

JOSEF HURSKY**THE PRAGUE UNDERGROUND,
ITS PRESENT AND FUTURE**

After World War II, the Hungarian capital Budapest was the first of the capitals of the socialist countries — except the Soviet Union of course — that opened a line of a real underground railway in 1970. Prague followed in 1974 and the third was the Roumanian capital Bucharest in 1980. In 1983, the construction of the Warsaw underground is underway.

Budapest has nearly double the population of Prague and, therefore, the proportion of the length of the underground network and of the number of inhabitants is almost the same in Budapest and Prague — in Budapest inclusive of the old underground tramway. Prague's underground lies completely under the ground, whereas in Budapest a smaller part — like e.g. that of the new underground in Marseille and in some other cities — is on the surface.

From the point of view of transport geography, the problem of configuration of the network or of the foot passenger accessibility of the stations is being paid more attention than the technical and financial factors. On the other hand, some special geographical problems, e.g. the detailed morphology of the surface, will not be mentioned, so that the paper represents an informative transport-geographical report rather than a real study.

Most cities with populations similar to Prague in number, have had less difficulties with their undergrounds than our capital. The relief of the surface with the main river valley and several relatively deep transversal valleys is one of the two main obstacles. The maximal deep of the underground is 53 m, while in Warsaw e.g. it is only 15 m. The longest escalator of the Prague underground is 87 m long, while its counterpart in London e.g. only 54 m. The difference between the highest and the deepest station is in Prague nearly 160 m, while in Vienna e.g. only 71 m. Also the geological conditions are somewhat complicated, however, not as much as in Warsaw (e.g. unstable sandbanks). Another serious obstacle is the old city of Prague with many

medieval monuments in the centre, with narrow streets and few squares. Whole blocks had to be cleared — not in the historical centre, of course — to make way for the stations and pedestrian subways which were in many cases constructed simultaneously. Some houses had to be propped up and their foundations reinforced. About 3000 lodgings were immolated, other 1000 will follow by the end of this century, when the basic network of the underground will be finished. What a difference in comparison with, e.g., Marseille where not even a single house had to be destroyed.

The first plan for an underground tramway in Prague, with 4 lines of some 15 Km, had already been worked out in 1926 and the project was consulted even with specialists from abroad. The world wide economical crises, and then the threat of Hitlerite Germany, and finally World War II prevented the project from materializing. In the fifties, an underground tramway was considered as the best solution of Prague's public transport system, in the sixties, the construction of it was started. The first section was to connect Prague's Central Railway Station with the suburb in the south, using the new viaduct over the Nusle Valley. In 1968, the government made a principle change in the concept of Prague's public transport system. An independent network of a real underground railway instead of an equivalent of both the other kinds of surface transport, i.e. of the tramway and busses, had to be created. The experience of Soviet specialists was very welcome. Consequently, the production of the light carriages for the underground tramway was stopped, because it appeared more profitable to purchase the carriages from the factory in the Bielorrussian capital of Minsk, which supplies all the undergrounds in the socialist countries, except Roumania. A difficult task was the strengthening of the viaduct mentioned, which was originally designed for the lighter trains of the underground (running in a tube), but also as a motorway.

Every year, on an average some 2 Km are added to Prague's network. In 1985 the main part of the basic network will be finished. The three diagonal lines will form a triangle whose apexes have to enable the transfer of passengers in all five existing directions in 1985. Moreover, this triangle will make it possible to reduce very remarkably surface public transport in the old centre of the city. The three diagonals are distinguished by the letters A, B and C, originally also a fourth radial line, which will have been planned. Only line C has a secondary branch, C 1, which will have its terminal in the western part of the South Town. In the attached sketch, the full lines show the sections of lines which will be operating by autumn 1985, the dashed lines show the status in 1995. In 1985 the length of the network will be 27 km and the number of stations 32; in the year 2002 there will be 56,5 km of railway and 57 stations.

The southwestern half of line C was completed first. With its 13 stations it

serves the South Town where, in the seventies, the population increased more than in other Prague's satellites towns and suburbs. In the same year (1980) also line A was opened. It consists of the NW radial and the E-radial. This year (1984) the first section of the other radial of line C will begin to operate. It will serve the northern suburb and, later, it will be tended to the North Town. The central section of line B with its 7 stations is scheduled for opening by autumn 1985. The construction of this section requires the third crossing of the river. Its fourth crossing will follow in about 1992. The whole network shown in the map will become operational by the end of this century.

At present Prague's underground has one depot. It is located in the area of line C. Depot number 2 of line A in the east is now under construction. Line B will have its depot later.

It is difficult to get information of the same kind for reliable comparisons of cities with underground railways and a similar number of inhabitants. In this regard, the nearest to Prague is the capital of Austria, Vienna, which has about a quarter more inhabitants than Prague. Vienna prefers, as all centres in Western Europe, individual transport and, therefore, the underground in Prague is undoubtedly more important to its population than Vienna's underground to its inhabitants. The utilisation index of Prague's underground is about 40% higher than that of Vienna's underground.

In 1983 Prague's underground had 320 carriages with 58000 places and in the same year Vienna's underground possessed 136 double carriages with 54000 places. The difference of 4000 places is, however, only formal because in Prague one square metre serves 5 standing passengers, in Vienna only 4. The real total space in the train is, therefore, in both cases almost the same. The place-kilometres run index is more telling. Prague's underground has an index about 10% higher than Vienna. Most perspicuous is, of course, the number of passengers carried. In 1983 it was in Prague 262 but in Vienna 179 Mill., that means 32% less. The number of passengers kms was in Prague 1500, in Vienna about 1200 Mill.

There is no difference between Prague's and Vienna's undergrounds in the maximum speed which is 80 km/h (in Budapest only 70 km/h). The route of Prague's underground has a larger maximum gradient than in Vienna, its travel speed is a little lower, namely 33 km/h as opposed to 34 km/h in Vienna. Vienna's underground railway is powered by 200 KW motors i.e. 40% stronger than those of the Prague underground. The consumption of electric power in Prague is 66 mill., in Vienna 83 mill, kW. Prague envies Vienna its grade of electrification of its public transport means which is 83%. Prague having 62% will reach at best 75% of the share mentioned after the year 2000.

The interior of the stations in Prague is — like in Budapest — more

artistic than in Vienna. The side walls are lined with marble, hard limestone or aluminium sheets. The platforms in Vienna are 20 m longer than in Prague where platforms 100 m long are sufficient for the train with five single coaches. On the platforms in Prague there are time indicators which show how many minutes and seconds have lapsed since the last train left. The intervals in the evening peak periods are 2 minutes and 20 seconds, but the modern signalling system enables trains to be run at intervals of 1 1/2 mins if necessary. The distance between stations in Prague is 950 m, in Vienna only 850.

New underground railways make nearly always the other kinds of the public transport complementary, tramway and bus schedules and routes have to be adapted to the underground. This adaptation is not quite satisfactory everywhere in Prague; additional corrections are still desirable, because the reduction of the number of tram and bus lines and the prolongation of intervals were too large. The forecast of decreasing intensity of tramway and bus traffic was too optimistic and did not materialize in full. When the underground began to operate the planners believed that the share of passengers by tram in all public transport would drop from 73% in 1974 to 44% in 1980 and to 32% in 1985. The decrease, however, was considerably smaller. Bus transport was expected to drop as for 1980 but the decrease in its share is still (1984) insignificant because in the meantime some bus lines have been extended.

By the year 2002 nothing will be changed in the construction plan of Prague's underground. A single theoretical possibility is a small shortening of the northern section of line C, which will perhaps have to reach its terminal directly to save 2 km track and two stations. For the future perspective after the year 2002 there are nine alternatives of the pattern of lines which should follow. Only three alternatives, however, have any chance of being discussed seriously. It is, therefore, very important that the capacity of the three transit stations in the city should be able to cope with the increasing transport demands until 1995. A circle or a semi-circle line would be of great help in this respect. Concepts of circle lines assumed either a small or a larger circle. The large type cannot be considered seriously and even the smaller type could only be realized in its eastern half at best, as the so-called "eastern tangent line". Those very interested in the protection of the historical centre are advocating one or the other alternative mentioned and fighting against the primary concept of line D, which would cross the south-western part of the old city. Their slogan is "by no means another radial". The forth line and the new sections of the now existing lines will have a total length of 36 km, i.e. more than one third of the network planned after the year 2000 as the limit (92,5 km). The extensions will run W, NW and N as prolongations of the northern halves of all three existing lines.

In conclusion there is the question, if the geography of transport is able to participate in tasks such as the preparatory work for the project, what course the new routes and what locations the new stations should have. The answer is positive, i.e. transport-geography and transport-cartography can ameliorate the characteristics serving the optimal solution. Above all more precise methods of defining and measuring station accessibility — time accessibility as well as frequency-accessibility — must be taken into consideration. The less compact the housing areas are, the better of course is the chance of applying the methods mentioned. Moreover, it is possible that transport geographer could cooperate in the preparatory work on the work on the great dream of Prague's transport planners, i.e. in materializing an "integrated system of public transport". A promising start in this regard is represented by a study of a young czech transport geographer who examined "the Dynamics of Public Transport System in Prague in the Relation to Time Accessibility of the Town Centre"(*).

(*) JAN KOCTA. In: Acta Universitatis Carolinae. Geographics. tom. 18. Prague 1983.

The sections of lines which
will be finished

- a: in 1985
b: 1986 — 1995
c: 1996 — 2002
d: after 2002
- Depots — D₁ D₂ D₃
Crossings: Ms — Museum
M — Mustek
S — Sokolovská

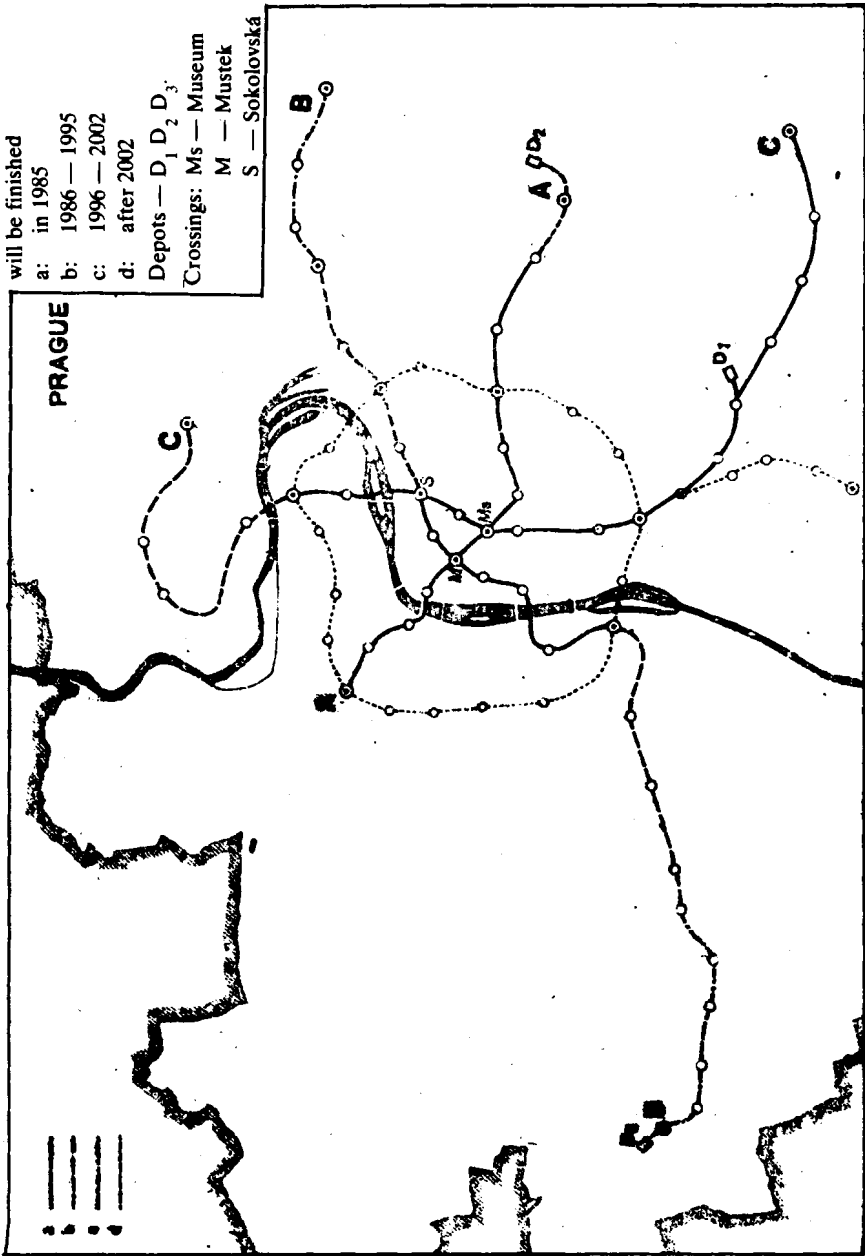


FIG. 1 a

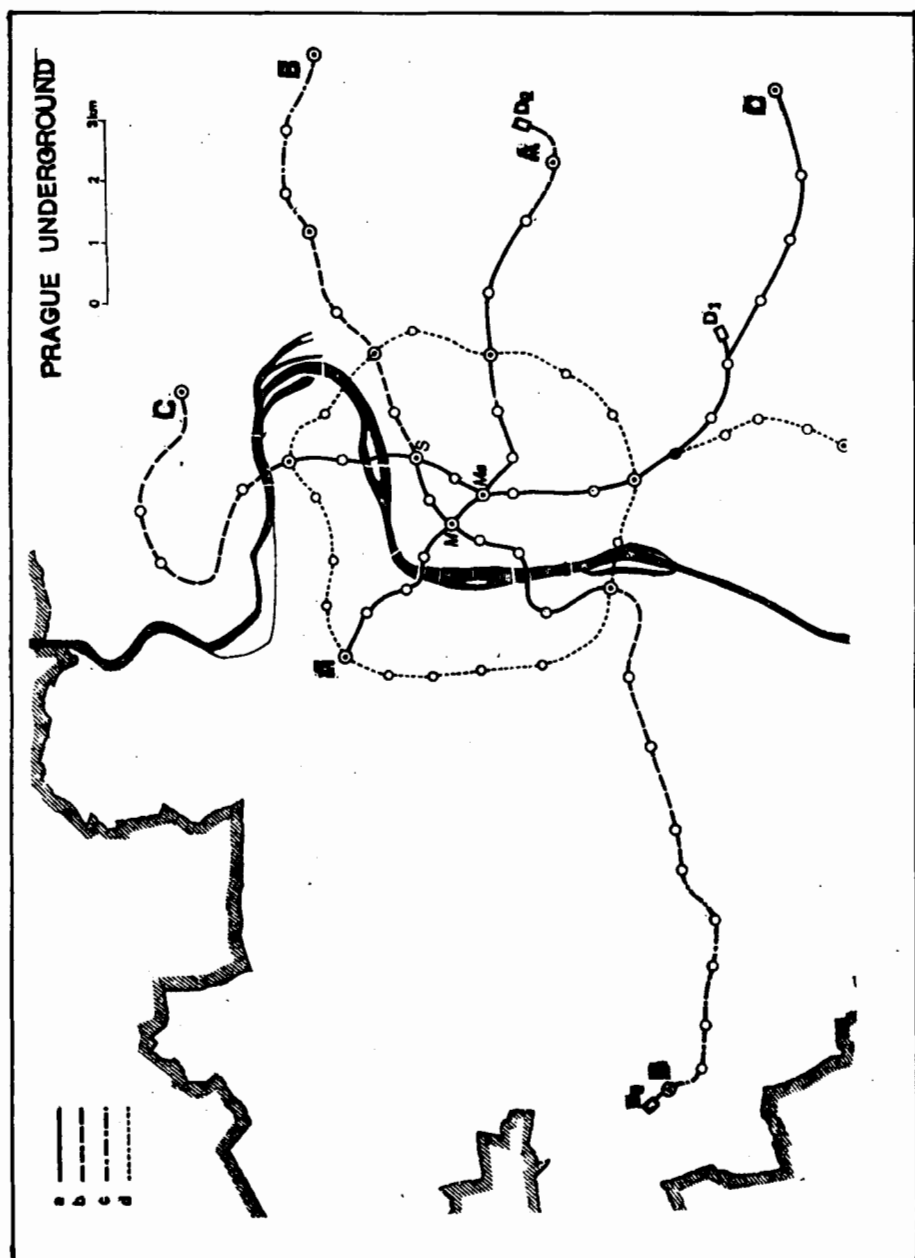


FIG. 1 b