TRANSPORT SYSTEM, TELECOMMUNICATION NETWORKS AND PUBLIC SERVICES IN ROMANIA BETWEEN 1990 AND 2000

CRISTIAN TĂLÂNGĂ
University of Bucharest, Romania

The paper present some problems of the developement and geographical repartition of the transport system, telecommunication networks and public services in Romania in the last part of the 20th century and their influence on the settlement system. A hierarchy of Romania's towns in terms of transport rates are based on three categories of criteria: geographical position, demographic size and transport specialization level.

Key words: *transport system, telecommunication networks, public services, Romania*

Introduction

Development of the Transport System between 1990 and 2000

Road transport. The development of the road network in Romania has been marked by successive stages with relevance in the inter-war period. Our analyse covers the 1990-2000 interval, when the total length of public roads registered moderate increases, from 72,816 km in 1990, 73,260 km in 1998, up to 78,479 km by the end of the year 2000. A classification of public roads in terms of internal and international traffic shows the following:

- motorways and roads open to international traffic represented 14,863 km (20.4 %) in 1990 and only 14,824 km (18.9 %) in the year 2000;
- international traffic motorways and roads listed under the European traffic corridors across Romanian territory covered 113 km (0.8 %) of the total and 5,572 km (37.6 %), respectively in the year 2000;
- the quantitative growth registered over the 1998-2000 period was result of the extension of county and communal roads from 58,133 km in 1990 to 63,655 km in 2000, facilitated by bigger public investments made at regional (county) and local community level.

In 1990 there were16,592 km (22.8 %) of modernised roads and 20,544 (28.2 %) of light asphalt pavement, while 2000 figures showed 19,418 km (24.7 %) and 19,999 km (25.5 %), respectively in the year 2000. These figures show a light quality improvement by having more light asphalt pavement roads. By and large, however, modernisation works stagnated. It has been estimated that nearly 62 % of all upgraded roads and 73 % of the light asphalt pavement roads were out of the guarantee period.

In view of this situation, modernisation programmes of national, regional and local public is a stringent necessity.

The road transport of goods has sharply dropped (by 7.35 times) from 1,934,362 thous tons in 1990 to some 600,000 thous tons in 1995 and 262,943 thous tons in the year 2000. The mainly because of the country's general economic decline.

The same fate had the passenger transport, 781 million in 1990, 206 million in 2000, that is a 3.48 time decrease.

Railway transport. Between the latter half of the 19th century and the year 1980, Romania's railway network kept expanding. After that date quantitative evolution showed down to the benefit of quality: electrified and double-track railways being mounted on major traffic avenues.

Over the 1990-2000 interval the situation looked as:

- a decrease in the operated railways overall from 11,348 km to 11,015 km when narrow-gauge lines were put out of public service;
- a slow increase of electric railways, from 3,180 km to 3,950 km;
- a slow increasing of double-track rails, from 2,949 km to 2,965 km.

There was a significant and steady decline in the freight transport from 218,828 thous tons in 1990 to 71,460.8 thous tons in the year 2000. The backslide proved in the 1990-1994 interval, when traffic fell below 50 %. A feeble comeback was noted in 1994-1996, followed by a relapse though at a slower pace this time. Until 1960, railway transport was prioritary in traffic of goods, subsequently being largely replaced by road transport.

The passenger traffic, also marked a decrease, from 407.9 mill. persons in 1990 to 117.5 mill. in the year 2000.

River transport. According to statistics, the total length of inland waterways in 2000 was 1,779 km, spread out as following: 1,075 km on the Danube River, 524 km on the Danube branches, 64 km on the Danube-Black Sea Canal, 28 km on the Poarta Alba - Midia Navodari Canal, 48 km on man-made lakes at Izvorul Muntelui (Bicaz Lake, 30 km) and in the Arges Valley (Vidraru Lake, 18 km), and 40 km on the Bega Canal. The same statistical figures were reported for 1990, too. So, inland navigable channel length no changes over the studied period.

Freight transport on the Danube River and the Danube-Black Sea Canal dropped from 12.04 mill. tons in 1990 to 6.2 mill. tons in 1992, rising to 14.8 mill. tons, and sliding again at 13.1 mill. tons in the year 2000.

The boom of the 1992-1998 period was due to joint ventures and private companies operating on river. In 1996 was held by state-owned 70 % of goods transport, 24 % by private firms and 6 % joint ventures. In 1998, 53 % was controlled by joint ventures, 26 % by state-owned firms and 21 % by private companies. In 2000, the situation looks as follows: 62 % joint ventures, 35 % private and 3 % all-out state owned.

In terms of freight destination (2000), 88.3 % was for domestic market, 9.9 % for international clients, and 1.8 % represented transit transport. River transport (mainly through the Danube-Black Sea Canal) registered 11.3 % mill. tons (2000).

Passenger river transport is limited rather to small areas, hardly accessible by land (the Danube Defile and the Danube Delta). This type of transport would fluctuated depending on demand, costs, and the low purchasing poor of the population. The number of passengers using it was reached 1.6 mill. in 1990, 0.9 mill. in 1993, 2.4 mill in 1996, and 1.5 mill. in the year 2000. These values designating both the domestic and international passenger traffic. In 2000, it englobed only 52 % of the overall domestic traffic.

Maritime transport. Geographical position gives Romania an outlet to the Black Sea, a pofitable trade exchange facility. The country's general economic decline, over the 1990-2000 period was mentioned by the maritime transport as follows:

- a sharp fall 27.6 mill. tons in 1990 to 4.5 mill. tons in 1998 and somewhere around 1.4 mill. tons in 2000;

- two discontinuity intervals (1992-1993 and 1994-1995) suggesting some improvement.

Forms of property in 1998 and 2000: private firms, 64 % / 73 %, joint ventures 27.8 / 26.4, state owned 8.2 % / 0.6 %, respectively.

Out of the overall goods transported on sea, only 388,300 tones were loaded and unloaded in the Romanian ports. In 2000, 82.5 % were loaded and 17.5 % unloaded in the Romanian ports. The ratio of loaded versus unloaded goods in 1998 (38 % and 62 % respectively) comparatively with year 2000 (82.5 % and 17.5 %) shows that more products were exported that imported modicating a comeback in Romania's foreign trade balance.

Air transport. It was largely of quality of the domestic network that registered improvements by the addition of new airports in international traffic (Arad, Cluj-Napoca, Satu Mare, Iasi, Suceava, Sibiu and Bucharest - Baneasa) to those operating before 1990 (Bucharest-Otopeni, Timisoara and Constanta).

And yet, for all modernisation efforts (better fleet and airport facilities), the passenger traffic drop considerably, from 2.7 mill. persons in 1990 to 1.08 million in 1998. A slight increasing tendency (1.3 mill. persons) appeared in 2000, but regular domestic flights reached a mere 12.6 % (160,900 pers.) of total, the rest being covered by international traffic.

The traffic of goods, in its turn, decreased from 37,000 t in 1990 to 10,000 t in 1998, and after some fluctuating evolution (1990-1996) it dropped at 7,600 t in 2000 (7,200 t i.e. 94.7 % representing international destinations and only 400 t, 5.3 % internal ones.

Telecommunications (telephone networks and mass-media). There was a substantial increase in the number of telephone users, from 2,358,041 in 1990 to 2,750,000 in 1994 and 3,705, 515 in 1999. As of 1997, statistical figures indicate fluctuating evolution with line and mobile telephone networks.

For all the extension of radio and Tv posts, radio subscriptions would fluctuate between 2,399,793 in 1990 and 3,943,000 in 1994, declining at 3,590,506 in 1999. Tv subscriptions had a similar record: 3,645,140 in 1990, 4,054,000 in 1994, and 3,710,465 in 1999.

Geographical Distribution of Transport and Telecommunication Networks

Density of roads. The territorial disparities found in the road networks are connected with the landform pattern, the national and local investment policy, population size and structure and intensity of economic life, configuration of urban networks, and not least, complementariness to other communication networks.

The development of road (by county) over the 1990-2000 interval features as follows:

- wide variation interval, from -104 km (Vrancea County) to 1,160 km (Hunedoara County);
- no change in two counties (Neamt and Tulcea);
- moderate falls in the counties of Olt, Mures and Mehedinti;
- the majority of counties in the east and south of Romania registered increases of up 100 km each;
- top values (100-500 km) scored the counties from central and western parts of Romania.

As already noted, this evolution was result extending road length at county and local levels, also increasing density values (km/100 km2). This was a positive development easing inter-settlement connections.

Taking a comparative look at road density (by county) over 1990-2000 interval reveals the following:

- higher variation interval (14-43.1 km/100 km^2 in 1990, to 13.90- 46.6 km/100 km^2);
- few disparities in the density of geographical speed above-average values (30.7 km/100 km^2 in 1990 and 32.9 km/100 km^2 in 2000 recording some counties from Moldavia (Botosani, Iasi, Vaslui, and Bacau), from the south of Romania (Buzau, Prahova, Dambovita, Arges, Valcea, and Olt), from the west and north-west (Hunedoara, Alba, Cluj, Salaj, Bihor and Satu Mare).

The length of upgraded roads features as follows:

- variation interval between 0 km (Dolj County) and 494 km (Satu Mare County);
- the length of modernised roads remained constant;
- modest increases in the majority of counties (1-100 km) are suggestive of low investments car marked at county and local level;
- top values (100-494 km) registered the counties of Suceava, Tulcea, Hunedoara, Teleorman, Vaslui, Vrancea and Satu Mare.

Upgradings in the year 2000:

- modernised roads / total county length varied between 12.60 % (Buzau County) and 48.60 % (Satu Mare County);
- most counties scored below the national average (24.70 %) or close to it;
- highest values against the average were recorded by the counties of Suceva, Neamt, Vaslui, Harghita, Covasna, Barsov, Vrancea, Tulcea, Dambovita, Valcea, Bucharest city, together with Ilfov, Calarasi, Ialomita, Giurgiu, Teleorman, Caras-Severin, Maramures, and Satu Mare.

County and local roads. According to 1990-2000 statistics, the situation of county and local roads looks as follows:

- the majority county roads in Romania were extended from 1,154 km in Hunedoara County to 1 km in Tulcea County. In same other counties (Olt, Suceava, Mehedinti and Vrancea), the situation was reversed, roads getting shorter, with a record low in Vrancea (-105 km);
- in 1990 and 2000, county and local roads represented 65 % and 89 % respectively of the total road network of each country;
- Statistical data for the year 2000, being more detailed, conclusions reached in regard of this type of roads are the following:

1. The length of county roads varies with each county from 1,383 km (Cluj) to 368 km (Covasna).

2. Very few counties have modernised roads (0.5 - 25 % of the total).

3. Roads in the countryside cover between 1,000 km and 1,418 km (Botosani, Bacau, Alba, Timis, Arges, Buzau, Hunedoara, and Bihor); roads are the shortest in Covasna, Giurgiu, Tulcea, Ilfov, Calarasi (under 300 km in each of these counties); between 300 and 500 km in Teleorman, Ialomita, Brasov, Braila, Harghita, Maramures, Galati, Sibiu, Bistrita Nasaud, and Satu Mare; 500 - 1000 km in Caras Severin,Vrancea, Dambovita, Olt, Neamt, Valcea, Salaj, Gorj, Suceava, Mehedinti, Prahova, Mures, Arad, Dolj, Vaslui, Cluj, Iasi, and Constanta.

4. The greatest majority of village roads are not upgraded.

Railway density and structure. A comparative analysis of the situation (by county) over the 1990-2000 interval indicates the following:

- average densities dropped from 47.8 km/1000 km^2 in 1990 to 46.2 km/1000 km^2 in 2000;
- decreases were associated with the elimination of narrow-gauge railways, used for timber transport; density maps in the two reference

years show an uneven distribution connected largely with the natural and socio-economic conditions of each territorial units;

- far variation intervals compared to the case of roads (Tulcea County: 8.1 km/1000 km^2 in 1990 and 8.4 km/1000 km^2 in 2000; Bucharest city + Ilfov County: 176.9 km/1000 km^2 and 194.4 km/1000 km^2 in 1990 and 2000, respectivelly);
- a NV corridor (following approximately on the direction of one of the European traffic corridors) crosses the counties of Bihor, Alba, Sibiu, Brasov, Prahova, Ilfov (Bucharest included), Ialomita, and Constanta; branches out arc-shaped into a second corridor that passes through Mures, Bistrita Nasaud, Suceava, Iasi, Vaslui, and Galati counties; a third one is the western corridor (Satu Mare, Bihor, Arad, and Timis counties); densities along these three corridors top the national averages;
- most counties having mountainous areas on their territories below the natural average (30-50 km/1000 km^2).

Railway structure:

- narrow-gauge railways were put out of service in Alba, Bistrita Nasaud, Cluj, Maramures, Mures, Satu Mare, and Sibiu counties;
- operating wide-gauge railways in Galati, Iasi, Maramures, satu Mare, Suceava, and Vaslui counties, to facilitate links with Ukraine and the Republic of Moldavia;
- electric railway percentages stand between 0 and 100 %. Some counties have no such facilities (Botosani, Vaslui, Tulcea, Arges, Valcea, Bihor, Satu Mare, Maramures, and Salaj), other have them in excess totalling over 50 % (Hunedoara, Calarasi, Bacau, Harghita, etc.), up to 100 % (Mehedinti County).

Fluvial and maritime port traffic. A classification Romanian waterways:

- the fluvial-maritime Danube, 170 km long, 4 major ports: Braila, Galati, Tulcea, and Sulina, annual traffic capacity 34,205,000 tons;
- the Danube River, 905 km long, major ports: Orsova, Drobeta Turnu Severin, Giurgiu, Oltenita and Calarasi, annual traffic capacity 16,370,000 tons;
- the Danube-Black Sea Canal, 64 km long, two major ports: Medgidia and Basarabi, annual traffic capacity 1,590,000 tons;
- the Poarta Alba-Midia Navodari Canal, 28 km long, 2 ports.

The four Black Sea harbours (Constanta, South Constanta, Midia-Navodari and Mangalia) total a traffic capacity of 82,750,000 tons / year.

A classification of Romanian ports by freight traffic:

1. Large ports, over 10 mill. t / year: Constanta and Galati.

2. Medium-sized ports, 3-10 mill. t / year: Braila.

3. Small ports, 0.5-3 mill. t / year: Tulcea, Calarasi, Giurgiu, Cernavoda, Medgidia, Drobeta Turnu Severin and Orsova.

4. Very small ports, under 0.5 mill. t / year.

Air traffic and airports. The gateway to air traffic for passenger and goods are the 17 airports situated in 16 towns. Since in various periods of time air transport would registered a slowdown, some airports ceased temporarily operating (Craiova, Tulcea, Bacau, Caransebes).

Particularities of domestic air traffic:

- Bucharest concentration of activities by the two airports: Otopeni (Henry Coanda) and Bucharest-Baneasa (both with international status);

- highest number flights (more than 10 / week) link Bucharest with Timisoara, Cluj Napoca, and Oradea;
- average number of flights (5-9 / week) between Bucharest-Arad, Bucharest-Baia Mare, Bucharest-Constanta (particularly in the summer season);
- small number of flights (1-4 / week) start from Bucharest to Iasi, Suceava, Tg.Mures, Sibiu, Satu Mare.

This was the situation in 1999, which comparated with 1994 marked an obvious regression.

A Classification of Romania's Towns by Accessibility to the Transport Systems

Owing to the current pattern of internal transport networks, not all the settlements benefit by direct access to the transport systems, a situation that affects inter-settlement relations and polarisation capacity. The present criterion of classification had in view the position of towns, as points of convergence of transport networks and activities:

1. First-class towns direct access to all the five transport systems (rail, road, air, fluvial and maritime): Constanta and Tulcea. The latter accessing the maritime transport by way of the Danube; sometimes, direct air traffic is temporarely suspended for lack of demand.

2. Second-class towns direct access to major railway axes, national or international highways and air transport (Bucharest, Bacau, Iasi, Suceava, Tg.Mures, Cluj Napoca, Baia Mare, Satu Mare, Oradea, Sibiu, Timisoara, Craiova and Caransebes), as well as the city-ports along the Danube, the Danube-Black Sea Canal and the sea coast, towns with access to the waterways and differentiated possibilities reaching the major or local rail-and-road lines: Orsova, Drobeta Turnu Severin, Calafat, Corabia, Turnu Magurele, Zimnicea, Giurgiu, Oltenita, Calarasi, Braila, Galati, Cernavoda, Medgidia, Basarabi, Navodari, and Mangalia).

3. Third-class towns are the most numerous ones and have a relatively homogeneous geographical diffusion. Access to rail-and-road, especially if located alongside major traffic axes. This category also lists the towns of Harsova, Isaccea, and Macin with access to the river and road networks.

4. Fourth-class towns access to one transport system alone (road or water). From this viewpoint appears to be the least favoured group, which is largely true. However, some settlements located in the neighbourhood of big cities have indirect access to the rail and air networks: Baia Sprie, Cavnic, Cisnadie, Sacele, Ocnele Mari, Baile Govora, Baile Olanesti, Baicoi, Urlati, Techirghiol, Bolintin Vale, Mihailesti, etc.

A Hierarchy of Romania's Towns in Terms of Transport Rates

The classical estimation criterion used designate settlement functions is the structure of the active population in the three sectors of activity (primary, secondary and tertiary). However, this criterion, of active population in a certain domain (sector), says transports, does but partly reflects the reality.

Taking the figures of the population census (1992) to draw up a town hierarchy based on the active population working in transports and telecommunications has revealed the following:

- a variation range between 0.37 % (Rasnov) and 23.47 % (Fetesti);
- an average of 6.69 % for the whole urban system;

- towns specialised in railway transport (Fetesti, Faurei and Simeria) and in river transport (Sulina) register between 20 % and 24 %;
- high traffic values (16-20 %) in three railway knots (Piatra Olt, Adjud and Jibou), in Constanta city-port and in a border town (Curtici);
- 21 towns, usually small-and medium-to-low sized that have a different economic potential but act as junction points within the national railway system, or are Danubian (Orsova and Tulcea) have a score of 10 - 15 per cent;
- 65 towns register between 6.69 % (average value) and 10 %. This category includes city-ports (Giurgiu, Galati, and Braila), big urban centres (Bucharest, Timisoara, Arad, etc.), but also scores of small and medium-sized towns;
- the other towns rank below the average, the majority having 3-6.69 % record.

This hierarchy gives a faithful picture of some towns strictly specialised in transports, but a distorted image of most of the others. For example, here Bucharest city has the same rank as Bocsa; Timisoara as Novaci, or Arad as Calafat. The truth could partly be restored referring to data on population engaged in transports and telecommunications provided the upper part of hierarchy lists Bucharest, Constanta and other large cities (Craiova, Timisoara, Brasov, Cluj-Napoca, Iasi, Braila, Ploiesti, Oradea, Arad, Bacau, Pitesti, Buzau, Tulcea, Sibiu, Targu Mures, Drobeta Turnu Severin, Baia Mare), in which case some settlements specialised in transports would inevitably left out.

It follows that a classification of towns by transport function should ratio several criteria, so as to accurately reflect the position of each settlement within the national transport system.

Such a classification was attempted based on three categories of criteria: geographical position, demographic size and transport specialization level.

a) geographical position = town accessibility to various transport systems;

b) demography = 1. town rank within the national urban hierarchy according to total number of inhabitants; 2. town rank in the county urban hierarchy; 3. town rank in the urban hierarchy according the share of active population in the transport branch; 4. town rank in the urban hierarchy according to absolute values of active population engaged in transport activities.

c) economy = 5. town rank in the hierarchy of rail junctions; 6. town rank in the hierarchy of switch-yard centres; 7. town rank in the hierarchy of railway complexes coordinating the organisation of the national railway system; 8. classification of ports by annual freight traffic; 9. classification of towns by average air passenger and freight traffic / year; 10. a hierarchy of centres with economic agents in the field of transport generally.

The geographical position ranks towns by accessibility to various transport systems. Four accessibility categories have been taken into consideration. Accessibility is a factor influencing to a large extent the other hierarchisations, but the classification thus obtained (presents and titled A classification of Romania's towns by accessibility to the transport systems) is only a partial reflection of the settlements transport function.

The national urban hierarchy worked out by the demographic size criterion proceeds from the fact that the number of urban population is intimately connected with town's economic power, which in turn sets demand for transport services in that particular town and in its influence zone. Similar

considerations were used in an urban hierarchy at county level.

The other two hierarchies based on active population ratio in transport and telecommunications (1992) per total active population and in terms of absolute values highlight, as previously said, transports specialist centres and their importance for transport services demand.

Economic criteria have in view hierarchisations connected with the particularities of each transport type.

Railway transport: hierarchy of urban railway knots, hierarchy of centres with marshalling yards, and hierarchy of railway centres acting as coordinators of the national railway system.

The classification of railway knots (by number of lines converging in a given point; one might also add the passenger traffic expressed in the number of trains (24 hrs.) emphasises four categories: very big knots with over 7 lines (Bucharest and Timisoara), big knots with 6 lines (Arad), intermediate knots with 4-5 lines (Oradea, Brasov, Faurei, Buzau, Caransebes, Oravita, Medgidia, Craiova, Galati, Tecuci, Simeria, Iasi, Piatra-Olt, Ploiesti, Satu Mare, Sibiu, Suceava, Rosiori de Vede, Lugoj, Bârlad, Marasesti), and small knots with 2-3 lines (Alba Iulia, Blaj, Ocna Mures - Razboieni, Teius, Ineu, Pâncota, Lipova - Radna, Chisineu Cris, Pitesti, Costesti, Bacau, Comanesti, Valea lui Mihai, Dorohoi, Resita, Dej, Câmpia Turzii, Huedin, Constanta, Navodari, Sf.Gheorghe, Târgoviste, Titu, Filiasi, Calafat-Golenti, Targu Jiu, Tg.Carbunesti, Deva, Petrosani-Livezeni, Slobozia, Fetesti, Tandarei, Urziceni, Pascani, Viseu de Sus, Strehaia, Targu Mures, Ludus, Sovata, Roman, Caracal, Carei, Jibou, Copsa Mica, Videle, Buzias, Jimbolia, Sânnicolau Mare, Focsani, Adjud).

We dewed it necessary to include also the railway centres with marshalling yards, based on the total daily capacity to marshal the trains, even though marshalling yards today are used less than half their capacity, some being in a state of conservation. The variation range goes from 500 to 7,000 carriages. The largest marshalling yards are in Constanta and Bucharest, followed (in decreasing order) by Ploiesti, Galati, Brasov, Iasi, Adjud, Dej, Simeria, Craiova, Caransebes, Oradea, Arad, Curtici, Suceava, Piatra Olt, Pascani, Sibiu, Buzau, Giurgiu, Videle, Marasesti, and Medgidia.

A third criterion connected with the railway transport targets the railway complexes playing a coordinating role in the system. It is a hierarchy that emphasises the scope and breadth of this function revealed according to number of subordinated stations (Timisoara - 175, Cluj-Napoca - 160, Craiova - 129, Iasi - 125, Bucuresti - 122, Brasov - 100, Galati - 86, and Constanta -60).

Another economic criterion has in view the annual average port traffic of goods. This indicator varied directly proportional to the number of employees, complexity of ports equipments and port area. The first rank holds Constanta (far above 10 million tons), followed by Galati and Braila (up to 10 million tons) Tulcea, Calarasi, Cernavoda, Medgidia, Giurgiu, Turnu Magurele, Drobeta Turnu Severin, and Orsova with a modest annual traffic of 0.5 - 3 millions. The other town-ports register below 0.5 million tons traffic / year.

The hierarchy of the annual average air traffic of goods and passengers Bucharest, Timisoara, Cluj-Napoca, Oradea, Arad, Iasi, Suceava, Targu Mures, Sibiu, Constanta, Satu Mare, Baia Mare, Bacau, Caransebes, Tulcea, and Craiova.

The hierarchy of towns by number of economic agents operating in the general road transport reveals the importance inter-settlement relations as well as regional disparities of demand for this type of services the direct consequence of destructive economic development. At the top of the hierarchy ranks Bucharest with over 500 road transport companies. Second in line stays Brasov, followed by Constanta, Timisoara, Arad, Oradea, Cluj-Napoca, and Baia Mare, with more than 50 firms each. Craiova, Ploiesti, Bacau, Iasi, Piatra Neamt, Bistrita, Targu Mures, Sibiu over 25 firms; Buzau, Galati, Braila, Suceava, Botosani, Satu Mare, Deva, Alba Iulia, Drobeta Turnu Severin, Pitesti, Slatina, Târgoviste, Miercurea Ciuc, Sfantu Gheorghe, Onesti, Roman, and Odorheiu Secuiesc between 10 and 25 firms; and over 80 small and medium-sized towns have below 10 general road transport firms each.

On the basis of these criteria and the summation of the standardised values of the above indicators, a town hierarchy was worked out, also high lighting the importance of transport in the functional structure of towns, and their rate of coordinators of transport activities in the territory:

- the pretty large variation interval yielded by summating the ten indicator values (0.048 at Azuga and 7.916 in Bucharest) is suggestive of the huge disparity in the rate transport activities in Romania's towns.

1. First rank towns. Bucharest alone enjoys this position due to the pattern of ground and air networks and the proportion of active population working in this sector.

2. Second-rank towns score values between 4 and 4.6 (Timisoara, Constanta, and Galati). The rank was assigned mainly in terms of geographical position, accessibility to transport networks and demand for transport services. Next in line stand the towns with 3.1-3.8 score (Iasi, Brasov, Cluj Napoca, Arad, Oradea, and Craiova). This hierarchy points to the importance of the transport function in respect of accessibility to rail, road and air networks, or the magnitude of the rail-and-road traffic (Brasov).

3. Third rank towns score between 2 and 3. They correspond to centres of intense railway traffic (Ploiesti, Simeria, Buzau), and to some towns accesssing several transport systems (Sibiu, Suceava, Tulcea, Braila, Targu Mures, and Satu Mare). Under this same category list the towns with 1-2 score: county seats, some with good access to various networks (Giurgiu, Bacau, Calarasi, Piatra Neamt, Drobeta Turnu Severin, Baia Mare, Pitesti, Alba Iulia, Targu Jiu, Slobozia, Focsani, Resita, Targoviste, Sfantu Gheorghe, Deva, Ramnicu Valcea, Botosani, Bistrita, Slatina, Alexandria, Zalau, Miercurea Ciuc, and Vaslui), towns specialised in transport area (Caransebes, Adjud, Fetesti, Dej, Medgidia, Sulina, Rosiori de Vede, Orsova, and Piatra Olt), and some other playing a polarising role (Barlad, Copsa Mica, Hunedoara, Turnu Magurele, Petrosani, Strehaia, Oravita, Roman, Fieni, and Gheorgheni).

4. Fourth-rank towns (0.5-1.0 score). Although some of them maybe specialised in transport operations yet the general economic slowdown, has pretty much reduced their activities (Tecuci, Jimbolia, Blaj, Videle, Pascani, Navodari, Oltenita, Marasesti, Calafat, Lugoj, Caracal, Cernavoda, Mangalia, Titu, Jibou, Faurei, Corabia, Zimnicea, Moldova Noua, and Curtici); others hold a local polarising position (Odorheiu Secuiesc, Dorohoi, Darabani, Medias, Cristuru Secuiesc, Ocna Mures,

Motru, Tandarei, Urziceni, Lipova, Fagaras, Lupeni, Valea lui Mihai, Ludus, Targu Carbunesti, Chisinau Cris, Aiud, Carei, Sebes, Covasna, Campulung Moldovenesc, Vatra Dornei, Vulcan, Gura Humorului, Toplita, Husi, Sovata, and Buzias).

5. Fifth-rank towns score below a 0.5 value, that is reduced transport function with negative impact on their polarising role despite some being railway junctions (Teius, Filiasi) within the settlement sub-systems.

Urban Passenger Traffic. Structure, Distribution and Rates

A comparative analyses of the urban passenger traffic over the 1950-1998 period reveals that towns running this type of transport grew from 27 in 1950 to 142 in 1998.

After 1990, the social and economic decline of Romanian society led to numerical decrease of this category of towns.

This situation also indicates that the administration of towns showed little interest in transports, partly because of money shortage.

However, looking at the 1996 figures versus 1995, it appears that the number of public transport towns rose from 163 to 166, respectively.

The expansion of the urban passenger traffic was connected with the increase in the length of lines and number of carried passengers.

Throughout the studied period the bus and tramway topped the list of transport means.

Looking at the 1996 statistical figures in the territory (1996 was taken as reference year because the 1999 Statistical Yearbook of Romania, published in the year 2000, does not contain this urban transport towns) reveals that out of the 262 urban localities extent at that time, large towns possess all the three ground transport networks (Bucharest, Brasov, Braila, Cluj-Napoca, Constanta, Galati, Iasi, Sibiu and Timisoara; Ploiesti was added later). Their share within the overall number of passengers is directly proportional to their demographic size, transport network length and vehicle capacity.

The second category of towns have only two classical urban means of transport: either bus or tramway (Ploiesti, Craiova, Resita, Arad, Oradea, and Botosani), or bus and trolley bus (Targu Jiu, Satu Mare, Suceava, Slatina, Piatra Neamt, Vaslui, Targoviste, Medias, and Baia Mare).

The others have only one means of conveyance (bus).

The demographic size of towns running an urban transport system varies widely, from 3,199 to 2,054,079 inhabitants. This clearly shows that the offer and demand for transport services is connected not only with demographic size, but also with the territorial size of an urban settlement.

A comparative analysis of the urban passenger traffic in towns with two or three transport systems, correlated with their demographic size and territorial coverage (at the expense of residential areas) indicates direct proportionality among these elements.

Telecommunication Networks. Structure and Geographical Distribution

Geographical distribution of telephone users over the 1990-1999 period:

- increasing number in all the counties, between 11,565 telephone posts in Teleorman County and 190,1999 in Bucharest City + Ilfov County;

- increases were particularly significant in the highly urbanized counties: Prahova, Constanta, Timis, Iasi, Galati, Mures, Dolj, Bacau, Cluj, Sibiu,

Brasov, Arges, Arad, and Braila (31,000 - 83,000 telephone posts), and mainly in the big centers with over 100,000 inhabitants;

- the huge discrepancy (of 1999) between Bucharest (+ Ilfov County) and the others counties, was also the consequence of the distinctively different demographic size of Bucharest and of the other towns in Romania, e.g. 28,000 users in Giurgiu County and over 770,000 in Bucharest;
- most counties register values between 28,000 (minimum values) and 95,000;
- counties with the highest numbers of telephone subscriptions (between 101,000 and 175,000) are: Prahova, Constanta, Cluj, Timis, Iasi, Bacau, Brasov, Mures, Galati, Dolj, and Sibiu);
- the number of subscriptions / 1,000 inhabitants at national level averaged 165 in 1999 as against 104.5 in 1993;
- the territorial variation of this indicator goes from 80.9 in Teleorman County to 338.3 in Bucharest + Ilfov County;
- above the average national level of 165 telephone subscriptions / 1,000 inh. Scored only the counties of Galati (169.2), Braila (170.4), Cluj (181.1), Brasov (183.2), Arad (186.4), Mures (186.9), Timis (189), Constanta (201.2), Prahova (203.6), Sibiu (228) and Bucharest +Ilfov County (338.3).

Public Services

Water supply networks:

- In 1990, a number of 2,331 localities benefited from a water supply network, the majority in Maramures County (167) and fewest in Dolj County (8).
- In the year 2000, water networks existed in 1,620 administrative units (265 towns and 1,355 communes), the majority in Cluj County (71), fewest in Giurgiu (7) and Dolj (8) counties.
- The total length of the water supply networks in 1990 stood between 2,133 km (Bucharest city and Ilfov County) and 155 km (Giurgiu County).
- Network length in the year 2000 registered some increases in certain counties 2,179.2 km in Bucharest city and Ilfov County and 144 km in Giurgiu County.
- Water networks were uneven spread in the rural areas, between 50 % and 75 % in the counties of Gorj, Timis, Satu Mare, Calarasi, Harghita, Cluj, Ialomita, Dambovita, Maramures, Vrancea, Buzau, Tulcea, and Salaj.
- Values below 20 % registered in Caras Severin, Bacau, Hunedoara, Sibiu, Giurgiu, Iasi, Dolj, and Ilfov counties.

Sewarage networks:

- In 1990, 542 localities (of which 257 towns) had a sewarage system in place along 13,000 km.
- Most villages benefiting from the system were found in the counties of Mures - 23, Prahova - 21, Ilfov - 21, Cluj - 18, Maramures - 15, Hunedoara - 13, Bacau, Suceava, and Timis - 11 each, and Arges - 10. The other counties listed under 10 rural settlements in this category.
- The length of the network varied between 88 km (Giurgiu County) and 893 km (Constanta County). In Bucharest city and Ilfov County there were1,748 km of sewarage pipes.
- In the year 2000, a number of 639 administrative units (264 towns and 375 communes) were connected to the network that totalled 16,348.4 km (15,319.6 km in town and 1,028.8 km in the countryside.

- That same year (2000) registered very few sewarage networks in the countryside, from 19 % in Tulcea County to 0 % in Alba County.

Natural gas networks:

- In 1990, the network was 10,778 Km long and supplied 522 localities, the majority located in counties with rich natural gas resources or registered a great demand: Bucharest and Ilfov County, Mures, Prahova, Cluj, Sibiu, Brasov, and Dambovita. At the other end of the spectrum stood Constanta, Teleorman, and Vaslui; Mehedinti and Tulcea counties which did not benefit from this facility.
- In the year 2000, the network supplied 169 towns and 353 communes the overall length rising to 21,597.9 Km (14,168.2 Km in the urban and 7,429.7 Km in the rural).
- The counties with important networks in the countryside were: Mures, Cluj, Prahova, Sibiu, Alba, Dambovita, Maramures, Brasov, and Bistrita Nasaud. No natural gas supply in the rural areas of Constanta, Giurgiu, Ialomita, Mehedinti, Teleorman, and Vaslui counties.

Expenditures on Public Services, Transport and Telecommunication covered from the Local Budgets (2001)

The analyses of transport routes and facilities (water supply networks, sewerage networks and natural gas networks) have revealed a deficient situation mainly in the countryside.

Measures to improve this state of things ought to be taken at both county and local levels. Modest percentage from the local budgets were earmarked to the transport system, in particular.

- At county level: 8.5 - 41.8 % of all expenditures are allotted to public services. Highest percentages recording Bihor, Hunedoara, Constanta, Bucharest, and Botosani counties.
- Investments in transports: from 1.1 % (Calarasi County to 23 % (Bucharest city), values rising in the counties lining the European traffic corridors crossing Romania.
- The local budgets of municipia are similarly to the county ones in this respect.
- In the other towns, money are directed mostly to the public services (between 56 % in Ilfov County and 9.1% in Vaslui County), transports and telecommunications receiving incredibly low sums in general up to 1 % from their most of the county budgets.
- Rural public services register between 2.6 % (Vaslui County) and 23 % (Ilfov County). More generous are the counties from the central and western parts of Romania.
- The figures for transports and telecommunications are even lower from zero (Arges, Braila, Dambovita, Harghita, Sibiu counties) to 7.9 % (Mehedinti County). The allocated money is totally insufficient for the maintenance or modernisation of village roads.

BIBLIOGRAPHY

Hansen, T., Ianos, I., Pascariu, G., Platon, V., Sandu, D. (1997*), Profiles of the Romanian development regions*, Phare Programme - Regional development policy, Rambol Consultancy Group, Bucuresti, 57 pp.

Tălângă, Cr. (2000), *Transporturile şi sistemele de aşezări din România*, Editura Tehnică, Bucureşti, 192 pp.

*** (1994), *Romanian ports*, Ministerul Transporturilor, Bucureşti, 40 pp.

*** (1996*), Legea nr. 71*, Monitorul Oficial al României, Bucureşti, pp. 1-9.

*** (1997), *Carta Verde*, Politici de dezvoltare regională în România, Guvernul României, Comisia Europeană, Programul Phare, Bucureşti, 88 pp.

*** (2001), *Transportul de pasageri şi mărfuri pe moduri de transport în anul 2000*, INSSE, Bucureşti.

*** (2001), *Lungimea căilor de transport la 31 XII 2000*, INSSE, Bucureşti.