

# **Comparative Research on parking policies in European cities from 2004 to 2014**

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## **Abstract**

Parking issues are influenced by many aspects. Demographic changes, evolution in urban agglomerations, new traffic means and new technologies alter the requirements of people, even in traffic. Parking is an important part of it. So parking businesses have to consider the new customers' requirements and the user's behavior.

Prof. Dr.-Ing. Petra K. Schäfer undertook a survey in 2004 about the parking situation in various Germany cities. Ten years later, the survey took place again. By comparing the results of the survey from 2004 and 2014, the changes in parking could be analyzed. By inference, the requirements in this field of research became clear.

## **1. Introduction Professor Dr.-Ing. Petra K. Schäfer**

Prof. Dr.Ing. Petra K. Schäfer completed her PhD in 2004 about Alternative Methods for Parking Duration Control and for Payment of Parking Fees. She published scientific articles on transport issues and parking in different national and international journals. She is head of the FGSV (German Road and Transportation Research Association) working group "Parking" and member of the Scientific and Technical Committee for the European Parking conference.

Since 2007 Petra Schäfer is Professor for Transport Planning at Frankfurt University of Applied Sciences (FRA-UAS) in Faculty 1: Architecture · Civil engineering · Geomatics. The FRA-UAS is one of the major Universities of Applied Sciences in Germany. Currently, around 12,000 students are enrolled in over 50 Master and Bachelor degree programs. The FRA-UAS has four faculties: Architecture · Civil Engineering · Geomatics; Computer Science and Engineering; Business and Law; Health and Social Work. According to the university's understanding, the degree programs have a strong focus on the application and transfer of acquired knowledge into professional practice.

Petra Schäfer is leading the Department New Mobility, a research group that belongs to Faculty 1 at the FRA-UAS. Prof. Schäfer and the Department New Mobility have several years of research experience and have completed projects in different fields of transport planning and parking (electro mobility, mobile phone parking, truck parking, commercial transport in inner cities and traffic at major events) and social research (surveys of mobility behavior, investigation of use patterns, acceptance analyses). The team consists of Prof. Schäfer, Prof. Santowski, Prof. Becker, five research assistants and six student assistants.

## **2. Reasons why parking is important**

It is a fact that car trips start and end with parking. Statistically, each registered vehicle is about 23 hours a day in a parking position. Therefore the availability of parking space in inner cities for residents, commuters and customers is an important topic in traffic planning. In most municipalities it is impossible to provide the required parking space, but is it really necessary? Offering, even huge areas for parking, means that people will use it. The consequences of this are a higher amount of traffic in cities and worse quality of traffic flow, more noise and emissions and a poorer traffic safety situation. To prevent those scenarios it is important to give attention to the parking issues in the municipalities, because parking management can influence peoples' choice of destination and traffic mode. So it is up to municipalities to integrate parking issues and concepts into their Sustainable Utility Mobility Plans and transport plans.

### **2.1 Current situation and the customer's needs**

Often parking management concepts fail because in addition to municipalities there are further stakeholders dealing with parking e.g. car park operators who pursue different aims than the municipalities. In a lot of cases there is no communication between them. For that point we need to find solutions.

Another topic is the required parking space. For several years now there has been an ongoing trend towards people moving back into the inner cities to live and work. A lot of them do not own a car and instead use the public transport system and other new traffic modes such as sharing systems. But there are still parts of the population who need a car or do not want to share it. Municipalities have to manage available public space responsibly. Parking management is one important part of it and moreover a source of income for public funds.

In the digital world, citizens have different needs on traffic issues. Everything has to be connected and easy to apply. In a lot of cities, it is already common to reserve and pay for parking slots by smart phones. But for this technical solution it is necessary to have smart phone applications which indicate free parking spaces in the required area. The parking industry has to open up to these new technical possibilities. Apart from the customers' advantages, there is another very important factor in using smart phones and applications for parking. The collected data that comes with the application is important to understand the customer's needs, behaviors and to evolve the business.

Parking spaces decrease and other transport mode options appear. Traffic is changing and parking is an important part of it. There are a lot of new aims and remits in the business that need to be considered.

### 3. Parking Survey 2004 and 2014

#### 3.1 Comparison of parking in German cities

In the PhD project of Prof. Schäfer in 2004, a survey was undertaken about the parking situation in German cities. The focus was on parking fees for on-street and off-street parking, percentage of managed parking spaces, monitoring and fines. The call for participation was through the Association of German Cities (Deutscher Städtetag). About 119 cities took part in the survey in 2004. Because of the importance of the topic, Prof. Schäfer decided in 2014, to undertake a new survey with the same municipalities and the same questions to find out how parking has changed and developed during the last ten years. In 2014, 65 municipalities participated in the survey. A not really surprising result from the survey is that parking meters have almost disappeared. This was quite foreseeable. The comparison has also made clear that parking has become more expensive in the last ten years. Considering the inflation and adjust the costs to the CPI (Cost Performance Index), it is hardly an increase at all. The average costs for a parking ticket for on-street parking is about 1.47 € per hour in 2014, which means a plus of 0.38 € in ten years. The average costs for parking off-street is about 1.75 € per hour in 2014. In 2004 off-street parking was about 1.31 € per hour. Figure 1 shows the parking fees off-street in 2004 and 2014. In 2014, only 50 municipalities give information about the parking fees off-street in the survey.

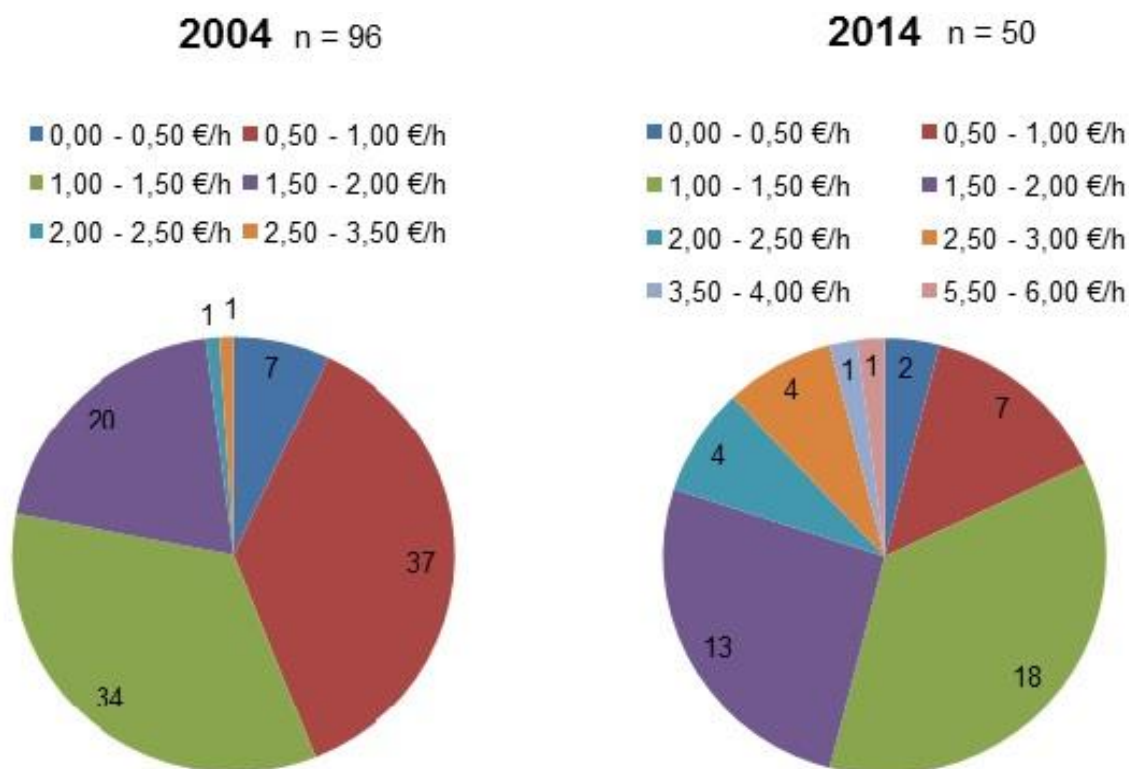


Fig. 1: Comparison of the parking fees for off-street

The analysis of the survey showed that parking off-street is in general more expensive than on-street in cities with a population under 1 million inhabitants. In cities with more than 1 million inhabitants, such as Hamburg and Cologne, parking on-street is ordinarily more expensive than off-street. Figure 2 shows that evaluation, which is based on the amount of the fee.

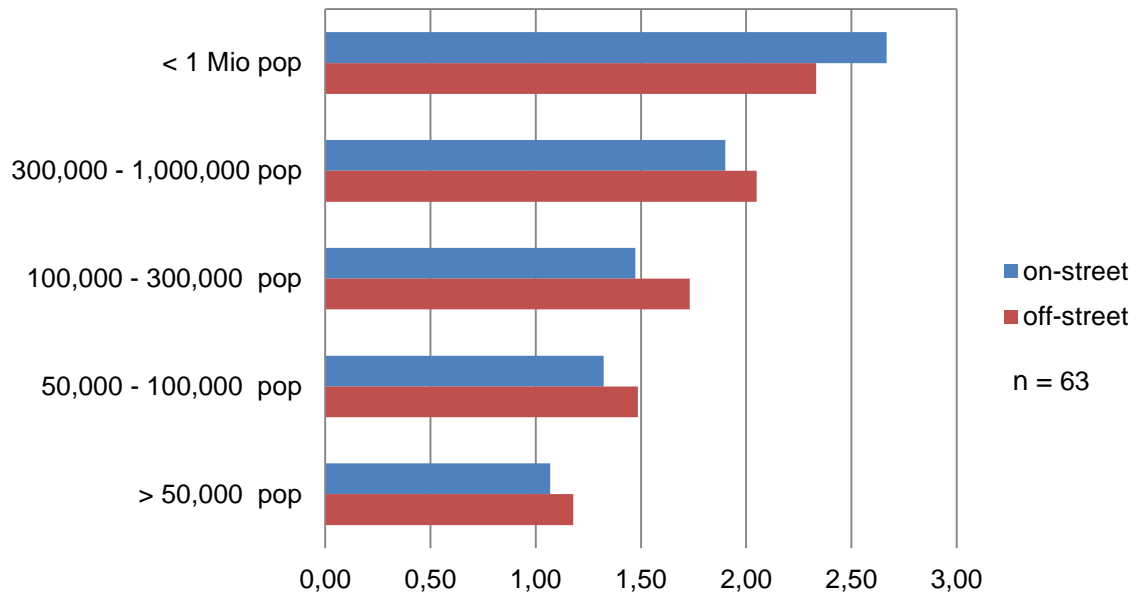


Fig. 2: Comparison of the fees in € for on-street and off-street parking in 2014

In terms of the number of participating cities, on-street parking is still cheaper than off-street parking in the majority of cities. In 2004 in 79 of 96 cities, on-street parking was cheaper or the same as off-street parking (see Fig. 3). From the survey in 2014, in 34 out of 48 cities parking fees are cheaper or the same as off-street parking. Even today in various cities, fees for on-street parking often are cheaper or the same as off-street, but there is a tendency to higher fees for on-street parking.

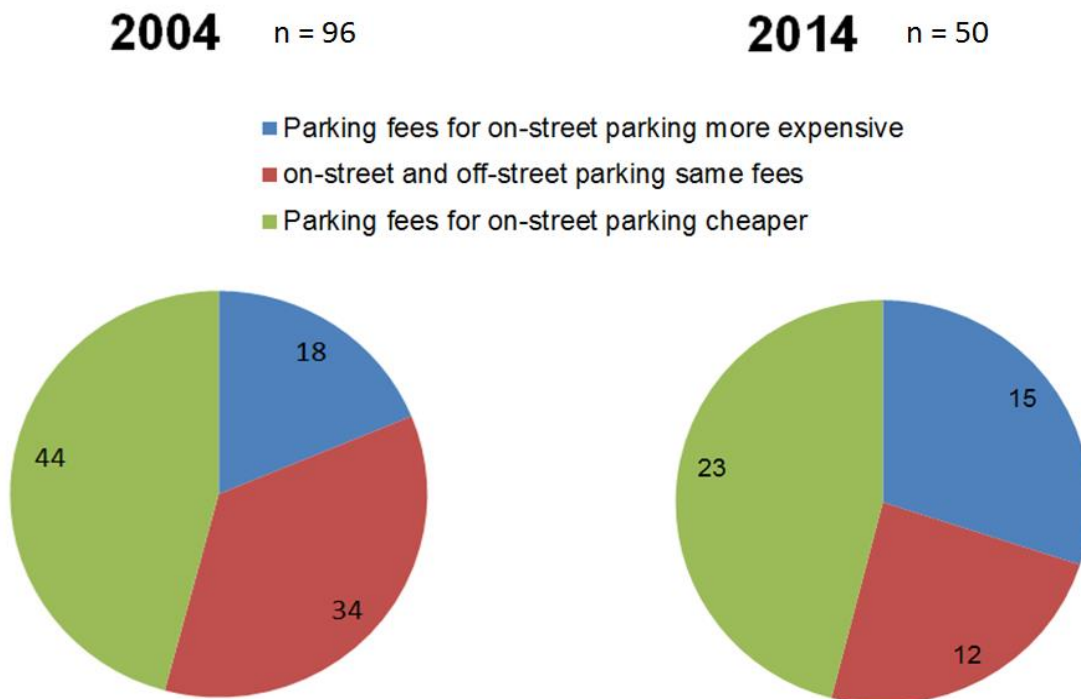


Fig. 3: Comparison of the fees for on-street and off-street parking

The prevalence of managed parking space rises with the number of inhabitants in 2014. In cities with more than 300,000 inhabitants the managed parking rate is about 93%. In 2004 the proportion of managed parking was lower. In cities with more than 300,000 inhabitants the rate of managed parking rises from 88% in 2004 to 93% in 2014. In the category of population between 100,000 and 300,000 the rate rises about 2.4%. As well, in the third category, cities with 50,000 to 100,000 inhabitants, the managed parking rate increases about 8%. In the cities with less than 50,000 inhabitants, the rate of managed parking spaces has increased about 10% in ten years. Most German cities in the survey have parking spaces left, which are free of charge.

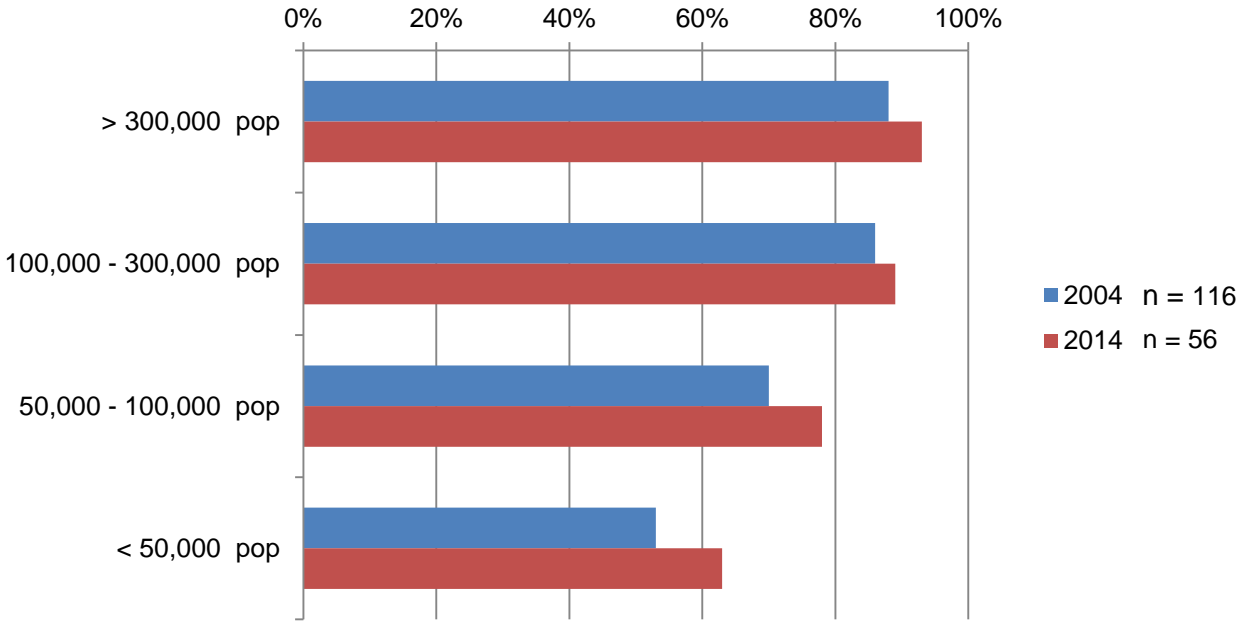


Fig. 4: Managed parking space according to population in 2004

The ratios of staff and parking area monitoring are quite similar to ten years ago. In three-quarters of the participating cities one person is responsible for up to 250 parking lots. The monitoring generates an income for the city, especially in cities with a higher population.

Just in 19 of 49 cities all of the ticket and display machines accept debit- and credit cards in 2014. In 2004 31% of the machines accepted payment transactions with debit – and credit cards (see Figure 5). It turns out that some cities, which already had ticket and display machines with debit- and credit card acceptance in 2004, had abolished these by 2014.

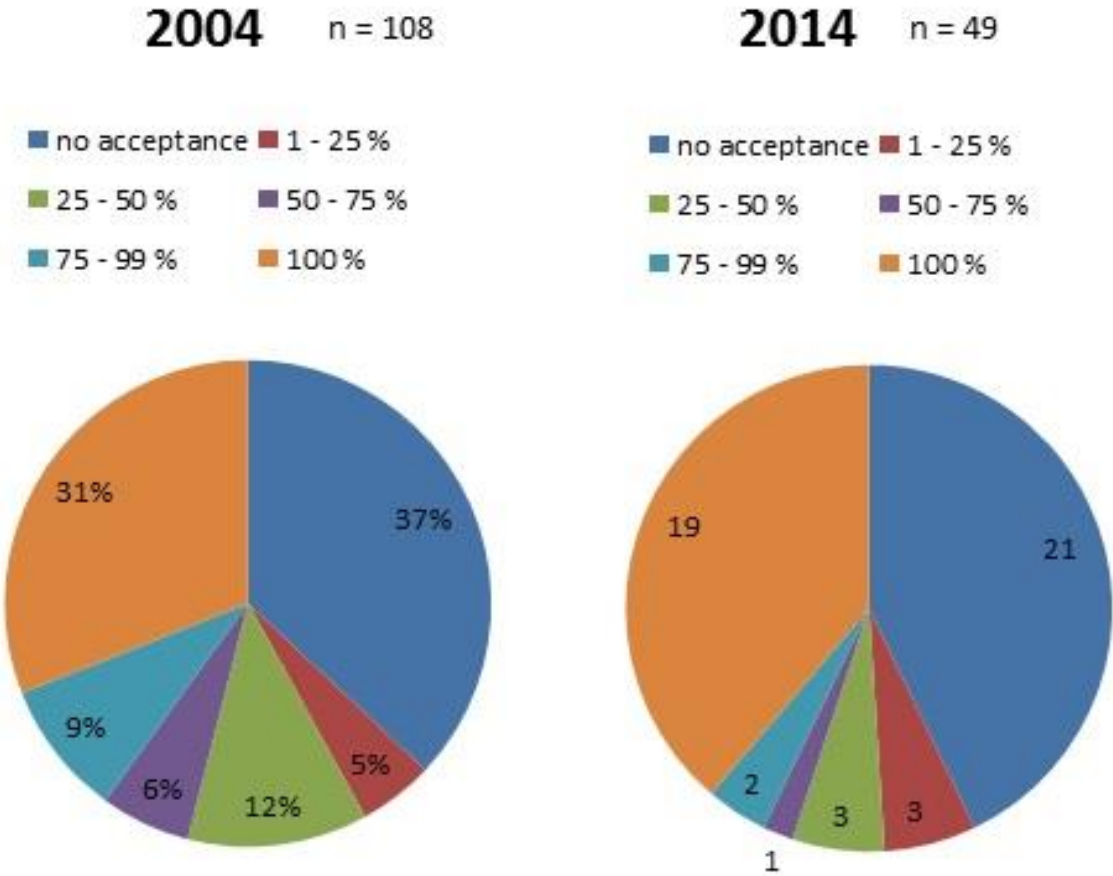


Fig. 5: Debit- and credit card acceptance on display and ticket machines

### 3.2 Comparison of parking in European cities

To take the results of the national survey into a European framework, the members of the STC were asked to exchange parking data from their countries and cities. The international comparison shows that parking in Germany is relatively cheap.

City	Population	On-street-parking per hour [€]	Car park per hour [€]	Off-street per hour [€]
London	8,100,000	1.40 – 8.40	3.08 – 12.60	3.36
Berlin	3,452,000	2.00 – 3.00	1.50 – 3.00	2.00
Rome	2,863,000	1.20 – 1.50	2.80 – 7.00	1.20 – 2.20
Paris	2,240,600	3.60	2.80 – 4.00	
Vienna	1,794,700	2.00	2.00 – 4.80	
Hamburg	1,746,300	2.00	3.00 – 3.50	2.00
Barcelona	1,621,000	2.50 – 3.00	3.00 – 3.50	
Prague	1,243,200	1.50	1.50 – 2.20	1.00
Cologne	1,034,175	3.00	1.70 – 2.50	1.50 – 2.00
Stockholm	868,140	2.80 – 4.40	6.50 – 10.00	2.00 – 5.00
Amsterdam	809,890	Ø 4.16	Ø 4.11	2.50 – 4.00
Zurich	404,780	1.60	2.00 – 5.00	0.50

Fig. 6: Parking fees depending on population size of the city

In particular, the penalties for parking are different in the various European cities and in the case of Germany, even the penalties are comparatively low.

City	Parking without ticket [€]	Parking where prohibited [€]	Specials
Amsterdam	40 – 60	90	Parking on handicapped parking: 370
Barcelona	45	90	50 % discount if payed within one month
Frankfurt	10 – 30	10 – 65	
London	84 – 112	154 - 182	50 % discount if payed within 14 days

Fig. 7: Penalties for parking infringements in four European cities

## **4. Conclusion**

In the sector of parking, Germany is less evolved than other cities in the European Union. . There are still a lot of municipalities which barely carry out any parking management. Even some cities with more than 300,000 inhabitants still have free parking lots without any monitoring or control. Apart from that, parking in German cities is very cheap in contrast to their European neighbours, even in the cities with a population of more than 1 million. It was also determined through the surveys, that on-street parking is still cheaper than off-street parking in most German cities, though the comparison showed a tendency that off-street parking has tended to become more expensive than on-street parking. By comparing the different parking situations in various European cities, the data demonstrate wide differences in management, monitoring, fees and penalties. The differences occur cross-border and also within the cities in Germany. Germany is behind in the state of parking development, even in the methods of paying parking fees. Display and ticket machines with debit and credit card acceptance have not been widely implemented. Actually, some municipalities have abolished the machines which accepted this alternative paying method.

On the whole Germany, and particularly the German municipalities, should seize the opportunity to learn from their European neighbors how to better deal with the parking issue. In the future it is important to reinforce the international and the national parking network to work together, learn from each other and establish effective data and knowledge exchange.

### **4.1 Research requirements**

Out of the surveys in 2004 and 2014 there are some research requirements for parking issues. A lot of municipalities don't understand parking as an instrument that is able to influence traffic planning, as well as to improve urban development plans. There are a lot of cities in the European Union that are implementing best-practice in parking management. German municipalities should take this as an example. The most important factor is to implement parking management into Sustainable Urban Mobility Plans from the beginning and to use it as a strong instrument of regulation.