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# THE CONTEMPORARY DEVELOPMENT TREND AND PROGNOSIS OF THE EVOLUTION OF BRATISLAVA AND ITS METROPOLITAN REGION

The contemporary Bratislava is rapidly developing in various directions. The direction of the western zone which includes Kútiky, Dúbrovka, Záhorská Bystrica, Stupava, Mariánka and Borinka, the north-eastern direction including Jur pri Bratislave, Pezinok, Vinosady, Myslenice and Modra, the eastern direction with Bernolákovo, Veľký Biel, Tureň, Senec, Ivanka pri Dunaji, Nová Dedinka and the south-eastern direction which includes Rovinka, Šamorín, Mliečno and Dunajská Lužná are all expressively formed. In the last two years there arose a new part on the right bank of the Danube river, which in a short time will have 150,000 inhabitants. In spite of the fact that the creation of new residential zones relatively distant from the centre and from the industrial areas evokes new impacts on investments into the infrastructure from the standpoint of the motivation of life in a healthy environment and social motivation, this new development is justifiable. It is necessary to coordinate the short and long-term aspects. It is not possible to allow a great number of actions under construction and a chronic poor equipment with services and infrastructure. The construction in new areas is possible only after their perfect economic justification. An expressive development began also in the whole gravitation territory of Bratislava. The gravitation area includes the districts Bratislava, Dunajská Streda and Senica. Besides these districts we must underline also the increasing linkage between Bratislava and Trnava and its urbanistic region. The improvement of transportation will strengthen these linkages more, therefore we must consider Trnava as an important part of the metropolitan structure of Bratislava.

In the subsysteme of transportation there exists an irrepressible pressure on the development of automobile transportation. In 1959 the relation between the permanent and transient inhabitants of Bratislava and the number of cars was 1:20.3, in 1965 1:13.5, in 1975 1:7.5 and in 1978 1:4.39. This trend is bound to the need of the construction of highways, express ways in the city, fast circles, parking places, auto-services and garages. The new needs are very demanding on investments and transformation of the hitherto city transportation system. The same is the pressure on the improvement of transportation in the inner town and in the whole urbanized territory. The mass transportation of people in 1940 on the territory of Bratislava was 19.9 million of people in a year. In 1960 127.1 mil. passengers, in 1973 223.7 mil passengers and in 1978 289 mil. passengers. The rise in price of energy, mainly of gasoline stresses the necessity of the building of

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city transportation lines of a mass type. According to the proposal of the general extension plan of Bratislava there is considered the construction of fast line which in the central part of the town would have the character of the underground — the realization of this project should be in the 7th five year plan. This tendency is to be supported because only a fast and cheap traffic can provide a continuous working of the town system of Bratislava which with regard to specific natural conditions and specific historical development is characterized with a large extension. The problems of the energetic sphere create preconditions for a new situation which will influence the growth of the compaction of land coverage and it becomes again to be more dense. The increase of density of the built up area is naturally in conflict with the new motivation of a healthy environment and the social motivation of the building of the socialist town — therefore we must critically evaluate it. The rise of the prices of the fuel shows that the transportation costs of persons in the following decades will have an increasing tendency and therefore the mass transportation of persons must be improved. The development shows that with regard to the transportation costs there moves also the limit of the number of inhabitants for the profitable operation of the fast line and underground downwards, i.e. the towns with half million inhabitants can economically employ these sorts of traffic. Of great importance is also the construction of 2 new bridges over the Danube and the prepared construction of underground under the Danube which will connect the central parts of the city with the area of Petržalka. Only an effective and cheap mass communication and the reduction of fuel prices for individual means of communication or the substitution with new cheaper sources of energy can give reasons for the dispersions of the town. The transportation between the hinterland and Bratislava proper will also have a growth tendency, therefore we have to enlarge and improved the bus and railway transportation and set into operation new passenger railway and bus stations.

The river transportation on the Danube has for the C.S.S.R. an increasing importance and after the construction of the Danube- Main- Rhine canal and the Odra-Danube canal the importance of the Danube harbour in Bratislava will increase. Therefore the opinions urging the reconstruction of this harbour and the enlargement of its capacity are fully justified. An important stimulus of the development of the harbour is the proper growth of Bratislava itself. The enlargement of the transportation sphere of the Danube will have an influence also on the location of new industrial branches in Bratislava and its hinterland.

The long distance railway transportation is one of the most important town forming functions in Bratislava. The location of Bratislava on the important European communication line was one of the factors of growth of the town and of its industry. This location will further act on the specialization of Bratislava in the framework of the cooperation of the socialist states of the CMEA. Together with the location on the Danube there is created an important system of long distance communication lines which has an inner growth dynamics. Therefore it is necessary to improve this system of communication network so that it should be in conformity with the contemporary and future technological and economic demands. If we join the east-west highway which is being built up in the present time, the vicinity of the southern highway on the Hungarian and Austrian territory and the planned highways from Scandinavia through Poland to the Adriatic Sea with a branch to Turkey, the growth power of the communication will increase. Because the system of the communication network is always of the individual communication lines. As these lines meet on the territory of Bratislava or they approach it in its broader gravitation area, it is necessary to fully employ the positional and natural preconditions e.g. the transition through the Devín and Lamač gate, the

location on the contact point of 3 states, the transition on the Danube and other advantages for the formation of a coherent communication nodal point of a high order. It is necessary to underline also the important task of the newly built long distance oil pipe lines and gas lines which have accentuated and privileged even more the position of Bratislava.

From the standpoint of the whole communication system the central European communication network system can be defined as a polycentric one. The neighbouring centres, mainly Budapest and Vienna have already historically transformed orientation of their communication network to the territory whose nuclei they are. In the present time Bratislava builds communication lines and organically integrates itself into this polycentric central European System. There is no doubt about the importance of the improvement trend completion of the system with the necessary communication lines and with the orientation to Bratislava which should be underlined with a purposeful planning and managing. There belongs here mainly the construction of the sections of long distance communication lines on the territory of Bratislava and in its urbanized zone, the construction of new bridges over the Danube, the construction of the harbour, freight and passenger main railway station. A special place in the modern communication belongs to the air transport. Bratislava has evidently an advantageous situation and also favourable climatic conditions for the construction of an international airport. These factors together with the growth of the town and the increasing importance of the whole state functions reason the opening of the new airlines which would connect Bratislava with the important metropolitan centres of the socialist states and the capitals of the world with which the C.S.S.R. and Slovakia have important contacts. The building of a modern airport is therefore a great success and its improvement should be included into the plan of Bratislava. From the standpoint of the growth of employment the airport is an important town-forming power. Of a great importance for the correct operation of the urbanic system is the subsystem of work. Industry belongs to the most important elements of the subsystem. From the standpoint of the goals of the inhabitants to reach a higher social level of a primary importance are the job opportunities and the production of consumers goods. From the standpoint of the preservation of a healthy living environment it seems to be necessary to re-evaluate the structure and the localization of industry on the territory of Bratislava. We can agree with the opinions that the dominant position of the chemical industry directly in the town is not typical for the metropolis of the type of Bratislava as well as with the standpoint that in the future development it will be necessary to give priority to the development of the electrotechnical, machinery and polygraphic industries as well as to other processing branches. Several works of the chemical, alimentary and building industries which had a negative influence on the densely settled areas are to be relocated into the hinterland. Many of them have no preconditions for a further growth and show a tendency to migrate to the margin of the urbanized territory.

The new development of the automobile industry has a great impact on the economic development and dynamics of the whole space structure. The car industry evokes a series of economic stimuli and creates the multiplication effects. From this standpoint as well as from the standpoint of the situation of Bratislava its localization can play an important role. From the standpoint of town-forming and region-forming it is necessary to fully support it. Disputable is the question of the best suitable place for its localization. From the standpoint of the necessity to preserve the priorities of the western areas for residential purposes and ser-

vices, a natural position would be the territory eastwards from Bratislava in the linkage to the older industrial sector. We must also calculate with the gravitation power of the newly constructed highway in the western direction from Bratislava. The highway at all not act with a grew power on a series of smaller works, store-houses and institutions. Therefore it is necessary to calculate with a chain reaction of the living elements in the western area for the highway as well as for the automobile works. Such chain reaction can create a barrier for the intended residential belt and for the building of a complex healthy residential zone of Záhorie.

A great increase is to be expected in the consumption of electric energy. It is connected with the fast growth of the consumption of electric energy in the housing system, in the communication and industry. We can presuppose that data gained by extrapolation about the ten-fold increase till the year 2,000 will be exceeded. Even if the part of the increased consumption will be covered by classical sources mainly by the hydroelectric power station of Gabčíkovo, the planned thermal power station in Slovnaft the planned hydroelectric power station Wolfstahl and Devínsky Lom. From the standpoint of Bratislava extraordinarily important is the selection of the suitable locality for the atomic power plant. The atomic power plant with the output cca 1,000 MW could cover the needed demands its linkage to Bratislava as a big consumer center is correct and mainly in the economic vicinity to the sources of consumption lies one of the advantages of the atomic power plants. The opinions about the localization in the western part of Bratislava in the area of Devínska Nová Ves where its localization would be bound also on the automobile works of Bratislava does not seem to be correct. As the experiences show it is not possible to exclude the failures even in the most modern atomic power plants. In such case the prevailing western winds would transfer the undesirable concentration of radioactivity over the whole territory of Bratislava. The territory is exposed to the neotectonic movements and characterized by a seismicity. According to the localization theory of the atomic power plant it is better not to use such territory if we have other areas at our disposal. The third reality which speaks against it is the above mentioned chaining of the industrial plants. The interest to maintain the healthy environment leads us to the conviction that it is not right to construct a new large industrial area in the western prevalingly residential part of Bratislava. It would be better to localize the atomic power plant in a greater distance from Bratislava where the geological, pedological, hydrological and climatic conditions as well as the linkage to the great concentration of inhabitants create a more suitable combination than in Devínska Nová Ves. It is necessary to avoid the error from the years 1965-70 when in the eastern part of the town in order to bring nearer the working place to the residential quarters we built in immediate linkage new plants of chemical and building industry, facilities of railway, air and ship transport as well as energy power plants. A great deal of the constructed 51.130 flats is exposed to undesirable exhalations, noise and also the supply of drink water was connected with difficulties. It would be better to reserve these western areas for the rapidly developed quarry and tertiary sector. For the development of industry it is necessary to prepare more extent areas. Even if in the metropolises of the Bratislava type the importance of the tertiary sector grows rapidly, it is necessary to anticipate a great development with regard to the absolute number and extension of the factories. Bratislava and western Slovakia also in the future will be a very attractive place for the localization of new plants which will be connected with the new inventions of the scientific-technical revolution. For this development it is necessary to reserve enough areas.



The form of the ground plan of Bratislava, i. e. its space structure is the result of a complex of forces and motivations. The town forms a whole with mutually bound parts. The centripetal forces lead to the concentration of central functions into the central part, the centrifugal forces expell several activities into the marginal parts. In the town as a system there act the parallel series, hierarchic linkages as well as the linkages of the sector complementarity, feed-back bounds — both positive and negative, inductive in and against the stream. The space structure is the result of a complex of various linkages, processes and complicated structure of the decision process. The decision process has an essential importance for the future form of Bratislava. It depends on the scientific, ideological, political, artistic and economic environment which influences the decision markers. The decision process is not rectilinear but it is the result of a selected strategy and very often a compromise, in the consequence of different interests of individual interest groups and departments. E. g. the department of industry, the department of agriculture, the department of environment protection, the department of housing construction, the department of construction of scientific institutions and universities, the department of communications etc. The opinions of the groups of interests are connected with the types of their own information milieu and information sources. It is natural that the socialist Bratislava cannot be a pure complex of individual housing quarters created around the places of job opportunities. The functional system organization creates a complex in which the polyfunctional, monofunctional or specialized parts mutually form a highly organized whole.

A decisive importance have the central functions of Bratislava and their whole national and whole state character. The elaboration of these functions with respect to the central position in the urbanistic system of Slovakia should be paid greater attention. The same may be said about the elaboration of problems concerning the metropolitan region and mutual influences of the three spatially very near national capitals in the Danube region. In the decades to come it will not be possible to avoid questions in connection with the vicinity of Budapest and Vienna. Bratislava in about 2000 — 2050 will certainly face problems brought along with a new type of the urbanistic structure — megalopolis. Since many investments of the technical and social infrastructure will be effective even in 25 years, the study of the urbanistic structure of Bratislava should be carried out from wider European and international aspects.

An important role in the formation of the spatial type of the town is played by communication. The inner division of the town is in a close relation with the technical level of transportation and the type of the transportation means. Trams, rail and trolley lines cause that the number of passengers is relatively stable and unchangeable. Therefore many activities dependent on these lines are situated in their vicinity, or at the crossing of the lines with communications which are suitable for the transportation of the mass loads.

The development of the passenger and freight automobile transport loosens these traditional bonds. In places where the express ways had been built there was the decrease of people and migration of old establishments to the border part. The sphere of economical transportation by cars on express ways and highways is growing due to higher speed and lower transport, time and financial expenses.

The border locations of the town in the vicinity of the main communication lines will become attractive also for the department stores, services, sports stadiums and places of rest and entertainment. Besides good communication accessibility there is also enough space for parking site, one floor houses and there

are no barriers to exploit mobility and speed of cars and thus to save both money and time. From these regions it is easy to reach the centre of the town, main residential quarters and recreational areas what as a consequence attracts the localization of motels, car-services, tourist restaurants, etc. Such a trend influences the formation of suburbs of a new type and speeds up the process of suburbanization. These suburbs are not situated directly in the main communication lines but are joined to them with vertical by-roads and overpass crossings. The developing of the tertiary sphere is the most characteristic factor of the present urbanization processes. The localization of the tertiary sphere and its communications lay demands on space. Besides the correctly anticipated development of the central part and a new centre of services in Petržalka, it is necessary to fully appreciate also these new possibilities.

In the present scale of Bratislava we can speak about the star-polynodal spatial structure, but from the aspect of the future growth of the metropolitan territory and continuity of the urbanistic structure in the Danube region it will be necessary to consider also a more universal large-scale model of the zonal urbanistic structure. This points out at the necessity to organize the whole territory with respect to built up areas, industrial zones, agricultural, water economy, forest, recreational and other areas. Such urbanistic structure is not only of national but also of international character. The planned economy with its international approach can solve these problems in a more liberal way than it was possible in the past. Therefore it will be useful to pay greater attention to the contact border territory.

The socialist Bratislava should develop in a harmonic conformity with 3 groups of forces:

- a) the forces of the socialist system which as a consequence of a new social motivation give a socialist town spatial features which are different from a capitalist town
- b) the forces following from national, ethnic, regional and historical peculiarities
- c) the forces following from the character of our planet and which are therefore common for the whole planet.

Of a special importance for the city life are green and recreational areas. Parks in the inner town do not cover large areas, therefore the opinions about the formation of the continuous green belts connected with the forest areas of the Small Carpathians and low lying river forests of the Danube should be taken into account. The building up of services, especially boarding, lodging, sporting, entertaining and transport facilities in the recreational areas of Bratislava is of great importance. To this effect it is necessary to survey the hitherto not built areas and to reserve them for parks or other recreational areas. From this aspect it is necessary to consider also the slope locations of Dúbravka.

If we are to include also expenses concerning health of the people as the precondition of a happy city life as well as those concerning the preservation of man as a biological species, then we must consider the optimization of the spatial structure in a different way. The preservation of the correct relation between the ecologic and social-economic system of the town and the assurance of the quality of life come to the foreground of attention.

The above discussed spatial structure is very demanding as for areas. It is evident that it would not be possible to preserve all what nature or society has formed, i. e. valuable biotypes, agricultural, forest and recreational areas. The building of communications, flats, industry on the territory of Bratislava will cover 4,500 ha of agricultural land. The loss in the agricultural production till the year 2000 is estimated in the present prices to 10,796 mil. Kčs. This loss shows

how complex is the problem of the construction of the modern urbanistic structure. It is disputable which should be preserved the vineyards on the slopes, which in the consequence of a high investment of labour have a high price, the arable land which in the consequence of thousand years lasting activity of nature and man contains a stratum able to produce food or the forest soil suitable for recreation? Where to localize the new construction of housing quarters and the services and other facilities. The world trend speaks in the favour of the arable land. Mainly the soil of low fertility with a low value for agriculture is being taken for building. We must find a relation between the built up areas, production of food and recreation areas and think over the employment of the employment of the areas for several aims/e. g. agriculture and recreation, agriculture and water economy, water economy and recreation, the protected biotops-zones of rest and leisure etc. From the standpoint of the fertility of soil and paralelly from the standpoint of the law on protection of the most valuable arable land appears an orientation towards the belt of Záhorie as substantiated for the next decades even if it is not the traditional main direction of the development of Bratislava.

Bratislava the capital of the S. S. R. reached in 1979 the number of 369,000 inhabitants. Besides the permanent inhabitants there lives here 28,300 students of University and Colleges and 16,000 apprentices, about 80% of these the statistics does not register as the inhabitants of Bratislava. Besides this there are about 74,500 commuters from the hinterland. The important central services and market places are visited daily by cca 10,000 persons. From these facts follows that the number of daily present population in the town is cca 480,000. The prognosis of the general extension plan for the year 1985 calculates with 398,000 permanent inhabitants and with 550,000 daily present people. The prognosis of the Research institute for regional planning presupposes 520,000 permanent inhabitants and 648,000 daily present people. These prognoses are based on the extrapolation of the growth of Czechoslovak towns in the period 1970 — 2,000 will increase by 170 % — 300 %. For Bratislava especially from reasons of flat construction there was accepted the lower limit of growth, in spite of the fact that it belongs to the most rapidly developing towns. In the period 1945-1970 i. e. in 25 years there were built in Bratislava 51,130 flats, in the period 1971 — 1980 i. e. in ten years the whole volume of new flats should be 52,270. During the years 1971 — 2,000 they presuppose to realize the construction of 140,290 flats. In 1970 — 2000 there is presupposed a decrease of occupancy rates of the housing unit from 2. 92 to 2. 55. This index has a great impact on the number of flats and paralelly on the need of built up areas in the individual five years plans. The decrease of occupancy rate of the housing unit is fully substantiated from the social reasons, but on the other hand it means a quick expansion of the built up areas and increased costs for the construction of the infrastructure. It means new residential zones and a great transfer of investments into the infrastructure. There is needed a synchronization with the creation of new economic values in the production which would allow such transfer of investments into the construction. If these means could not be at disposal then this relatively good standard of the occupancy rate could not be reached and the new construction in the area of Štupava and Pezinok should be postponed a later period.

The development trend of the inhabitants and the stimuli of grown of the geographical location and economy show that we have to calculate with a more rapid rate of growth as originally presupposed. It demands increased investments into the town infrastructure and the introduction of new forms of the construction of family houses and flats.

## **SEDANJI RAZVOJNI TREND IN NAPOVEDI RAZVOJA BRATISLAVE IN NJENE METROPOLITANSKE REGIJE**

Bratislava se hitro širi v različne smeri, predvsem proti vzhodu. Poleg tega je urbanizacija zajela celotno gravitacijsko območje mesta ob vse močnejšem povezovanju Bratislave s Trnavo ter njunima mestnima regijama.

Na razvoj Bratislave in njenega zaledja ima poseben vpliv prometno omrežje. Daljnovidne železnice so sploh eden od osnovnih mestotvornih dejavnikov Bratislave. Načrt regionalnega razvoja predvideva nadaljne organsko vključevanje v policentrični prometni sistem srednje Evrope. To bo možno z izgradnjo novih mostov preko Donave, pristanišča in glavne železniške postaje, z vključitvijo v načrtovan sistem mreže avtocest ter z izgradnjo mednarodnega letališča. O nujnosti ureditve lokalnega prometa pa priča podatek, da so l. 1960 sredstva mestnega prometa prepeljala 127 milijonov potnikov, l. 1973 223,7 milijona ter l. 1978 že 289 milijonov potnikov, ne da bi posebej omenjali porasta števila osebni avtomobilov.

V mestu in okolici je še vedno dosti industrije, ki močno onesnažuje okolje. V bodoče bo dan povdarek razvoju elektrotehnične, strojne in poligrafične industrije.

V današnjem obsegu ima Bratislava zvezdasto-polinodalno prostorsko strukturo, medtem ko bo v bodočem metropolitanskem razvoju v donavski regiji moral biti upoštevan bolj splošen model zonalne urbanistične strukture. Pri tem bo potrebno paziti na medsebojne odnose med bivalnimi, industrijskimi, kmetijskimi, rekreacijskimi in drugimi funkcijami in jim zagotoviti ustrezne površine. Vse bolj namreč prihaja v ospredje ohranitev pravičnega odnosa med ekološkim in socio-ekonomskim sistemom mesta in zagotovitev kvalitete bivanja. Pri tem se ne da povsem izogniti izgubi kmetijskih površin; do l. 2000 bo izgradnja komunikacij, stanovanj in industrije na območju Bratislave zahtevala 4500 ha kmetijskih površin.

L. 1979 je imela Bratislava 369.000 prebivalcev. Za l. 2000 se predvideva povečanje števila prebivalcev za 170 do 300 %. Posebno zaradi stanovanjskih problemov je bila sprejeta spodnja meja rasti in to kljub dejstvu, da spada mesto med najhitreje se razvijajoča mesta.