

CRACOW—ITS ECONOMIC STRUCTURE AND DEVELOPMENT TRENDS

by

ZOLTÁN ANTAL

Department of General Economic Geography, Eötvös Loránd University, Budapest,
Hungary

and

BRONISLAV KORTUS

Department of Economic Geography, Jagiellonian University, Cracow, Poland

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1. *An outline of historic and territorial development of the city.*

The origin of Cracow has been favoured by its advantageous geographical situation. The essential features of Cracow's situation are its nodal, bridge and defensive conditions of the Wawel Hill providing the geographical base of the city's origin. (Bromek, 1969).

In the IXth century there already existed a ducal stronghold on Wawel and in the Xth century also an adjoining borough. In the XIth century Cracow becomes the capital of Poland. In the XIth and XIIth centuries there were growing north of Wawel, on a dry pleistocene alluvial fan, merchant-craft settlements. Out of them as early as in the XIIIth century a town emerges. In 1257 owing to a location act the settlement was given formal town right and privileges. The XIVth and XVth centuries were the time of quick development of town functions and its territorial expansion. The functions of the capital, in addition to the far-reaching trade and an exuberant growth of handicraft brought about the foundation beyond Cracow's walls of the new towns of Kazimierz and Kleparz as well as a few suburbs. The XVIth century was a period of Cracow's splendour. The urban set covered at that time 3 sq.km and reckoned 30 000 inhabitants. In the XVIIth and XVIIIth centuries Cracow suffered from economic decline due to the loss of its capital function and because of wars. Its economic animation started at the end of the XVIIIth century. The settlement aggregate of Cracow was joined together to form a city covering 6 sq.km.

In the middle of the XIXth century, under the Austrian rule, Cracow was changed into a strong fortress. The encircling of the city with a belt of fortifications restrained its spatial growth and brought about the intensification of building grounds within its boundaries. At the end of the XIXth century there started rapid economic development with a share of industry. Nevertheless, the main function of the XIXth century Cracow was its cultural-scientific function as a capital for the Polish lands.

Despite difficulties there were growing suburbs situated within the fortress belt and those outside it. This was the reason for the incorporation of adjoining parishes. By 1916 Cracow's boundaries covered an area of 47 sq.km. The number of its inhabitants increased to 165 000.

In the inter-war period takes place the management of the districts incorporated. In the eastern and southern districts industry is being located while in the western ones house-building develops. Quickly becomes peopled the belt surrounding city's boundaries. As a result in 1941 takes place another ring extension of the city's area to 165 sq.km.

After World War II the most important town-forming function becomes industry. In 1949 was started the construction of a metallurgical works in a distance of some 12 km east of Cracow's centre. In connection with the growth of the industrial and residential settlements of Nowa Huta, many new villages were included in the city (1951), thus increasing its territory to 230 sq. km. The final extension was performed in 1973, mainly in the south of the city, enlarging its area to 320 sq.km.

Till the mid- XIXth century Cracow developed along its meridional axis directed towards the ford across the Vistula. For the next century the city expanded according to a concentric-radial set while nowadays it grows in the parallel direction.

2. Functional structure and development trends

Up to the Second World War Cracow was mainly a centre of education, science, art, and place of historical monuments. Its industrial functions lagged far behind service, trade, educational, cultural, tourist functions. Historical tradition was the dominant force. During the postwar period, however, significant changes in Cracow's economic structure took place. In 1931 the number of people employed in industry and construction was equal to 32,6% of the total number of people employed in Cracow. In 1950 it was already 44,2% and in 1970—57%. Cracow became a large industrial centre and a huge construction site. The number of people employed in industry and handicraft went up from 30 000 in 1938 to 140 000 in 1975. The population of the city doubled during the period 1938—1965 from 260 000 to 520 000. Cracow ranked third among Polish cities in regard to the number of population (713 000 in 1977), after Warsaw (1 470 000) and Łódź (820 000). Those facts and figures point to the dynamic development of Cracow during the postwar period. No other city in Poland, with the exception Warsaw, did undergo such dynamic development. Industry was the driving force of Cracow's growth, and today it is one of the most important functions of the city. This however does not mean that Cracow lost its traditional functions. It is the country's second cultural and scientific centre and one of Europe's major tourist centres.

The development of Cracow after the Second World War was the function of its industrial development. If we take the percentage of people employed in industry as an index of industrialization, it would mean that the industrialization level of Cracow went up from 10% to over 21% during the years 1938—1970 (Fig. 1.). The rapid industrialization as it is widely known, has been a characteristic feature of the postwar Poland. While, however, the index of industrial growth (measured according to production value) during 1950—1970 was equal to 760 for the country as a whole, it amounted

to 2100 in the case of Warsaw, 1300 for Cracow, 795 for Wrocław, 733 for Poznań and 440 for Łódź. The postwar industrialization of Cracow was much faster than that of other Polish cities (except Warsaw) and it was twice faster than the national average.

The main component in the industrialization of Cracow was the Lenin Steel Works, the biggest industrial investment in People's Poland. Out of its more than ten locations considered the one near Cracow was selected due to such factors as: proximity of Silesian coal, the presence of the Upper Silesia-Cracow-Przemysł-USSR railway line through which coal and iron ore are supplied and large reserves of manpower in the nearest hinterland. Apart from that Cracow's scientific institutions, particularly the Mining and Metallurgical Academy could provide qualified personnel and research facilities. The proximity of large city and the cultural centre was also an important factor from the point of view of the social adaptation of migrants to urban conditions of living and work. In 1946–1960 migrations to Cracow amounted to 100 000 persons, out of which 60% came from rural areas.

In 1977 the Lenin Steel Works produced 6,7 million tons of steel, 38% of the national total. Over 35 000 people are now employed in the still expanding Works. Thus the Lenin Steel Works became the dominant element of Cracow's industrial structure. Its share in total industrial employment is equal to 26% and in value of industrial production — 48%.

Apart from the steel works about 20 large and 50 smaller industrial plants were constructed in Cracow since 1945. A number of already existing

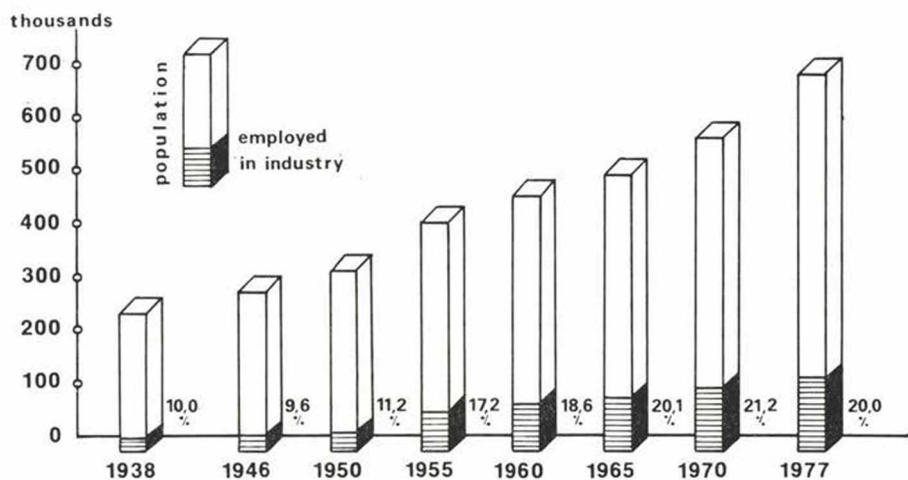


Fig 1* THE GROWTH OF POPULATION AND INDUSTRY IN CRACOW (1938-1977)

factories were expanded. As a result Cracow became one of the biggest industrial centres in Poland, ranking after Upper-Silesia, Warsaw and Łódź.

Table 1.

Branch structure changes in Cracow's industry, 1938 - 1975

Industrial branches	Employment (%)		Location index*	
	1938	1975	1938	1975
Energy	3,3	4,8	0,3	0,4
Metallurgy	—	25,0	—	4,5
Metal and machinery	23,5	19,7	1,4	0,7
Electrical engineering	7,7	7,0	3,5	1,2
Chemical	10,0	9,3	1,4	1,3
Mineral	5,5	6,4	0,5	1,1
Wood	2,6	1,4	0,3	0,3
Paper	4,5	1,3	2,0	1,1
Printing	6,3	3,6	3,5	3,3
Textile	1,9	1,3	0,1	0,1
Apparel	6,1	4,6	3,0	1,1
Leather	4,3	4,1	2,7	1,3
Food	23,6	9,8	2,2	0,9
Other branches	0,7	1,7	0,9	0,7
Total	100,0	100,0	×	×

Source: Statistical Yearbooks of the Central Statistical Office and the calculations made by the author.

* Location index was calculated according to the following formula:

$$I_{loc} = \frac{K_x/K}{P_x/P}$$

where:

- K_x/K — per cent of employment within a given industrial branch to total employment in Cracow's industry,
 P_x/P — the respective quotient for the country as a whole.

The industrial structure of Cracow has been also subject to major change (Table 1). Before the Second World War machinery and electrical engineering (31,2% employed), food processing (23,6%) and chemical industry (10%) were dominating. The metallurgy, which was added to the three traditional branches, became today the dominant one. According to the location index which reflects industrial specialization, Cracow is a significant metallurgical (4,5) and printing centre (3,3). (Tab. 1.) It also specializes in chemical, electrical engineering and leather industries. According to the principles of contemporary industrial structure a decline in the machinery and electrotechnical industries (1,4 to 0,7 and 3,5 to 1,2) is a negative phenomenon. It was caused by the fact that priority was given to steel industry, while other branches were relatively neglected.

In comparison with Wrocław and Poznań, cities similar to Cracow in size and function, Cracow's machinery and electrical engineering industry accounts for a small percentage of its industry, only 26,7%. In Poznań, Wrocław and Warsaw the above mentioned percentage is accordingly 51,5%, 54,8% and 55,3%. The situation in Łódź is similar to that in Cracow. That is why the contribution of the so-called "new branches" (machinery, electrical engineering, chemical) to industry as a whole is equal to 66% and 64% in Poznań and Wrocław whereas in Cracow only 36%. Cracow on the other hand is a bigger university and industrial research centre. In 1970 the number of employed in such specialized research institutions in Cracow was equal to 16,000. In Poznań it was equal to 11,000 and in Wrocław to 13,000. In this respect Cracow ranks third in the country, after Warsaw and the voivodship of Katowice. In accordance, various processing (rather than primary) industries should be developed in Cracow, especially those requiring close links with scientific and research institutions. However, Cracow's scientific potential is to a higher degree connected with non-local, rather than with the local industry.

From the viewpoint of both genesis and structure, present urban-industrial centres can be divided into two groups (Kortus, 1968, 1969):

1. Centres based on local mineral resources; these include mining and industrial towns in districts rich in coal, iron ore and oil deposits, or less frequently towns based on hydropower. In such towns industry was as a rule the primary phenomenon, and the town itself a secondary one. In cases where towns already existed, their structure and functions changed completely under the influence of mining and industry.

2. Old historical cities (lacking as a rule mineral resources) in which the development of industry was a secondary phenomenon, often adjusted to their tradition and historical functions.

Primary industries are typical of the centres belonging to group 1, while cities belonging to group 2 are characterized mostly by manufacturing industries.

The structure and the character of industrial centres of the second type can, however, be modified by the proximity or discovery of industrial raw materials, and they, in turn, may induce the expansion in a given city of some primary industry based on such resources.

Cracow with its industry is an example of such a city. Application of salt as the raw material for the chemical industry and the proximity of the coal-mining and metallurgical base of Upper Silesia have enabled Cracow to develop its basic chemical industry (sodium products, fertilizers), its machine-building and metal industry, which consumes vast amounts of metal, and also its metallurgical and building materials industry. This city as an industrial centre lies half way between historical centres with a predominant manufacturing industry and the young mining and industrial centres in which basic industry prevails. Its situation on the peripheries of the Upper Silesian Coal Basin was a decisive factor of such a structure (Fig. 2).

During the period of the country's intensive industrialization after the Second World War, Cracow as a peripheral industrial centre of that type, acquired a number of industrial investments which the Upper-Silesian Industrial District was unable to accommodate. The location of steel and aluminium works in Cracow and its satellite centre, Skawina was a concrete example of a policy of passive deglomeration in regard to the Upper-Silesian Industrial District. (According to a former plan the steel works were to be located near Gliwice and the aluminium works in Jaworzno, both within the Upper Silesian agglomeration).

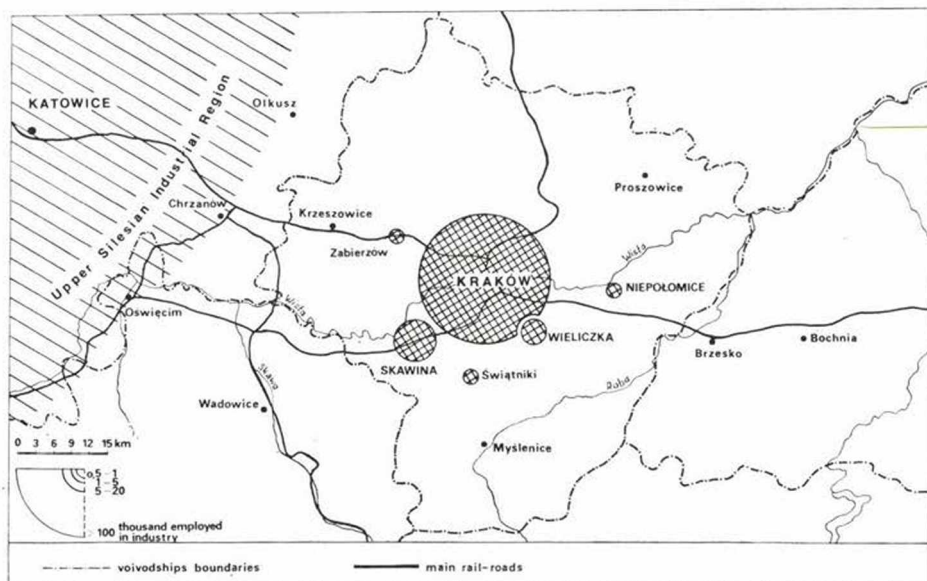


FIG. 2. CRACOW URBAN-INDUSTRIAL AGGLOMERATION

The scientific and cultural functions are following those of industry as far as the number of employees is concerned while bearing the first place among the non-productive (service) functions (tab. 2). At the same time they constitute the oldest functions, called to life by the foundation, in 1364, of the Jagiellonian University, and they play a prominent role both in the city's functional structure and on the national scale, with Cracow taking the second position only after Warsaw. A strong development of higher education (11 schools at the university level with 68 000 students in 1977) has stimulated the growth of scientific institutions, affiliated to the Polish Academy of Sciences as well as numerous industrial research centres. With the post-war development of industry and construction Cracow became an important scientific and research centre meeting the needs

Table 2.

Cracow – functional structure (1977)

Branches of economy (excluding private sector)	Employment structure %
Industry	36,0
Construction	19,8
Agriculture and forestry	1,0
Transportation	7,0
Trade	9,0
Education, science, culture	12,7
Others (health service, administration, etc.)	14,5
Total	100,0

Source: Statistical Yearbook of Cracow 1978.

of southern Poland's coal mining and other industries. The territorial range of Cracow's influence as a centre of university education, the science and cultural functions encompasses entire Southern Poland.

Another function of Cracow on a supra-regional, national and to a large extent international scale is its function as a tourist centre. The tourist movement to Cracow which in the inter-war period stood at about 80 000 persons per year, has passed presently the 4 000 000 persons per year mark. Foreign tourists constitute about 12% of the total number of visitors.

The following elements make Cracow a major tourist attraction:

- numerous and well preserved historical and art monuments;
- widely known cultural institutions, especially museums containing valuable and varied collections;
- the proximity to such tourist centres as the National Park of Ojców, the Wieliczka Salt Mine and the Oświęcim (Auschwitz) Museum of Martyrology;
- a convenient location from the transportation point of view.

There are 713 historical monuments in Cracow, both secular and sacral – a record number in comparison to other Polish cities. Out of Poland's 52 monuments graded in the "O" group, that is monuments of the highest artistic and historical value on an international scale, Cracow has 11, outnumbering by far Poland's remaining regions and cities.

Finally, Cracow's transportation function is also one of supra-regional importance. Its railroad junction, the airport and partly its highway junctions are of national importance. The expansion of city's economy and population has caused a substantial increase of transportation demand. A new complex of railroad terminals has been established in the eastern part of the city to handle the transportation needs of the Lenin Steel Works. It is connected by a new by-way with the Upper-Silesia – Przemyśl – railroad by-passing the city. The total transport volume was

47 million tons in 1977 (the in-coming tonnage was 31 million tons). In this aspect Cracow is ahead of Poland's other railroad junctions, with the exception of course, of Upper-Silesia. About 70% of Cracow's goods transportation is connected with the Lenin Steel Works.

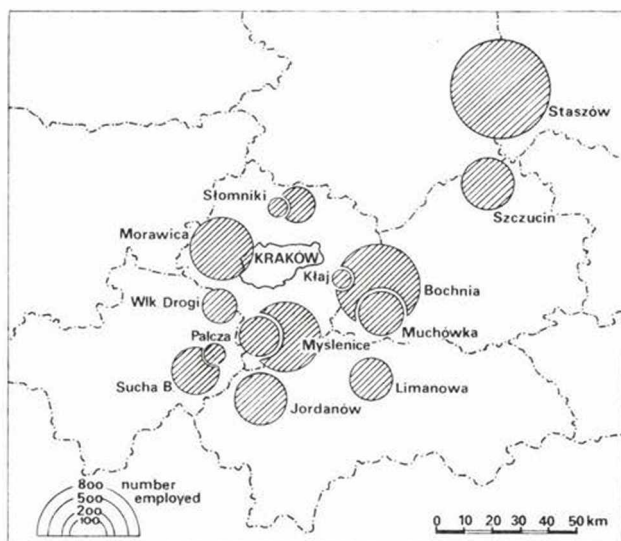


Fig 3 THE BRANCH PLANTS OF CRACOW'S INDUSTRY (1973).

Intraregional flows (within the Cracow voivodship) account for about 15% of total tonnage handled, while interregional flows (to other voivodships) account for 60% (in this Katowice voivodship for about 30%) and flow to and from abroad — for about 25%. These proportions confirm the existence of strong economic linkages of Cracow on the national and international scale.

About half of Cracow's railroad and bus passenger trips are attributed to home-to-work commutation. The large labour deficit due to the constant development of industry and construction makes this kind of commutation necessary with 60 thousand (in 1976) persons travelling daily there and back. After Warsaw, it is the highest number of commuters within a single city in Poland.

The ranges of this commutation in the Western (up to Krzeszowice) and Eastern (up to Bochnia) directions clearly demarcate Cracow's sphere of influence from that of Upper-Silesia and Tarnów. In the Southern and Northern directions Cracow's commutation ranges are fairly small, and in the South most of the commutation is headed in the direction of Skawina and Wieliczka.

Within Cracow's close vicinity there exist several small industrial centres which might be called "industrial satellites" (Wieliczka, Skawina, Niepolomice, Zabierzów and others). Like in Cracow, the industrial growth of these towns is mainly a post-war phenomenon. Skawina, where in 1954 Poland's first aluminium smelter was erected and later a big power station (570 MW), has developed the most. Wieliczka on the other hand gradually ceases to be Cracow's industrial satellite. Its salt mine is nearly exhausted, thus Cracow's soda plant takes its brine from the more distant Bochnia. Wieliczka's historic mine is presently mainly a tourist attraction as well as a health resort (an anti-asthmatic sanatorium). However, as a town Wieliczka is still Cracow's satellite since over 6000 persons (40% of the total population) commute daily from there to Cracow.

We should bear in mind that in the near future Cracow's strong and vigorous industry will cause the establishment and development of further industrial centres in its vicinity. For a few years now we may observe in Cracow — as in other large industrial centres — difficulties in the further development of industry due to labour shortages, a deficit of water and so on. One of the ways of overcoming these difficulties is the establishment of branches of Cracow's larger industrial plants in the surrounding areas where labour force is still available, that is mainly in the east and in the south. In 1968 there was established in Bochnia a branch of the Lenin Steel Works. In the next years branches of other factories were established. The city authorities encourage other large industrial plants which meet growth thresholds within the city to establish branches in smaller towns and other places. This is undoubtedly the right kind of policy since it is in accord with the deglomeration policy of Cracow's industry as well as with the policy of stimulating economic expansion in less developed areas (Fig. 3).

The spatial growth of the agglomeration of Cracow is headed in the Western (Trzebinia) and Eastern (Bochnia — Tarnów) directions along important transport lines: the Upper-Silesia — Cracow — Rzeszów — Przemysł electric railroad and highway and the natural gas pipeline. The Eastern direction of expansion must be regarded as proper and it is stimulated by appropriate locational decisions — in places like Bochnia, Brzesko and others. The same cannot be said about the Western direction where the growth should be stopped. The area situated between Cracow and the Upper-Silesian Industrial District is especially attractive for industrial development due to the already existing technical infrastructure (transport, energy and other lines) as well as a possibility of cooperation with both the industries of Upper-Silesia and Cracow. But an integration of the Cracow agglomeration of over 700 000 inhabitants with that of Upper-Silesia with its over 2 million population should not be allowed. Such an occurrence would worsen the bioclimatic, health and sanitary conditions in that area. The Cracow voivodship aims at preserving the biological protective zone between Cracow and Upper-Silesia, that is, agricultural and forest areas which are industrialized only to a very small degree. The future joining of the Upper-Silesian and Cracow agglomera-

tions is unavoidable but the connecting area should be as narrow as possible — in other words — only along the transport routes.

The spatial development of the agglomeration core — Cracow — will head beyond the city's present administrative boundaries. All the vacant land between Nowa Huta and old Cracow as well as at the outskirts of the city's present territory will soon be used up. The city's future development in the Eastern direction is closed by the Lenin Steel Works, while development in the Northern direction is not advisable because of valuable soils there. In the Western direction the terrain is partly unsuitable for construction, and on the other hand, it is partly occupied by attractive recreation areas, which should be protected. Thus, there remains only the Southern direction which is designated for the city's urban development. The present satellite-towns of Skawina and Wieliczka will be incorporated into the city.

Cracow of the nineteen nineties will be a city of about 900 000 inhabitants, in which a dominant role will be played by industry. The leading place in carrying out that function will be taken by the combine of the Lenin Steel Works to be extended its production ability 9—10 mln tons of steel per year.

The satisfaction of needs with respect to housing will take place mainly within the extension of the already existing estates, in addition to realization of new ones. The role of Cracow, the oldest and second largest centre of science and higher education in the country will keep on growing.

The future dynamic development of motor transport to be brought about mainly by the increase of the number of passenger cars (1977 — 75 per 1000 inhabitants, 1985 — 200 per 1000 inhabitants) will lead to radical changes of the network of road communication. There will be continued the circular-radial set of road communication represented by a complex of express thoroughfares and circular streets. The main means of mass communication will be a modernized tramway which will be supplemented by a network of bus lines.

The dynamic growth of the city will create a necessity to rebuild the nonmonumental buildings and revalue the ancient part of the Old Town, and to create a New Service Centre for the city. In the vicinity of the Old Town, which will become cultural and touristic centre of Cracow, there is designed the New Centre, on the area of the present railway station Kraków Główny (on the area of 104 hectares) to be completed in 2005.

The character of changes determined in the perspective plan of the city's spatial management will tend to create such spatial structures owing to which Cracow will become a more functional modern city organism, in which in the best way will be carried out the perspective functions of the city as an important centre of industry, administration and economic life, of science, higher education and culture, as well as of an important centre of inland and foreign tourism.

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РЕЗЮМЕ

ЭКОНОМИЧЕСКАЯ СТРУКТУРА И НАПРАВЛЕНИЯ
РАЗВИТИЯ КРАКОВА

В статье прослеживается общественно-экономическое развитие города с момента основания до наших дней. Благоприятное географическое положение и политическая роль рано выдвинули Краков среди других польских городов. С момента основания местного университета в XIV веке в области образования и науки город опережала только Варшава. Обилие архитектурных памятников, а также туристическое достопримечательности окружения города сделали его значительным центром туризма. Промышленность играла подчинённую роль вплоть до освобождения страны и была в основном перерабатывающей. В процессе социалистической индустриализации и прежде всего с пуском постоянно развивающегося металлургического комбината имени Ленина Краков приобрёл индустриальный характер, но теперь уже преобладают исходные отрасли промышленности. Это частично отрицательное явление, так как на базе научной жизни города можно было бы создать развитое машиностроение. Краковская агломерация расширяется в направлении запад-восток в соответствии с расположением основных линий транспортной и энергетической инфраструктуры. Срастание краковской и верхне-силезской агломераций по соображениям охраны окружающей среды постараются не допустить. Расширение самого города по существу распространяется только на нынешнюю административную территорию Кракова (320 км²) и лишь в южном направлении есть возможность для увеличения его теперешней территории. К 2000 году прогнозная численность населения Кракова должна составить около 900 тысяч человек.