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Social inequalities of access: What is the impact of local transport policies?

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Abstract

Switzerland is often cited as an example of good practices in relation to the quality of its public transport provision and its intermodality. References are frequently made to radical parking policies and the strong interlinkage between public transport infrastructures and urban development – particularly in the agglomerations of Berne and Zurich – which serve to promote the use of public transport as a daily mobility tool. However, are these policies not the source of rising spatial segregation? Are social inequalities not generated by restricted accessibility to the city centre?

In an attempt to answer these questions often raised in scientific circles, our paper uses a comparative methodology to examine French and Swiss mobility surveys, with the aim of uncovering the links between transport policies, spatial typologies of habitation and travel practices in eight Swiss and French agglomerations.

First, the results show that the use of different means of transport is linked first and foremost to the services on offer. For example, the Swiss-German agglomerations benefited from a regional rail network, which interlinks with an extensive bus service. In the other agglomerations in our study, there is a striking contrast between determined, committed policies which favour public transport in the city centre, and a regional transport service which is still regarded as the poor relation despite their adequate infrastructures.

Second, we noted contrasting developments between differing policies. The introduction of supply-based parking management in Berne (pronounced abolition of parking spaces) has not had the same impact as the cost-based parking management operated by Zurich (high parking prices). In Berne, car use does not vary greatly across socio-professional categories – employees use the car as much as executives. In Zurich, on the other hand, segregation is reinforced further, with a significant overrepresentation of higher socio-professional categories among motorists.

Finally, our analysis looks at car dependency. In the four agglomerations with a good regional rail service (Strasbourg, Zurich, Berne and Lausanne), people living on the outskirts of the agglomeration are not disadvantaged by not having access to a car. Of course, when interpreting the segregating effects of policies which restrict car access to the town centre, due consideration must be taken of these different situations. The introduction of parking restrictions in the city centre which has a functioning rail transport service with periurban links is radically different in terms of the access conditions than if such measures are introduced in agglomerations which do not have a such a transport network. The latter leads to greater access inequalities, particularly if the periurban areas are inhabited by the socially disadvantaged.

1. Introduction

Switzerland is often citied as an example of good practices in relation to the quality of its public transport provision: tram networks in several cities, the introduction of regular hourly train schedules in 1982, the Rail 2000 project aimed at developing a system of hubs to ensure rapid and smooth train connections nationwide, and a transport policy which has a strong intermodal focus. References are also frequently made to radical parking policies and the strong interlinkage between public transport infrastructures and urban development – adopted in particular by Basle, Berne and Zurich – which serve to promote the use of public transport as a daily mobility tool. In addition, organised activities which are designed with the use of public transport in mind and good knowledge of the public transport services on offer add to the already complex organisational structure of travel in Switzerland.

Media coverage of these urban transport policies and attempts to export them elsewhere have caught the attention of researchers (Ascher 1998, Pucher and Lefèvre 1996). Their subsequent works criticised these policies for their segregating effect, particularly with regard to real estate and access inequalities.

- On the issue of real estate, several studies have shown that in Swiss cities which adopted the aforementioned model, greater accessibility to the public transport network has led to higher real estate prices, and as a result the relegation of the poor and families to the urban fringes where public transport services are inadequate (Pucher and Lefèvre 1996). To support this theory, they cite the rising price of city centre real estate, the high level of tertiairization observed in the centres of Zurich, Berne and Basle, as well as the sharp decline in the number of city centre residents over the past thirty years (Ascher 1998: 102). In turn, this creates spatial segregation and negative transport externalities. A high-quality public transport network would primarily benefit individuals who can afford to remain in the city centre and thus force those living in periurban areas to drive.

- On the issue of access inequalities, analysts consider that the “Swiss model” reduces the access of the disadvantaged population to city centres due to price-related factors. In particular, they point to dissuasive city centre parking rates (2-4 euros/hour) and tight parking controls which restrict access of those in the lowest income bracket to the city centre (Whitt 1979, Urry 2000). Restricted city centre access by car (notably through the high costs of parking, not to mention the possible introduction of tolls in urban areas) would once again negatively affect low-income households. Having been pushed out of the city centre by high real estate prices, their daily commute to work in the city centre is then “taxed”.

While these arguments help stimulate thought-provoking debate on the social inequalities of access, their scientific bases are often fragmentary and do not allow for direct comparisons. The present research paper has two aims (Jemelin et al. 2005). The first is to provide a methodology which enables a comparison of mobility surveys undertaken in France and Switzerland. The second is to bring together the transport policies, the types of habitat and travel practices in eight French/Swiss

cities (Zurich, Berne, Lausanne, Geneva, Strasbourg, Rennes, Lyon, and Grenoble). The main findings are presented below. With regard to the methodology used, the authors established comparable territories which were the subject of existing surveys. Weekend journey indicators from Swiss surveys were omitted, as the French surveys did not take such indicators into account. For more detailed information on the methodology used to compare the survey data, interested readers should refer to the op. cit..

2. Methodology

To measure the impact of local urban transport policies on the social inequalities of access, several comparisons of the eight selected cities were made: (1) an analysis of transport policies carried out between 1980 and 1990 based on interviews with local authorities and reports; (2) an analysis of the geography of social inequalities in each city using national census data (1990 and 1999 for Switzerland; 2000 for France); and (3) a statistical analysis of the modal shares and their development during the 1980-1990 period. The 1994 and 2000 transport microsurveys (using a representative sample of the Swiss population and carried out every five years) and the Enquêtes Ménages Déplacements (household travel surveys, using a representative sample of the population of each large French city, and carried out intermittently – see http://www.certu.fr/mobilite, for more details) are the primary statistical sources for the third analysis.

The tables below contain the basic structural data (population trends 1990–2000) on each of the eight cities.

((Insert Table 1 here))

The article presents the three central findings in succession and then examines them in terms of the general debate on the impact of transport policy on social inequalities of access.

3. Results: comparative analyses to evaluate the impact of transport policies

3.1 Varying policies aimed at developing transport services and city centre access

Our comparative analysis of the policies advocated by the eight cities and their impact on access inequalities expose three differences:

The first concerns public transport. During the periods under investigation, some cities invested in projects to rebuild their tram network or to install underground trains in order to improve urban public transport services (an automatic underground train line was introduced in Lyon, while Grenoble, Strasbourg, and Geneva set about rebuilding their tram networks which had been abolished several decades before). Others invested in projects to improve their existing regional train services (Zurich and Berne). However, two cities, Rennes and Lausanne, did not introduce any new segregated public transport corridors during the period under investigation.

The second difference concerns the link between transport and urban planning. While Lyon, Grenoble, Strasbourg and Lausanne let the “structuring effects” of the market run their course, Rennes and Geneva consider that road infrastructures provide such a link. On the other hand, Berne and Zurich see public transport accessibility as the link between transport and urban planning.

Finally, the third difference concerns policies which regulate city centre access. During the period under consideration, some cities, such as Lyon and Rennes, developed a supply-based parking policy (generalisation of free short-stay parking or reduced rates with residential parking disc). The parking management policy adopted by Zurich, however, is price-based. Grenoble and Geneva were the only two cities which did not implement any parking management measures during this period.

((Insert Table 2 here))

Finally, linking the reach of the transport infrastructures and services with the local transport policy in place at the time showed that four distinct situations exist:

- Cities with good urban and regional public transport services, which optimise the existing infrastructure and services and have a policy to manage car access to the city centre: Strasbourg, Zurich and Berne.
- Cites with good urban public transport services but inadequate regional services; at the same time they developed their existing urban public transport

infrastructure and road infrastructures but have a watered-down policy to restrict car access in the city centre: Lyon, Grenoble and Geneva.

- A city with well developed regional public transport services but have not invested heavily in their infrastructure (segregated public transport corridors) and have adopted a policy to manage car access to the city centre access: Lausanne.
- A city with little urban and regional public transport services, which followed a policy to promote private transport measures: Rennes.

3.2 Social geography of each city

The impact of transport policy on the social inequalities of access depends on the geographical location of disadvantaged populations and families. We developed a system to distinguish between the different types of social geography, while taking into account the following three indicators:

- The *share of executives and highly educated professionals* (compared to the rest of the working population) in order to evaluate the wealth of the residents;
- The *share of blue-collar workers and the unskilled working population* in order to identify districts with a high concentration of low income households;
- The *share of couples with children* in order to locate districts with greater numbers of families, which in turn reveals both *family and non-family districts.*

Districts are then further classified according to a range of categories; here the over- and under-representation of each variable (25% lower/higher than the average) is also taken into account.

Based on these indicators, a comparative analysis of the socio-spatial structure of each city uncovers shared characteristics and structural specificities:

- "Rich"[i] districts tend to be concentrated in specific areas, while poor districts tend to be more widely dispersed. This is true for all districts examined in the present study and is in line with the findings of other studies (Huissoud et al, 1999, p. 139).
- There are more executives in France who live in the city centre than there are in Switzerland. With the exception of Berne, the Swiss capital, which has a high number of executives due to it being the site of the public administration, few people in this socioprofessional category in Switzerland are city centre residents. In France, however, three out of the four city centres qualify as "rich" (with the exception of Grenoble, if we accept the 1992 EMD zone). City centre access does not pose the same problems for low-income households in French cities as it does for their Swiss counterparts, given that a larger share of low-income households in Switzerland live in the city centre.

- There is an under-representation of families living in city centres. In most of the cities studied here, they are consigned to the city outskirts. Diachronic analyses of Swiss cities also provide further evidence of this “centrifugal” force, and reveal a generalised slump in the number of families living in city centres.

((Insert Figure 1 here))

((Insert Figure 2 here))

The examples of Lyon and Zurich perfectly illustrate the four central points mentioned above. Greater Lyon is sharply segregated: most of its western districts that are close to the city centre have an over-representation of executives, while there is an over-representation of blue-collar workers in the eastern districts of the city (where public transport services are currently being developed). Furthermore, couples with children are over-represented in the northern districts but under-represented in central Lyon. However, central Lyon has a high share of executives in the resident population. Only in the south is the population relatively mixed.

The case of Zurich is very different, except on one point (the concentration of “rich” districts close to the city centre). There is less segregation: districts with an over-representation of blue-collar workers are dispersed across the greater Zurich area and more than half of these districts, compared to a mere one third in Lyon, tend to have a greater population mix (neither over- nor under-representation), Finally, couples with children are under-represented in central Zurich, yet the city does not have an over-representation of executives in the resident population, unlike Lyon.

3.3 Modal practices: trends and differences

A comparison of the rates of public transport use shows that the quality of the services on offer plays an important role. Swiss-German cities have preserved their tram networks, while Strasbourg, Lyon [the first transport project aimed at reducing car dependency], Grenoble and Geneva are currently reinstating this means of transport. A radical policy adopted by the greater Zurich region enabled the introduction of the first Swiss rapid rail-transit network in the early 1990s, while Berne sought to maintain its extensive regional train hub. The first case illustrates these important differences in use (changes between the first and second period under examination). The second case underlines – for France at least – the clear contrast between strong and committed policies which favour city centre public transport, and regional transport services which in almost every instance come a poor second. It should be noted that even where regional transport infrastructures have been maintained, the potential of these services remain largely untapped.

((Insert Figure 3 here))

Cities of particular note are Strasbourg, where the modal share of public transport is much lower than for the other cities (coupled with high numbers of cyclists), and the two Swiss-German cities where this share was greater than 20% in 1994 (followed by a subsequent decline). In Lausanne, the modal share fell to almost the same level as that of Grenoble, while only Lyon and Geneva managed to maintain a share close to 15% between the two periods. During this interim period, these two cities undertook projects to develop their public transport services.

One reason for the noticeable slump in Zurich is a shift from public transport in favour of walking and cycling in the city centre. In Berne, this phenomenon was also accompanied by a drop in the modal share of public transport in the periurban zone (outer commuter belt).

((Insert Figure 4 here))

For public transport, the variation in the modal shares according to the geographical setting where the surveyed populations reside reveal a direct link. The modal share of public transport in the periurban areas of Zurich and Berne is equivalent to that in the city centres of Lyon and Grenoble – and even higher than in Rennes and Strasbourg. As previously mentioned, this can be attributed to the excellent quality of the transport services provided (particularly rail services) in Greater Zurich and Greater Berne.

Independently of modal practices, it is interesting to observe that the two Swiss cities of Zurich and Berne, which adopted policies to restrict car access to the city centre, have also seen the greatest rise in the share of resident executives. While this finding may serve to fuel the arguments of those who claim that restrictive policies have a sharp segregating effect, we should remember that Lyon also has a higher share of executives, while Strasbourg, which also adopted a restrictive policy, has seen the lowest rise in the percentage of executives living in its city centre. These results indicate that there is not an automatic link between the phenomenon of social segregation and policies which restrict access to urban centres.

((Insert Table 3 here))

In order to study the social inequalities of access, we devised an indicator which describes the modal practices of respondents according to sociodemographic factors, particularly their socioprofessional status. We then calculated odd ratio tables, which involve measuring deviations from the average (set at 100). A figure lower than 100 indicates under-representation, a figure higher than 100 is an over-representation.

((Insert Table 4 here))

((Insert Table 5 here))

Almost all cities have a significant share of residents from higher socioprofessional categories who travel by car. Of particular note are Berne, Strasbourg and Zurich, i.e. those cities which had adopted a restrictive city centre parking policy.

In Berne and Strasbourg, supply-based parking management (pronounced reduction in the number of parking spaces) does not have the same impact as the price-based parking management policy adopted by Zurich (high parking prices). In the first case, we can observe that between 1994 and 2000 car use was similar across socioprofessional categories – car use equally prevalent among employees as among senior executives. However, in Zurich, segregation was reinforced further, with a significant over-representation of higher socioprofessional categories among car users. For example, over-representation of senior executives among car users fell from 146 to 126 in Berne and from 140 to 128 in Strasbourg. In contrast, Zurich city witnessed an astonishing increase: from 115 to 168 [in table 5 the values are for Zurich and suburbs].

To end, it appears useful to return to our initial results on the modal shares of public transport according to urban setting (in this study: central urban, suburban and periurban). In the four cities with a good regional rail service (Strasbourg, Zurich, Berne and Lausanne), people living on the outskirts of the city were not disadvantaged by not having access to a car. Of course, when interpreting the segregating effect of policies which restrict car access to the city centre, due consideration must be taken of these different situations. The introduction of parking restrictions in a city centre which has a functioning rail transport service with periurban links is radically different in terms of access conditions than if such measures were introduced in cities which did not have such a network. This leads to greater access inequalities, particularly if the periurban areas are inhabited by the socially disadvantaged. This is especially true for the eastern districts of greater Lyon.

4. Conclusion: multiple impact of urban transport policies

We can draw three main conclusions from our findings:

A. The same measure does not have the same effects everywhere. Without entering into the unending transferability debate, we conclude that the claim that policies aimed at regulating mobility always have the same impact mistakenly oversimplifies matters. In fact, consideration of the spatial context (morphology of the city and its growth), the social context (distribution of social categories within the territories studied) and the transport services on offer (quality of urban and regional public transport services) is necessary for the precise evaluation of the impact of mobility-related measures. It is impossible to confirm or refute conclusively the arguments outlined in the Introduction. The impact of a policy which restricts city centre parking will differ depending on the absence/presence of good public transport services (both in the city centre and on the outskirts) and depending on whether the city's

resident executives, blue-collar workers and families are dispersed and segregated or not across the territory. Systematic consideration of these two elements would enable public policies to propose more effective measures in relation to the modal share of public transport and measures that are more egalitarian in terms of the increase in journey times and transport costs.

B. To restrict access to the city centre presupposes the existence of alternative regional public transport services if it is to avoid creating segregating effects. The distinction is relatively clear between cities which have a good regional transport network and those which do not; restricted car access to the city centre obviously has a greater impact if public transport services do not represent a credible alternative to car use. In Zurich, the “poorest” neighbourhoods are in the inner suburbs or in the city centre itself, and generally have good public transport services (Joye et al., 1995: 114; Huissoud et al., 1999). Consequently the segregating effects of restricted car access are weaker than in Greater Lyon, where poor neighbourhoods are located to the east, often far from the city centre and with poor public transport services. This result shows that urban transport policy has a segregating impact at both the city and district level.

C. The manner in which parking is restricted also has a bearing on the segregating effects of transport policy. Price-based parking regulations, as adopted by the city of Zurich where paid parking is widespread and expensive, exacerbate the segregating effects of restricted city centre access. On the other hand, parking management based on offering this service free of charge or at greatly reduced rates but for a limited duration (“blue zones”), such as in Berne or in Strasbourg, limits the segregating effects of measures to restrict car access to the city centre. This is an important fact to note, as it is used to justify calls for the introduction of tolls in urban areas. It would be fair to assume that the introduction of such tolls in Switzerland would have a similar impact. However, this issue has yet been the subject of scientific research; current assessments of the impact of urban tolls in London or in Stockholm are primarily carried out by advocates of this measure and thus lack the necessary scientific rigour. The development of urban planning measures that tie in with existing regional public transport services (which still have untapped potential) as well as improvements to the often negative image associated with the suburbs could be an alternative solution to greater car traffic in periurban zones, by offering types of habitat which would be attractive to families (city centre housing, green spaces, density of commercial and public transport services).

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6. Tables

Table 1 Population trends in the eight selected cities (1990–1999/2000)

FRANCE		Lyon	Grenoble	Rennes	Strasbourg
Population 1999	*EMD zone*	1,302,106	704,361	364,596	601,781
	city centre	445,274	153,426	206,194	263,941
Population 1990	*EMD zone*	1,251,943	662,285	326,226	557,957
	city centre	415,479	150,815	197,497	252,274

SWITZERLAND		Zurich	Berne	Lausanne	Geneva
Population 2000	*EMD zone*	975,292	297,401	306,656	413,074
	city centre	363,273	128,634	124,914	177,964
Population 1990	*EMD zone*	927,810	304,173	296,877	378,557
	city centre	365,043	136,338	128,112	171,042

Note: The EMD zone refers to the area covered by the most recent household travel survey in France. To facilitate comparisons between France and Switzerland, the authors of the present study have defined similar zones for Switzerland based on local oversampling.

Table 2 Organisation of transport networks in the eight selected cities [at the time of the surveys]

FRANCE	**Lyon**	**Grenoble**	**Rennes**	**Strasbourg**
PT services	Heavy rail network Underground + bus	Bus + tram	Bus	Bus + tram
Management of road access to city centre	Conducive	Conducive	Car-friendly	Restrictive in terms of regulations
Parking Policy	Development of car parks in city centre	No specific measures	Development of car parks in city centre	Parking for residents/short time visitors
SWITZERLAND	**Zurich**	**Berne**	**Lausanne**	**Geneva**
PT services	Heavy rail network	Heavy rail network	Bus + tram	Bus + tram
Management of road access to city centre	Restrictive in terms of price	Restrictive in terms of regulations	Conducive	Car-friendly
Parking Policy	Restrictive in terms of price	Parking for residents/short time visitors	Parking for residents/short time visitors	No specific measures

Table 3 *Number of city centre residents who are executives or highly educated professionals (source: INSEE/SFSO), between 1990 and 1999/2000*

	1990	1999/2000	1990–1999/2000
Lyon	37 596	45 849	+22.0%
Grenoble	12 108	14 332	+18.4%
Rennes	14 432	16 881	+17.0%
Strasbourg	18 873	21 788	+15.5%
Zurich	25 068	35 119	+40.1%
Berne	8 786	10 912	+24.2%
Lausanne	8 397	9 505	+13.2%
Geneva	14 801	17 074	+15.4%

Table 4 *Odd ratios of the population who travel by car during the day according to socioprofessional category (France)*

	Lyon		**Grenoble**		**Rennes**		**Strasbourg**	
	1985	**1995**	**1992**	**2002**	**1991**	**2002**	**1988**	**1997**
Shop owners, skilled trades people, company directors	108	116	115	120	90	100	98	105
Self-employed professionals, executives	133	132	129	133	131	126	140	128
Middle management	142	130	133	135	128	121	136	133
Employees	102	100	104	115	105	98	104	105
Blue-collar workers	98	100	96	104	116	103	96	107
Non-active, retired	63	68	58	64	74	71	*	68
Students, school children	71	82	76	85	78	81	64	70
	100	100	100	100	100	100	100	100

Table 5 *Odd ratios of the population who travel by car during the day according to socioprofessional category, Switzerland [not exactly the same categories as in France]*

	Zurich		**Berne**		**Lausanne**		**Geneva**	
	1994	**2000**	**1994**	**2000**	**1994**	**2000**	**1994**	**2000**
Self-employed	139	141	142	126	123	162	120	133
Senior management	118	148	146	126	169	135	114	133
Middle management	132	124	138	122	120	132	140	125
Employees	125	114	121	122	111	116	126	117
Students, school children	68	58	58	63	89	59	77	72
Non-active, retired	68	72	67	78	71	68	63	81
	100	100	100	100	100	100	100	100

7. Figures

Figure 1: Social typology of the Greater Lyon area (1999)

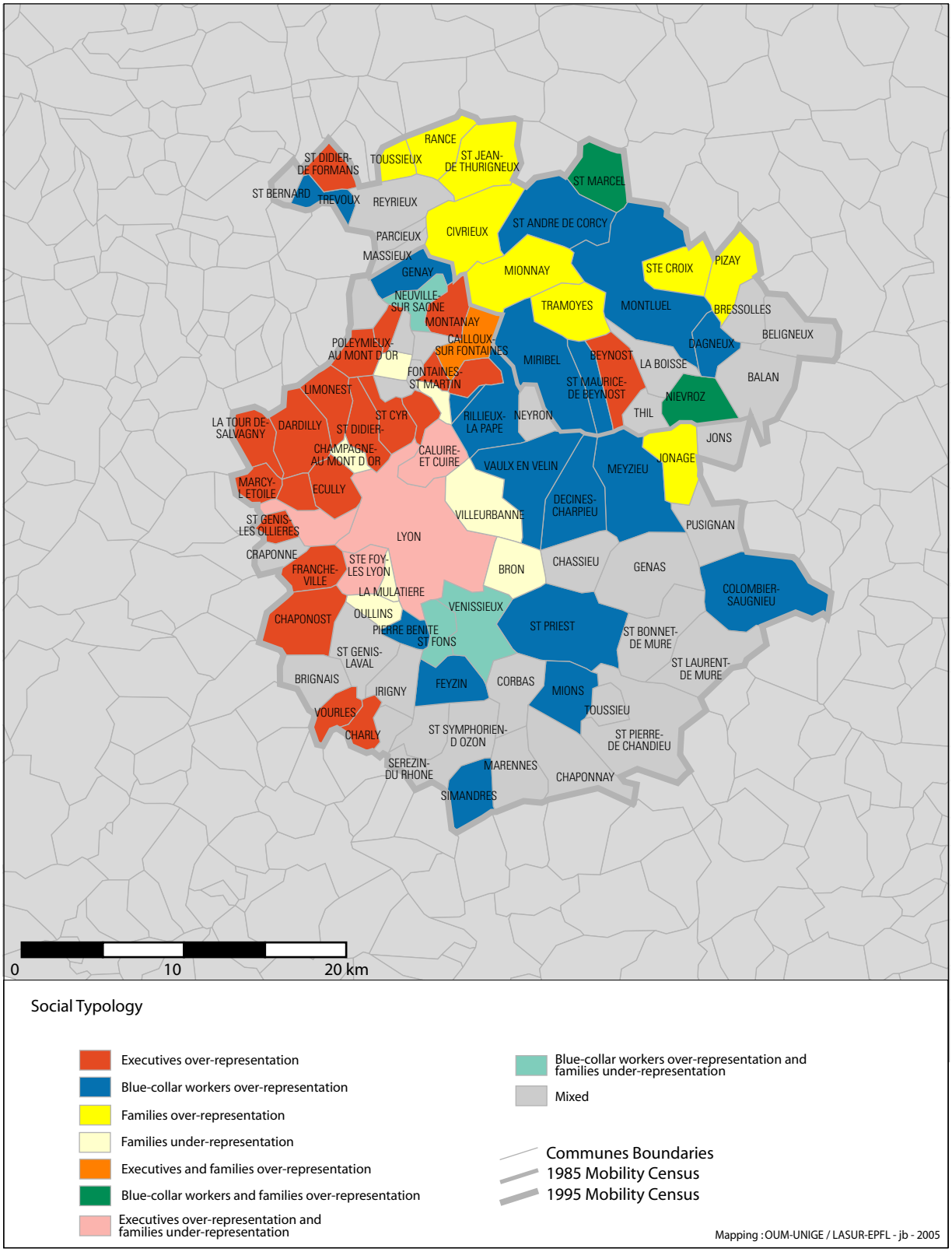


Figure 2: Social typology of the Greater Zurich area (2000)

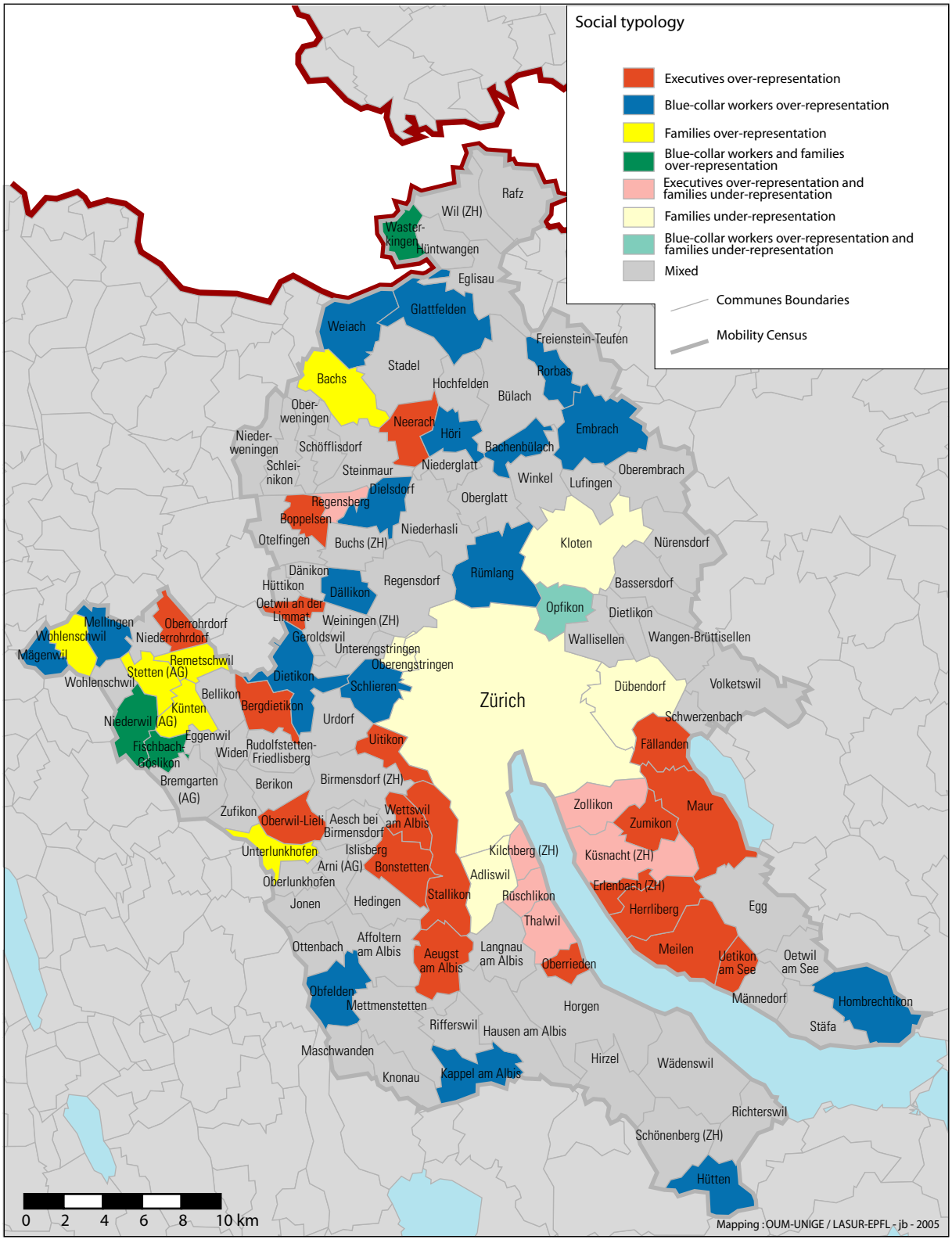
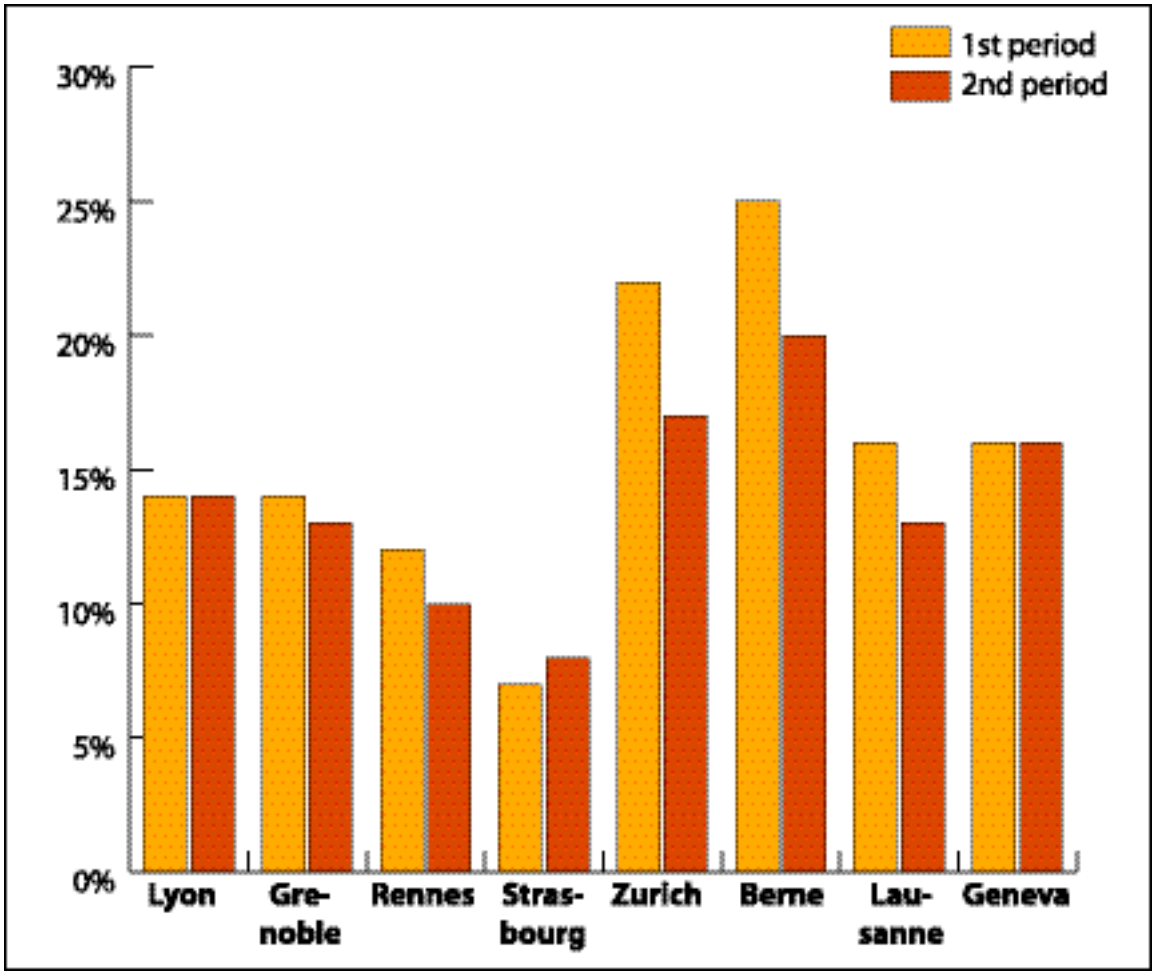


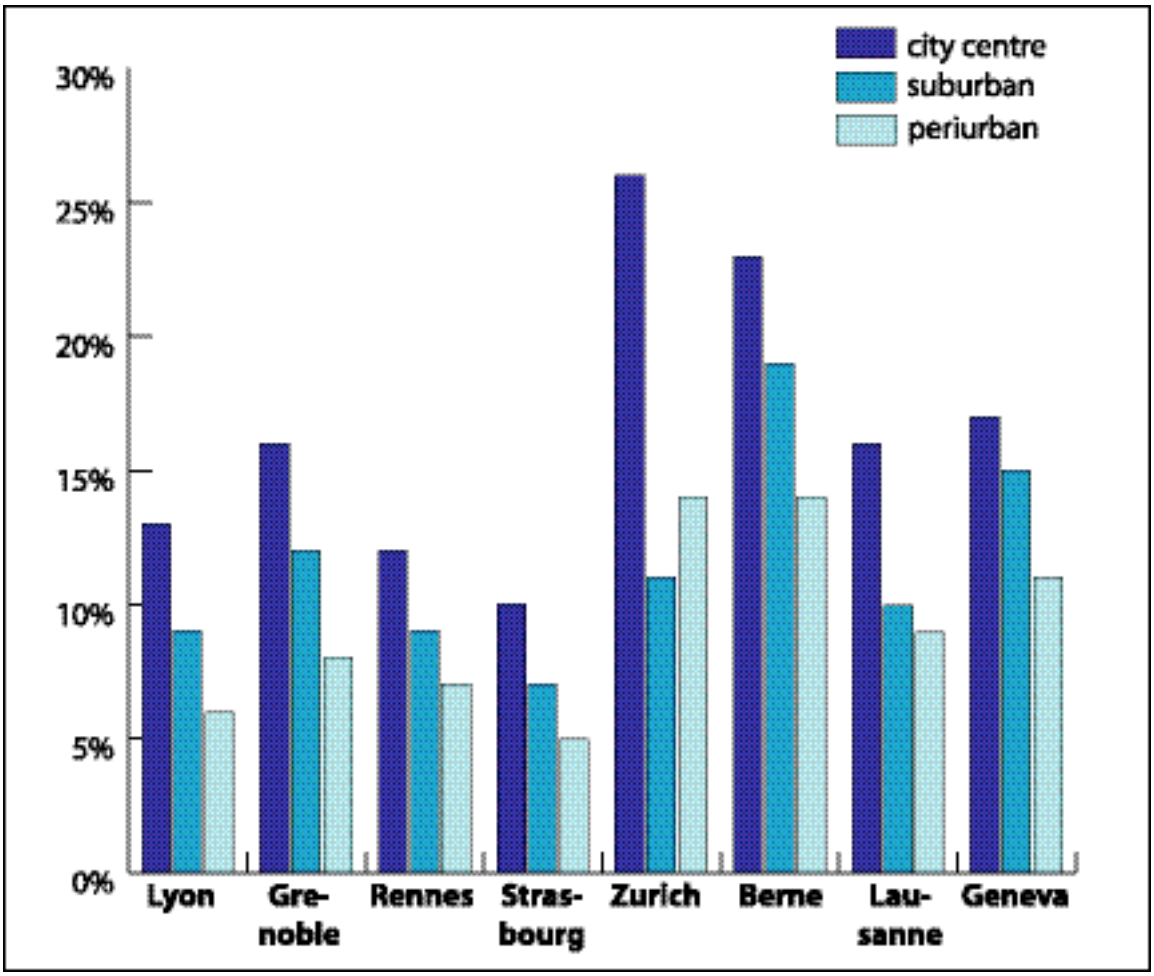
Figure 3 Modal share (percentage of total journeys) of public transport over time.



Switzerland: 1st period 1994; 2nd period 2000.

France: Lyon 1985-1995; Grenoble 1992-2001; Rennes 1991-2000; Strasbourg 1988-1997.

Figure 4 Modal share (percentage of total journeys) of public transport according to urban setting in 2000 for Switzerland, and during the most recent period available for France



Switzerland: 2000.

France: Lyon 1995; Grenoble 2001; Rennes 2000; Strasbourg 1997.

8. Footnotes

[i] For simplicity's sake, we refer to districts with an over-representation of *executives and highly educated professionals* as "rich" or as "districts with an over-representation of executives ". Likewise, districts which have a significant *share of blue-collar and unqualified workers* are referred to as "poor" or as "districts with an over-representation of blue-collar workers". "Rich" and "poor" here do not refer directly to the fiscal strength of the given district. "Family" districts refer to areas with an over-representation of *couples with children*.