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THE TOWNS AND THE TRAFFIC OF THEIR OUTSKIRTS IN SLOVENIA

In the urban policy of the long-term development of SR Slovenia the decision has been made that in this republic several regional centres of development would be adaptively developed. That is to say, that we have decided for a poliocentric system of development. Various important factors, specific for this republic, have influenced this decision. Slovenia is a small /25,000 km²/, morphologically, regionally and regarding its mutual connections a very agitated and colourful country. Traffic-remoted and less developed regions have begun to lose their population. To develop a monocentric system would mean that the capital Ljubljana would become a large city, while over 60 smaller centres in Slovenia would hardly survive, would be problematic to keep, and would not be capable to prevent emigrations of their inhabitants. Does such a small national unit can afford the emptying of some regions? This would mean a loss of our national space, and what is essential, a loss of some remote and even of frontier regions. The morphologic shape of Slovenia requires several centres of development if we want to control it gravitationally by the meand of traffic. That is why we have accepted a planned principle to develop several regional centres of development, and beside them a number of smaller ones which, proportionately arranged, would assure the same possibilities of development and those of supply to the whole space.

In this way our projected decision is the following:

Ljubljana, the central city of the republic with all its central functions would have in prospect 400.000 inhabitants, central functions for over 2 millions of inhabitants and central regional functions for 100.000 inhabitants of its surroundings. We would also develop four more important regional centres/Maribor, Celje, Koper and Novo mesto/ with 35 to 75 thousands inhabitants and with influential areas of 60 to 100 thousands inhabitants.

Besides above mentioned centres there are several regional centres that have a special meaning in the scheme of urbanisation, in this way in Slovenia, there are 13 regional centres of development with a slighter more considerable centralisation.

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Among others an important question for the realisation an normal functioning of the planned urban system is that of outskirts traffic network of the centres of development in SR Slovenia.

How is this traffic network prepared for the planned or actual centralisation? For the starting point the following has also to be mentioned and considered:

1. In the above mentioned urban centres and their outskirts there are approximately 5 inhabitants on one motor vehicle.
2. Slovenia has no internal water communications, and regarding the short relations the percentage of merchant transport that the road traffic takes over from the railroad is much higher than it is on an average in other developed countries. So, this is an additional charge of the road network.
3. The urbanisation is spreading quickly outwards from main regional centres, nowadays generally along the roads) within 30 minutes reach from the centres. The road traffic is already bringing above 50 % of inhabitants that central gravitation moves, and the vein roads are 80 % burdened by private vehicles.
4. Besides the normal gravitation caused by the centralisation /we have roughly estimated it with the equation $G = \frac{P}{d}$; G - gravitation, P - the number of the inhabitants of a gravitational centre and d - distance / it is necessary to consider that some of the centres of development /Ljubljana, Maribor, Koper, Nova Gorica, Celje, Kranj/ are situated along very important international routes. It concerns the strong tourist streams that transfuse through this area 80 % of all tourist vehicles that come in Yugoslavia/ per year/. Regarding such traffic situation the complete tourism of those towns is under strong impression of this transitory tourism. At the same time it is necessary to mention that strong transitory streams from Western, North-Western and Northern Europe to Yugoslavia, to the Balkans and to the Near Orient are passing the above mentioned towns. Tourism and transitory transport are such important factors that it is necessary to correct with them the dividend in the gravitational equation: $G = tq \frac{P}{d} / t$ - tourism, q - transition/.

On the enclosed graph we have presented some examples of the slovene centres of development and of their outskirts network. What interests us for example is the relation among radial, orbital and tangential directions of the lines. Each one has a determined meaning, it characterises the functions of transport. The basic attractive force is marked by radial edges, the higher level of development is shown by orbital directions, with the intention to avoid the concentration in the centres, and tangential edges may be either a part of incomplete orbital ones or a sign that a weak town-attractive force has not attracted them yet.

On the graph we have fitted the network with the circles marking the distance from the town centre

radius	sphere
8 km	50 km
16 km	100 km
24 km	150 km

Because the radial edges are the lines along which the radiation of urbanization is spreading outwards, we are establishing how they cut the circles of distance. We expect that the number of radial edges in each next circle increases outwards.

By means of the number of radial edges on fixed distances we can calculate "the branching ratio", if with the number of radial edges that cut the circle on a fixed distance we divide the number of radial edges that cut the circle on the next fixed distance. This branching ratio is valid for a certain calculated orbit. We can also calculate the density of radial edges on various distances from a town centre. We present it with the number of radial edges on the sphere of 10 km.

Ljubljana	Distance from town-centre	8	16	24
	Number of radial edges	8	12	14
	Branching ratio	1,5		1,16
	Density on the sphere			
	of 10 km	1,6	1,2	0,93
Celje	Distance from town-centre	8	16	24
	Number of radial edges	6	10	12
	Branching ratio	1,66		1,2
	Density on the sphere			
	of 10 km	1,2	1,0	0,8
Maribor	Distance from town-centre	8	16	24
	Number of radial edges	8	8	13
	Branching ratio	0,0		1,62
	Density on the sphere			
	of 10 km	1,6	0,8	0,8
Novo mesto	Distance from town-centre	8	16	24
	Number of radial edges	5	5	7
	Branching ratio	0,0		1,4
	Density on the sphere of			
	10 km	1	0,5	0,46

Kranj	Distance from town-centre	8	16	24
	Number of radial edges	8	11	12
	Branching ratio	1,37	1,09	
	Density on the sphere of 10 km	1,6	1,1	0,8
Murska Sobota	Distance from town-centre	8	16	24
	Number of radial edges	8	11	13
	Branching ratio	1,37	1,18	
	Density on the sphere of 10 km	1,6	1,1	0,86

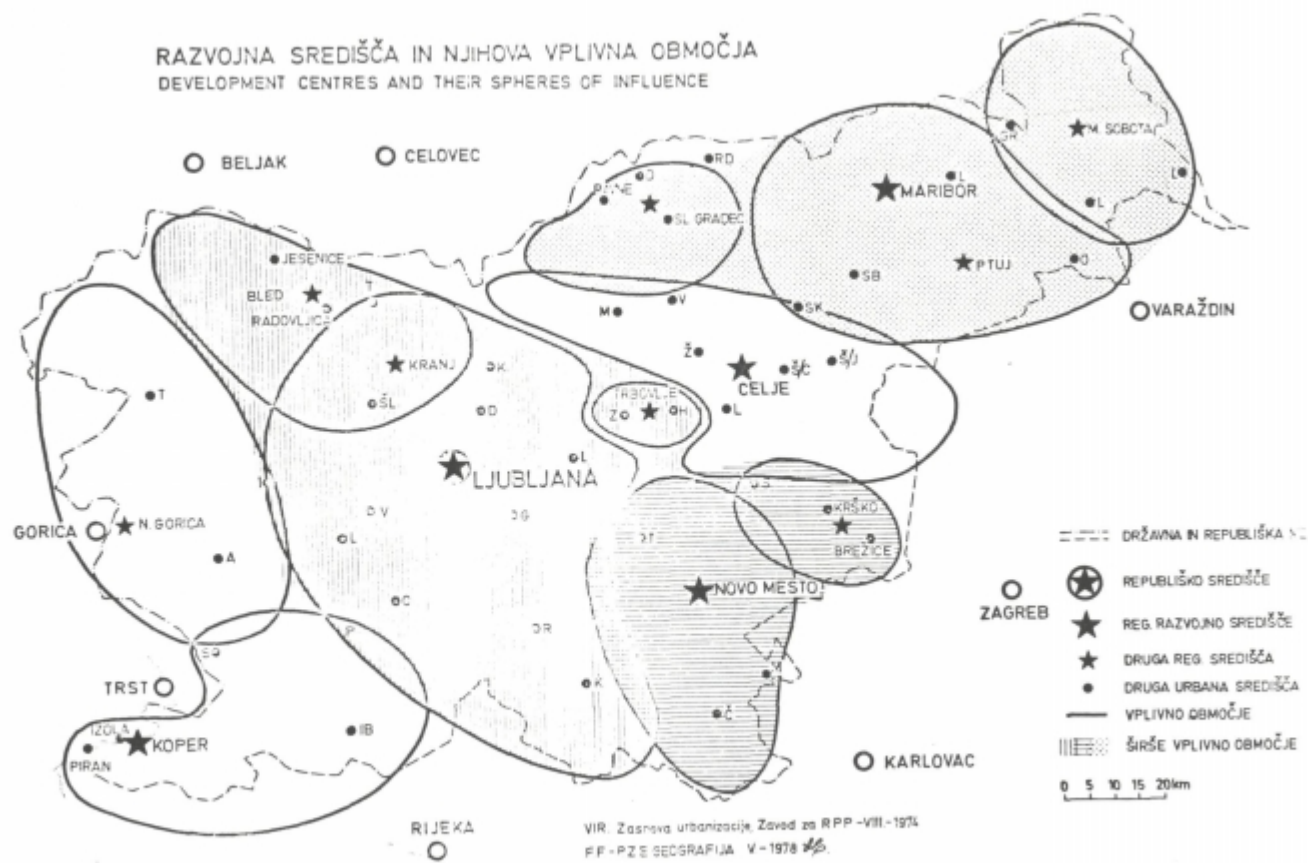
The examples of radial systems on slovene roads

On the enclosed index the results of such an analysis on the examples of outskirts networks for some slovene towns are presented /pict. 2 B, C, D, E, F, G/.

From the index and from both graphs one can see considerable differences among the radial systems of the discussed towns. The graphs made on the basis of schemes of radial systems from the pict. 2 show how the number of radial edges on principle combines proportionately of the distance from a centre and also how the density of radial edges on the sphere of 1 km decreases proportionately to the distance.

1. The analysis and reciprocal comparison must include the fact that the compared towns vary considerably in the number of inhabitants and also in functions, development and grade of centralisation.
2. The systems of the towns Ljubljana, Celje, Maribor and Kranj are very similar and they have been expected. The number of radial edges increases from inwards to outwards, the density of these edges decreases outwards more or less regularly, the reducing of the branching ratio is hardly worth mentioning. There are naturally, slight differences among these towns, e.g. the number of radial edges in the area of Kranj is fixed between 26 and 24 km, in the area of Celje the density of edges slightly reduces. The detailed analysis of the properly chosen circles of distance would show a lot of other peculiarities the reasons for which must still be searched for.
3. Maribor and Novo mesto vary considerably from above discussed systems. They are both centres of important regions, they both have relatively favourable morphology conditions, and they both show unexpected features... At the beginning the number of radial edges does not increase outwards at all but in the next orbit between 16 and 24 km it rises unexpectedly. This is also shown by the branching ratio which is at first 0,0 for both, then it rises on 1,4 to 1,62. It presents a total contrast to the rest of the towns.

RAZVOJNA SREDIŠČA IN NJIHOVA VPLIVNA OBMOČJA DEVELOPMENT CENTRES AND THEIR SPHERES OF INFLUENCE



B LJUBLJANA



D MARIBOR



C CELJE



E NOVO MESTO



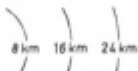
F KRANJ



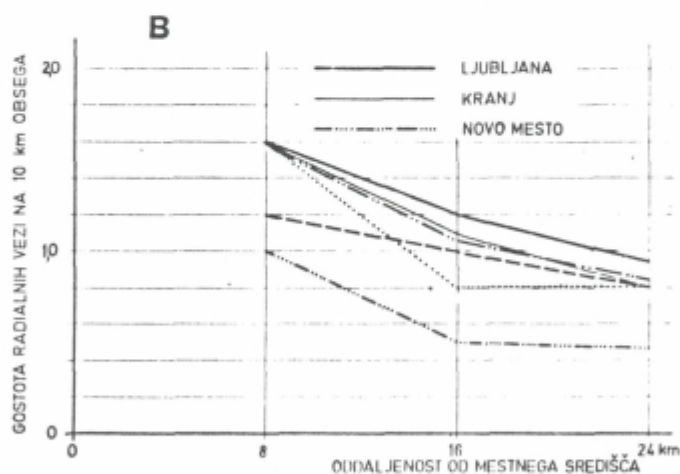
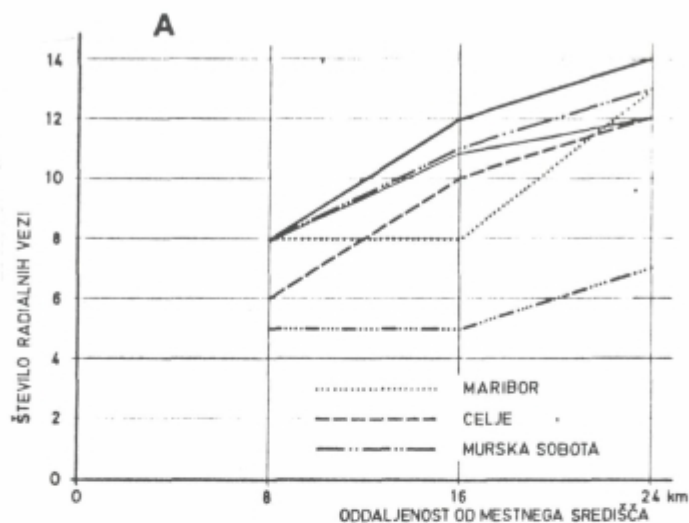
G MURSKA SOBOTA



SREDIŠČE ●



P.F. - P.Z. E GEOGRAFIJA IX - 1977 2/2



GRAFIKONI PONAŽARJAJO RAZLIKE MED
MESTNIMI RADIALNIMI SISTEMI

GRAPHIC PRESENTATION OF THE DIFFERENCES
AMONG THE URBAN RADIAL SYSTEMS

The discussed factors can warn us, that these towns have a special inward structure and special morphology, they can also be a way-mark for the direction in which we have to search for the causes.

Marjan Žagar

Slovenska mesta in promet v njihovih obmestjih

V načrtih regionalnega razvoja SR Slovenije je predviden hitrejši razvoj večjega števila centralnih naselij. Kot važen dejavnik takšnega razvoja se pojavlja prometna funkcija. Pri tem je treba zlasti upoštevati naslednje:

1. V prizadetih centrih in v njihovih ožjih vplivnih območjih pride okoli 5 prebivalcev na eno motorno vozilo.
2. Slovenija nima plovnih rek in glede na kratke razdalje je odstotek po cesti prepeljanega tovora višji kot v drugih razvitih deželah.
3. Urbanizacija izvenmestnega prostora je dosegla visoko stopnjo, predvsem ob glavnih cestah. Cestni promet opravlja okoli 50 % gravitacije prebivalstva, od tega 80 % z osebnimi vozili.
4. Največja središča ležijo ob pomembnih mednarodnih cestah, po katerih potuje 80 % turistov, ki pridejo v Jugoslavijo. Podobno je s tovrnim prometom.

Opravljen analiza oddaljenosti med posameznimi središči in obmestnega prometnega omrežja določenih središč (kar je prikazano na priloženih skicah) je dala naslednje ugotovitve:

1. Primerjalna analiza mora upoštevati dejstvo, da so mesta zelo različna po številu prebivalstva, funkciji, razvoju in stopnji centralnosti.
2. Sistem mest Ljubljane, Celja, Maribora in Kranja je zelo jasn in pričakov. Število radialnih povezav narašča od znotraj navzven, gostota teh povezav upada bolj ali manj pravilno. Razlike med temi mesti so minimalne, radialne povezave v obmestju Kranja so med 26 in 24 km, v območju Celja se to število zmanjša.
3. Maribor in Novo mesto imata zelo različen sistem. Oboji sta središči pomembne regije itd. Število radialnih povezav je bilo med 16 in 24 km, kar je odvisno tudi od morfologije obmestja.