



Public transport can pay. A historical analysis of transport policies in Bern (Switzerland) and Bielefeld (Germany) since 1950

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Public transport can pay. A historical analysis of transport policies in Bern (Switzerland) and Bielefeld (Germany) since 1950¹

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Abstract

The case studies of Bern and Bielefeld show two in many regards quite comparable cities with huge differences in their transport sector: In the agglomeration of Bern one third of all trips is made by public transport compared to only 15% in Bielefeld. This questions some well-established results of international comparative research on urban transport policies. Without denying the importance of land-use patterns and other often used explanations like gas prices, incomes or car ownership, it seems obvious that these factors cannot sufficiently explain why transport systems in Bern and Bielefeld differ that much. More attention should be paid to historical and institutional explanations. The case studies show that the most important decisions for the development and the efficiency of the future transport sector fell in the mid 60ies, years before the so-called “environmental turn” of 1970. External incentives to build costly and inefficient infrastructure were much stronger in Bielefeld with the result that the uncovered cost per ride were almost three times higher than in Bern in 1995. These results underline the importance of comparative in-depth case studies of urban transport policy.

Keywords

Transport policy, urban transport, history of transport – Swiss Transport Research Conference
– STRC 2001 – Monte Verità

1. Introduction

The relationship of the city and the automobile is all but a love story. Congestion, safety problems, environmental damage and urban sprawl caused by the automobile: All these unsolved problems remain a challenge to urban planners and politicians all over the world. Promoting public transport is one of the most obvious strategies to create a sustainable transport system for urban areas. This seems to be a very difficult task since there is a decline of public transport in most places. Nevertheless, a closer look at in many aspects quite similar cities often reveals huge differences in their transport systems. The explanation of these differences could help to evaluate actual strategies of strengthening public transport. This article is a pleading for in-depth case studies of single cities that incorporate the whole era since World War II. As the examples of Bern (Switzerland) and Bielefeld (Germany) show this could lead to a reformulation of commonly given explanations for the determinants of urban transport.

2. Similar cities - different transport

Since the total number of trips per person does not differ considerably in cities compared- at least where data are available - modal split share is a good indicator for the outcomes of urban transport policies (Apel 1992, Pucher 1988). Figure 1 shows this data for the agglomeration of Bern and the city of Bielefeld:² Most striking is the huge difference in the use of public transport: One third of all trips in the agglomeration of Bern is made by public transport compared to only 15% in Bielefeld. People in Bern count 470 trips in public transport per person and per year, people in Bielefeld only 168. Since the use of the “slow” modes bike and walking is slightly higher in Bern as well, car use is much higher in Bielefeld. This fact even intensifies if only the central areas of the cities are considered: There the modal share of the car in Bielefeld is twice the one of Bern (53% versus 27%)!

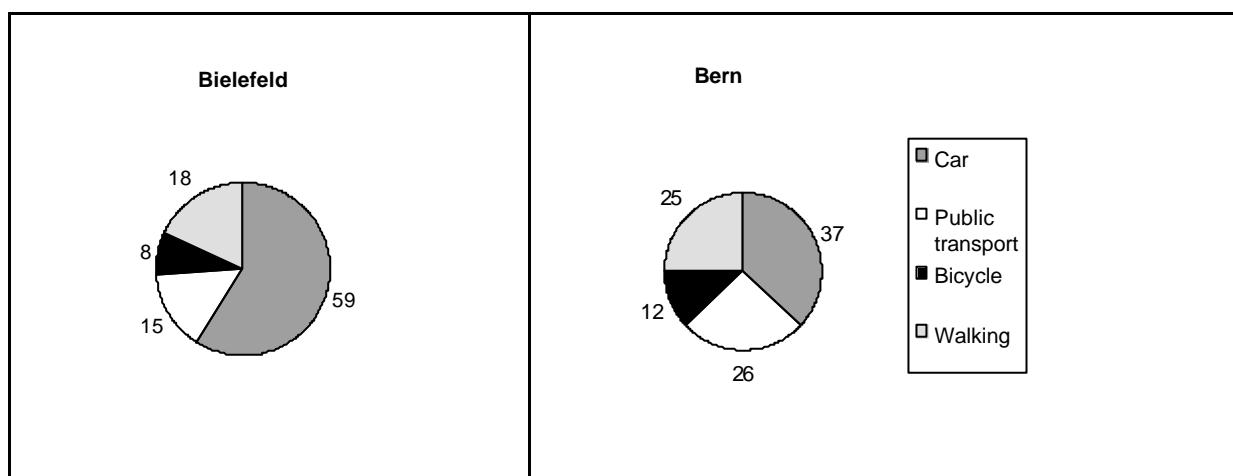


Figure 1 Modal Split in Bern and Bielefeld (1994). All trips of the local population, workday.

Sources: Kaufmann (2000, 107) and Ingenieurgruppe IVV Aachen (1997)

² Urban areas often include several communities. The conceptual level of the agglomeration is seen here as the appropriate level of analysis. In Germany data for agglomerations are normally not available, so the data for Bielefeld and the other cities include only one community. But since the community reform of 1973 greatly enlarged the size of the central community, most of the German agglomerations lie within the boundaries of the central community. For this problem see also: Kenworthy/Laube (1999, 26ff.).

How can these enormous differences be explained? In literature the following factors are considered to be the most important: The size of and the economic role of the cities, land use, car ownership, average income, financing and taxation of the transport modes, prices of gas and of public transport tickets, parking policies and the way funding of transport is organised (Pucher/Lefèvre 1996, Pucher 1999). So let's have a closer look at these issues.

The size of the two urban regions is comparable: The agglomeration of Bern has 319'000 (1999) inhabitants compared to 323'000 (1998) in Bielefeld. Cities of comparable or higher size and importance (Munster and Hanover respectively Zurich and Basle) are within quite the same distance. Both cities have universities and other educational institutions of more or less the same size. Average incomes in Switzerland are slightly higher than in Germany.³ According to earlier research a strong correlation between income and higher car ownership is to be expected (Pucher/Lefèvre, 1996, 11) but on the contrary, car ownership is considerably lower in Bern (see Tables 1 and 2). The same counterintuitive facts for gas prices: there has never been much difference between gas prices in Switzerland and Germany but still car use per capita is more than 10% higher in Germany than in Switzerland (1992: 5'824 km/year compared to 5'184).⁴ The prices for public transport trips are more or less the same in both cities.⁵

So far these factors cannot explain the differences in the transport system of the two cities.⁶

For many authors land use is the key factor and there can be no doubt that for example the huge differences between the cities considered in this article and the US-American cities are tightly connected with the patterns of land use. Nevertheless land use cannot explain why transport in Bern differs that much from the one in Bielefeld since there is no big difference in density of settlement between the two cities: 40 persons/ha in Bern compared to 32 in Biele-

³ BIP/per capita: 25'512 US\$ in Switzerland and 22'169 in Germany (1999). Source: Spiegel Weltalmanach 2001. without the „Neue Bundesländer“ the income per capita in Germany is probably more or less the same as in Switzerland.

⁴ Pucher/Lefèvre 1996 13, no data available for the local level. See also Pucher 1988, 396.

⁵ One normal trip: Bielefeld 3.20 DM, Bern 2.40 CHF (2000).

⁶ Concerning parking policies, no comparable data were available since the total number of parking places is not a sufficient indicator considering that restrictions to use these places can greatly vary from city to city.

feld (see Tables 1 and 2). Compared to the high density in cities like Tokyo (1990: 71 persons/ha) at the one extreme or the low density in Cities like Phoenix (1990: 10 persons /ha) at the other, the contrasts between Bern and Bielefeld seem almost negligible (Kenworthy/Laube 1999, 289 and 361). Of course this does not mean that there are no important differences in land-use between the two cities. More sophisticated methods of the of land-use-analysis which cannot be introduced here would probably reveal interesting new aspects, for example what concerns the access to areas of intense traffic areas by the different modes. Yet one argument shouldn't be underestimated: Land-use is primarily to be understood as the outcome of long term policy and therefore it seems indispensable to have a closer look at the underlying factors which shaped this policy.

3. Exemptions or typical cases?

Quite surprisingly, the commonly mentioned factors deliver no satisfying explanation for the differences between the transport system of the two cities! One could argue now, that Bern and Bielefeld are exceptional cases that do not reflect the average city of this size in their countries. However this is not true since both cities are quite typical at least for their region as the following data show. Table 1 gives information about the key factors car ownership, modal share of private motorised transport and density in the five Swiss agglomerations of Basle, Bern, Geneva, Lausanne and Zurich. Obviously, the three cities in the German part of Switzerland - Basle, Bern and Zurich - do not differ significantly regarding these key factors (besides the population considerably bigger in Zurich) whereas in the two French-speaking cities car-dependency is clearly higher. Thus Bern can be considered as typical only for agglomerations in the German part of Switzerland.

Table 1 Key factors for urban transport in five Swiss agglomerations.

	<i>Inhabitants (31.12.1999)</i>	<i>cars/1000 inhabitants (1999) [inner city]⁷</i>	<i>modal share of private motorised transport.* (1994)</i>	<i>density (persons/ha in urbanised area)**</i>
Basle	402'000	377 [312]	35	51
Bern	319'000	419 [356]	37	40
Geneva	458'000	525 [445]	53	42
Lausanne	288'000	516 [420]	59	37
Zurich	943'000	488 [368]	35	39

Sources: Bundesamt für Statistik, Kaufmann (2000, 96), Verkehrsbefragung Nordwestschweiz 1991 Amt für Kantons- und Stadtplanung des Kantons Basel-Stadt, Tiefbauamt Stadt Zürich, Verkehrsplanung (Grundlage: Mikrozensus 1994, Erhebung Zürich).

*inhabitants, all trips, all purposes **only surfaces for settlement and transport, data 1990-2. *** 1991, only Canton Basle-town and the communities in the counties of Arlesheim, Pratteln, Augst, Dornach.

In Table 2 Bielefeld is compared to the four German cities. For historical reasons Bielefeld shouldn't be compared with cities of the former German Democratic Republic like Dresden. Compared to cities in the western part of Germany, the dominance of the car seems to be a

⁷ Within the borders of the core community.

little bit greater in Bielefeld. Several distorting effects – e.g. nearby big agglomerations (Ruhr: Wuppertal, Dortmund), proportion of students (Munster) – could explain this differences. Thus Bielefeld can be regarded as typical for agglomerations of this size in the western part of Germany, though the car-dependency maybe somehow overemphasised.

Table 2 Key factors for urban transport in five German cities.

	<i>Inhabitants 1.1.1997</i>	<i>cars/1000 inhabitants 1.7.1997</i>	<i>trips/person with p. t.* [modal share of privat motorised t.]***</i>	<i>density 1997 (per- sons/ha)**</i>
Bielefeld	324'000	490	168 [59%] (1994)	32
Dortmund	594'000	455	175 (1998) [56%] (1990)	37
Dresden	459'000	427	290 (1998) [43%] (1990)	40
Wuppertal	380'000	457	[48%] (1999)	45
Münster	265'000	478	[49%] (1994)	31

Sources: Statistik regional 2000; Jahrbuch der Deutschen Gemeinden, Ingenieurgruppe IVV Aachen (1997), Münster, Nahverkehrsplan Dortmund, Pucher/Lefèvre (1996), www-sites of the cities ,
*inhabitants and trips with the main local agency only **only surfaces for settlement and transport ***all trips, all purposes.

All in all an adequate explanation of the differences in the transport system of the two cities is still missing. Therefore, an approach with more emphasis on historical and institutional aspects is suggested. Doing so, an in-depth analysis of the two cities transport policy history is crucial.

4. Institutional aspects

Bielefeld is located within the Bundesland of North-Rhine-Westphalia where after World War II the British system of a community constitution was introduced and partly survived until today. In an international comparison the communities in North-Rhine-Westphalia are quite strong, but in a rather technocratic manner (Haefeli 1998, 21-24). The direct participation of citizens is small, but since 1970 grass-roots movements became an important actors in transport policy (Haefeli 1999). The financial autonomy of the communes is generally rather small. In 1992 only 57% of the public receipts of Bielefeld came from the superior institutions, most of them earmarked for given purposes (Haefeli 1998, 6).

The dependency of German cities like Bielefeld from the federal government and the states is in the transport sector even higher than for most other purposes: During the last five decades the cities themselves had to pay not more than 10-20% of their investments in transport infrastructure which means road building *and* public transport. On the other hand, local governments have borne virtually all operating deficits of bus tram and metro (Pucher/Lefèvre 1996, Klenke 1995). These costs were normally covered by cross subsidies from the gas, electric and water utilities.

As everywhere in the *Bundesrepublik* the suburban communities and the central core were melted in 1973 to a new Bielefeld with now twice as much inhabitants. This made a more coherent transport policy possible.

Switzerland is famous for its so-called (half-)direct democracy, that is, the most important decisions are made by votes. Communities are even stronger than in Germany but for several reasons the influence of urban areas on political decisions is rather small (Pucher/Lefèvre 1996, Klenke 1995).

The financial autonomy of Swiss communities is considerably higher than for German ones. In Bern only 23% of the public receipts were earmarked subsidies from superior institutions in 1994. As in Germany there is an earmarking of gas taxes for road building and maintenance but in Switzerland this earmarking does not involve local public transport and roads in the responsibility of the local governments. Therefore the problems of the Swiss communities in financing investments in transport infrastructure are obvious but, at the other hand, the incentive to build expensive and inefficient infrastructure is much weaker than in cities like Biele-

feld. In most policy fields, the communities are more autonomous than German ones. But unlike Germany, there was no melting of all the communities in the suburban layer, which sometimes made transportation policy quite complicated.

5. Transportation history

Bielefeld and especially its medieval core were largely destroyed in World War II. Most of the Central Business District was rebuilt in a traditional manner which of course made it better available for pedestrians than for cars and which many planners denoted as a missed chance in the 1960ies (Harlander 1998). Nevertheless there was a great consensus about a policy of accommodating and facilitating car use until 1970 in the other parts of the city and the readiness to sacrifice attractive living areas to the car was certainly bigger than in Bern. Public transport was neglected in these decades, though otherwise than in many German and Swiss cities two tramway-lines survived the campaign of the Bus-Lobbyists (Köstlin/Wollmann 1987). 1966 the decision for a short but very costly net of light rail, partly in the underground, was made to give the car way on the surface. Because of the lack of financial resources, the rest of the public transport net suffered from this decision. As a second infrastructure project a big expressway was built right into the heart of the city (*Ostwestfalendamm*). The total direct cost of each of these two projects - for some politicians a matter of prestige - exceeded 500 Billion DM. After 1970 there was a growing resistance against auto-dominated planning. Consensus for new roads now was hard to get, as everywhere in the *Bundesrepublik*. The second part of the *Ostwestfalendamm* (from the railway station to the northeast) was never finished due to the violent protests of worried citizens. But the (few) measures to strengthen public transport taken by the government didn't bring a real shift in the official policy mainly due to the financial crisis of the community, but as well because restrictions of car-use were not accepted neither. Many people moved to the suburbs where access without car is restricted. So urban sprawl is quite obvious today.

Bern has preserved most of its quite large core as it was built before 1800, which is typical for Swiss cities. There were two important phases of development. The population grew from 30'000 to 90'000 between 1850 and 1914. Since the 1950s there is second phase of growth. In 1963 a maximum of 168'000 inhabitants was reached. Since then a considerable amount of suburbanisation at the outer layer of the urban area due to the automobile lifestyle is to be noticed (Haefeli, 1997).

Public transport is a mixture of tramways, buses and trolleys. Very similar to *Bielefeld*, planners suggested enormous investments in road infrastructure in the 50ties and 60ties. But until 1970 only a small part was fulfilled partly due to the lack of financial resources mentioned

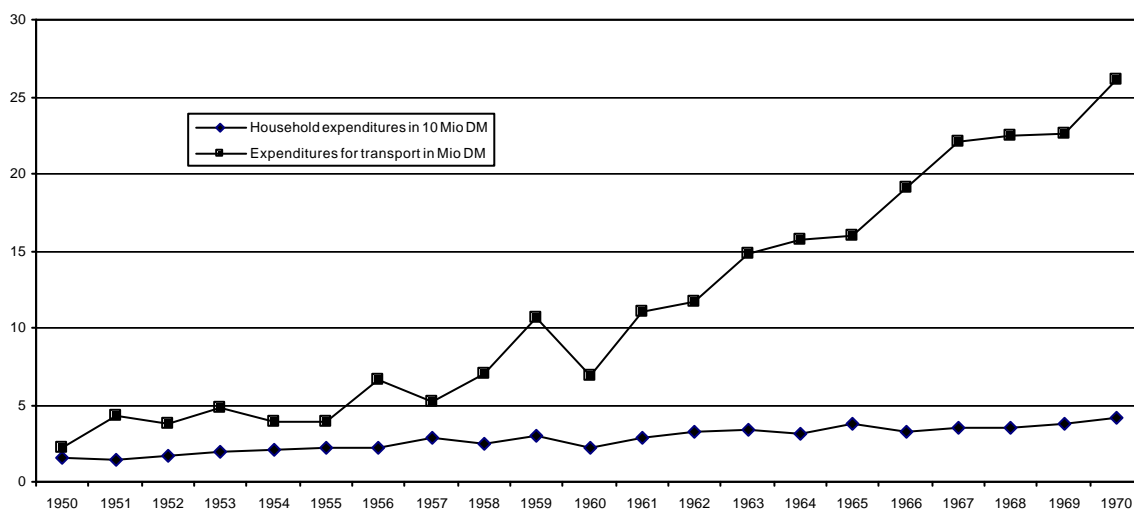
above and partly because of a public consensus not to destroy too much of the historical core to accommodate the car (Seewer 2000).

After 1970 there is sharp turn in public opinion towards a more environmentally friendly transport policy. Voters rejected new infrastructure as a solution to transportation problems by several occasions (Haefeli in print). As a consequence the government was forced to a transport policy which favoured demand management. Many measures to strengthen public transport were taken including a limited set of measures that restricted private auto use (mainly in the field of parking policy). As in Bielefeld, only pedestrians are allowed in a substantial part of the Central Business District. The infrastructure itself didn't change much since the 1970ies. In the second half of the 1990ies more attention was paid to a land-use planning which favoured commuting by train (Entwicklungsschwerpunkte).

6. Was everything set up before 1970?

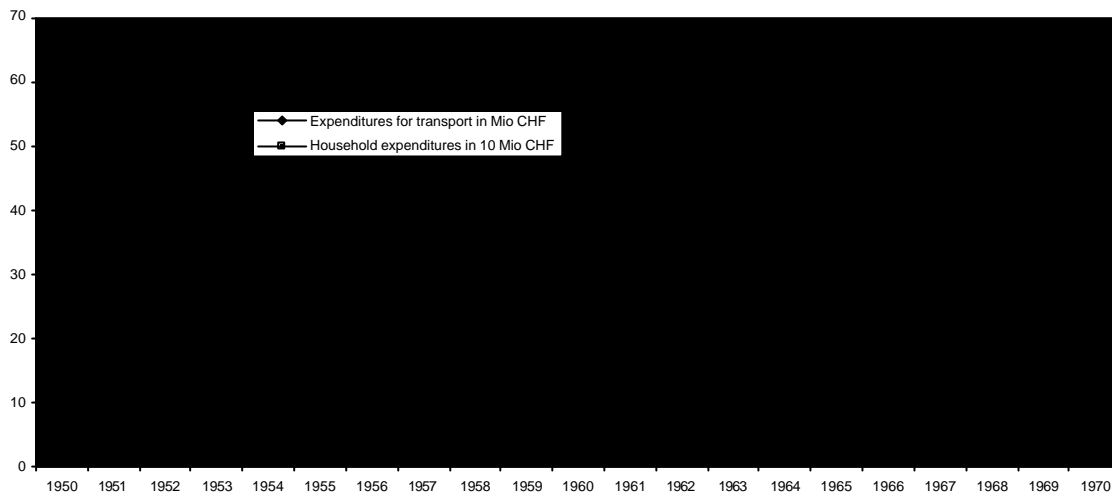
Two major implications of this institutional and historical comparison can't be overlooked: Firstly there were strong institutional incentives to build an expensive infrastructure in Bielefeld and secondly, the most important differences in transport policy of the two cities were decisions made before 1970 (a time period excluded by most comparisons). Figure 2 and Figure 3 show the expenditures of the two communities (and its major public transport agencies) for transport compared to the whole budget between 1950-70. In Bern the expenditures for transport developed parallel to the budget (with the exception of the early 1960ies, when investments around the new railway main-station led to a raise of transport investments). In sharp contrast to Bern, the expenditures in Bielefeld for transport grew much faster than the whole budget. In both cities the vast majority of these expenditures was dedicated to road transport, which corresponded perfectly with the public opinion of this era.

Figure 2 Expenditures for transport: City of Bielefeld and Stadtwerke Bielefeld 1950-70 (prices of 1985).



Source: Haefeli 1998.

Figure 3 Expenditures for transport: City of Bern 1950-70 (prices of 1985)

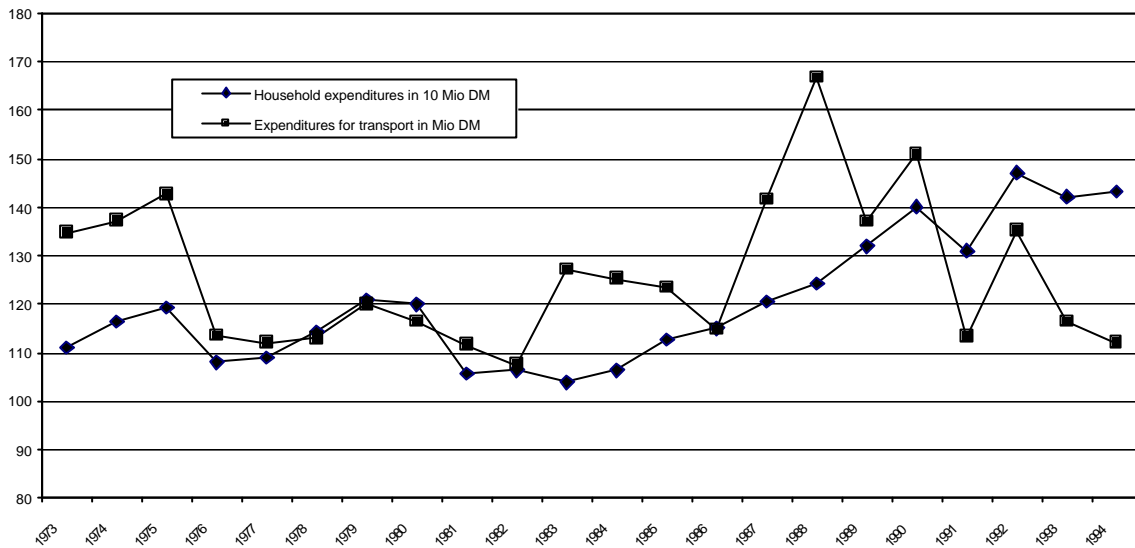


Sources: Gemeinde-Rechnung der Stadt Bern, div. vol., own calculations.⁸

Figures 4 and 5 show the development of transportation expenditures in relation to the whole budget after 1970: Both had to cut down their transportation investments due to the economic crisis in the midst of the 70ies. Both cities were struggling with raising costs for social welfare and high budget deficits in the following decades. The peak of the transport expenditures in Bielefeld in the late 80ies was mainly due to the construction of the last part of the light rail tunnel and the *Ostwestfalendamm* and is therefore a consequence of one definite decision of the 60ies. The shadows of the 1960ies even intensify if it is considered that the operating cost of 4.5 km light rail tunnel exceeds 4 Billions of DM per year.

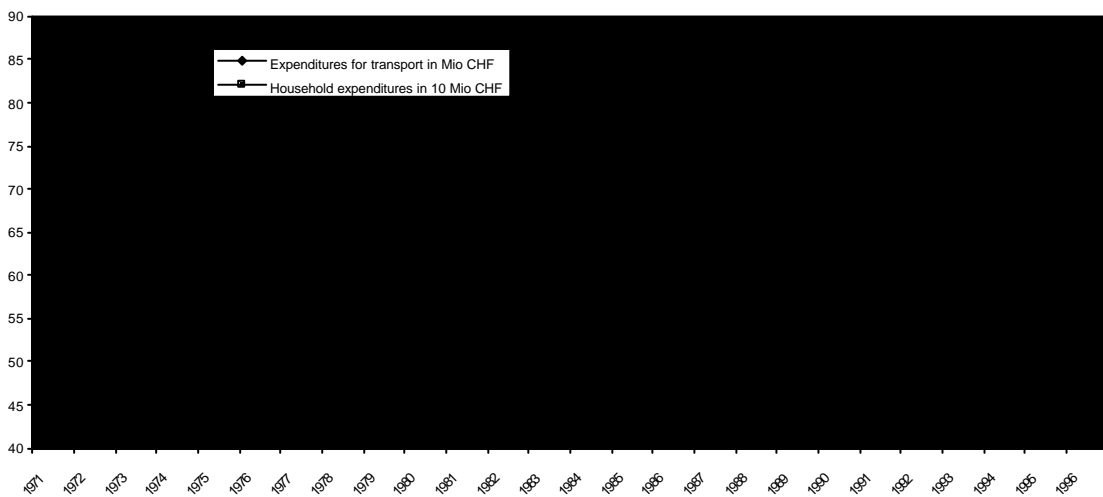
⁸ I thank Andreas Stucki for his help in getting this data.

Figure 4 Expenditures for transport: City of Bielefeld and Stadtwerke Bielefeld 1973-94 (prices of 1985)



Sources: Haefeli 1998.

Figure 5 Expenditures for transport: City of Bern 1971-95 (prices of 1985)

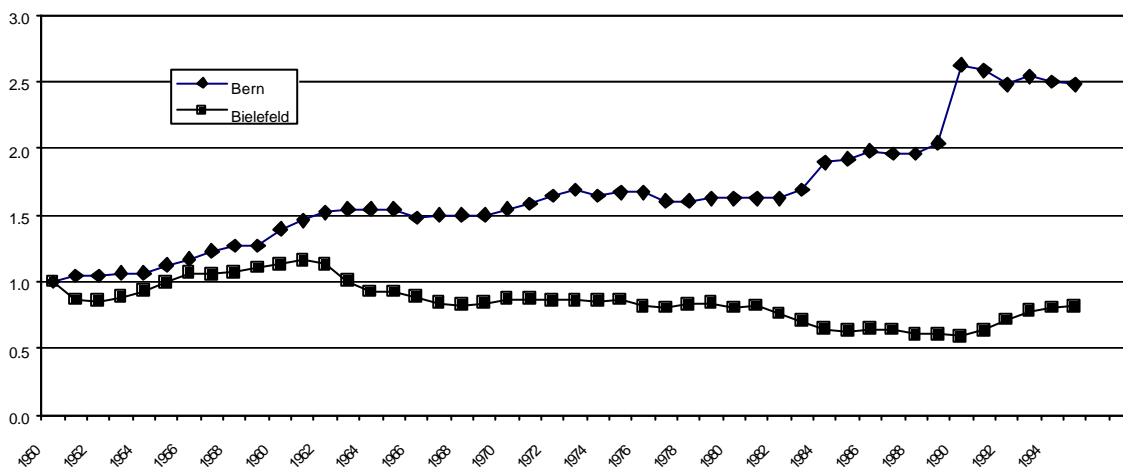


Sources: Gemeinde-Rechnung der Stadt Bern, div. vol., own calculations

7. Effectiveness and efficiency

What is about the effectiveness and efficiency of this transportation regime? It's of course not easy to evaluate a city's transport policy over five decades. When it comes to effectiveness, both towns after 1970 continuously declared the inclination to strengthen public transportation. So the number of the trips in public transport can be used as an indicator for this target. Figure 6 shows how the scissors between Bielefeld and Bern opened after 1960 and led to an impressive difference until the 1990ies (compare also Figure 1). Obviously, the outcome in Bern is much more consistent with the targets of its own transportation policy. But at what costs?

Figure 6 Public transport: comparison Bern - Bielefeld: trips 1950-1995. 1950=100⁹



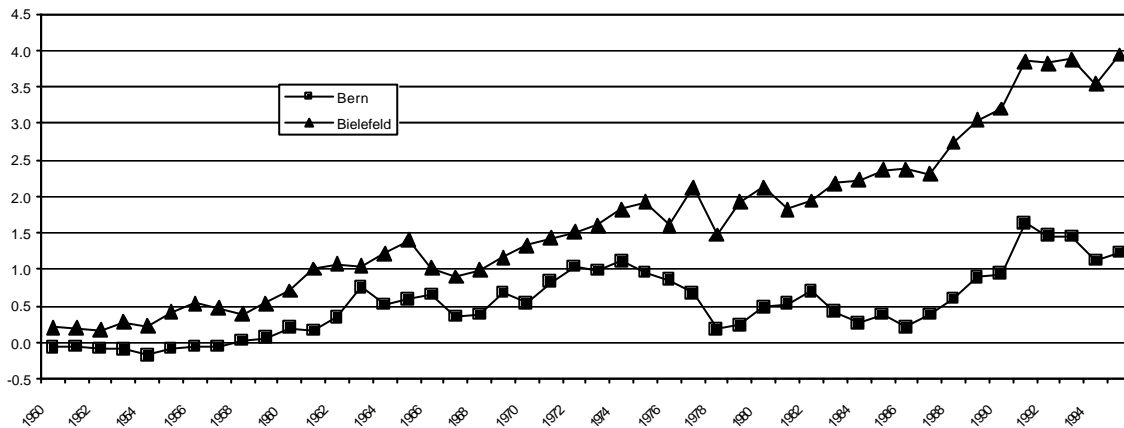
Sources: Jahresberichte der Verkehrsbetriebe Bern, div. vol., the big increase between 1990 and 1991 is a result of a changed method of calculating passengers and therefore an artifact.

⁹ Data for commuter rail were excluded due to the fact that consistent data are very hard to get, however there are several strong hints, that this data would show the same trend.

The next two Figures (7 and 8) show the overall deficits of the two transportation agencies and the deficits per trip.

Again the result is clear and impressive: The deficits rose in both cities but much faster in Bielefeld than in Bern. In the mid-90ies the deficit per ride in Bielefeld is more than three times higher than in Bern. Obviously, there are strong hints that the transportation policy of Bern is not only more effective but as well more efficient.¹⁰

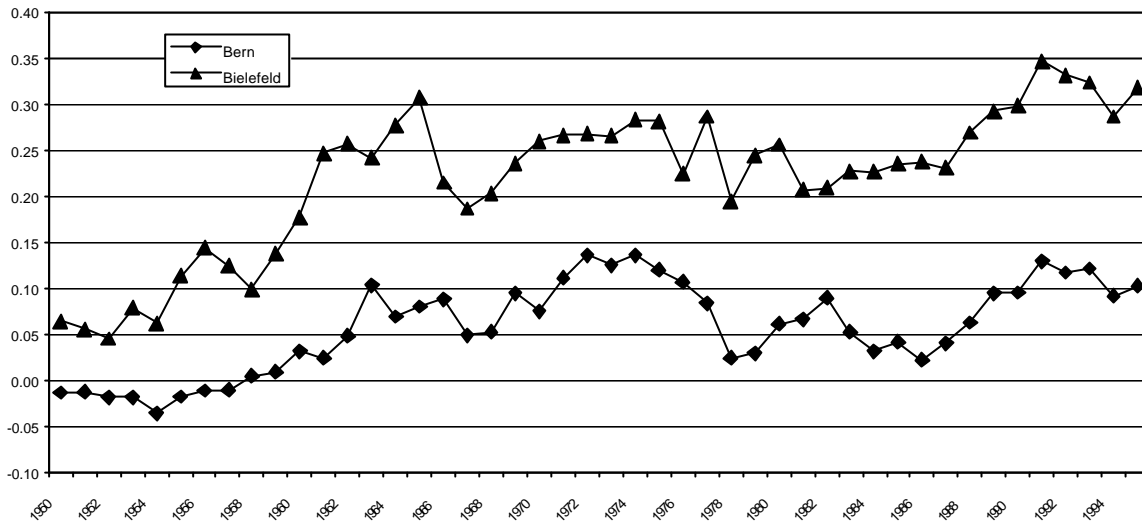
Figure 7 Public transport: comparison Bern - Bielefeld, deficits: in 10 Mio of SFR/DM in prices of 1985)



Sources: Haefeli 1998, Jahresberichte der Verkehrsbetriebe Bern, div. vol.

¹⁰ See also: Pucher, (1988), here: 386 and 390. In this comparison of productivity of urban transport, Switzerland is in the first rank (Germany 7th) what concerns passenger trips per employee and in the second rank (Germany 4th) what concerns vehicle-km per employee (1982). Operating subsidies were the lowest in Switzerland in 1982 compared to the other Western Europe Countries as well as Canada and the United States.

Figure 8 Public transport: comparison Bern – Bielefeld, deficit/trip in SFR/DM (prices of 1985)



Sources: Haefeli 1998, Jahresberichte der Verkehrsbetriebe Bern, div. vol.

8. Conclusions

The case studies of Bern and Bielefeld question some well-established results of international comparative research on urban transport policies. Without denying the importance of land-use patterns and other often used explanations like gas prices, incomes or car ownership and so on, it seems obvious that these factors cannot sufficiently explain, why transport systems in Bern and Bielefeld differ that much. More attention should be paid to historical and institutional explanations that have been underestimated up to now. The long time effects of big new infrastructure projects on the financial scope of the urban transport policy seem absolutely crucial. On the one hand, the Bielefeld case proves that institutional settings, which give incentives to build expensive infrastructure, haven't been very successful in fulfilling its policy targets. At the other hand the institutions in Bern, where local people have to bear directly the financial consequences of their transport policy, decisions seem better-suited to reach a development of local transport according to the long-term policy targets.

These case studies show as well, that the most important decisions on building or not building new infrastructure fell in the mid 60ies, years before the so called "environmental turn" of 1970. Before World War II the transport systems of the two cities were very similar but until 1970 public transport in Bielefeld had lost a great deal of its attractiveness. Therefore it seems justified to consider the 1960ies as the crucial years for the future transport system of the two cities. It is important to realise that after the environmental turn of 1970, in both cities it was almost impossible to gain public acceptance for substantial new infrastructure projects. The policy targets of both cities now focused on a strengthening of public transport but since Bern has had a considerable advantage at the starting point its efforts were much more effective and efficient: The best way to get a better transportation system is to have already a good one.

The gained results underline the importance of comparative in-depth case studies on urban transport policy. Further research is necessary: by including other cities in the two countries as well as introducing new countries into the comparison. Moreover cultural aspects neglected in this article as for example environmental awareness, anti-urbanistic feelings or the devotion to the "American way of life" may also play an important role to explain the far reaching differences between cities like Bielefeld and Bern.

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