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Manfred Wacker



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Parking Policy Measures and their Effects on Mobility and the Economy

Subject: Case Inventory and Analysis – Germany

Cologne, Rathenau Viertel
Lüneburg

COST 342/18-D Rev. 1

Case Inventory and Analysis: Cologne, Rathenau-Viertel

The following text and the data refer to the report „Gesamtwirkungsanalyse zur Parkraumbewirtschaftung“, FE 77406/96, Baier et. al., November 1999.

3-1 Local context

Regional function: centre of major importance in the conurbation Cologne-Düsseldorf

3-2 Local situation

Inhabitants	960.000
Employees	about 500.000
Motorization	465 PkW/1.000 inh.
Modal split	
whole town (1989)	43 % IT 16 % PT 11 % bike 30 % pedestrians
city centre (1989)	23 % IT 60 % PT 17 % bike / pedestrians

Trips per inhabitant and per day 3,6

PT accessibility railway station (DB) of national importance, combined underground-/urban railway- / bus-system with good service quality

Additional elements dynamic traffic control system, differentiated P&R-concept with car parks on all important stops and all terminus of the urban railway system as well as on the rail rapid transit stations in the surroundings

Parking fees (city surveys, investigations of ADAC)

1992	2 DM / hour
1993	1-2 DM / hour
1997	2-4 DM / hour
1999	2-4 DM / hour

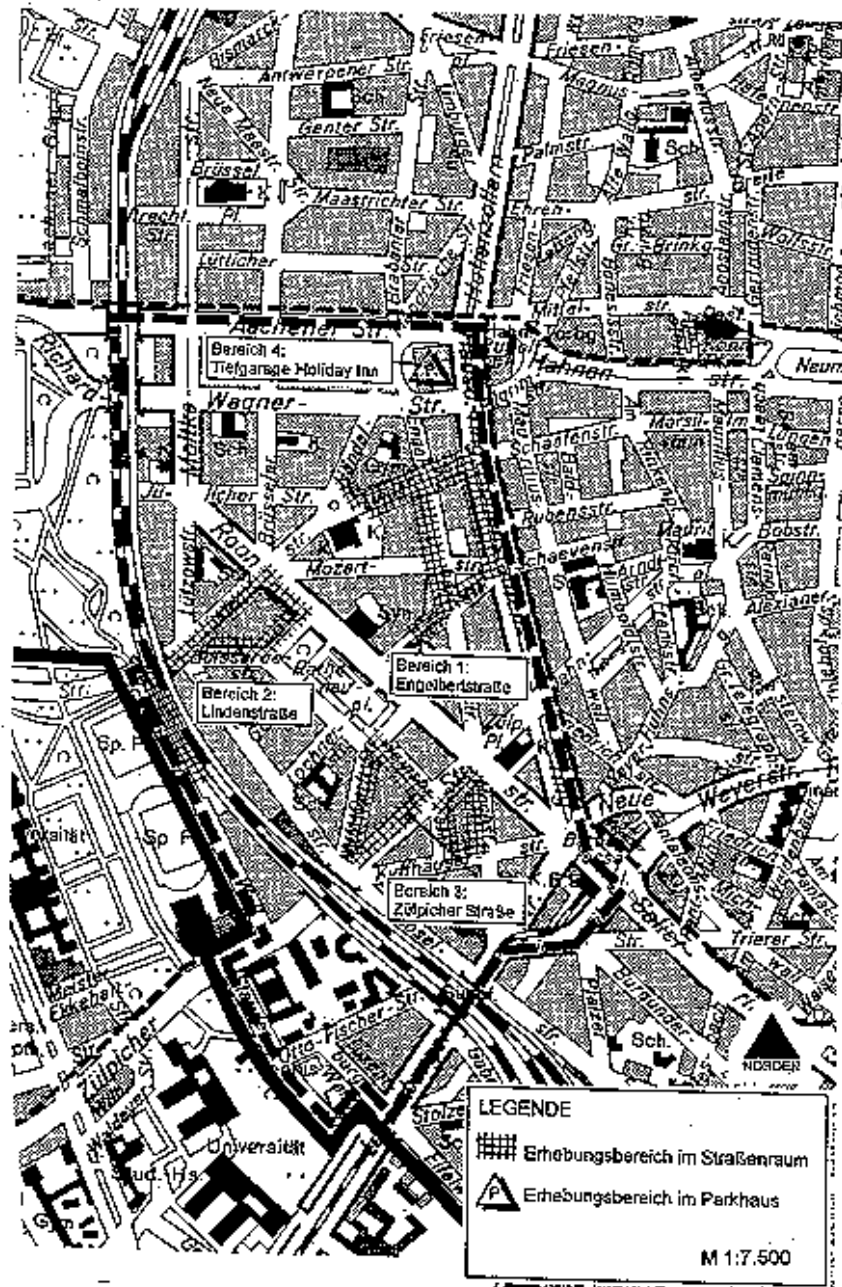
Plan to reduce the fees (1999): first 15 minutes free of charge, initiated by the mayor, first exploratory investigations have begun

3-3 Description of the *Rathenau-Viertel*

Local situation

Western district directly adjoining the city centre at the main ring road (*Habsburger Ring*, *Hohenstaufenring*) which encloses the centre (see fig. 1).

The mixture of small scale forms of usage leads to a superposition of various parking purposes.



Lageplan Köln-Rathenauviertel mit Darstellung der Erhebungsbereiche
(Quelle: HUBER-ERLER/TOPP 1996)

Fig. 1: Rathenau-Viertel with survey areas

3-4 Measures implemented

October 1994:

Parking management and regulation was introduced. In the most cases the separation principle was organised in a fine way which means that for example one side of the street was reserved for the residents, the other side was open to short-term parking with parking fees. Partly after 6 p.m. or 11 p.m. also the short-term parking spaces were reserved for the residents (changing principle). Altogether in the city centre of Cologne and in the adjoining quarters a very user oriented and differentiated parking management was pursued.

May 1998: „Judgement of Cologne“ concerning parking management:

All regulations concerning residents parking organised due to the separation or the changing principle were revoked.

Short-term measures - June 1998:

The scope of existing parking meters were extended to former resident parking zones. In the most cases these parking meters were marked with a „red point“ which releases the residents from the fee obligation. In the further areas of the quarter no parking management and regulations were pursued.

Long-term measures- September 1999:

By installation of new parking meters in all managed zones of the quarter the mixture principle was introduced.

Parking spaces with parking meters:

Maximal parking time: 4 hours, parking fees 1 DM per half an hour except parking spaces along the *Hohenstaufenring* and the *Habsburgerring* with fees of 2 DM per half an hour (like in the whole centre of Cologne). In the areas on the opposite direction of the centre long-term parking spaces are available in some streets for example along the railway with fees of 5 DM per day.

3-5 Results - Effects on Mobility, on Environment and on Local Economy

In an empirical investigation concerning the introduction of parking management and regulation of parking in the *Rathenau Viertel* in 1994 a parking survey concerning the state „before“ and the state „after“ from October until May 1998 was carried out. The investigations were carried out in September 1994 respectively in September 1995 (HUBER-ERLER/TOPP 1996: *Veränderungen im Verkehrsverhalten durch intensive Parkraumbewirtschaftung unter Berücksichtigung der Zusammenhänge von Stadt und Verkehr*, FE-Vorhaben 70416/93).

In addition the „deregulated state“, after the regulations concerning residents parking were revoked, between May 1998 and September 1999 was investigated by Baier et al. (see above). In May 1999 for about 50 % of the legal parking spaces no parking regulations were in force. The investigation was carried out with an analogous design like the former surveys to be comparable: In especially selected areas the registration numbers have been recorded by 30 minutes rounds between 7 a.m. and 7 p.m. and an additional survey at night at 5 a.m. Aim of this investigation was to determine the influence of the modified regulations concerning parking management on the demand structure and the loading

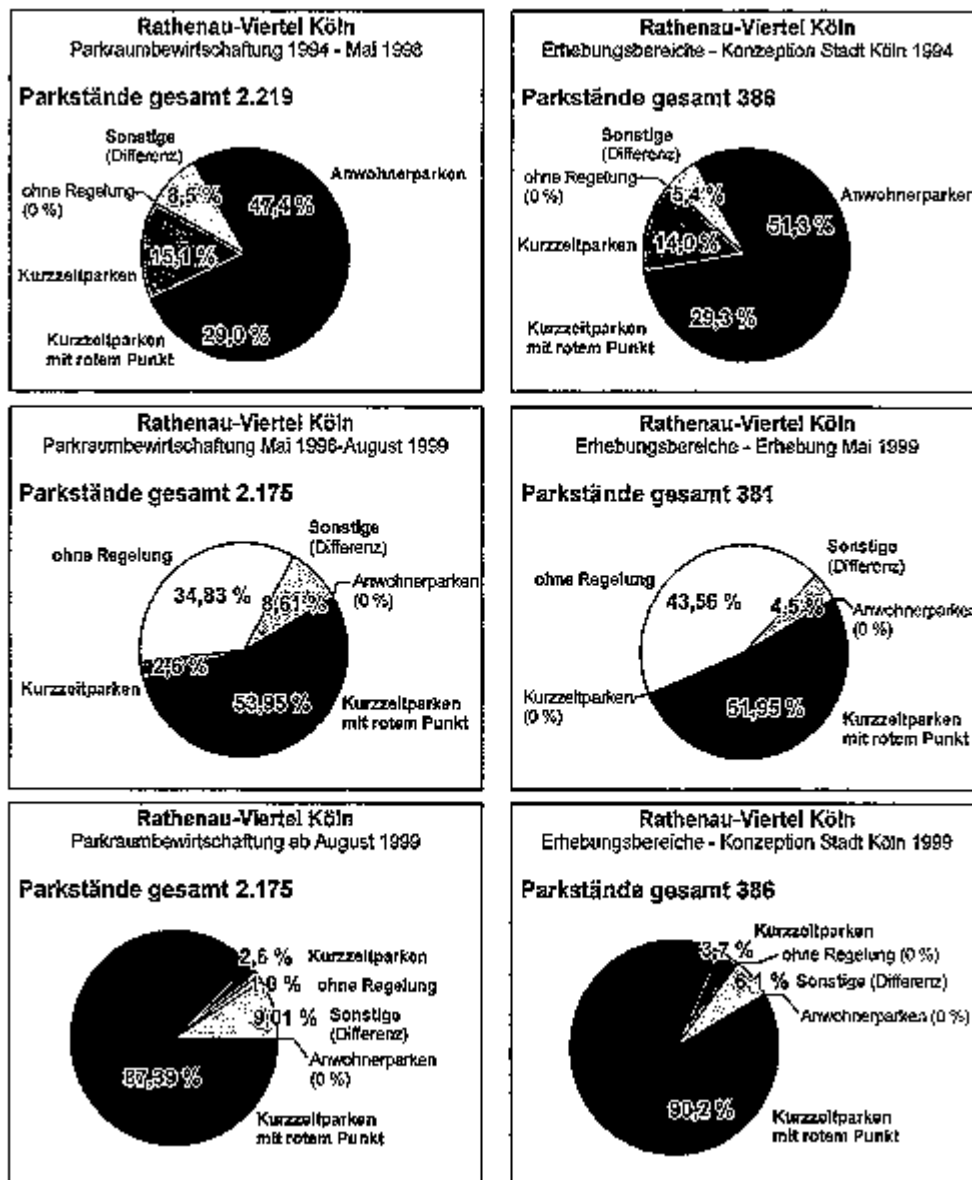


Fig. 2: Parking space supply in the Rathenau-Viertel, Cologne

The survey areas were selected in such a way, that they can be assumed to be representative for the *Rathenau Viertel*. Only in the state „before“ the share of parking spaces for residents lies in the survey area about 4 % higher then in the whole quarter. Correspondingly in the deregulated state the share of parking spaces without regulation in the survey areas is also a little bit higher then the average value of the whole quarter.

In the deregulated state, the share of parking spaces without regulation lies in the whole quarter as well as in the survey areas a little bit below the shares of the resident parking spaces which existed until then, since in the short-term after the regulations were revoked the scope of the existing parking meters was extended.

Partly the differences between the single survey areas are substantial concerning the regulations for the use of parking spaces (state „after“ as well as deregulated state). Whereas in the state „after“ until May 1998 the licensed residents were privileged in some streets also at night (6 p.m. respectively 11 p.m. until 8/9 a.m.) with 1834 parking spaces of 2219), no regulations exist since then in this time except some no-stopping zones. In Cologne the resident parking card was issued since introduction of parking management at the end of the eighties to car owners with first or second domicile in Cologne, in the *Rathenau Viertel* there were 2833 resident parking cards from October 1994 until end of 1995. In the following years this number increased to 3593 until the end of 1998. This means a growth of 760 resident cars in the quarter respectively an increase by about 27 %.

Main results

The turnover increased slightly since 1995 in the survey areas but also in the whole quarter from 2,9 to 3,1 turnover per parking space and day (fig. 3). In 1999 substantial differences for the different parking regulations can be stated:

- Street areas without regulation have an average value of 2,3 with a range from 2,2 to 2,5.
- Street areas with parking meters have an average value of 3,15 with a range of 2,6 to 4,5.

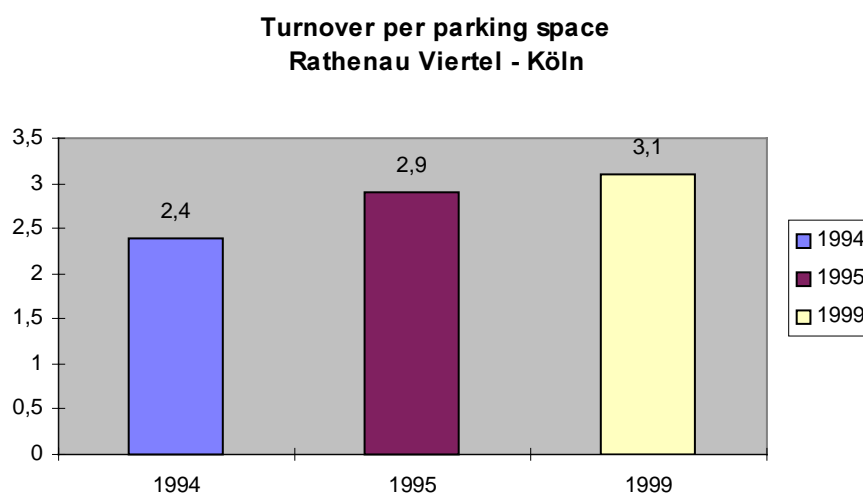


Fig. 3: Turnover per parking space, Rathenau-Viertel, Cologne

In street areas without regulation a high share of cars parking during the whole day respectively a long time limits the potential parking spaces for short-term parking. In addition in the areas with parking meters the regulation with the „red point“ is nearly without exception valid. This leads only to a small increase of the turnover per parking space.

The average parking time was determined applying the adjustment method used also in the first investigation. Thereby only those parking events were considered whose arrival and departure lie within the investigation period from 7 a.m. to 7 p.m.

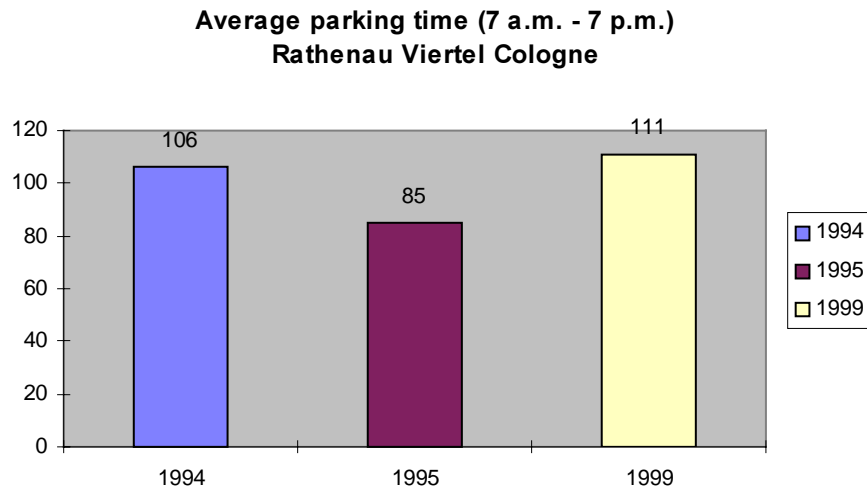


Fig. 4: Average parking time between 7 a.m. to 7 p.m., Rathenau Viertel, Cologne

The average parking time increased considerably in comparison to the state „after“ in 1995 by about 30 minutes respectively 31 % and lies in the order of the parking time of the state „before“ in 1994 (fig. 4). The reason is that after revocation of the resident parking the number of long-term parked cars (more than 4 hours, the maximum parking time in the areas with parking meters) in the streets increased substantially. Correspondingly the average parking time is in street areas without regulation clearly higher than in areas with parking meters. The share of parking events with a duration of more than 4 hours was about 26 % in street areas without regulations in comparison to 14 % in areas with parking meters. Moreover in the street areas with parking meters the amount of parking events with a duration of less than 2 hours predominate with 68 %, whereas in the areas without regulation the parking events with a duration of over 4 hours predominate (41 %).

In comparison to the results of the investigation of the state „after“ the share of the parking events with a duration of less than 2 hours changed only slightly from 60 % in 1995 to 59 % in 1999.

Parking events with a duration of 2-4 hours decreased from 20% to 14 %, whereas the number of parking events with more than 4 hours duration increased clearly: For parking times from 4 to 9 hours as well as more than 9 hours the increase was from each 10 % to 13 %.

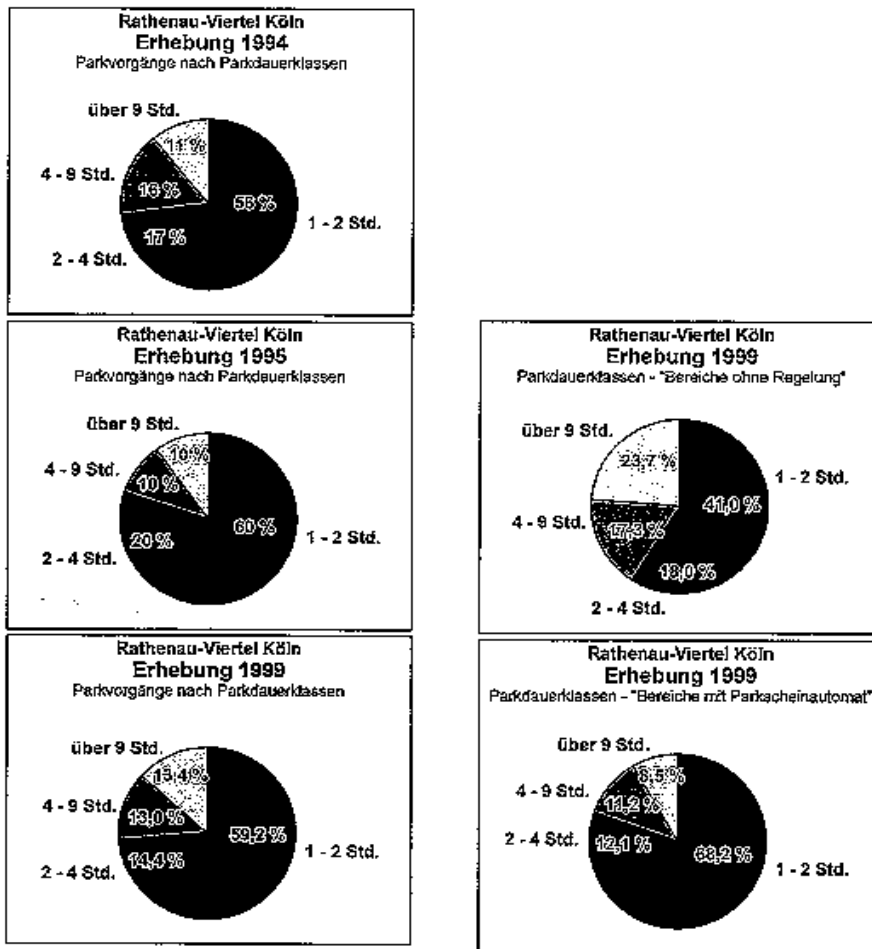


Fig. 6: Classification of parking events by parking time, Rathenau Viertel, Cologne

The average parking space occupancy in all survey areas changed only slightly from the „after“ state 1995 to the state in 1999. Corresponding to the above results this seems plausible: The number of parking events per parking space changed only slightly, only the parking time increased a little bit because of the high amount of parking spaces without regulations. Thereby in the single survey areas the changes differ substantially: Whereas in the *Lindenstrasse* the rate of parking space occupancy decreased by 11 % to a value of 82 %, in the other areas only a small increase of 1 % was observed.

Because the attractiveness of parking spaces free of charge is obviously higher for all user groups, the parking space occupancy in street areas without regulation is with 92 % with a range of 90 to 93 % higher than in areas with parking meters with a average value of 80 % and a range of 71 to 91 %.

The share of cars which are parked against regulations (except illegal parked cars, that means in no-stopping areas etc.) has an average value of 19 % in streets with parking meters.

**Average rate of parking space occupancy (%)
Rathenau Viertel, Cologne**

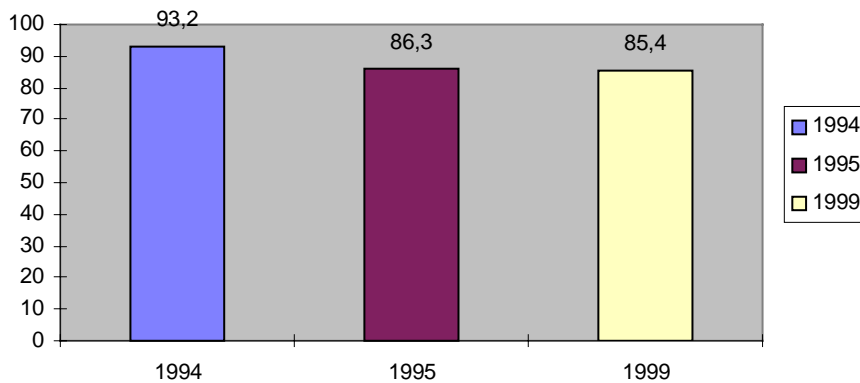


Fig. 7: Average rate of parking space occupancy in %, Rathenau Viertel, Cologne

In 1999 the parking space occupancy at night is conspicuous: It increases by more than 20 % from 1994/5 to 1999. This could be explained by the fact that the surveys in 1994 and 1995 (state before and after) were carried out during the university vacations where a relevant share of students was absent (the quarter is near to the university). Another explanation could be the increase of the numbers of resident parking cards by 27 % since 1995.

**Rate of parking space occupancy 5 a.m. in %
Rathenau Viertel Cologne**

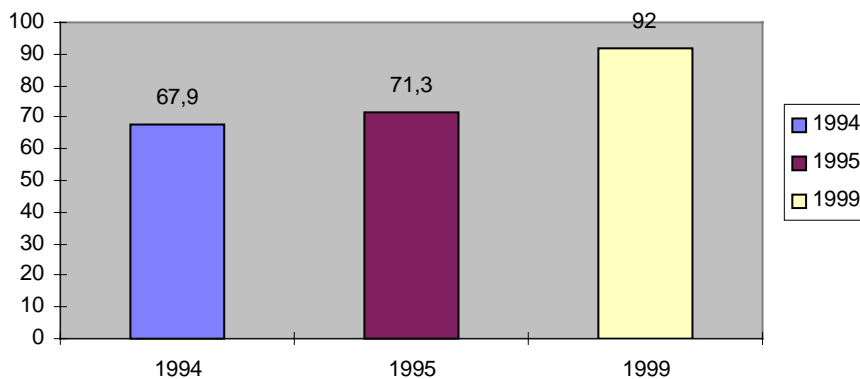


Fig. 8: Rate of parking space occupancy at night in %, Rathenau Viertel, Cologne

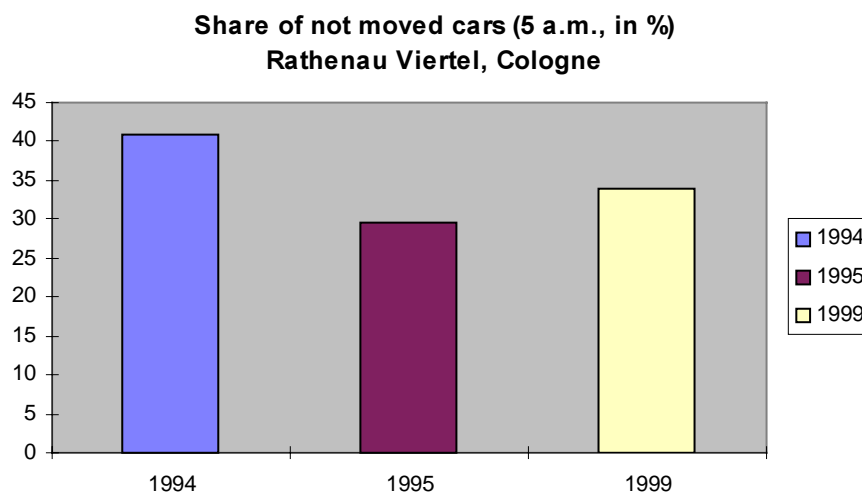


Fig. 9: Share of not moved cars at night in % Rathenau Viertel, Cologne

The share of cars which were not moved related to the amount of cars at night was in 1999 with 34 % in comparison to 1995 only 5 % higher although the rate of parking space occupancy at night increased from 1995 to 1999 by 20 %. This means that in comparison to 1995 a higher amount of resident cars parked at night was moved during the day.

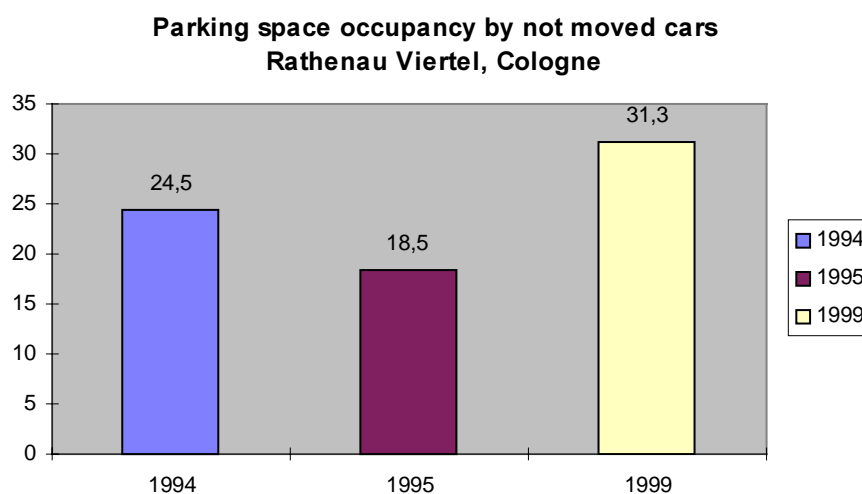


Fig. 10: Rate of parking space occupancy by not moved cars, Rathenau Viertel, Cologne

Differentiated due to the respective parking regulations interesting results can be found: In street areas without regulations the share of cars which have not been moved lies with 44 % over the value of 41 % in 1994. This is identical in all three survey areas. The difference between 1994 and 1999 could be explained by the fact that in Cologne all persons with first and second domicile get a resident parking card and that some of the students which have a higher frequency to change their domicile probably have taken the card only after parking management was introduced completely. For example it can be assumed that some students with cars which moved into the quarter in the winter semester 1998 preferred at first to park in street areas without regulation. A survey of the parking space occupancy at night found that a share of 76 % of 396 cars had a resident parking card.

Conclusions

The changes of the parking regulations in the Rathenau Viertel of Cologne due to the revocation of resident parking regulations did not lead to relevant changes in the demand structure although during a transitional period for about 50 % of the legal parking spaces no regulations were valid.

The only differences between survey results between 1995 (after state) and 1999 (deregulated state) concern the parking space occupancy at night. This could be explained by the increased amount of resident parking cards and that the investigation in 1995 was during university vacations.

The main result of the first investigation concerning intensive parking management was that the implementation of regulations for resident parking leads to increased use of cars of licensed residents because of improved parking possibilities. This result could be confirmed by a clearly increased parking space occupancy at night whereas the shares of cars which were not moved during the day increase only slightly.

On the base of these results a parking behaviour as it was observed in the investigated street areas in May 1999 can be expected after complete introduction of the mixture principle with „red-point“-regulation in the *Rathenau Viertel*. That means that the parking space turnover and the flow component of the car parking traffic will increase only slightly because obviously the parking space capacities were sufficiently dimensioned in view of the only small changes of parking space occupancy between 1995 and 1999.

The parking conditions of persons with resident parking cards didn't change much in the deregulated state but also in the new state in September 1999 in comparison to the state „after“. Therefore it can be assumed that the mobility behaviour of the residents will not change very much though changed parking regulations.

Case Inventory and Analysis: Lüneburg

The following text and the data refer to the report „Gesamtwirkungsanalyse zur Parkraumbewirtschaftung“, FE 77406/96, Baier et. al., November 1999.

3-1 Local context

Regional function: Centre of major importance in a rural region, the next centre is Hamburg (about 40 km away)

3-2 local situation

Inhabitants 63.000

Characteristics:

- city centre with shopping district and surrounding residential and districts with mixed usage
- PT-accessibility via regional busses with low service quality and school bus traffic
- inhabitants city centre: 1200

Parking space supply about 1300 public parking spaces in the streets and about 1350 public car parks

3-3 Description of Lüneburg

Partially strong superposition of parking purposes of residents, employees and visitors/customers.

Map see figure 11.

3-4 Measures implemented

Regulation principles

Before: In some areas parking management with parking meters, fees: 1 DM per hour with a maximal parking duration of 2 hours. About 400 charge free parking spaces without limitation of parking duration about 8 minutes away from the market place

After: Extension of parking regulations due to the mixture principle in the whole city centre

Additional elements: Dynamic traffic control system

The following data refers to a parking space analysis in the city centre of Lüneburg in 1993 immediately before and after traffic control measures and the extension of parking regulations to the whole centre due to the implementation of the transport plan (Fachbereich Angewandte Kulturwissenschaften, Abt. Wirtschafts- und Sozialgeographie: *Stellplatzanalyse für die Lüneburger Innenstadt im Auftrag der Stadt Lüneburg*, Lüneburg 1993). Simultaneously the public parking space supply in the streets at core quarters of the pedestrian precinct was reduced by 4 % (118) to about 3100, whereas the parking space supply on car parks near to the city centre was extended by 17 % (303) to 2100 parking spaces.

3-5 Results - Effects on Mobility, on Environment and on Local Economy

The main results of the investigation are summarised in the following (see also figures 12-14):

- 38 % private parking spaces (3.882 of 10.285)
- Extension of the whole public parking space supply by 11 % from 6.058 before to 6.403 after the measures were implemented
 - 3.080 in streets, about 1.779 = 58 % of them without regulations
 - 1.607 on public car parks, 94 % of them without regulations
 - 1.716 in public multi-storey car parks,
- In the area only 13 „pure“ resident parking spaces exist, besides a mixture principle is valid whereby residents were released from the fee obligation
- Rate of parking space occupancy in the investigation area
 - before: average value of 48 % on Saturday, 55 % on Monday; maximal value 74 % on Saturday and 65 % on Monday
 - after: average value of 44 % on Saturday, 50 % on Monday; maximal value 68 % on Saturday and 60 % on Monday

Substantial changes of parking space occupancy can only be observed on small scale.

- The highest demand was observed within the 12 a.m. - round.
- The share of parkers against regulations has a maximal value of 5-8 % at 12 a.m., the time with the highest demand.
- The highest share of delivery transport was observed at 10 a.m. with 1-3 %.
- The ranking of parking space occupancy in the multi-storey car parks is clear due to the average value as well as due to the maximum value (see figure below). The average maximum is 68 % (Nordlandhalle, Monday) respectively 62 % (Karstadt, Saturday), the highest value is 100 % (Karstadt, all days), all other multi-storey car parks have values below 80 %.
- In a counting at night (all parking possibilities, Sunday 6 a.m.) the number of residents was determined with 2.181 cars, 1.636 = 75 % with registration number of Lüneburg. Altogether 5.762 inhabitants were registered in the survey area and 1.047 resident parking cards were issued. The share of foreign registration numbers corresponds to the number of inhabitants with second domicile in Lüneburg (526 / 459)

Conclusions

- Concerning the shift of parking demand of commuters the decrease of the parking space occupancy indicate a driving out of commuters from the parking areas with regulations. The high share of private parking spaces (38%) reinforce this supposition, but no detailed results are available.
- Concerning the shift of parking demand of visitors or customers the study shows, that the decrease of parking space occupancy in the street areas results in a increased parking possibilities especially for short-term parkers, whereas in public car parks no significant changes of the parking space occupancy can be observed. Therefore no detailed examination of the spatial shifts are possible.
- Concerning traffic demand of residents, commuters, visitors or customers as well as the use of private parking spaces no data is available and therefore no examinations are possible.

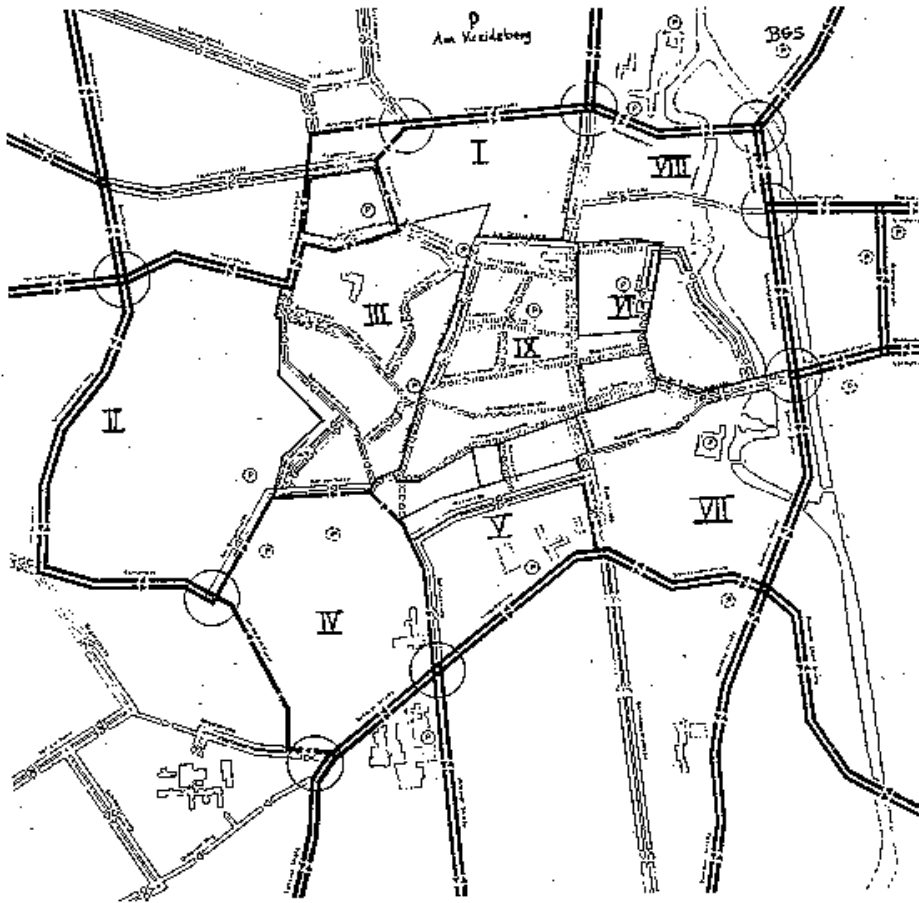


Fig. 11: Lüneburg, survey area

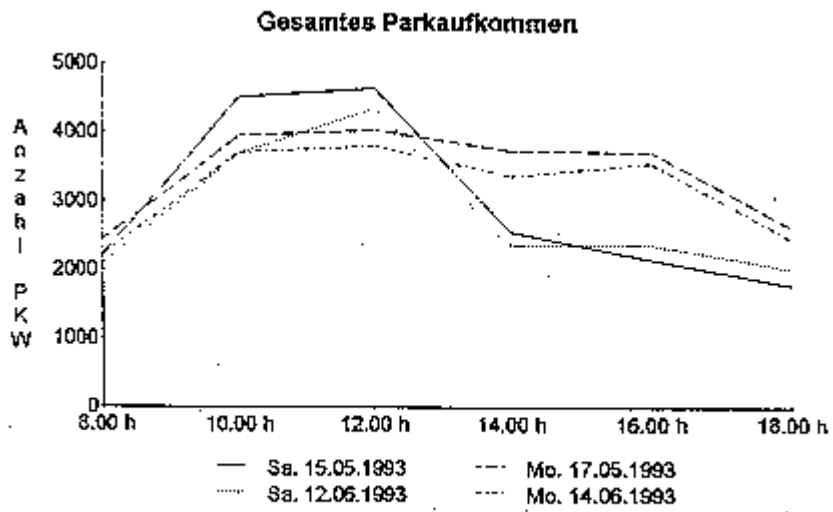


Fig. 12: Parking demand, Lüneburg

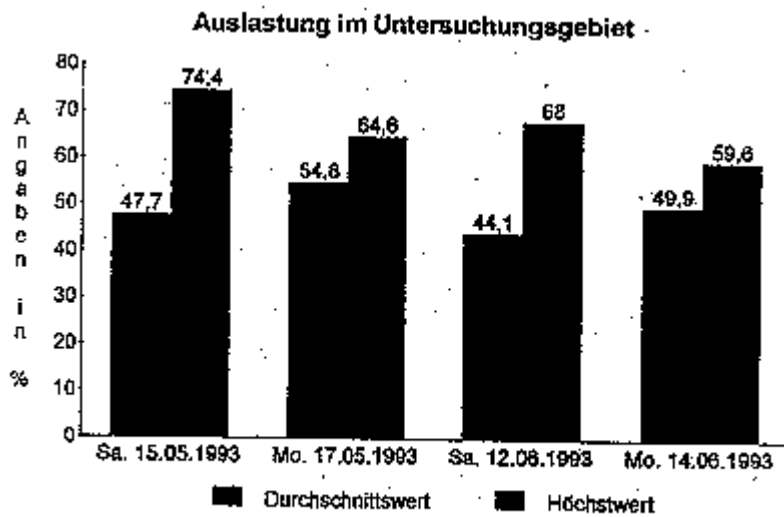


Fig. 13: Rate of parking space occupancy in the survey area, Lüneburg

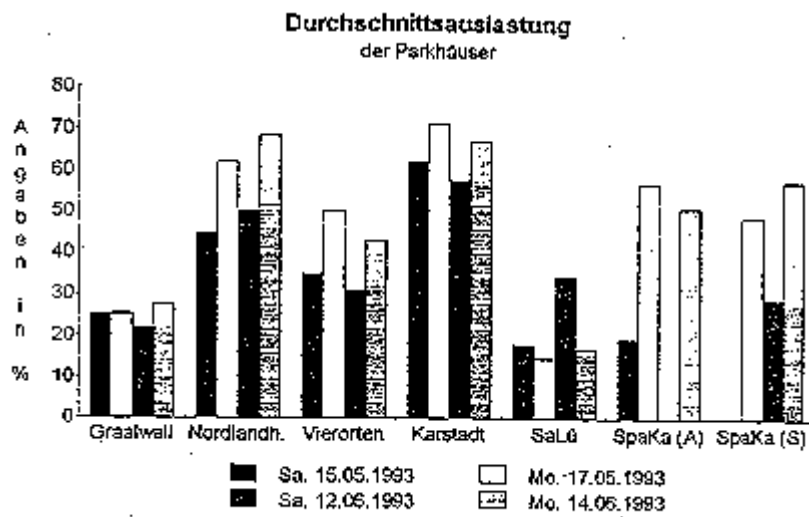


Fig.14: Rate of parking space occupancy in the multi-storey car parks, Lüneburg