Note on Prague's city Structure

By Alain and Marie Agnes Bertaud

This note has been prepared after a 3 days visit to Prague from July 31 to August 3, 2000. Ms Marketa Kubatova, from the Mayor's office, arranged appointments with local officials. We met with Mr. Ivan Plicka from the City Development Authority, Mr. Vaclav Patek, head of the Commercial Activities Department from Prague Municipality and Mr. Anderle from Terplan.

The municipality provided maps and documents concerning land use, land regulations, strategy, census data. However, because the zoning map could not be provided in digital form, it has not been possible to analyze it at this moment.

Because of the lack of opportunity to discuss urban policy in depth with Prague's officials, this note is somewhat descriptive, much more work and dialogue with local officials will be needed to make it more analytical and reach a point where recommendations could be made.

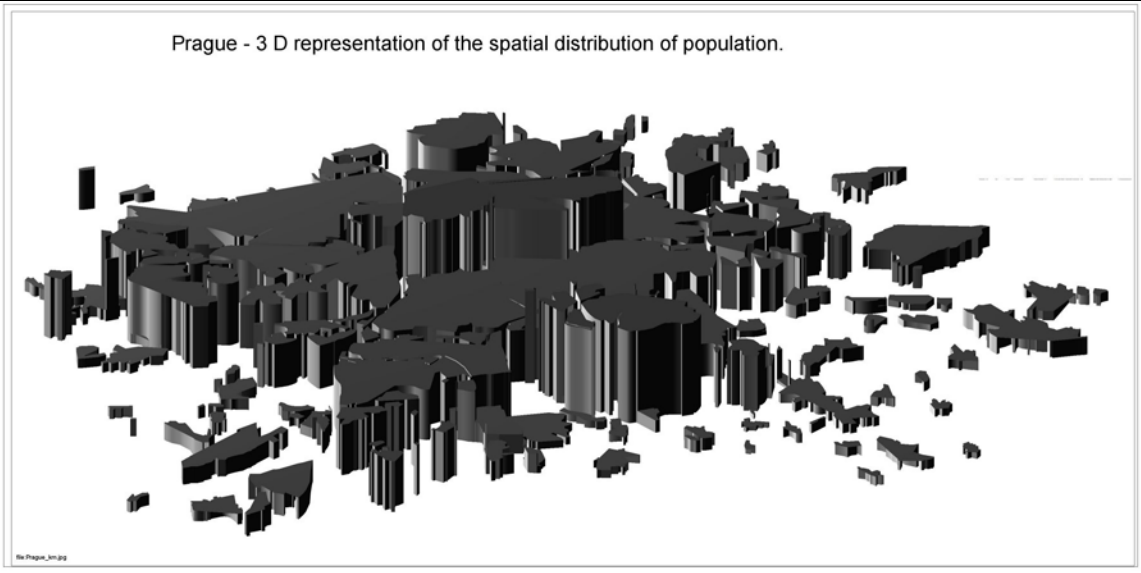

figure 1

Summary

From a spatial organization point of view, Prague is a rather mediocre performer compared to other cities of Central Europe. The fragmentation of the built-up area and the existence of large high-density panel housing projects in the suburbs contribute to the dispersion of the population. The urban strategy likely to be voted soon by the city council might not contribute to diminish this problem, although more efficient land use utilization is one of the objectives of the strategy. The maintenance of a high modal split for public transport might not be feasible in the future if the problem of fragmentation and land use efficiency is not addressed.

A. MUNICIPAL GOVERNMENT OBJECTIVES AND STRATEGY

Prague's municipality has recently formulated a Strategy, which should be put to a vote at the city council in September 2000. The current draft [1] is reflecting the discussions that have taken place over the recent months and is likely to be approved without many changes. It is interesting to note that the land use plan, which is close to a zoning plan, and which is supposed to be the major tool to implement the strategy, has been already approved in 1999.

The objectives expressed in the strategy are very similar the ones formulated in other cities of central Europe:

- Emphasis on economic development and development of the service sector, and explicitly on competiveness.
- Great concern for the environment and for historical preservation
- Strong emphasis on the use of public transport with a target of 65% split for public transport mode.
- Better efficiency in the use of resources: land, water, energy.
- Better integration into the network of European cities and into the European Union.
- Better public participation in the planning process

The part of the strategy bearing directly on the spatial structure of the city consists of:

- Development of a polycentric spatial structure to "distribute more equally housing and work place to relieve the city center". This in order also to "shorten the distance between jobs and housing".
- Integration of the labor force in one market
- Create job opportunities in the part of the city with insufficient number of job, mainly within the vicinity of large residential complexes.
- Deregulation of rents, more demand driven housing market.
- Modernizing, regenerating panel housing
- Preserving and developing the coexistence of the historic core with the central city functions
- Reducing private car traffic in major arteries, giving parking preference to to residents
- Restrict the construction of high rise buildings to preserve cultural heritage.
- Preserve the proportion of housing in Prague historical area.

[1] "Strategic Plan for Prague" draft 1998. English translation. Prepared by the City Development Authority of Prague.

- Creation of new off street public parkings and reduction of street parking
- Give preference to centralized heat supply

Comments on the internal consistency of objectives and the proposed strategy

Most of the objectives points toward a denser city: better functioning of the labor market, better utilization of land. It also points toward a reinforcement of the monocentric structure of the city, if one takes into account (i) the strong emphasis on public transport, and (ii) the fact that 70% of public transport trips are made by metro or tram, which have a fixed route converging toward the current CBD. As the fixed route public transport provide excellent access to the current CBD but not so good access between peripherical locations, a call for maintaining a 65% split mode in favor of public transport implies maintaining a strong dominant CBD.

However, some part of the strategy will constrain seriously the development of the current CBD. For instance, the limit put on high-rise (rightly so, in the authors' opinion), the maintenance of a constant ratio of residential vs other uses, will seriously hinder the development of the CBD. The fact that the historical area close to the CBD is also a major tourist attraction will create a competition for commercial space between tourist oriented retail (restaurants, souvenirs, etc) and business oriented retail (office supplies, messenger services, computer equipment). Given the extraordinary attraction that Prague represents for tourists from all over the world, it is not certain that business will win. It is probable that the real estate market will show a trend toward developing new businesses in an area where urban renovation is cheaper and less sensitive than in the historical district and where retails can be developed more oriented toward the business community. May be this is already occurring. It is not certain that the new location will be as well served by fixed route public transport as the current one.

Many aspects of the strategy are spatially consistent or compatible with objectives, with the exception of the creation of secondary centers. It is unavoidable that in a city of more than a million people some secondary activity centers develop over time. The evolution of the real estate market usually triggers this type of spatial development. But, it is naïve to think that the creation of secondary employment centers will reduce trip length, as it is claimed in the strategy. Dispersion of employment location always increases trip length. Secondary centers will also increase the attractiveness of private car over public transport, even if the secondary centers are located close to metro stations.

The preference given in the strategy to centralized heat supply – whatever its merit for energy conservation – have an interesting potential effect on spatial development. To be viable, collective heat supply implies a minimum density. We do not know what this density might be in Prague, but we may assume that it corresponds to the density of apartment buildings of at least 4 floors or a gross density of about 100 people/ha. A maximum operating radius around a heating plant determines the areas that can be served by collective heating systems. Building new heating plants is costly and lengthy because of the environmental studies that have to be made. Giving preference to centralized heat supply – if applied to new construction – might therefore limit in the future the areas that can be built at relatively high density. Developable land located

outside the operation perimeter of heating plants will loose value, as high-density building will not be allowed before a new heating plant is built. In spite of potential demand for well-located high-density apartments, developers might prefer to develop land at low density in order to avoid the requirement to be next to a heating plant. This aspect of the strategy might well reduce the amount of new high density residential building that are likely to be built and therefore increase dispersion, and increase the share of private car transport over public transport. The issue of heating plant in Central and Eastern Europe should be addressed taking into consideration the likely impact on the real estate market.

Municipal real estate holdings is a spatial development issue

The municipality of Prague owns about 20% of the developable land within the municipal boundary. The Municipality is therefore most probably by far the largest real estate landlord in Prague. The policy adopted to dispose or rent or lease municipal property is therefore of vital importance to the spatial development of the City. The strategy does not mention anything concerning the management of municipal property. Based on an interview with the Commercial Activities Department of Prague Municipality, it appears that the city has been auctioning some land and property, but that at present there is a strong preference for leasing or renting property. The first objective is to stimulate growth in the direction desired by the Municipality by leasing or renting at a rate below market to enterprises or organizations that are considered useful to city development. The second objective is to bring a stream of revenues from the rent and leases.

The effect that the large municipal property holding could have on the real estate market and on spatial development should be considered seriously by the municipal authorities. The temptation to use the municipal properties to “regulate” the land markets is common among Central European municipalities. Everywhere else where municipalities have tried to regulate land markets by using their land assets, the outcome has been the opposite of the one sought.

B. CITY STRUCTURE

The Fragmentation of the built-up area

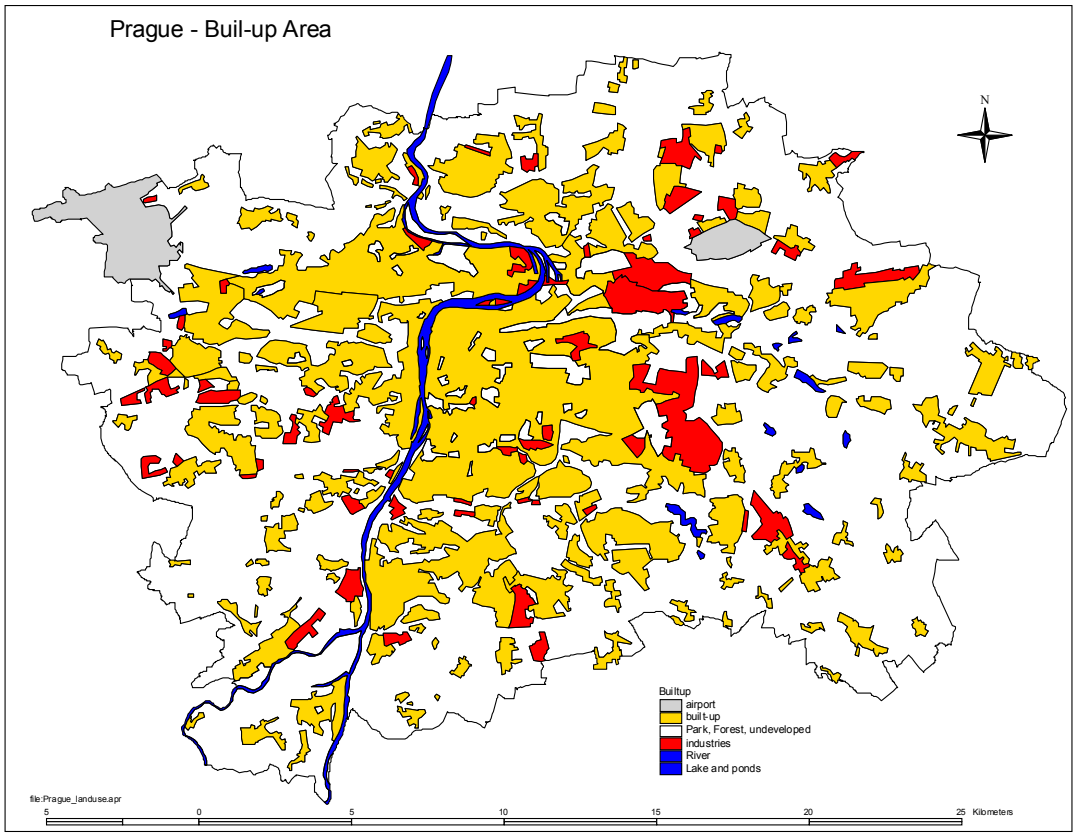

figure 2

The built-up area of Prague is quite fragmented as seen on figure 2. The built-up area represent only 35% of the total area within the municipal boundary.(see table 1). For a former socialist country, the amount of industrial land is relatively low (14%) but still high by market economy standards (average around 7%).

Prague: Agregated Land Use Distribution within Municipal boundary					
	areas in km2			% of total municipal area	% of Built-up area
Total area within municipal boundary:			496.16		
1. Built-up		171.39		35%	
of which : industries	23.89				14%
Other	147.51				86%
2. water bodies& rivers		8.12		2%	
3. Airports		10.56		2%	
4. Undeveloped, agricultural areas, large parks and forests		306.09		62%	
	171.39	496.16	496.16	100%	100%

Table 1.

The fragmentation of the built-up area is already seen on the map of Figure 2 is quantified on the graph of Figure 3. The built-up area stays about constant at around 18 square kilometer for each kilometer interval between 4 and 9 kilometers from the CBD. This fragmentation is only partially due to the large parks and forests surrounding Prague (The availability of a digital land use map would allow to improve the diagnostic by showing how much of the fragmentation is due to parks and forest and how much to just left over space between settlements).

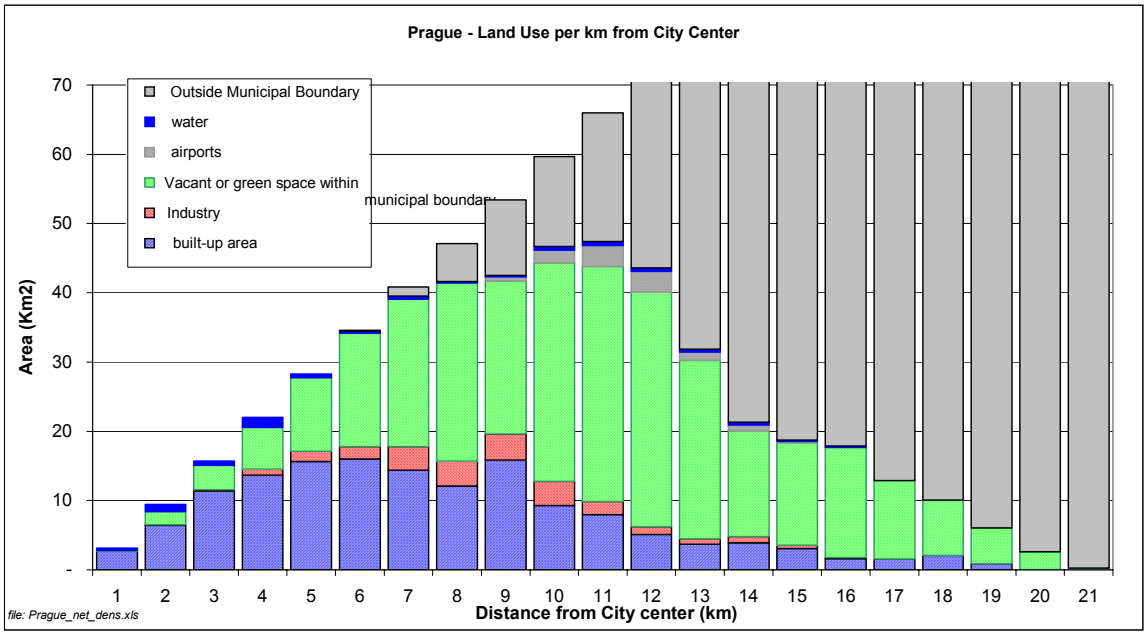

Figure 3

The fragmentation of the built up area is quite possibly inherited from the socialist time. When land is not traded at market value, there is no particular reason to use more intensely the areas located close to the center as opposed to the one located further away. In addition, in the absence of land markets, it is cheaper to develop land along existing radial primary roads rather than add secondary infrastructure to develop the land located between the radials. In a market economy, the potential high value of the land located

between the primary radials constitutes the major incentive to develop the secondary infrastructure that will allow its development. This demand driven process produces less fragmented built-up areas. It is possible than in the case of Prague the best approach to reduce fragmentation would be to improve the functioning of land markets and make sure that the land use legislation allows densities compatible with supply and demand.

One of the municipal objectives is to make better use of land. It would be expected therefore that some of the vacant land between the radials will be allowed to develop.

The Pattern of densities

The map of Figure 4 shows the population density pattern in the built-up areas. One can note the pockets of high density corresponding to high rise panel housing residential areas in the Southern and Western suburbs of the city.

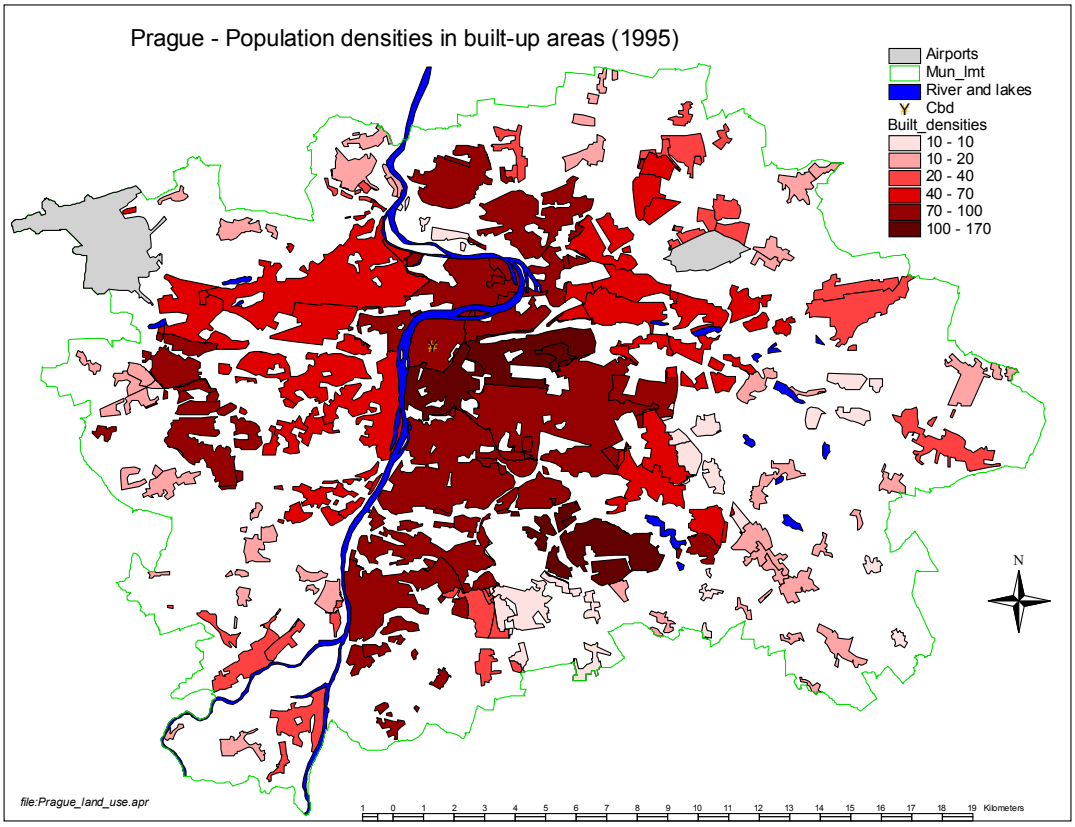

Figure 4

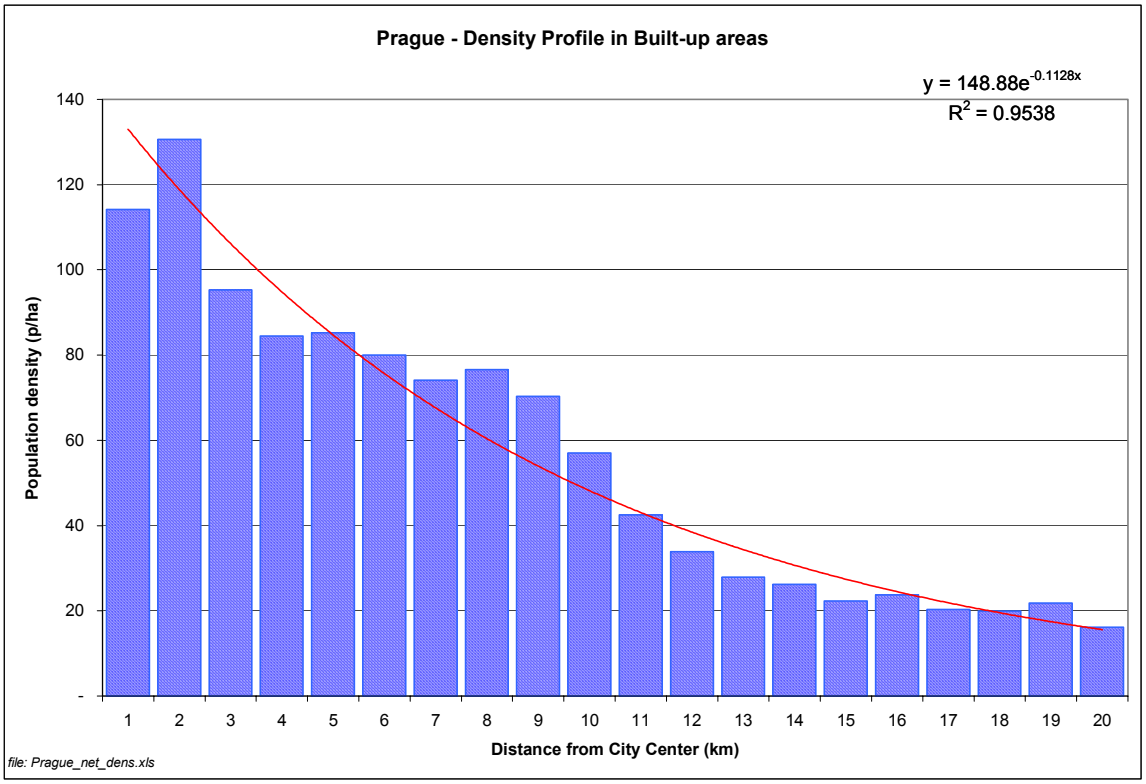

figure 5

The density profile of Figure 5 shows a very small decrease in density between km 4 and 9 . This is the effect of the large panel housing development mentioned above.

No data was available on the spatial distribution of land values, but it was indicated that land values drop abruptly just outside the city center, i.e. at about 4 km from the center. If it is so, the dense residential areas shown on the graph of Figure5 at 7 to 9km from the center must be of very low value.

C. PRAGUE CITY STRUCTURE COMPARED TO OTHER CITIES OF EUROPE

Integration with the network of European cities and at the same time competition with other cities of Europe is one of the objectives contained in Prague strategy. It is therefore useful to compare the spatial characteristics of Prague with other cities of Europe.

Comparison between the value of the spatial parameters of some cities of Europe

cities	population	Built-up area (Km2)	Average Density (p/Ha)	Dispersion index	Density gradient	R2	Distance between CBD and center of gravity (km)	Average distance per person (km)
Barcelona	2,775,449	163	171	1.32	(0.10)	0.89		6.33
Berlin	4,212,381	1,176	36	0.98	(0.04)	0.62	3.57	12.65
Budapest	1,937,162	309	63	0.96	(0.11)	0.76		6.36
Cracow	730,600	112	65	1.18	(0.17)	0.81	2.37	4.68
Ljubljana	247,969	54	46	1.21	(0.19)	0.87		3.35
London	6,626,272	1,062	62	1.03	(0.02)	0.53	2.02	12.63
Marseille	800,447	151	53	0.92	(0.35)	0.89		4.28
Moscow	8,543,867	470	182	1.39	0.05	0.50	0.62	11.30
Paris	7,877,729	893	88	0.89	(0.10)	0.90	0.83	10.03
Prague	**1,209,816**	**171**	**71**	**1.22**	**(0.11)**	**0.95**	**2.20**	**6.00**
Sofia	1,137,033	120	94	1.07	(0.14)	0.91		4.44
St Petersburg	4,241,341	351	121	1.24	(0.08)	0.47	2.37	8.70
Warsaw	1,575,283	235	67	0.99	(0.17)	0.87		5.71
Yerevan	1,249,406	74	168	1.33	(0.09)	0.69	0.44	4.31

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Table 2

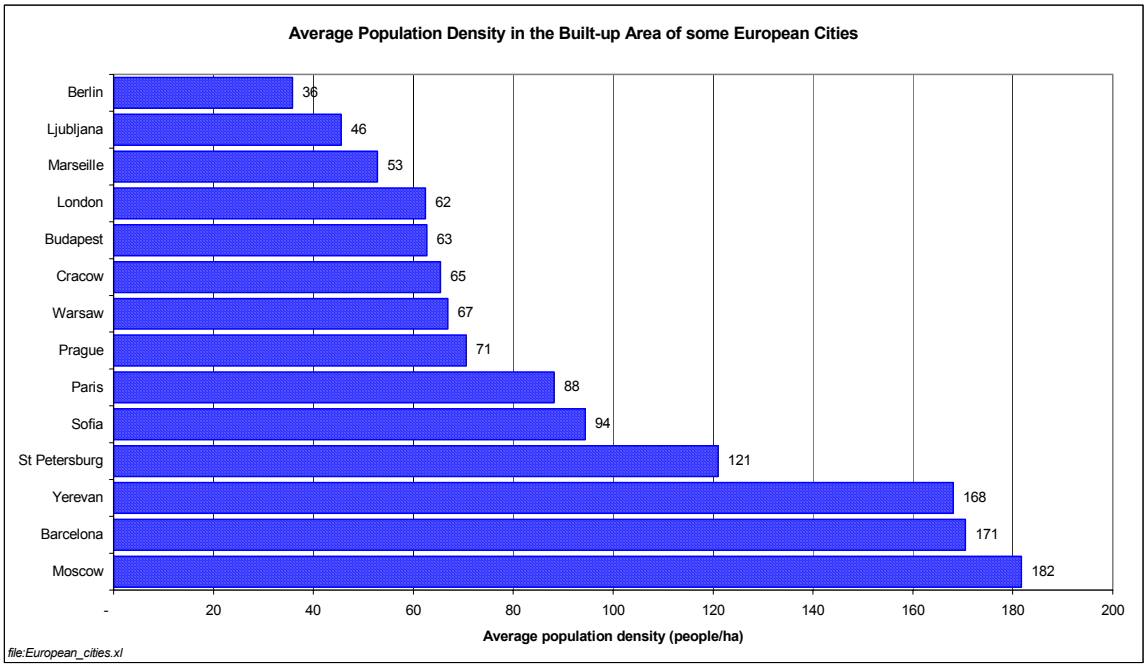

Figure 6

The average density in the built-up area of Prague (71 persons per hectare)– located somewhere between Paris and Warsaw – is very similar to the density of the other cities of Europe. There is no range of population density that is specific to former command economies. (See Figure 6)

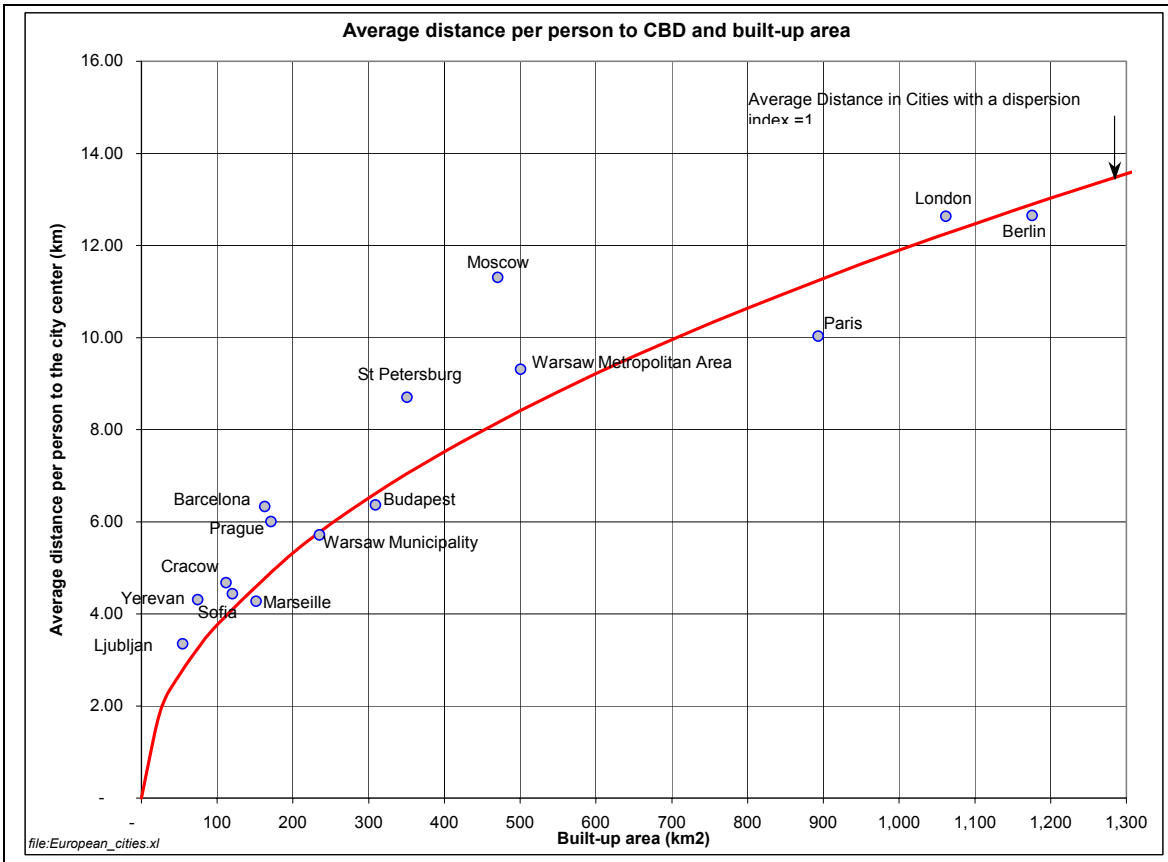

Figure 7

The average distance per person to the CBD related to the size of the built-up area is a good measure of compactness. In the case of Prague, the average distance per person to the CBD is 6 km. This is high for a city of its area. Figure 7 shows the relation between size of the built-up area and average distance per person. One can see on the graph that Prague is one of the worst performers among the sample of cities presented here. For instance Warsaw municipality with an area 37% larger than Prague has an average distance per person to the CBD that is 5% shorter that the one of Prague. Only St Peters

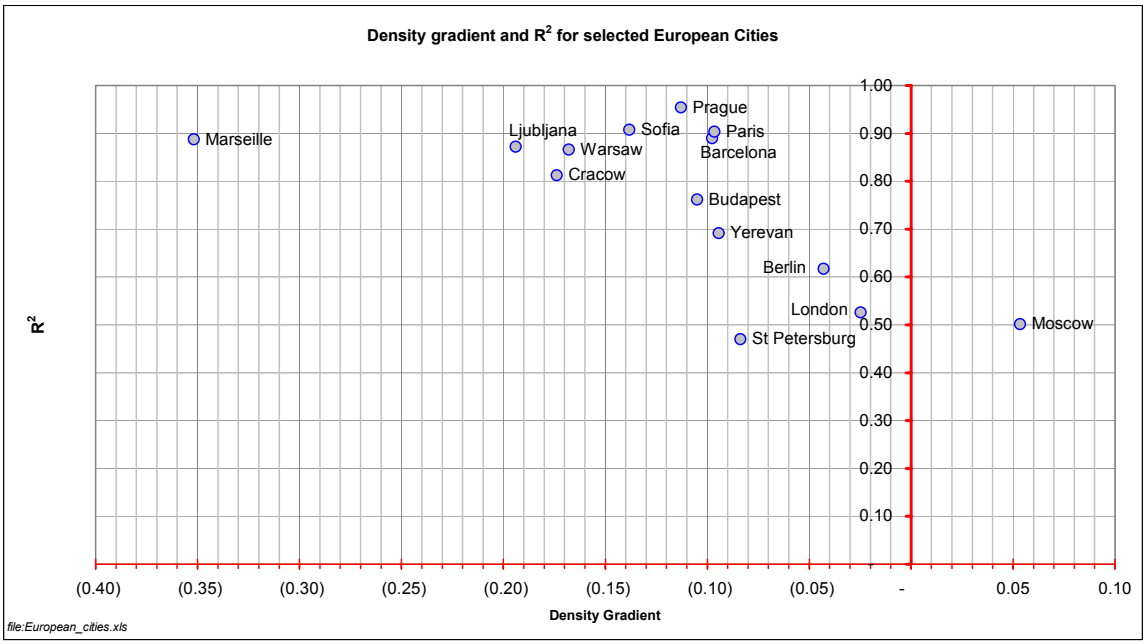

Figure 8

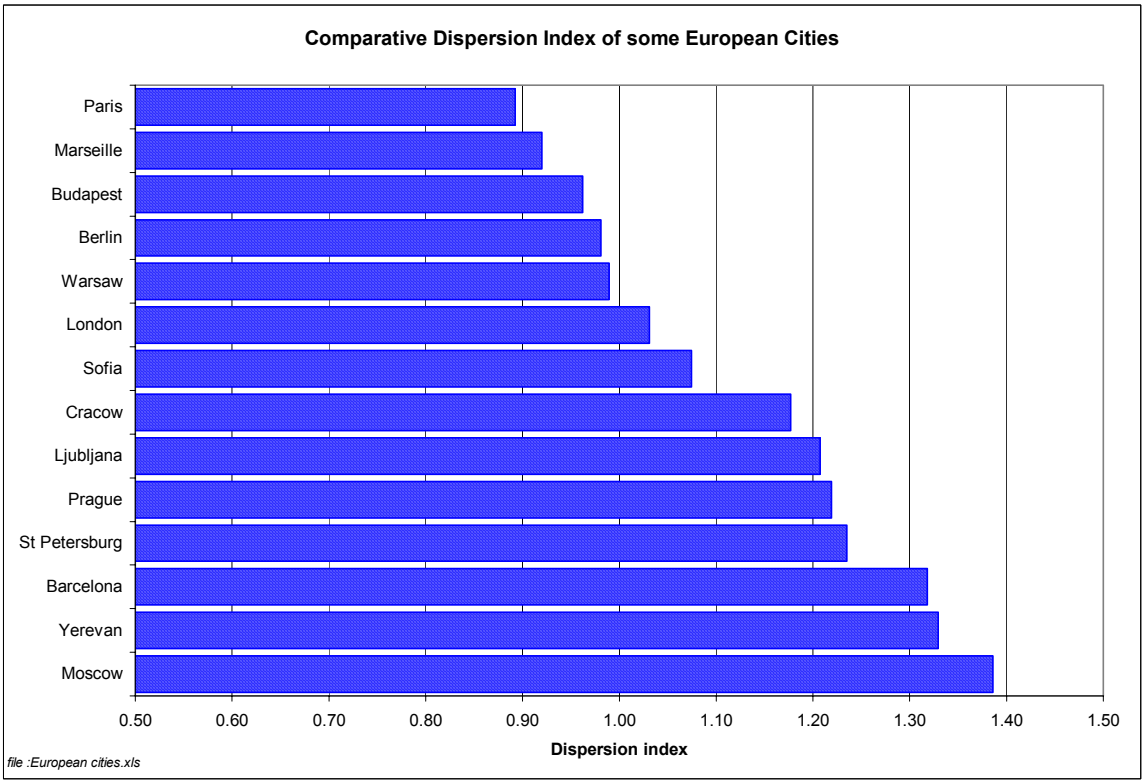

Figure 9

A high dispersion index implies longer trips and more costly transport, (everything else being equal). When households can afford to use their cars on a daily basis, a city with a high dispersion index is more likely to see a decrease in the use of public transport than a city with a low index.

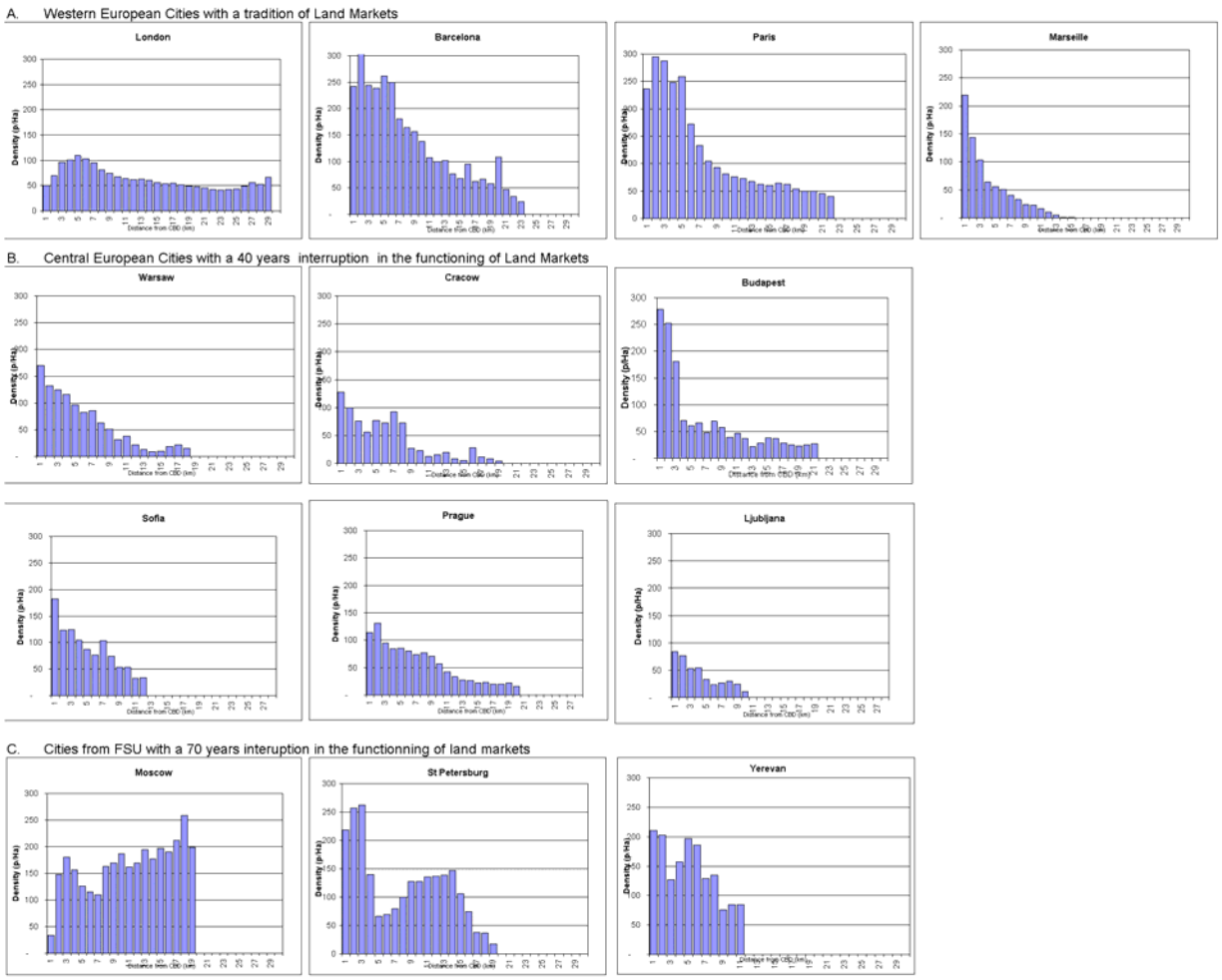
Comparative density profile of 13 European Cities
A. Western European Cities with a tradition of Land Markets
London
Barcelona
Paris
Marseille
B. Central European Cities with a 40 years interruption in the functioning of Land Markets
Warsaw
Cracow
Budapest
Sofia
Prague
Ljubljana
C. Cities from FSU with a 70 years interuption in the functionning of land markets
Moscow
St Petersburg
Yerevan
Density (p/Ha)
Distance from CBD (km)

Figure 10