

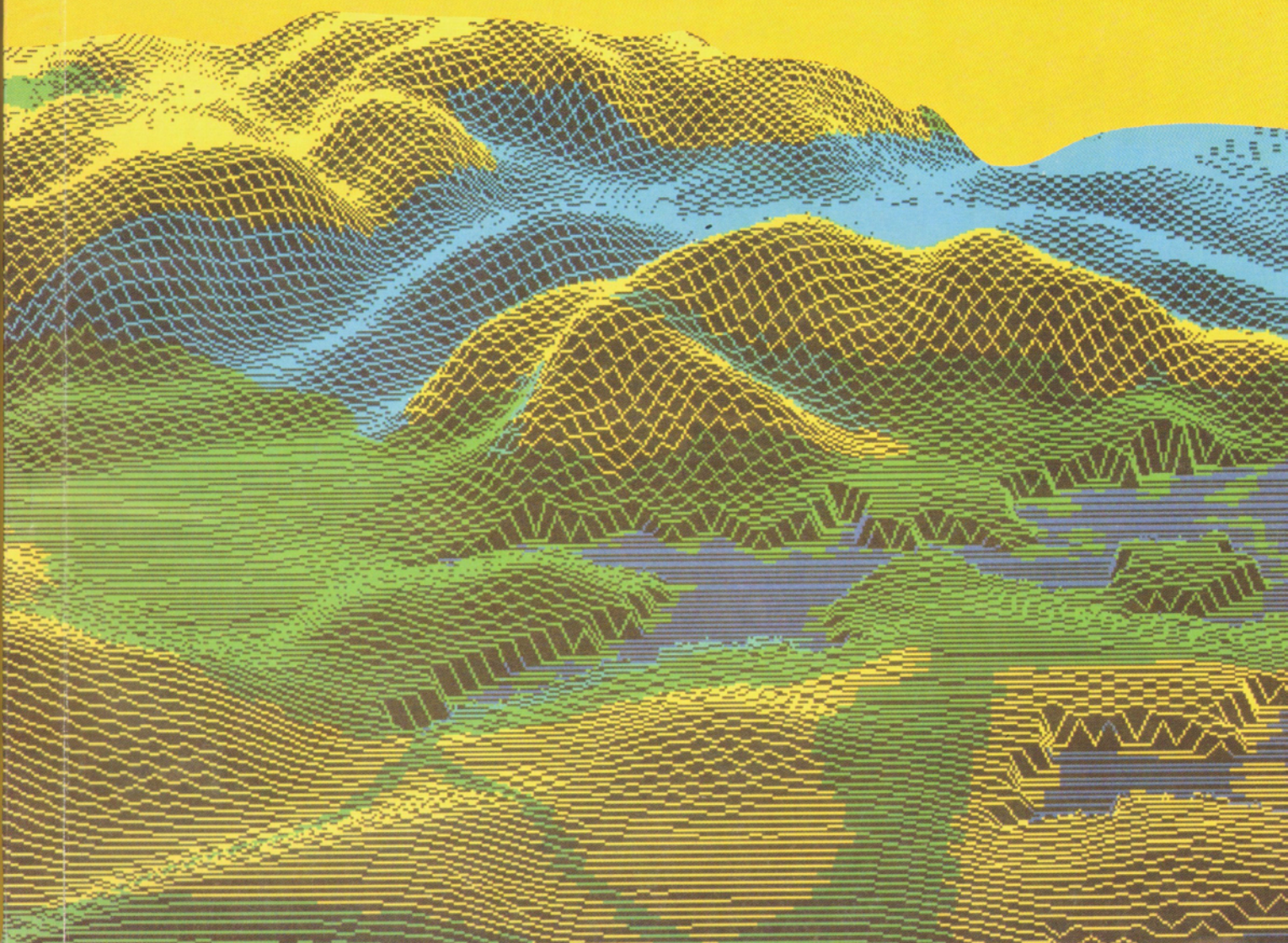
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## CASE STUDY: LJUBLJANA

# THE CULTURAL AND ECONOMIC CONDITIONS OF DECISION-MAKING FOR THE SUSTAINABLE CITY

*Metka ŠPES - Barbara LAMPIČ - Aleš SMREKAR*

### Abstract

*Environmental degradation of Slovenian towns is discussed on the example of Ljubljana. Concepts of city traffic to 2010 are discussed on the background of growth of the urbanized area in 1880-1993, development of city transport system and present land use. Attention is also paid to the development of retail trade and problems of green areas. Since Ljubljana has recently become capital of a new European country - Slovenia, its further development must be scheduled with respect to this new function of the city.*

### Shrnutí

*Je pojednáno o environmentální degradaci slovinských měst na příkladu Lublaně. Na pozadí růstu urbanizovaného území v letech 1880-1993, vývoje městské dopravní sítě a současných metod využívání krajiny je diskutováno o konceptech dopravních řešení do roku 2010. Dále je věnována pozornost vývoji maloobchodu a problematice zelených ploch. Protože se Lublaň stala nedávno hlavním městem nového evropského státu - Slovinska, je nutné plánovat její další rozvoj už s ohledem na tuto její novou funkci.*

Key words: environmental degradation, land use, traffic restraint, retail sector development, green spaces, Ljubljana

## 1. Environmental Degradation in Slovenian Cities

### 1.1. Introduction

For several years, the research group at the Institute of Geography, University in Ljubljana, has also been including the problems of environmental degradation into the investigation on Slovenian cities and urban landscapes, resultant from the past sustainable development and specific physical-geographical and socio-geographical features of Slovenian landscapes.

Besides the complex evaluation of causes and effects of the environmental degradation in urban landscapes, we have also established indirect impacts of degraded environment on humans and individual groups of people that are supposed to be, on the one hand, inducers of the majority of negative changes in the environment, and on the other hand, receptors of these changes and negative effects. The theme of our interest is how the various groups of people receive the degraded environment, what are the causes of differences in the degree of their reception, and how this is reflected in their responses. Our prime attention is paid above all, to the study of spatial effects resultant from these responses. Since the different groups of people show different reactions to the polluted environment,

their re-settling in variously degraded environment occurs and, consequently, differentiation of urban landscape.

Research of this type was also included into the original program of the project called "Transition in Central and Eastern Europe: A Challenge for Urban Environment"; an international group of geographers (Czech, Hungarian, and Slovenian ones) applied to the Commission at the European Union for financial support for this project.

On the basis of later motions made by the COREP (November 3, 1994) to focus the research on "the cultural and economic conditions of decision-making for the sustainable city", the Institute of Geography, University in Ljubljana, began at the end of 1994 such an investigation in our biggest city, Ljubljana. The investigation is conducted upon the samples of the studies from Italian and British reports.

### 1.2. Some main Informations about Environmental Degradation in Slovenian Cities

The study of some most polluted urban areas in Slovenia has shown that they mostly lie in the Alpine and sub-Alpine regions of Slovenia; they are limited to basins, and narrow and deep mountain valleys. They

are pronounced, yet smaller in scope, and local in fact, for we mainly cannot talk about the regional extent of over-pollution so far. These areas still remain disconnected, since the elevated landforms between them (mountains, hills) are relatively non-polluted or without permanent pollution. The location of the polluted areas on the bottoms of deep valleys and basins even increases the need for space, and consequently also the physiognomic heterogeneity of individual town districts. Therefore, industrial functions, public services, and other functions in the town space are intensely intertwined.

The location in valleys and basins is also directly linked with lee conditions, which often prevent that emissions, harmful to the environment, be distributed and transmitted over longer distances. Particularly unfavourable as to the air pollution are the frequent occurrences of temperature inversions which cause that the polluted air thickens on a rather limited area, often covered with the "inversion cap", which intensely increases the vulnerability of environment. Since temperature inversions with poorer ventilation of the atmosphere are more frequent and more pronounced in the cooler half of a year when also, due to the heating of homes, the greatest quantities of emissions are generated, an explicit annual degradational regime is characteristic of the discussed settlements, with typical winter maximums.

At first sight, the pronounced character of degraded environment is surprising in the discussed areas, because smaller towns are in question, where municipal emissions are also of smaller quantity; yet, they are still too abundant for the natural capacities of the ecologically vulnerable basins and deep valleys in which these towns are located. Harmful emissions are additionally increased by the use of domestic coals of poorer quality.

In industrial environmental pollution, particularly of the atmosphere, emissions from a single industrial source are usually most problematic. After all, these sources are not very big, neither industrial nor the power producing ones. The greatest share of emissions comes from old, technologically outmoded and ecologically objectionable industrial plants. In the recent years, their impacts have been reduced, yet the quality of our environment in general has not been significantly improved. However, this reduction of impacts is due rather to the current economic conditions than environmental protection. Namely, it is more the result of reducing or even closing down industrial, economically non-profitable production, and less the result of positive effects of technological revitalization resulting in environmental improvement.

Data on the relatively small quantities of harmful industrial and municipal emissions on the one hand, and the still intense general environmental pollution (high immissions) on the other, call attention to the basic

characteristic of our most degraded areas. It is the great disparity between emissions and immissions.

It is no coincidence that the most polluted Slovenian areas are our oldest industrial centers with over a century-long industrial tradition. Their origins which mostly reach back to the second half of the 19th century, were based on favourable location factors, favourable transport positions in particular, cheap labour, handicraft tradition, etc. - which was all especially typical of the bottoms of basins and valleys. Such conditions are the least favourable from the aspect of ecology, and, due to the post-War forced industrialization, they became even more critical. Unfavourable for environmental protection was also the fact that a part of raw materials had to be imported already from the beginning, from nearby or even very distant places. These materials were not always of the highest quality, unfortunately. The development of industry over a hundred years was uneven, of course, since it depended on general economic, political, and social conditions which underwent numerous changes during this period. Parallel to this and the increasing production, the level of pollution also increased, of course, and consequently, the extent and variety of negative impacts on environment. It is not only the matter of degradational heritage related to the relatively early beginnings and development of industry, but also the result of later, very dynamic period of industrial development, typical for the second half of the 20th century. Being intensely industrialized, according to the post-War planning, old and new industrial settlements attracted numerous labour of lesser qualification from rural areas and even more so from other republics of the former Yugoslavia. These people inhabited, at least at the beginning, the housings of inferior quality in towns or in the close vicinity of industrial plants, despite the heaviest pollution of such environments, because it was easier to obtain these housings and they were cheaper and close to their jobs. Because of poorer financial state of the immigrants, and very limited possibilities for the improvement of their housing conditions, the quality of dwelling environment of these inhabitants was getting worse and worse. As a contrast, better provided social groups of inhabitants began to move elsewhere from such places, above all into suburban districts. Thus, differentiation of towns began also due to the above mentioned changes, although this trend was not advocated by the socialist system; at the most, it was tolerated. In fact, the post-War social development was oriented towards a more even development of town districts. Therefore, prices of housings did not explicitly depend on the quality of closer or wider dwelling environment, and certainly less so than they would depend in market conditions.

In the research work, we have established, above all, the indirect impacts of polluted environment on the inhabitants who are also receptors of negative effects of their own unsustainable activities. Responses to

negative environmental changes depend, to a large extent, on general economic and social conditions, as well as on technological possibilities; nevertheless, these responses exert influence on changes in the environment. Moving away because of a degraded environment or passive attitude towards such an environment where matters are becoming worse, are only two extreme forms of reactions which lead to the differentiation of towns and wider urban landscape. Internal structural (socio-geographical) differences between variously polluted areas in the researched urban landscapes were evaluated by means of various demographic indicators and the analysis of economic structure of population; both were further complemented by the interview on the attitude of inhabitants towards their own environment and their apprehension of ecological problems in general.

Neither the former and even less the recent development have caused a more explicit differentiation in Slovenian towns so far, therefore, relatively homogeneous town districts have not been distinctly formed. Differences in the structure of variously degraded parts of urban landscape confirmed by the investigation are thus largely the result of spontaneous reactions of the inhabitants; however, they will undoubtedly only increase in future. It can be expected that areas will further be formed with a relatively homogeneous socio-economic structure of inhabitants that will receive and apprehend the environment in more or less the same way and equally respond to negative phenomena caused by pollution of their dwelling environment. Since the quality of the dwelling environment will undoubtedly effect the price of housing, it should be expected that less polluted environment will attract, even more than so far, higher socio-economic classes of inhabitants. It has already been established that apprehension of the latter of their own environment is very close to the actual situation; also their ecological awareness is higher, and besides, they have better possibilities for ecological improvements. In contrast to this, in more polluted areas, as it has already been happening, groups of people will concentrate who have neither the knowledge, nor the material basis, nor a true interest for the improvement of environment. Therefore, no spontaneous environmental improvements can be expected here, and no adequate investments into the ecologically inoffensive facilities. Thus, the differences in the quality of dwelling environment and the environment in general will only keep increasing. They can only be mitigated by external interventions (by the state or city), such as the construction of heating plants and the extension of heating networks, gasification, revitalization of residential buildings, etc.

The research furthermore exposed that, according to some socio-economic indicators, individual groups of inhabitants have already been formed who equally apprehend their dwelling environment and wider environ-

ment together with the ecological problems to which they respond equally. Also, their spatial distribution coincides relatively well with the degradational structure. Besides, there are also demographic indicators which are not decisive for the distribution of the inhabitants in variously polluted areas (e.g. age). Also the specific geographical character of each investigated landscape contributes to the evaluation of the factors which have, due to socio-geographical features of the inhabitants, different impacts on the differentiation of degraded landscape; the same is also true of referential areas.

General ecological awareness is lowest in the areas where the inhabitants have been directly depending on work in industry or mining for several decades; however, it is better in rural environments, not only due to greater connection with and dependence on the nature but also due to lesser dependence on industry as regards employment. Since ecological awareness increases also with the level of education, the importance of ecological education in particular is thus manifest, but also the importance of general education which enables wider apprehension of the causes of environmental pollution and its results.

### 1.3. Conclusions

The research highlights results of the landscape degradation in the specific (natural and social) Slovenian geographical conditions. We have established, in fact, a surprising degradational structuring which has been formed in the relatively small Slovenian urban centers, hardly comparable to bigger industrial and urban landscapes elsewhere in the world. Notwithstanding the small size of the investigated settlements (minor towns), degradation is well pronounced in them, and explicit inner degradational division has already come into effect. It is not only direct and physical, and the result of actual pollution of the air and other natural elements of the environment, but also of socio-geographical character and as such related as well to the physiognomic, structural and functional differentiation of the environment and to the population structure itself. Natural-geographical features undoubtedly not only condition the typical vertical and horizontal asymmetry of immission areas, the explicit annual degradation regime, etc., but also the considerable disparity between emissions and immissions, which is due to spatial limits of narrow and deep valleys and basins, and particularly due to temperature inversions occurring in these landforms. All these facts, of course, condition the physiognomic and functional heterogeneity of individual town districts.

Taken as a whole, degradation or environmental protection problems which were investigated in towns (urban landscapes) that are, no doubt, typical of Slovenian circumstances, are characteristic in many aspects. They are not only typical from the natural-geo-

graphical aspect which shows the great natural vulnerability of our environment (due to the landforms, climate, etc.), but also, and even more, from the socio-geographical aspect, which has not been mentioned sufficiently so far, or it has been mentioned but one-sidedly. Particularly relevant here are the effects that the economic and general social development has had on environment, especially the effects resulting from the planned industrialization in the second half of this century, and all that was related to it, including also the polycentric development of Slovenia and the growth of numerous, but therefore smaller industrial towns, typical not only for their urbanization but also suburbanization processes. All this reflects typically, and rather specifically as to our circumstances, also in the degradational structure of our urban environment, including the socio-geographical structure.

## 2. Case Study Ljubljana

### 2.1. Basic Data on the City and its Suburbs

After the dissolution of the former Yugoslavia and founding of the new state of Slovenia, in 1991, Ljubljana became one of the youngest European capitals. With 270,759 inhabitants (1993), it is also the biggest city in this country of nearly 2 million inhabitants. Thanks to its central position at the crossroads of several traffic flows the city has been the center of various political and administrative units since times immemorial (Roman Emona). At the end of the Middle Ages, Ljubljana had 4,000 inhabitants. During the Reformation, this figure grew to an estimate of 5,000 and by the end of the 18th century to 10,000. At the turn of the century, the city had 45,000 inhabitants, in the first post-war census (1948) their number reached 98,900, but the biggest population growth was experienced by Ljubljana after the year 1950.

**Table 1.** Number of inhabitants

1953	113 666
1961	166 702
1971	215 420
1981	256 380
1991	267 000

The city is situated on the southern edge of the Ljubljana basin, a broken rim of which enables the easy passage of traffic. Ljubljana lies at the intersection of major traffic routes, amply used already in the past, leading from the Adriatic Sea and northern Italy to the Pannonian plain, and over the Alpine mountain passes from Austria towards the Balkans. Good traffic accessibility of the heart of the Ljubljana basin was in the past

complemented by waterways on the Sava and the Ljubljanica rivers, and from 1849 on by a railway line.

The old city center consists of three parts - squares - two of which are squeezed between the hill topped with a medieval castle and the Ljubljanica river, whereas the third one was built across the river, on a higher terrace. Later on, this medieval Ljubljana began to be joined by suburbs and villages whose names have, more or less, remained in use until today.

Development of modern Ljubljana dates back to the second half of the 19th century, when the city began to spread rapidly along its main arterial roads, from the old medieval core and its suburbs to the North and West. Crucial for the city development at that time was the construction of the municipal water supply network, establishment of the city park service (1894), which began to tend municipal gardens, and, above all, of the municipal power plant. A severe earthquake in 1895 destroyed a considerable part of the city, but also represented a turning point in the city's urban development because at that Ljubljana got its first official town planning program, which continued to regulate its spatial development for many decades to come. Today, the city spreads over 16,368 hectares, with an average population density of 16 inhabitants per hectare.

Industrialization of Ljubljana was initiated by erection of its sugar plant (1828) but began to flourish only after construction of the railway, when first a brewery and then a tobacco factory were built. In the beginning of the 20th century, the process of industrialization slowed down, and came into full swing after the Second World War, when the authorities at that time saw the promotion of industry as the fastest possible way of reducing economic backwardness - also at the expense of rational use of natural resources, which later on caused numerous environmental problems (air pollution, water, etc.).

At the time of the latest census (1991) the city had 99,607 housing units, of which as much as 38 % were built after 1971 and 12 % after 1981. An even more rapid growth of population and housing took place in the suburbs and suburban areas around Ljubljana. After 1971, their growth was almost three times faster than their natural population growth, which means that they were becoming more attractive to live in than the city itself. A wide suburbanized belt (25 km) has thus developed around Ljubljana, inhabited by a large part of the population who commute to Ljubljana on a daily basis. This is also one of the reasons for the heavy street traffic in Ljubljana: the number of jobs in the city is by 30 % higher than that of the active population actually living there - the remainder are commuters.

Tendencies to move to the city periphery or the suburban fringe are mainly due to the lack of adequate housing in the city, cheaper individual construction and lower land prices outside the city (although at the ex-

## LJUBLJANA 1880



## LJUBLJANA 1914



Fig. 1. Development of Ljubljana from 1880 to 1993 (1/2)

pense of better municipal infrastructure), relatively good traffic accessibility, a widespread desire of Slovenes to live in a single-family dwelling with garden, and, lastly, also because of excessive air pollution in the city itself. The city is situated in a basin in which all year long and especially in winter temperature inversions occur, accompanied by fog, which contributes to the high concentration of harmful emissions in the city. The biggest air polluter in Ljubljana is combined heat and power plant but due to its high smokestack its emissions are transferred to higher air layers, and so excessive air pollution in the city itself is caused primarily by coal-and-wood-burning stoves used by city dwellers and traffic.

## 2.2. Economic and Social Structure

Despite the fact that Ljubljana has an important administrative, supply, and traffic function, and that the

Slovenian society is gradually entering the post-industrial period, the exaggerated importance of industrialization in past decades is still visible in the structure of employment. Industrial branches still employ nearly one-quarter of Ljubljana's population (according to data from 1993) but their share is gradually declining (in 1968 the industry employed 40 % of the active population). In contrast, the share of people employed in tertiary and quaternary activities is increasing, being well above the Slovenian average. The latter is also true for the educational and qualifications structure of employed persons, with the average monthly gross salary in Ljubljana exceeding the Slovenian average by almost 20 %.

## LJUBLJANA 1963

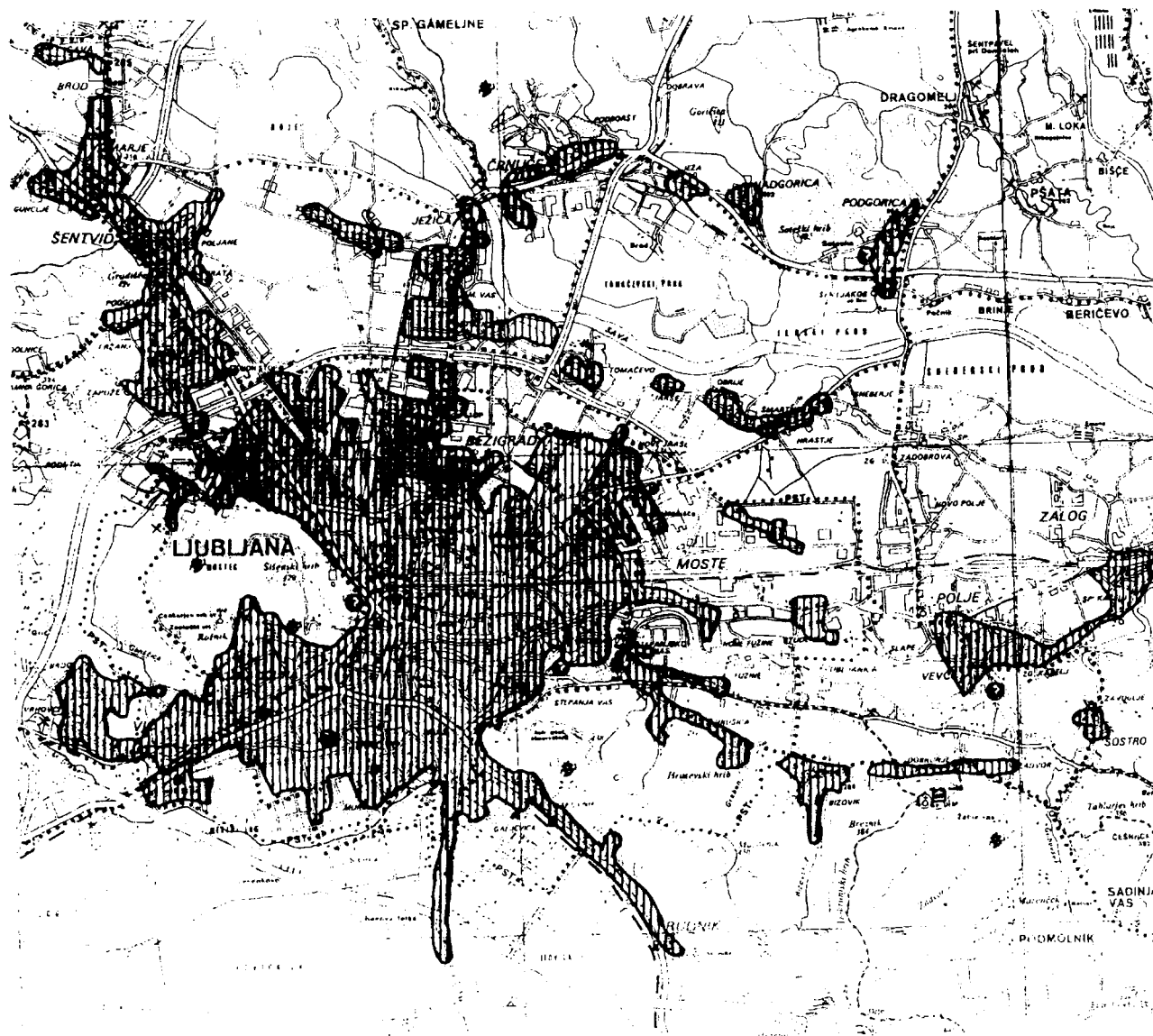


Fig. 2a. Development of Ljubljana from 1880 to 1993 (1/2)

Table 2. Structure of persons in paid employment in Ljubljana

Manufacturing, mining and electricity supply	31 746	23.3%
Agriculture and fishing	527	0.4%
Forestry and hunting	103	0.1%
Water management	429	0.3%
Construction	6 139	4.5%
Transport and communications	9 228	6.8%
Trade	18 256	13.4%
Hotels, restaurants and travel agencies	3 221	2.4%

Crafts and personal services	4 220	3.1%
Community service activities	2 720	2.0%
Financial and business activities	15 232	11.2%
Education, culture and science	18 335	13.5%
Health and social security	13 496	9.9%
Public administration, funds, associations and organizations	12 257	9.0%

Among individual industrial branches, the metal, power and food industries employ the highest shares of the active population.

## LJUBLJANA 1993

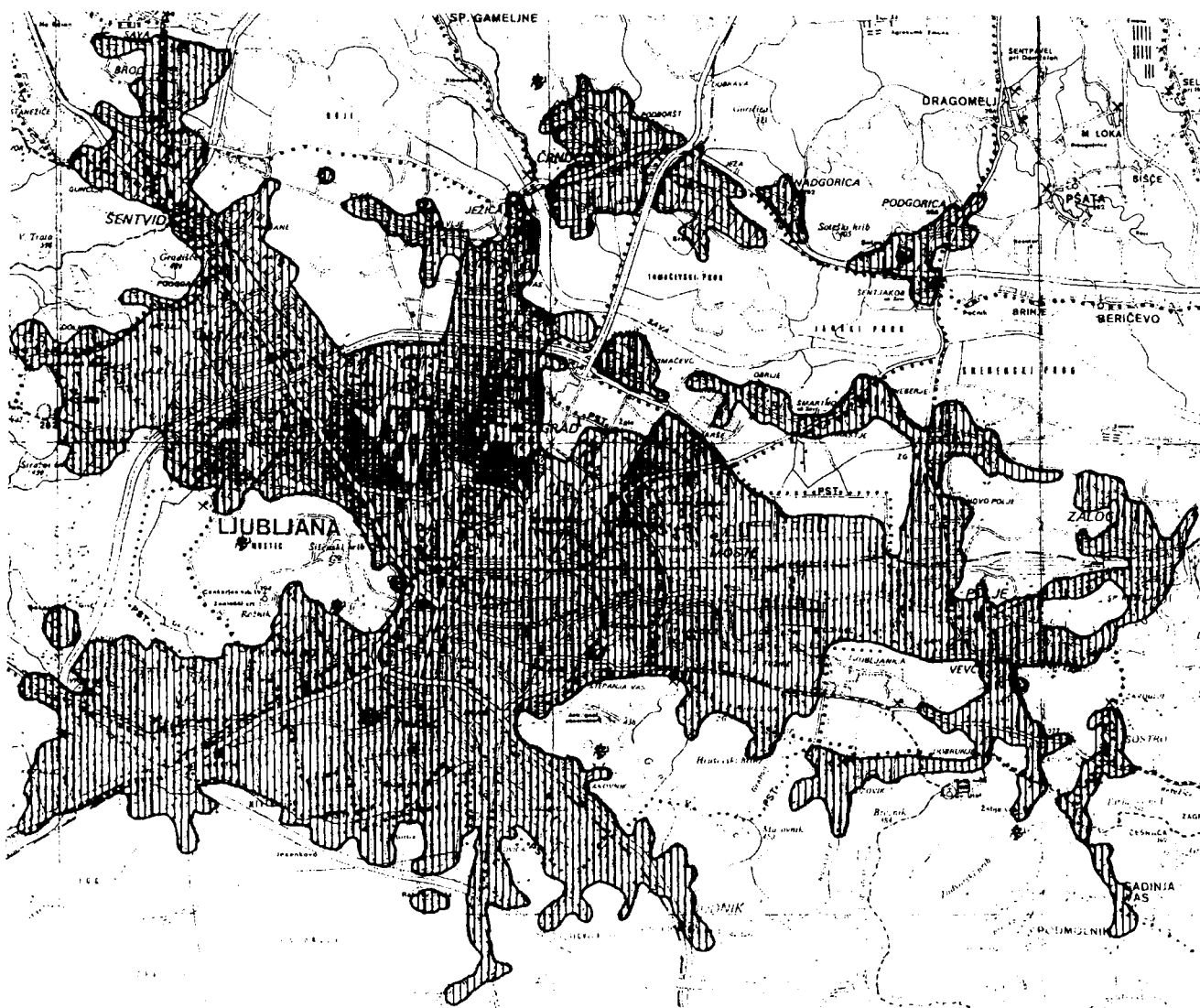


Fig. 2b. Development of Ljubljana from 1880 to 1993 (1/2)

Table 3. Share of employed persons by industrial branches in Ljubljana (1991)

energy	4.5%
metal	30.7%
power	17.1%
chemical	9.1%
construct. materials.	1.6%
wood	4.5%
textile, footwear	8.8%
food, tobacco	14.1%
other	9.3%

The employment structure of the population has been undergoing rapid changes in the last five years, not only in Ljubljana but in the entire country. On the one hand, there is a declining share of persons employed in large industrial plants, as a result of restructuring the technologically obsolete production, ownership transformation, etc., while on the other hand, the share of people employed in smaller private companies is increasing, especially in service activities. As the capital of the new state, Ljubljana also had to take over, after 1991, a variety of new administrative and political functions, which resulted in an increased number of people employed in quaternary activities. Rapid transformation of the socio-economic structure of the population can also be predicted for the future, since privatization of

social ownership has not yet been fully completed, and transformation into market economy is bringing about numerous initial oscillations resulting from inadequate knowledge of the principles of operation of the market economy. Positive changes are seen especially in tendencies towards an increasing number of jobs demanding higher qualifications, as well as from numerous signs indicating that, as regards the transition into an information society, the lag behind highly developed countries is decreasing. Indirectly, this is also reflected in the structure of unemployment, which is characterized by a marked surplus of unskilled labor.

### 2.3. Administrative Structure of the City

As a result of its post-war growth, in 1952 the city was divided into five administrative units or communes which, with the exception of the commune Center, also encompassed their wider rural hinterlands. Such division brought about, among other things, a variety of difficulties concerning the evaluation of statistical data during particular time periods. As late as in the last year (1994) the Slovenian Parliament adopted a new administrative system for Slovenia according to which Slovenia now has 147 communes instead of the former 62 with the city of Ljubljana becoming once again an independent and unified commune. It was granted the status of an urban commune (there are altogether 11 such communes in Slovenia), which is formed as a geographically, economically, and culturally integrated area, within the framework of which common development policy with wider geographical significance, as well as common town planning and municipal policies are carried out. Besides its economic functions, a urban commune also performs various cultural, educational and social functions for its wider surroundings. As transformation to the new local self-government has not yet been completed, distribution of functions between the state and the new communes have not yet been clearly defined either. More perceptible, however, are changes which the city has undergone since Slovenia has claimed its independence. With the city having assumed a new function (the capital of the state) new demands have emerged for the use of the most attractive and expensive city land. Here are primarily spatial needs of the newly-founded foreign embassies and other agencies, of ministries and administrative agencies, protocol premises, and national cultural, educational and scientific institutions. Along with new state borders, demands have also been changed for traffic connections between the country's heart and its neighboring, as well as wider European, regions. As a consequence, the interests of users of space at the municipal level on the one hand, and of those at the state level on the other frequently compete and conflict, as was particularly evident between 1992 and 1994, when the political and program orientations of the ruling parties in the national and city government were totally different. The conflicts were

further intensified by the city's obsolete town planning program, which is not adapted to the new circumstances and spatial requirements imposed on the present-day Ljubljana as the capital of a sovereign state.

Ljubljana got its first town planning program after a severe earthquake 100 years ago. On the basis of the heritage of Baroque and Neoclassical urban planning, the western part of the city, in particular, got a rectangular network of roads with wide streets and uniform facades. In later building, the city reflected the characteristic stamp of well-known - also on the European scale - architects such as Sitte and Fabiani, who mostly dealt with the question of a new city center, and above all Plešnik, who understood urban planning primarily as artistic design of urban space and organization of networks of streets and squares according to some logical order. The post-war period was marked by a series of different ideas about the further spatial development of the city, the leading one being the idea of a star-like pointed design of the city, according to which Ljubljana was to expand mainly along its main arterial entry roads. The good side of this concept was also the planned wedge-shaped indentation of green surfaces into the very core of the city, which was, however, realized only partially. Subsequent town planning concepts had to take into account spatial limitations for expansion of the city. When the latter began to reach more and more into rural areas in its hinterland, planners began to call attention to the rational use of urban space, thereby supporting the concept of multistorey constructions in the city and of the use of its green surfaces for construction purposes. As already mentioned, this did not stop the city from expanding into its surroundings and suburban areas.

## 3. Policy Area I: Traffic Restraint

### 3.1. Traffic in Ljubljana and some Basic Problems of the System of Traffic Regulation

Ljubljana has a built-up infrastructure network in the form of a radial, seven-pointed star, with seven arterial entry roads coming together in the center of the city. Their immediate hinterland is inhabited by 56 % of Ljubljana's population and provides 72 % of the jobs.

For the construction of its road infrastructure Ljubljana used a surface of 840 hectares, of which 98 % is for roads and parking lots and 2 % for garages of the city's public transport and pedestrian surfaces. In Ljubljana 69 % of all travel is on public transport or in passenger cars and 31 % on foot and bicycles, this ratio having remained unchanged for several decades. The development of road infrastructure, the growth of motorization, and low quality of public transport services are all leading to an increased use of passenger cars. In 1970, 45 % of all motorized journeys were made with

passenger cars, and today this figure has already surpassed 50 %. The reason for this lies in the fact that 98 % of available funding was invested in road infrastructure and only 2 % in public transport infrastructure. Since city buses as a rule have to share the road with cars, their journey times are up to 30 % longer than those of passenger cars. In this way public transport is automatically reduced to a means of transportation which is, as a rule, used only by passengers who have no other alternative.

Very similar proportions can be found in commuter passenger transport, where in 1991 54 % of all travel was done using public transport, of which 72 % was by buses and 28 % by trains, and the remaining 46 % by car.

#### *Road and Railway Traffic*

Ljubljana is an important, primary road, traffic intersection. Traffic flows through Ljubljana are therefore constantly on the increase, both in terms of local traffic, which chokes the city center, and long-distance traffic, which burdens mainly the as yet uncompleted bypass around the city. At a distance of 3.5 km from the city center, this bypass is an intersection of road routes leading from the West to Central and East European markets, and from the North to the Balkans, and further on to the Middle East. Due to the present uncertain situation in the Balkans the latter axis is burdened to a much lesser extent. The railway network is utilized to a considerably lesser extent, as the bulk of freight traffic still rolls on the roads.

Bus and railway stations in Ljubljana are located in the city center. In 1993, 998,000 passengers departed from the railway station alone. Freight railway terminals are located in the city periphery, but, unfortunately, all freight traffic passes through the center of Ljubljana and, what's more, through the passenger railway station. No substantial changes are to be expected in the near future, since an agreement on the construction of a bypass railway line has not been concluded yet. In 1993, 89,000 tons of goods were loaded and 206,000 tons unloaded at Ljubljana railway stations.

In the last few years the city center has become even more jammed with traffic, as there are already 390 cars per 1000 inhabitants. The use of passenger cars has increased substantially in recent years, as indicated by the fact that in 1993, a 15% rise in traffic was observed on the western bypass road. This results from the increasing number of cars registered after 1991, when import duties for cars were lowered. The number of registered passenger cars has therefore climbed by as much as 25,7 % in the last five years.

#### *Pedestrian Areas and Bicycle Paths*

At the end of the 1970s, two streets in the city center (Čopova and Nazorjeva street) were closed for all traffic

in a total length of around 350 m, and later on also the old medieval core between the Ljubljanica river and the castle hill.

Bicycle paths run along some arterial entry roads on separate lanes, thus enabling fairly easy and safe access to the city center. The network of bicycle paths in the center of the city, which runs in the East-West and North-South directions, is modest and does not meet the requirements of city cyclists.

An acute shortage of pedestrian surfaces and bicycle paths in the city center hinders the normal flow of pedestrians and cyclists in the center of Ljubljana. As no essential improvements or changes of these surfaces are envisaged, this remains a very urgent problem.

#### *City Public Transport*

Since 1990, Ljubljana has had 21 city bus routes for a total length of 228.3 km, and at present no new routes are being planned. These bus lines cover a major part of the city, but in recent years, no study has been done on the adequacy of these routes. Daily rush hours are from 6.30 to 9.00 and between 13.00 and 16.00, when city buses carry 65 % of all passengers. Only a few years ago, the morning rush hour was from 5.00 to 8.00, but the number of passengers travelling between 5.00 and 6.30 has fallen by 80 % as a consequence of changed working hours (adaptation to the EU) and the increasing number of passenger cars. In 1994, city buses carried 110 million passengers, while in 1985 this figure was 135 million. According to forecasts this figure should reach its lowest value in 1997, when the age structure of passengers (younger and older) should become extremely apparent.

Bus fare is SIT 80 (DEM 0.98), regardless of the distance travelled. Tokens bought in advance cost SIT 60 (DEM 0.74) and a monthly ticket for unlimited travel for adults is SIT 2000 (DEM 24.54).

The entire fleet of city buses is completely outdated, the average age of a vehicle being 8.5 years. It is stipulated that this figure should not exceed 6.5, which means that up to 15 % of all buses from the fleet should be replaced annually. This percentage, however, was attained only in the last three years together. After 1991, there was a change in the standard of engines used in buses. The standard now requires diesel, so-called euro 1 engines, which in some EU countries have already been replaced by euro 2 engines whose price is even higher. The so-called euro 1 engines are more environment friendly due to their considerably lower emissions of exhaust gases and noise. Presently, only five buses with euro 1 engines are included in the city bus transport. Even more environment friendly are gas-driven buses, whose emissions in the air are reduced up to 98 %. After seven years of preparations one such bus is currently being tested in the streets. In general, fi-

nancing is left almost entirely to the company itself. In 1994, the company received SIT 500 million (DEM 613,496.93) in subsidies, which represents only 12 % of its budget.

The speed of city buses is limited to 50 km/h, but the actual speed on the busiest lines through the city center does not even exceed 10km/h, although back in 1990 it still exceeded 20km/h. This problem cannot be resolved unless separate bus lanes on the principal street in the city center (Slovenska road) are enforced 24 hours daily, and without redirecting some of the city bus routes to the 450 m distant, parallel Resljeva street. As early as in 1990, in one hour during the morning rush hour only 90 buses left in one direction from the most heavily used bus stop on Slovenska road. As each bus stayed at the bus stop for 2 minutes, up to 120 m-long uninterrupted lines of vehicles were formed. Only on one of the arterial entry roads, on Celovška road, which leads to the garages, are two of the four lanes for a length of 2,4 km reserved solely for city buses and taxis during rush hours. In Ljubljana, the construction of seven parking lots located at city bus terminals (the so-called park and ride system - P+R) has long been contemplated. In 1990, the first and as yet the only such parking lot was built. However, it was not a success, since motorists have no incentive to leave their cars 3 km from the city center and, against payment, ride to the center of Ljubljana by bus, as long as they can park however they please and free of charge on the edges of the city center.

Pressure from inhabitants living near public garages and along the busiest city bus routes is considerable. They complain particularly about high levels of noise, which were also confirmed by emission measurements. But until new, quieter buses are introduced, there will be no lasting solution to this problem.

In Ljubljana, there are seven taxi associations incorporating 235 drivers with their own vehicles. In the morning, when the demand for taxis is greatest, 130 vehicles are available while at night there are only about 60. Taxi switchboards usually receive up to 1400 calls daily and taxi drivers themselves pick up a slightly greater number of customers at taxi ranks and outside them.

### *Parking*

Parking in the city center is completely unregulated and chaotic, representing one of the biggest problems in the regulation of city traffic. Parking garages can take in only 2400 vehicles. Approximately the same number of cars are parked on the roads and streets, and up to 10,000 cars are parked outside the roads and streets (pavements, bicycle lanes, courtyards, green and other surfaces). Parking lots are used primarily by local residents, visitors and employees. In the city center barely one-third of motorists have their own parking space or garage. Too many people drive to work by car. The

rotation factor of these vehicles is very low, amounting to less than 1.2, while the rotation factor of cars parked for other reasons is significantly higher and amounts to 7.6. According to international standards the rotation factor of vehicles on public parking lots should be somewhere between 5 to 10. In Ljubljana it is less than 4.0, which means that the share of those who commute to work in their own cars is definitely too high.

Parking rates in public parking lots and spaces are stipulated by the decree of the Executive Council of the Assembly of the City of Ljubljana. In first-category parking lots they are SIT 70 (0.86) for the first hour, while in second-category parking lots and in parking spaces marked with a blue line, where only short-term parking is allowed, they amount to SIT 110 (DEM 1.35) for the first two hours. In third-category parking lots and blue zone all-day parking spaces, rates are SIT 150 (DEM 1.84) daily.

A comparison between the demand for parking space by all users and the existing legal parking possibilities shows us that in the present situation the demand exceeds the supply by 20 to 90 %. At the same time it can be established that the demand on the part of visitors, for whom the parking lots are mainly intended, nowhere exceeds the supply and that about 40 % of public parking lots are occupied by resident car-owners who do not have their own parking places or garages (Guzelj, 1994).

### *Impact on the Environment*

City users, both residents and employees, and partially also visitors, are feeling the negative impact of the traffic system, as is the environment.

Noise, caused mainly by motor vehicles, represents an ever growing problem. One should be aware that in Ljubljana at least half of the inhabitants are affected by excessive levels of noise. More than 135,000 inhabitants are exposed to a noise level of over 55dB and 43,000 inhabitants to a noise level of over 65dB. Excessive noise concentrations have negative effects on people's well-being and decrease their productivity at work.

Air pollution resulting from the emissions of motor vehicles is harmful to the health of people, vegetation, soil, underground water, etc. Motor traffic in Ljubljana emits about 30,000 tons of harmful gases annually. The biggest share of harmful gases in Ljubljana is caused by passenger cars. But SO<sub>2</sub> emissions are higher in the case of trucks with diesel engines. Great quantities of fuels used by passenger cars are the reason for substantial emissions of CO<sub>2</sub>, the gas with the strongest greenhouse effect. The emission of CO<sub>2</sub> by passenger cars in the Ljubljana area is 650kg per inhabitant. Despite the obsolete fleet of city buses, the latter are less harmful to the environment than passenger cars, if the quantity of emissions of major pollutants per every person transported is taken into account. Buses use

less fuel per person transported and their CO<sub>2</sub> emissions are therefore lower by a factor of 5.6 (Paradiž, 1994).

### 3.2. Development of Traffic in Ljubljana

Two years after the earthquake (1895) a decree was passed on the construction of tram routes that would connect the area of the city center, and link it, through extensions along the city's main entry roads, with the growing suburbs. In Ljubljana, the first electric tram was introduced in 1901, when it drove on two routes. Despite fast development of the city and the demand of the city council that tram routes should be supplemented and extended, the tram network was not expanded for almost 30 years. Unregulated inner city traffic, especially along the city main entry arteries, began to hamper the city further development. The situation became so unbearable that in 1928 public bus transport was introduced, and in the same year the construction of new tram routes began and continued until 1938, when the tram network obtained its final shape. The completion of the tram network accelerated and enabled the birth of the so-called big Ljubljana. The city began to spread along its main arterial roads, where tram routes were also built, thus changing in shape from a monocentric into a radial, star-like form that remains characteristic for the city even today.

In 1948, Ljubljana already had 120,947 inhabitants and that is why, in 1951 and in 1956 trolleybus and also bus traffic were introduced under the influence of motorizing. In 1958, tram service was eliminated for good. After 1963, the role of buses increased steadily, and by 1971, they had entirely replaced trolleybuses as well.

After 1960, motorization and use of passenger cars began to rise in Ljubljana as well. Motor traffic in the city had been steadily growing until 1979 and, after a five-year's period of stagnation that followed, it is today once again on the increase. Such a development has caused a conflict between the passenger cars and the existing structure of built-up areas. In terms of urban planning, the center of Ljubljana was not designed for the use of cars as a means of mass transportation. Such a development influenced the transformation of the urban environment. Streets were widened and traffic space needs were growing bigger and bigger. In the beginning of the sixties, underpasses began to be built under the railway lines. The first intersections were widened and the first four-lane road was built. In the seventies and eighties, construction and reconstruction of roads continued (Guzelj, 1991). A bypass highway around Ljubljana is just being completed.

### 3.3. Legal Regulation and Traffic Regulation Policy in the City

In Ljubljana, in the field of traffic regulation, both laws adopted at the state level and regulations passed at the

city level are in force. The most important of these are presented in detail below.

Regulation on the Road Traffic System from 1992 specifies special traffic surfaces intended for pedestrians and special traffic surfaces intended for pedestrians and cyclists, where motor traffic is allowed only to residents and those with parking places in the area, and for delivery. In the narrow city center it is prohibited to learn to drive a motor vehicle. Parking and stopping is permitted on specially designated parking areas. Bus stops must be situated outside driving surfaces unless the competent agency stipulates otherwise. Bicycles and mopeds may be parked only at places equipped with bicycle racks not to obstruct the traffic. Towing away of illegally parked vehicles is carried out by an authorized company. In the Official Gazette 8/1992 the Ordinance on the Traffic System is presented, which stipulates in detail the purpose of particular traffic surfaces in the city. The ordinance was amended in 1993 and in 1994.

The Regulation on Public Transport within the area of the Ljubljana communes, published in the Official Gazette 18/1983, regulates passenger bus services on bus routes in the city of Ljubljana and in nearby urban and suburban settlements.

The Regulation on the Organization of Taxi Transport from 1989 stipulates the non-stop and spatially unlimited coverage of car taxi ranks and related activities.

The Regulation on the Disposal of Deserted Vehicles is presented in the Official Gazette 65/1994 and regulates the procedures and conditions for and the manner of removing deserted vehicles from public traffic surfaces.

Although the regulations issued by the Assembly of the City of Ljubljana were passed, and later on amended several times, their implementation is often deficient due to inadequate provisions for their implementation.

In recent times, politicians and city planners have been advocating an idea that cars should be banished from the city center. Some of them would like to prohibit all personal passenger traffic in the wider city center without first building an inner bypass road, while others envisage the prior construction of such a road. Their visions regarding the construction of parking garages, too, differ widely, as some would like to have them built altogether outside the center of Ljubljana.

Even more disparate are their ideas about public transport. Some advocate the modernization of city bus transport with no essential and expensive construction interventions, while certain planners of future development see the solution to the public transport problem only in the construction of an extremely expensive city railway network that would entail destruction of a huge number of buildings.

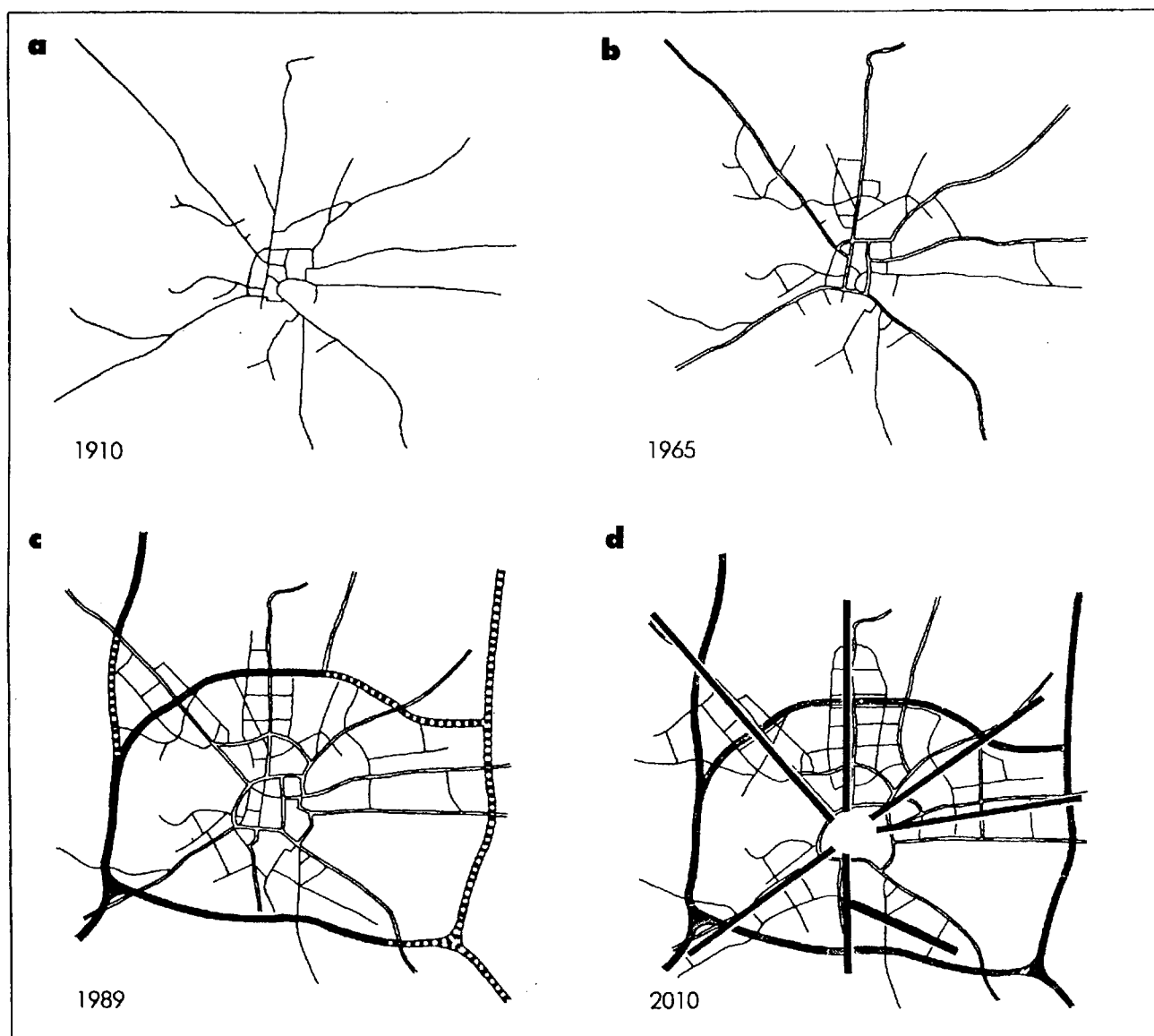


Fig. 3. The development of the city network (Guzelj 1991)

A very worrying sign is that none of those in authority at the city level are contemplating expansion of the bicycle paths network despite the fact that Ljubljana is highly suited to bicycle traffic. The settled part of the city is mostly located on Quaternary alluvia, and climatic conditions, too, enable cycling at least eight months of the year.

### 3.4. Planned Measures for Improving the Traffic Situation in Ljubljana

Although traffic in Ljubljana is extremely unregulated and in fact represents the most acute problem of the city, no plan has been adopted yet that would try to resolve this extremely urgent problem. A few studies have been made on the introduction of a city railway,

expulsion of passenger cars as a form of commuter transport from the city center, and construction of underground and above-ground garages in the city center. Residents will begin to go to work in the city center by public transport only when appropriate positive and negative incentives are in place: "park and ride", subsidized public transport, high parking rates in the center of Ljubljana that would get lower towards the edge of the city, and similar. Once such changes were introduced, city life would become not only more friendly but also more healthy as this would essentially decrease noise and exhaust gas emission.

Public transport has to be modernized so that passengers will feel comfortable when using it, yet at the same time, buses have to be introduced which would not excessively pollute the environment. Parking must

also be regulated, so that the inhabitants of Ljubljana will use chiefly comfortable public transport. But, as it has already been mentioned, the fact that almost no one thinks about regulating bicycle traffic is very worrying.

The biggest problem preventing any rapid improvement of this chaotic situation is the lack of financial resources. Some people are already suggesting that funds earmarked for this purpose be secured from the state and municipal budgets, along with international credits.

## 4. Policy area II: Retail Location

### 4.1. Retail - General

Unlike traffic, retail is an activity which is more service-oriented and concentrated in specific areas with a clear affinity for the city center. In this way its relationship to the hierarchy of central places is also defined. Of all services trade is the most urban one, being at the same time also a very good indicator of the city development. Contrary to retail trade, wholesale trade is oriented mostly to the outskirts of the city. Major shopping centers, too, are moving away from the city center, alongside some more important arterial roads.

As to its function and size the urban agglomeration of Ljubljana cannot be compared to any other city in Slovenia. The scope and diversity of the structure of services has to be considered, therefore, not only in light of the needs of the city but also in light of its wider role. Similar to other European cities, Ljubljana has in the last few decades undergone numerous changes which pointed to the increasing gap between the growing size, diversity and quality of retail trade in the city center itself on the one hand, and the growing concentration of lower socioeconomic groups of inhabitants in this environment and related lower purchasing power on the other. These groups of inhabitants were satisfied with cheaper and inadequately equipped housing (e.g. shared sanitary facilities, no central heating, etc.). Only recently, with the renovation of flats in the old city core, has this locality become more attractive for higher socioeconomic groups, especially for those with higher education (with persons engaged in culture and art predominating, there are signs of the so-called academization of the city core, similarly as in some other West European cities). Along with this are increasing the requirements and purchasing power of local retail shop customers. Well supplied and, above all, specialized shops in the city center also meet the needs for consumer goods (clothing, shoes) of people from the city wider hinterland. This is indirectly augmenting the already high traffic pressure on the spatially limited urban space marked by a shortage of parking.

The accelerated process of suburbanization and the flight of higher socioeconomic groups of inhabitants to the city periphery in the past decades speeded up

equalization of the quality of supply in these areas with that in the city, especially with respect to retail trade or goods for general consumption and daily needs. Reasons for this can also be found in the former administrative division of Ljubljana into five communes, when secondary supply centers were formed in each of them, so that centers were created which represented an intermediate stage in the supply hierarchy between the historical city core and peripheral centers.

In Slovenia there is on average one shop per every 167 inhabitants. This average is a little higher in Ljubljana (258 persons per one shop) because of the higher density of the urban population. Viewed from a wider perspective, trade in the Ljubljana region accounts for almost half of total Slovenian earnings from trade.

Some specialized shops in the city center (shops with specific Slovenian products or designer products, souvenirs, antiques, etc.) are, due to the quality of products and especially their prices, also attractive for tourists in transit, who are by far most numerous in Ljubljana. Highly attractive for both locals and foreign guests is also the Ljubljana marketplace, which is situated in the very heart of the old city core, along the river. The part of it which was designed by Slovenian architect Plečnik represents a real curiosity and is protected as a monument. The marketplace is attractive because of its selection of produce, primarily of fruit and vegetables, as well as of products of traditional Slovenian crafts, prices of which are generally lower here than in shops.

### 4.2. Development of Retail in Ljubljana

Its favourable location permitted Ljubljana to establish itself very early as an important commercial center. The oldest, medieval part of Ljubljana began to perform commercial functions as early as in 1200, trade being in fact its basic urban function at the time of its creation. Although its role and especially its size and quality oscillated somehow in the past, trade had an important impact on the shaping of the city appearance in all historical periods.

After the Second World War, the size and quality of retail trade were increasing in parallel with the rapid growth of urban population. It is in the last period, however, that the number of shops rose by one-quarter (24.1 %). This can mainly be ascribed to private, often family businesses where, if necessary, all members of the family offer their assistance. Indirectly, this is also evident from the fact that in spite of the increased number of shops in the last decade, the number of persons employed in shops grew by only slightly more than one percent (1.5 %).

It is characteristic that most private shops were opened in the last five years, notably after the entry into force of the old Yugoslav Company Law, according to which a very small amount of founding capital was

required for the establishment of a company. But as early as in 1993, the growth of private companies began to gradually slow down. This is due, to the adoption of the new Law on Commercial Companies (July 1993) requiring higher founding capital and providing for substantially stricter control, on the one hand, and to increased competition and decreased purchasing power of the inhabitants on the other (as a result of social and economic transformation the share of unemployed persons rose to 13 %), which has already forced some retail shops to close down. Planners of development in Ljubljana and economists forecast that such a relatively unbalanced development of retail trade will continue in Ljubljana for the next five years. During this time, laws of market economy will contribute to a more balanced relation between supply and demand, there will be a greater correlation between the quality and price of supply and the structure of buyers, and inappropriate shops will move out from the center of the city to its periphery. Shops with durable goods requiring road accessibility, in particular, will have to move away from the city, unless they switch over to catalogue or sample sales. The same holds true for shops whose income will not be sufficient to cover increasingly high rents in the most frequented locations.

Table 4. Retail in Ljubljana

year	no of shops	no. of employ.	turnover in shop	
			%food	%non-food
1975	907	7821	22.7	77.3
1983	831	6827	21.1	78.9
1993	1031	6930	19.5	79.5

Spatial distribution of particular types of shops in the city should be, according to law, regulated by area management plans. These plans are fairly detailed yet in many respects no longer suit rapid development of Ljubljana's after 1991 and, above all, are not sufficiently binding. Liberalization of social and economic relations such as it is advocated by present authorities has altogether relaxed legal restrictions. But above all, certain individuals knew very well how to take advantage of the situation when the new state had not yet passed all its laws and the old Yugoslav laws which were then still in force had been adopted in a different social order (self-managing socialism). And so the designated use of particular streets and city buildings or even commercial buildings as defined in the area management plans was changed rather easily, most often into more profitable cafes and restaurants. Nor are the basic spatial requirements of particular types of shops taken into account: connection of their activities with traffic accessibility, utilization of parking facilities, basic function of the city quarter in question and its suitability for particular types of retail shops, etc.

An important regulator of spatial distribution of shops with respect to their type and quality should also be shop rents. In Ljubljana the latter began to be formed according to market principles only three years ago. Huge differences have appeared in the level of shop rents with respect to attractiveness of particular parts of the city. This has a direct influence on the fact that in the city core itself and in the most frequented pedestrian precincts there are more and more shops owned by foreign companies (Benetton, Bata, Palmers, etc.) which can pay high rents.

Ljubljana retail trade is complemented by big supermarkets erected on the city periphery, also with the help of foreign investment. On the eastern periphery, in buildings that once served as public warehouses for storing goods from former Yugoslav republics that were intended for further distribution, a huge shopping center has been built with more than 300 shops which trade mainly in textile, food and technical products. The attractiveness of this and similar centers and discount shops in the city periphery is further augmented by large functional surfaces and parking lots and, for some groups of buyers, also by attractive prices of products which are not always of good quality. In turn, shopkeepers are attracted by lower shop rents.

4.3. Legal Regulation in the Field of Retail

In April 1993, the Parliament adopted a general law on trade which determines the basic orientation of this activity in Slovenia. Retail sale is defined as the sale of goods for personal consumption and household needs. In order to carry out trade activities minimum technical requirements must be met, as well as minimum hygienic and health requirements relating to both business premises and employees, and minimum education requirements depending on the level of skills needed in particular types of shops. An important aspect of this law is that among technical requirements, conditions are also specified relating to exterior and functional surfaces needed by particular types of shops. Their working hours, however, are coordinated at the local-community level. In practice, legal regulations usually take their full effect only when appropriate measures for inspection and supervision are defined. This law gives great powers to the market inspection agency, but even greater legal order in the field of retail trade may be expected from rather harsh penalty provisions that will apply when basic requirements are not fulfilled. In the set of laws regulating sales is also the Law on the Protection of Competition, which tries to protect buyers from unfair competition by requiring well-marked information about the goods offered. The Professional Association of Traders at the Chamber of Economy of Slovenia has prepared, on the basis of the Law on Environmental Protection, regulations on returning and disposal of packaging, either returnable or harmful to the environment.

A number of specific rules concerning the operation of retail shops are regulated at the municipal or local level. In view of the fact that Slovenia carried out the reform of local self-government only at the end of the last year, the municipal statute, passed by the city of Ljubljana in June this year, is still very vague, lacking execution provisions also from the field of retail trade. More detailed spatial and organizational aspects of this activity are to be regulated in the future by a non-professional committee for trade, catering and small industry. Its administrative, i.e. professional, function in regulating the operation of retail trade is in the hands of the Department for Economic Activity and Tourism. The latter should, among other things, monitor and analyze current trends at the municipal level and provide specialist assistance in the field of trade.

#### 4.4. Public Opinion on the State and Development of Retail

Changing relations between the public and the private that characterize the market economy pose numerous questions to planners: what to plan, what to leave to individual interests, in which cases to interfere with private ownership in the name of social responsibility, how to develop the area planning system so that it will be able to adapt to new circumstances when ownership is changed, etc. All these dilemmas a country in transition is faced with are also strongly reflected in the planning of the future development of trade as one of the basic functions of a city.

Experience of the past five years has shown that the totally liberal attitude towards the development of trade in Ljubljana has caused a considerable functional and visual "pollution" in the city, and especially in its old core. There are too many shops which simply do not belong in certain parts of the city. The public, both professional and lay, is dissatisfied with this situation. They believe the city authorities should intervene in this activity, and not leave everything to the operation of the market with the excuse that unsuccessful and inappropriate shops will go out of business. Instead of existing kiosks and other improvisations, the city should offer to interested parties shops and other premisses or office facilities along the busiest streets and roads. In such a way the latter would obtain their street function, with public activities on the ground floor, and residential functions assumed by higher floors.

There are increasing demands that the activities in the city core should be directed so that the latter would become an attractive shopping and service center with quality, although more expensive, goods. The expansion of trade stalls, which offer just about everything except specific and culturally or touristically interesting articles, should be prevented. Although Ljubljana seems a relatively attractive town to foreigners, the local population looks forward to more specialized shops with

a clear and aesthetic visual image. This does not necessarily imply ultramodern design but rather a replica of old traditional shops.

There is a pronounced need for a new town planning program with a clearly defined purpose for and priorities of particular parts of the city (provided also by the new city statute). Along with this a variety of both negative and positive tools for its implementation should be developed.

In general, there is a widespread opinion in the city that in developing the city and its activities quality should be given priority over quantity. All activities that are powerful generators of traffic but not in interaction with local residents have to move out from the city core.

People expect the city authorities to carefully monitor the impact of privatization of trade and services, since privatization is introducing new elements in the spatial structure of the city central area, and notably in those at its edges and areas situated along main entry roads. With respect to areas outside the strict city center, experts call for evaluation of locations that are accessible from the highway system and other city arteries and optimal for the development of large-scale shopping and service activities. According to the development of the concept of shopping center, such activities must be integrated into the city and connected with it by efficient public transport (so that they are no longer isolated at the periphery and oriented solely to passenger car use).

### 5. Policy Area III: Green Spaces

#### 5.1. Green Areas in Ljubljana

Green areas in cities are one of those public goods whose importance is appreciated only after they no longer exist. While they are still there we very often do not even perceive them.

Ljubljana is a relatively green city in comparison with other cities in this part of Europe. The quantity of greenery has never been pointed out as a problem in this city, neither its specific quality. Yet, vast green areas in Ljubljana have not been created on the basis of some comprehensively elaborated plans. Above all, they are a consequence of natural conditions and efforts of certain individuals. The entire city is surrounded by a green belt, which at some points projects into the very city center itself. To the South, Ljubljana is bounded by Ljubljansko Barje, to the South-East it is penetrated by the green wedge of Golovec and the Ljubljana castle hill, while from the West Tivoli with its hinterland integrates into the city core. The city's urban spread towards the North was confined by agricultural land, which has been preserved here primarily because of water supply in Ljubljana.

Such an "unprofessional" and at times even discriminatory attitude towards green areas persists even to

day. Within the framework of the city, the green areas can in no way begin to live equally and independently, as its component part. On the basis of this finding and the fact that in Ljubljana the structure of greenery is more problematic than its quantity, a so-called green system was conceived under the expert guidance of landscape architects, which represents preparations for a complex and systematic treatment of green areas. This is a proposal for the comprehensive resolution of the problems of public green areas in Ljubljana (the word "public" refers here to the mode of use and accessibility, and not to ownership). The green system should function as a mechanism for coordination and operation. A part of it is also the concept of public green spaces as a planning category, ensuring coordinated development of urban structures and public green areas within them (Simoneti M., 1992).

As it can be seen from a chronological review, the green areas in Ljubljana have always been present in the planning itself, yet very few studies were made that would have expertly dealt with this urban element (the only exception is the study Green System). Even the Municipal Geodetic Administration which is required by law to produce maps with the dimensions of all green spaces in Ljubljana, did not fulfill its task (other elements had priority). An additional problem is the fact that no classification of existing green spaces has been made. Most data on the city green spaces are therefore available in the Ljubljana Municipal Company (unit Rast), which operates and maintains public green areas.

**Table 5.** In 1988 the green areas in Ljubljana encompassed

parks	47.6 ha
green plots in residential areas	139.9 ha
green plots along roads and water courses	61.9 ha
the Path	43.1 ha (length 35 km)
forest parks	229.6 ha
green spaces managed by schools, nursery schools, sports associations, factories, etc.	196.0 ha
total	718.1 ha

Although a little bit out of date, these data clearly indicate that the quantity of green areas in the city is not critical, as there are over 25 m<sup>2</sup> of green area per inhabitant. However, these data serve merely for orientation because they include only the areas managed by the Ljubljana Municipal Company (private gardens, for instance, are excluded) and not total green areas (an error of 10 % should therefore be taken into account).

In addition, they also include the green areas outside the city area that are managed by the Ljubljana Municipal Company, but their share is minimal.

Apart from the above mentioned surfaces, the city has tree-lined avenues in a total length of 98.7 km (a total of 19,000 trees). According to the data from 1994 there is a total of 67,400 trees planted in the city. In the last 25 years, the biggest increase was in the share of green plots and trees in residential quarters as this was a period of rapid growth of new city parts. This growth which was most intensive in the years between 1970 and 1990, slowed down in the last five years. It should be emphasized, however, that great disparities existed in the past in the management of green spaces in the city. Ljubljana and its hinterland were divided into five communes each of them pursuing its own rather arbitrary policy also with respect to green areas. This is also reflected in today's appearance of the city: some areas and new residential quarters are fairly green (Bežigrad, Šiška) while elsewhere the greenery is very scarce (Vič).

## 5.2. Chronological Review of the Development of Green Areas

The first public green areas, a public park and an avenue in Ljubljana were designed and given to the public for its use by the enlightened citizen, Mr. Zois. The complex of Zois's gardens (the area between the present-day Prešernova and Rimska streets) was also a status symbol of the city. In that period, the municipal commune had already been planted with trees as well as the principal traffic roads. Other green spaces consisted of numerous gardens belonging to wealthy citizens and monasteries (usually secluded), vegetable gardens in the city periphery, and the natural hinterlands of Rožnik, Šiška hill, Barje, the Sava plain and Golovec.

For the city and its morphological development the construction of the southern railway in the mid -19th century represented primarily a town planning problem (it cut off the promenade, Latterman avenue and Tivoli).

The first regulations affecting the planned development of public green areas in Ljubljana date back to 1875, when the Construction Order for Carniola required the municipal commune to plant, with municipal funds, trees in all streets where conditions permitted.

When in the second half of the 19th century the city started to expand beyond its medieval core, the development of the modern city began. Besides the secluded gardens, avenues with trees and planned connections with the city edge were the predominant form of green areas.

The 1895 earthquake represents a turning point in the city development. In 1896, the so-called Construction Order for Ljubljana was prepared, which envisaged a new plan for the city. Fabiani's proposal was chosen,

in which he advocated an idea that the issue of green areas should be treated in a complex way, also at the expense of private ownership. But most of his ideas, although good, were never realized.

After the First World War, town planning was continued by Plečnik. Yet his plans, like Fabiani's, were in most cases not realized. Only later, in the 1930s, the Tivoli promenade and Trnovo street on the banks of Ljubljana were designed according to Plečnik's plans.

The Yugoslav construction law from 1931 was very advanced. It introduced protected green belts around cities that were set aside for forests, green plots, gardens and agricultural land. Construction was prohibited on these areas and along water courses. This law strongly emphasized the importance of the natural and cultural heritage.

After the Second World War, a draft of the town planning program for Ljubljana was prepared, which involved bold plans for the arrangement of green spaces in the city center. It proposed linking of both green wedges, Tivoli and Golovec, as well as an entire system of parks and greening of squares and streets. But once again the plans remained on paper, while Ljubljana was losing more and more of its green park areas.

In this period, the city was rapidly expanding but due to its huge needs the priority task of the municipal authorities was to build, provide traffic infrastructure, etc. Entire development of the city was based on half-measures until 1966, when the General Plan of Ljubljana was made, supplemented by regulation plans of individual communes. Unfortunately, the idea of a coordinated development strategy for the city regardless of the communes was never realized. With respect to green spaces this plan was quite advanced, pointing them out as an endangered element in the city structure. According to estimates of the time the share of green spaces in the city itself amounted to only 4.6 m<sup>2</sup> per inhabitant (standard: 25-45 m<sup>2</sup>). The plan stressed the importance of the structure of green areas (not only of their quantity), the distribution of vegetation masses, and accessibility to green surfaces. Simultaneously, it advocated for further greening of Ljubljana's streets, for at that time, the total length of avenues planted with trees was only 36 km (according to data from 1983 the total length of avenues lined with trees in Ljubljana was 99 km or approximately 19,000 trees).

### 5.3. Planning of Green Spaces

It is evident that in this plan the public green spaces were professionally evaluated (sports and recreation were treated separately). Yet once again, this plan did not become the guideline for directing the city appearance and growth. Like most older plans and eventually also the latest plan of 1986 (Ljubljana 2000 or Long-term Plan of the Communes and the City of Ljubljana for the Period 1986-2000), it remained unrealized.

The plan for Ljubljana of 2000 represents the city's general - and at this moment still valid - plan that should correct the mistakes of the previous one (which was very good in its concept). Within the framework of public green spaces it deals with park areas, more important green plots, sports and recreation areas, graveyards and larger recreation spaces (botanical garden, zoo, horticultural plantations, etc.).

**Table 6.** In determining the dimensions of public green spaces it strictly stuck to the standards, which envisage

	m <sup>2</sup> /inh.
public parks	5
greenery around houses	10
sports and recreation spaces	13
narrow recreation areas	17
total	45

On the basis of findings established from a chronological review and the present-day condition of green spaces in Ljubljana, a concept was made for the so-called green system, which is intended to be a global scheme for managing the city green areas. The leading role in this study was assumed by landscape architects of the Ljubljana Town Planning Institute, Institute for Area Management, and Institute for Landscape Architecture.

Natural conditions represent following main advantages in the organization of the green system:

- large forest areas on the city edges partly projecting into the city core itself
- numerous water courses (Sava, Ljubljana, and numerous creeks)
- great ecological variety
- great landscape variety
- high share of grassland in agricultural land (which partially enables recreation)
- relatively small share of devalued land (waste disposal sites, etc.)
- good traffic accessibility to areas covered by the future green system

The present situation also has some deficiencies to which the concept of the green system should pay additional attention:

- insufficient number of system connections (such as the Path) between individual openland units
- insufficient number of parks
- marked lack of bicycle paths, and in some areas also of pedestrian paths and sports facilities
- despite good natural possibilities there are not enough wildlife refuge areas (along water courses, for instance)
- lack of improved sites suitable for excursions, picnics, etc.

- an additional problem is the existent and planned highway network which will cut the wider natural hinterland from the city.

The planned future conception of green areas is multidimensional. Public green areas have the function of specific use, they visually enrich appearance of the city and, last but not least, they have a specific ecological function. On the top of this, the green system has a significant role in forming the city morphology. Here are, apart from its "spine" which runs in the direction Golovec - Rožnik, also the city entry arteries lined by trees, and the Path, which functions as a recreational connecting ring. Ljubljana's identity as a city on rivers should also be pointed out. Water courses should be covered by integrated management plans so that they would acquire a new functional content.

#### 5.4. The Attitude of the City towards Green Spaces

The attitude of the city and its dwellers towards greenery has gone through numerous phases. There were periods when they wanted to banish it from the city as an alien, a non-urban element, and periods when its importance was overemphasized.

Today, the green areas in Ljubljana are regulated by the Ordinance on Green Spaces in Settlements within the Area of the Ljubljana Communes, mostly insignificant amendments passed in the following years. It mainly relates only to maintenance, protection, and administration of green areas. As a result of changes that took place in Slovenia in the last few years, implementation of this ordinance is practically no longer possible. On the other hand, there is still no new "legal mechanism" that would comprehensively regulate the issue of green spaces. Consequences of this legal disorder are most strongly felt when it comes to the question of financing management of the green areas.

It has already become clear that this plan will never see its realization. While new ideas and approaches are already in preparation, no one no longer pays attention to those that are currently still in force.

Although it cannot be said that in the past decades green spaces were neglected as a planning category, they definitely were pushed aside in the implementation stage. While in the city center they were even getting in its way, slightly more attention was paid to them in some new residential areas (depending on individual initiative). In the post-war period there were practically no planned treatments, the only exception being the Path of Remembrance and Comradeship (today called simply the Path). This green pedestrian path encircling the entire city in a total length of 35 km (29 km outside roads) shows signs of some programmed planning.

Today, the city is nevertheless green, although there is a strongly felt lack of a planned approach to town

planning. Unfortunately, we were, and still are, not able to implement good plans by simultaneously taking into account excellent natural assets of Ljubljana.

However, the condition of green areas has, in the opinion of the majority of their managers, greatly deteriorated in the last five years. Until 1990, their management and maintenance was financed by commune municipal boards, later on by the city municipal board. Since 1990, when the commune municipal boards were abolished, the management of public green areas has been financed from the city budget. Up to 1990 they had had at their disposal DEM 1.2 for each square meter of green spaces (in Germany DEM 3). In 1994, this figure dropped to not more than DEM 0.5. Such a cut in funds is already reflected in the city visual appearance as well as in the growing number of complaints. In 1994, there was approximately a 30% reduction in the surface of parks and green plots managed by the city (Ljubljana Municipal Company). Of the previous almost 300 ha of green areas 100 ha have been transferred to the ownership of residents' councils. These surfaces are now tended by residents themselves or by smaller companies which, however, are not qualified for this type of work.

All in all, the inhabitants of Ljubljana are aware of the importance of greenery in urban settlements. Their opinion about the state of Ljubljana's public green spaces is pretty critical but supported with arguments. There are very few who claim that there is not enough greenery in Ljubljana. The majority is of the opinion that Ljubljana has enough greenery but lacks typically urban green features (avenues, parks, arranged footpaths), that its spatial distribution is inadequate, and that it should be improved in quality and not increased in quantity. They also point out inadequate management, as well as a lack of sanctions for inadequate treatment and management of both public and private green areas. There are very few who believe that the issue of greenery in Ljubljana is unimportant.

It can be concluded that the majority of problems relating to the issue of green areas stem from the fact that we have no law or regulation on green spaces that could be effectively applied in practice, at the present moment. Hence, we still have unregulated financing of the management of green areas and no apparatus that could sanction negative interventions in green areas of the city. As a result of such neglect, the fate of green areas is not determined by experts, planners, landscape architects or environmentalists, but left to individual initiatives and depending on current development trends.

#### 6. Conclusions

The study on the operation of three important users of urban space, who also significantly contribute to appearance of the city, and the assessment of their

organization, legal regulation, and the levels at which decisions are made on the scope and quality of their functioning, have shown a number of common traits. It is characteristic that these municipal service activities, too, are strongly influenced by wider social changes that have been taking place in this country in transition in the last five years. On the one hand, the process of privatization and denationalization of municipal buildings and activities should be emphasized as well as the completely liberal abandonment of particular activities to the operation of market economy, which is partly also due to the lack of new legislation and the inadequacy of the old. On the other hand, it should be stressed that great changes in the functioning of the city have been introduced by the new system of local self-government, which was adopted only at the end of the last year and therefore still lacks a clearly defined distribution of responsibilities between the state and the new communes, especially larger municipal ones.

Ljubljana is now one municipal commune (previously, the city was divided into five communes). According to its inhabitants and experts this is a much better solution since it will permit the city to develop in the future as a unified urban organism internally divided into functional and physiognomical urban neighborhoods. In this way, conditions have been eliminated for competition between individual communes, as well as for irrational use of the urban environment, which in the past often led to excessive exploitation of natural resources.

Having become the capital of a new European state, Ljubljana has slowly begun to adapt to this new function as well. Experts agree that, from a broader point of view, Ljubljana satisfactorily meets requirements for the development of European cities in the next millennium. In this respect, following features have to be stressed: its wider traffic position, attractive environment (proximity of the Alps, karst, sea, green areas in the city and its periphery, cultural, historical and architectural monuments), the existing economic basis and concentration of various activities. Within the framework of the latter, it is worth mentioning high quality level of service activities, the university, research institutes and cultural institutions. All these have managed to shape their own identity, which assures them their special place within the Europe of regions.

The traffic network, important for both urban and transit traffic, remains one of the biggest problems of Ljubljana. Today, Ljubljana is paying the price for the inability of its town planning to keep up with the needs of the lightning-quick development of traffic technology, and especially of the growth of passenger car use. When speaking of ecological town-planning policies and sustainable urban development, the OECD recommendations point out that the planning of traffic infrastructure must be linked with the planning of land use.

On the basis of these recommendations experts warn that the city will soon have to find more long-term solutions. But due to its central and markedly transit role, the city is also faced with demands for wider, national and international, traffic connections. Therefore, decisions on optimum traffic solutions are not formulated and taken only at the local municipal level.

In the last five years, retail trade has experienced growth in quality and, above all, in quantity, so that now it already exceeds demands of local inhabitants. The development of the activity was mainly left to private initiative and was not restricted by the city, either in terms of content or space and even less in terms of quality (visual image, quality of products on sale). More order has gradually been introduced into this activity by the not yet two-years old law and especially by laws of the market, competition, etc. However, the same still cannot be claimed of spatial distribution of shops (with respect to their quality, required traffic accessibility, type of products on sale, etc.) into particular city quarters. Spatial distribution of retail trade in Ljubljana is still relatively anarchic, although the opinions and initiatives of the expert and lay public are more frequent and decisive than in the past.

The city has preserved relatively many green areas. In addition, it is only a short-distance walk or ride to attractive landscapes in the immediate hinterland. But experts call attention to the importance of linking green areas with the living environment, the residential areas which lie in the immediate proximity of the city and are accessible to all groups of inhabitants. The green areas are at the same time the good to which the city inhabitants have, as a rule, a positive attitude and they quickly react to every change. In some residential areas it is quite common that the inhabitants themselves, upon the initiative of a group of environmentally-aware individuals, tend green spaces or even improve them. The city is technically in charge of the rational arrangement of green spaces so as to meet aesthetic and recreational demands of the inhabitants, but in many places the inhabitants themselves contribute to their improvement.

All in all, the study is an interesting contribution to the understanding of functioning of the city and its activities, and should be repeated in a few years. The topical and comprehensive social changes which the new state, and with it also Ljubljana has been undergoing contribute to the fact that the urban users treated in this study are developing very quickly but also in a highly disordered way. Only when ownership transformation is over, when the municipal powers are clearly defined, and when the development plans of the city are clear, also as of the capital of the new state, the role and significance of these municipal service activities and the levels at which the decisions about their functioning are taken will be defined.

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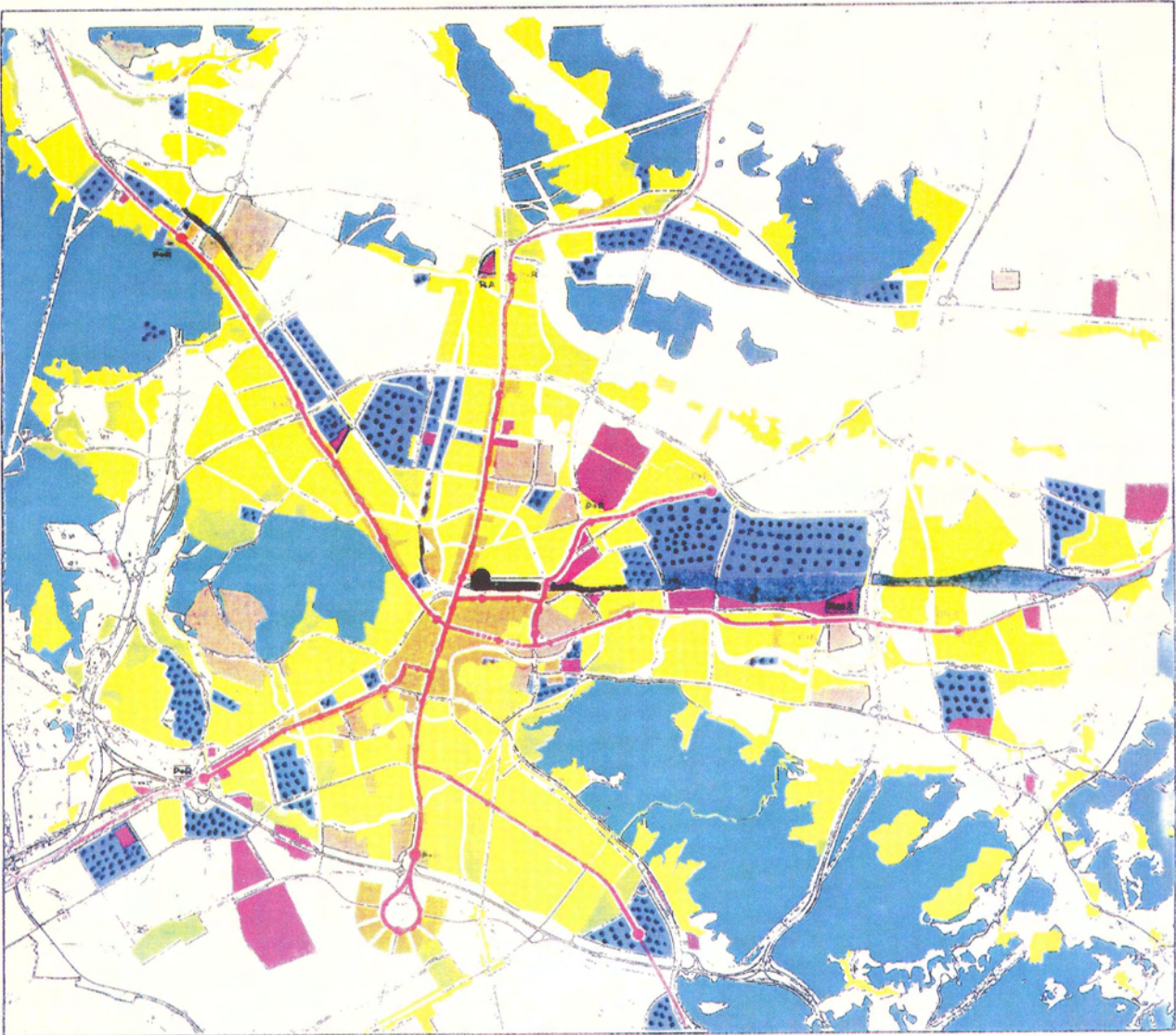
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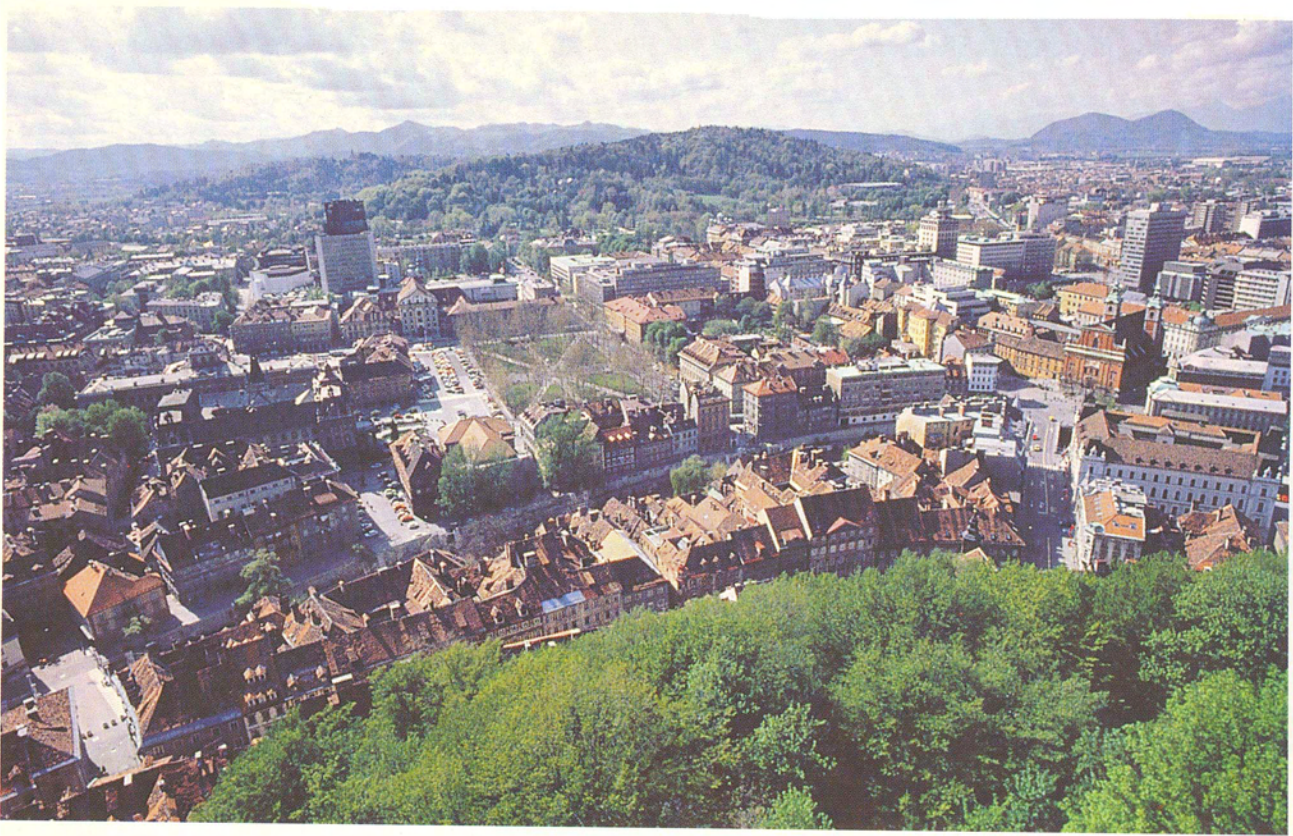
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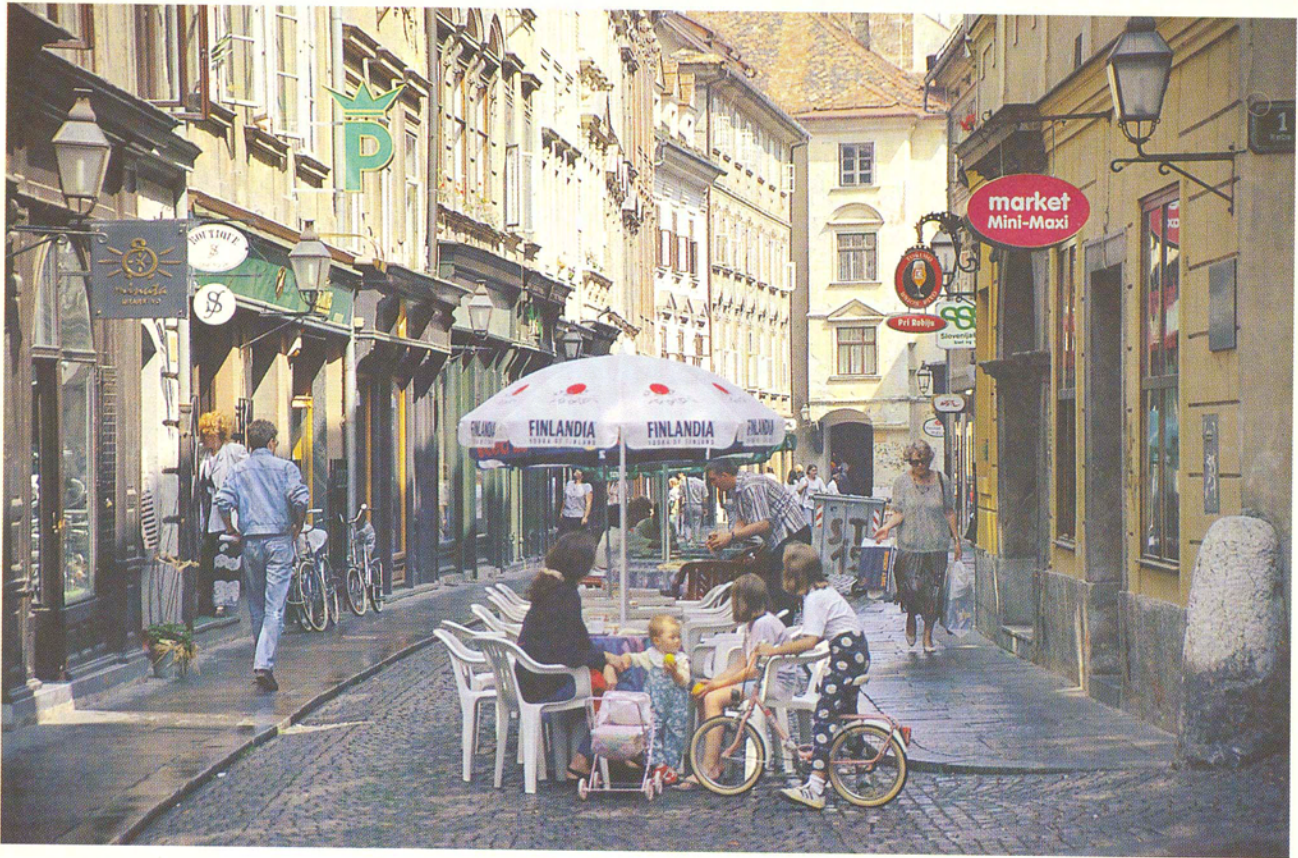


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|---|--------------------------------------|---------------|
| central city activities                         | education, institutes, health care   | city railway  |
| housing and related activities                  | railway facilities                   | local railway |
| production activities, warehouses and terminals | forest surfaces                      |               |
| municipal service activities                    | park, sports and recreation surfaces |               |



Panorama of Ljubljana

Photo: B. Brecelj



The old center of Ljubljana

Photo: A. Smrekar