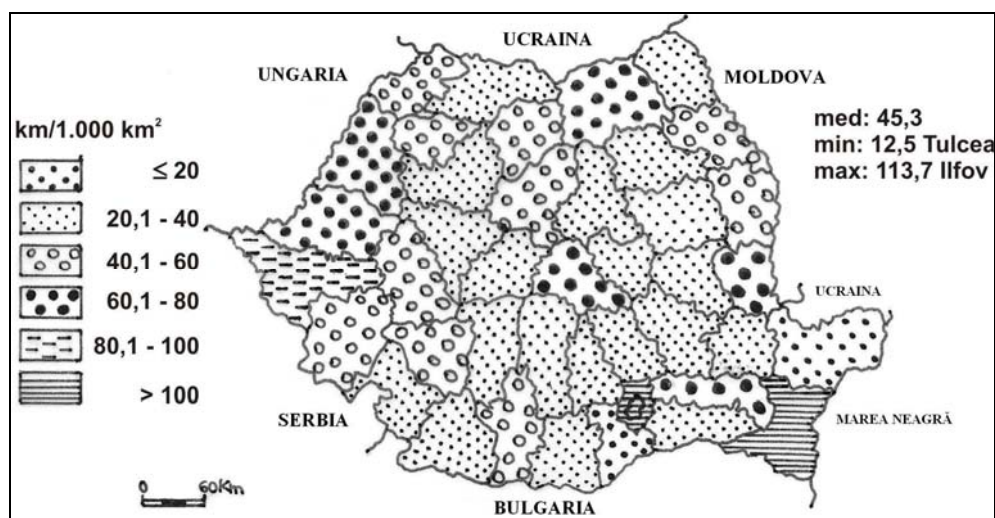


Fig. 3 The density of the railroad network in 2006

The distribution of relief forms led to a certain *configuration* of the railway network, with *two rings* and connection lines, which give a *unitary character*.

The connection between the two rings is done by *cross-Carpathian railways*: Ploiești – Brașov; Salva – Vișeu; Salva – Ilva Mică – Vatra Dornei – Gura Humorului; Suceava – Năsăud; Adjud – Ciceu; Râmnicu Vâlcea – Sibiu; Târgu Jiu – Simeria; Drobeta Turnu Severin – Caransebeș; Alba Iulia – Ilia; Cluj Napoca – Oradea etc.

Secondary railways brake off from the major and cross-Carpathian railways, reaching *all the regions of the country*. Some of them intersect in *railway system points*, such as: București, Ploiești, Brașov, Timișoara, Oradea, Arad, Roșiori de Vede, Făurei, Simeria, Mărășești, Pașcani, Caransebeș, Pitești, Ciceu, Teiuș, Filiași.

The Romanian railway network is connected with the European one through the following *cross-border points*: Jimbolia and Stămora Moravița (Timiș county) – to Serbia, Curtici, Vladimirescu (Arad county), Episcoplia Bihor, Salonta, Valea lui Mihai (Bihor county), Carei (Satu Mare county) to Hungary, Câmpulung la Tisa, Valea Vișeuului (Maramureș), Vicșani (Suceava) – to Ukraine, Ungheni (Iași) – to Moldova, Giurgiu (Giurgiu), Calafat (Dolj, by ferry-boat), Negru Vodă (Constanța) to Bulgaria.

Through the *international trains*, Bucharest is connected with some capital cities and other European towns, on the following routes: “*Friendship*”: Bucharest – Chișinău, passing through: Ploiești – Buzău – Mărășești – Bacău – Iași – Ungheni; „*Romania*”: Bucharest – Thessaloniki, through Videle – Giurgiu – Ruse – Gorna Oriahovița, splitting towards Kapikule-Istanbul and Sofia-Thessaloniki;

„Dacia”: Bucharest – Wien, through Ploiești – Brașov – Sighișoara – Curtici – Budapest, splitting towards Prague, Krakow și Wien; „Bucharest”: Bucharest – Belgrade, through Roșiori de Vede – Craiova – Drobeta Turnu Severin – Caransebeș – Timișoara - Stămora Moravița – Vârsac – Alibunar – Vladimirovac – Pancevo; „Ister” and „Panonia”: Bucharest – Budapest, through Ploiești – Brașov – Sibiu – Deva – Curtici ; „Bulgaria Express”: Sofia – Moscow, through Ruse – Bucharest – Bacău – Vicșani – Cernăuți – Kiev.

International trains depart also from Brasov („Transylvania”, through Curtici; „Corona” and „Harghita” through Episcopia Bihor), Cluj („Ady Endre”, through Episcopia Bihor), Târgu Mureș („Mureș”), Timișoara („Traianus”, „Criș”), Baia Mare („Someșu”, through Valea lui Mihai), Simeria („Zarand”, through Curtici) to Budapest with connections with other European cities.

Goods and passengers railway transport has evolved accordingly to the social and economic development of the country, the expansion and modernization of the railway infrastructure, as well as changes in travellers’ options (Fig. 4).

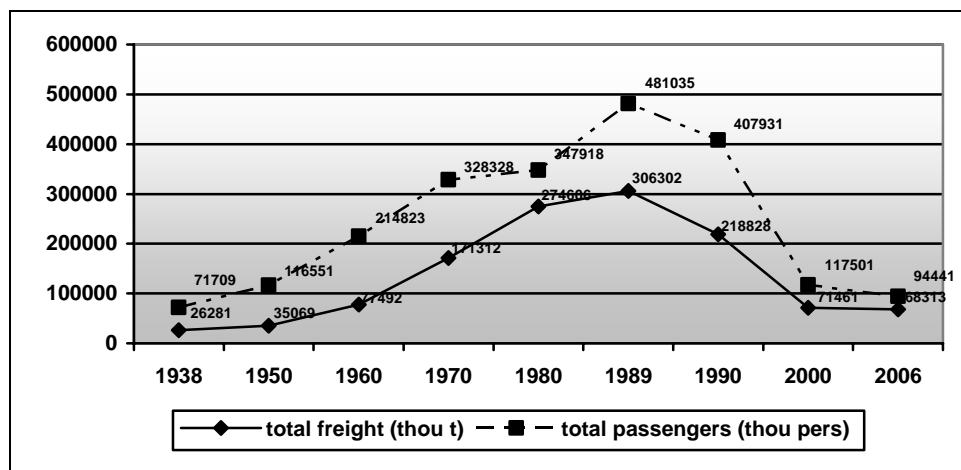


Fig. 4. The dynamics of goods and travellers using railway transport during the 1938 – 2006 period

The dynamics of *passenger traffic* experienced a positive trend until 1976, when the number of persons using the train exceeded 373,159 thousand persons as compared to only 71,709 in 1938 and 116,551 in 1950. During the following decades, the passenger railway transportation increases, reaching a maximum of 481,035 thousand persons in 1989. During the transition period, there is a sharp decline, for the last analysed year, the number of railway passenger being 77 per cent lower than that from 1990, as a result of the number of passenger cars that skyrocketed and the ever increasing costs of the train ticket.

The volume of *goods carried on railways* had a positive evolution until 1988, when there were registered more than 315 million tones, which is 12 times higher

than in 1938. During the last two decades, the goods traffic decreased 32 times (219 million tones in 1990, compared to only 68 million tones in 2006).

The structure of transported goods during the 1938-2006 period experienced significant changes (Table 3, Fig. 5).

Table 3

The evolution of goods carried by trains between 1938-2006

Specification %	Year	1938	1950	1960	1970	1980	1989	1990	2000	2006
Mineral and solid combustibles		7,4	8,6	8,5	11,0	10,8	20,9	19,38	34,6	37,3
Crude oil and oil products		20,7	10,8	12,9	9,4	9,1	8,2	8,2	14,6	17,7
Construction materials		5,1	7,2	7,5	9,8	9,3	15,8	7,9	5,0	3,2
Coarse or manufactures materials		12,8	19,7	18,0	22,1	24,6	23,2	21,9	11,9	5,3
Ferrous and non-ferrous ores, machinery, equipment		3,7	4,5	7,1	8,2	9,3	8,7	11,0	15,0	18,5
Wood, wood products		24,4 ¹	20,0 ¹	13,8 ¹	10,1 ¹	5,2 ¹	5,0 ¹	5,0 ¹	5,2 ²	3,7 ²
Cereals, seeds and oil plants		7,1	5,5	3,8	3,1	3,3	2,8	4,4	2,6	1,1
Food, vegetables, fruit		6,2	6,3	5,1	5,4	4,7	2,9	1,6	2,0	2,0
Products of the chemical and light industry		1,1	1,8	2,5	5,0	3,8	3,4	3,5	8,0	8,3
Other products		11,5	15,6	20,8	16,9	19,9	9,1	16,7	1,1	2,9

Own determinations; 1 – wood products and wood for fire; 2 – wood, Lombardy poplar

Source : Romania Statistical Yearbook, Bucharest, C.N.S., I.N.S., 1978, p. 408, 1994, p. 578-581, 2003, p. 443, 2007, p.673

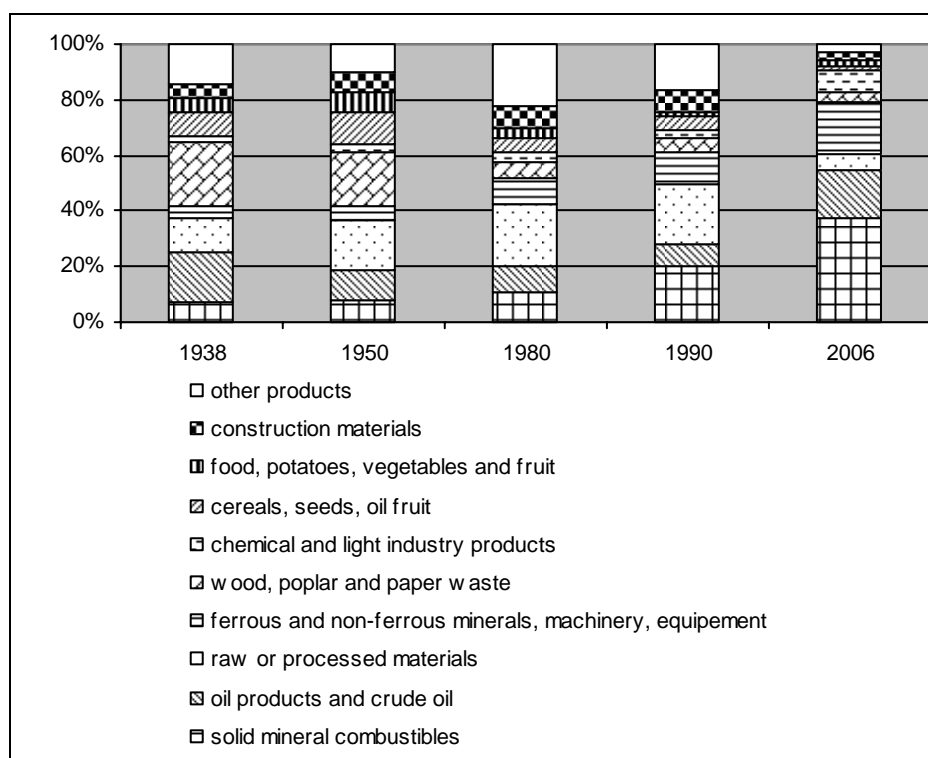


Fig. 5. The structure of goods carried by trains in 1938, 1950, 1980, 1990, 2006

- By analysing the data in the table above, the following conclusions can be drawn:
- Until the 70's and beginning with 2000, there predominates the raw materials;
 - The solid mineral combustibles slowly increased until 1980 (1.5 times) and during the transition period, the rhythm augmenting.
 - The crude oil and oil products experienced a sinuous evolution, with a great decrease between 1990 and 1994, augmenting after 2000.
 - The quantity of wood for fire and wood products diminished more than 6 times during the 1938-2006 period.
 - During the last decade, a slight increase in the transport of chemical and light industry products was noticed.
 - The share of cereals, oil seeds and fruits decreased during the last three years.

With respect to the structure of transported goods in 2006, the following groups of products are worth mentioning: solid mineral combustibles (37.3%), oil products (16%), chemical products (8.5%), iron ore, residues, steel, scoriae furnace (6.8%), equipment, machinery, engines, spare parts (6.7%), raw or processed minerals (5.3%), metallic products (4.1%), wood and wood products (3.3%), construction materials (3.2%) etc. (Fig. 6).

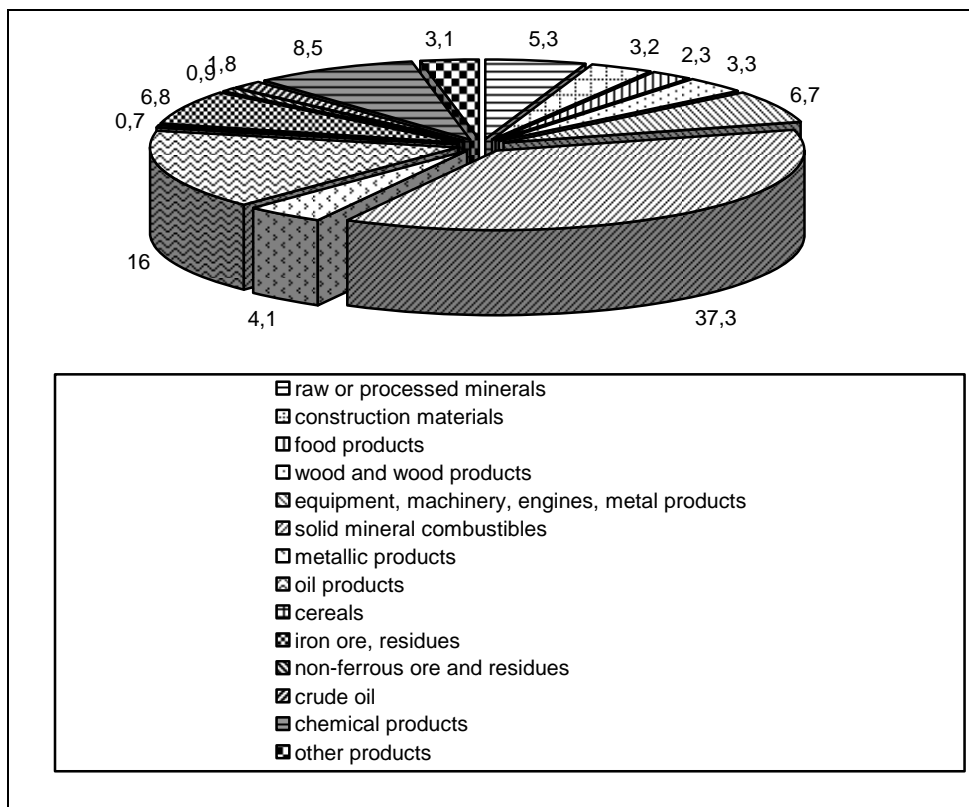


Fig. 6. Structure of main freight groups transported on the railways in 2006 (%)

As for the railway transport means, the number of locomotives in 2006

decreased 2.2 times compared to 1990. The railroad cars for freight diminished 2.6 times, while those for passengers 1.2 times (Fig. 7). However, the proportion of electric locomotives increased from 24.1 per cent to 37.9 per cent, and of Diesel locomotives of more than 350 HP from 93.2 per cent to 99.1 per cent.

According to the Ministry of Transports ([http://www.mt.ro/Ministerul transporturilor](http://www.mt.ro/Ministerul_transporturilor)), the railway network is made up of 1051 railway stations and halts, 50 railway depots and running sheds, 120 railroad cars revisions and zone workshops and 106 sectors for line maintenance, works of arts and installations for centralization and telecommunications.

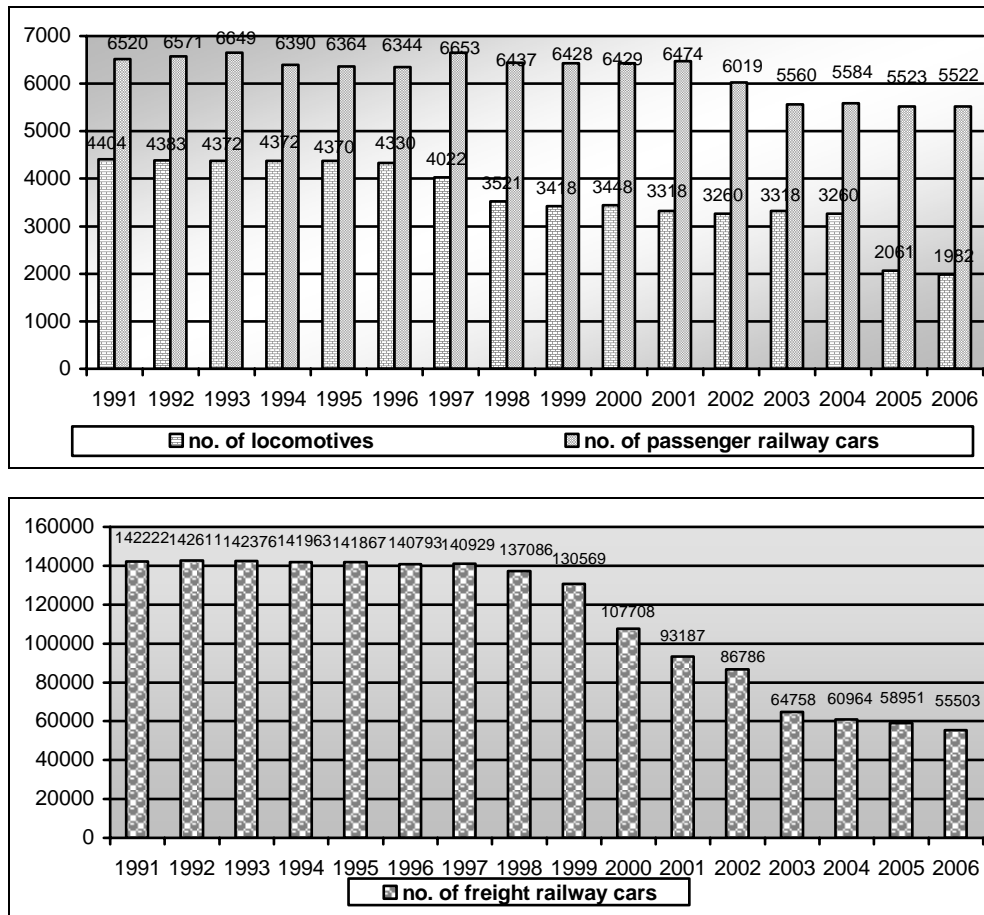


Fig. 7 Dynamics of the railroad transport means between 1991 and 2006

In conclusion, it can be said that the railway network covers practically the entire area of the country, with a density that generally comply with the demands, ensuring the connection with the neighbouring countries, and then, with countries from Europe and Asia.

In the *future*, according to the National Spatial Plan, First Section – Transport Networks (http://www.cdep.ro/proiecte/2006/400/20/0/p_1420.pdf), there is planned that the national railway network should join the Trans-European Railway, which is the modern network of the railways in Eastern Europe.

REFERENCES

- CEBUC, Al., MOCANU, C., (1967), *Din istoria transporturilor de călători în România*, Editura Științifică, București
- NIMIGEANU, V., (2001), *România. Populație, așezări, economie*, Editura Universității „Alexandru Ioan Cuza”, Iași
- POP, Gr., (1984), *România. Geografia circulației*, Editura Științifică și Enciclopedică, București
- REY, Violette, GROZA, O., IANOȘI, I., PĂTROESCU, Maria, (2006), *Atlasul României*, Ediția a 2-a revizuită, Grupul Editorial RAO, București
- TURBUȚ, Gh., (1981), *Sistemul unitar de transport al R. S. România*, Editura Tehnică, București
- *** (1984), *Geografia României, vol. II, Geografie umană și economică*, Editura Academiei, București
- *** (1998), *Dicționarul Explicativ al Limbii Române*, Editura Univers Enciclopedic, București
- *** *Anuarul Statistic al României*, C.N.S., 1978, 1981, 1995, 2003, 2007, București
- *** *Legea nr. 363/2006, privind aprobarea Planului de Amenajare a Teritoriului Național, Secțiunea I – Rețele de transport*
[http://www.mt.ro/Ministerul transporturilor](http://www.mt.ro/Ministerul_transporturilor)
http://www.cdep.ro/proiecte/2006/400/20/0/p_1420.pdf