

**European Co-operation
in the Field of Scientific and
Technical Research**

COST
Secretariat

COST 342/18 – S Rev. 1

3 September 2001
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Management Committee COST 342

Parking Policy Measures and their Effects on Mobility and the Economy

Subject: Swedish National Inventory. Case Studies.

Table of Contents

Case Study 1. - Parking as an Income Generator for the Commercial Activities in a City Centre.....	3
Case Study 2 - Assessment of P-In. Parking Information System in Göteborg. After Study.	9
Case Study 3. - The Effects of “No Square” Parking	14

Case Study 1. - Parking as an Income Generator for the Commercial Activities in a City Centre

Swedish title:

”Parkering som en intäktsgenerator för en stadskärnas kommersiella verksamheter”

Author: Lisa Sandahl

Translation, synthesis and comments by Paul G Höglund

Publishing data: Royal Institute of Technology, Stockholm, Sweden; Division of Traffic and Transport Planning. M.Sc. Thesis 97-42, January 1997. Lisa Sandahl.

Author's Abstract (in original English text):

“Parking and City Centres live in a complex co-operation. Cars and parking are a vital ingredients in the survival of the commercial business in the centre, but at the same time they are a threat to the centre, since cars make a negative part in the environment of the centre, and therefore also the commercial activities in the centre. Considering this, the topic of how great meaning a parkingspace has to the commercial profit of a city centre is of great interest.

The study was made through almost 2000 visitor interviews in three towns in Sweden, Södertälje, Örebro and Karlskoga. The interviews were conceived in co-operation with Pascale Gibert, who also is going to use the results in her thesis, which will be published during the spring of 1997. The full results of the interviews can be read in the separate reports A-C.

The results of the study show that car-customers are important to the city centre, that they spend a larger share of money, than they represent in visiting-shares. This is a well-known fact, which now has been even further confirmed.

A parkingspace is, according to the study, worth approximately SEK 300.000:-. This is a somewhat lower value than what you use in daily analysis. This probably has its reason in the fact that the parking in this case is mixed, both distant and near the commercial centre. The value of each space decreases with increasing distance, though not as clearly as one would think. The probable cause of this is that with further distance, the fewer visitors to the city centre park there.

On the other hand, what clearly shows, is how much the car means for a smaller town, when you tell the interviewed people that they cannot bring their car to the centre, but have got to use other transportation. In Karlskoga, the smallest of the three towns, 50 % of the total income to the city centre would be taken elsewhere if the consumers were not able to park! In the two larger cities the result was somewhat milder, 20 re. 25 %. Even the lighter scenario, where you had to park at a further distance, showed results, between 5 and 20 % of the income to the city centre would then disappear.

It is also interesting to observe how much the time, which you spend in the centre, affects how much money you spend there. Not surprising, the visitors that stay for a shorter time than 30 min spend the most money per minute, but more surprising is that those, who stay between 30 min and 1 h spend less money per minute than both those who stay shorter and those who stay longer!

The master's thesis tells some new interesting facts, confirms a couple of old ones, and mostly, rises new questions to be answered in further studies." (End of author's own text).

What was the problem?

Background

Town and city centres are mostly dominated by intensive activities related to visitors. For those the accessibility to the centre is important. In medium and small cities most visitors are car drivers, and therefore the parking facilities are of utmost importance for the city centres' commercial activities. Parking itself requires financial resources for necessary space as well as for construction and management of the designated parking areas. Parking can be a problem, which requires special and accurate assessment and calculating methods, especially in the processes of city and town centre renewal.

What were the objectives and targets?

Main aim

The specific aim with this study (a m. sc. thesis in civil engineering) is to find out how important parking is for the commercial quality of the city centres. In order to be able of quantifying this, the performed study uses the following method. First an assessment of how a specific parking space can be given a certain value related to the income for retail dealers, counted per parking space (parking bay) and year. Then what is the distance between the customer's used parking space and the shop etc in the city's commercial centre, where the shopping is performed.

Another second target is to conduct a larger interview with city centre visitors, getting information for describing their behaviours and attitudes regarding general aspects of the accessibility to city centres.

This study is not trying to assess the profitability of the parking as such, i.e. the demand of financial resources for the parking is not evaluated. The study is also limited and performed as case studies for giving an indication of the magnitude of the parking spaces' commercial values.

What was done?

Studied cities, selection criteria and character

Three Swedish medium and small size cities were chosen, i.e. Södertälje (close to Stockholm), Örebro (in the middle of south central Sweden) and Karlskoga (in the west middle of the south central Sweden). The selection criteria were "to be beneficial for the work itself" but also the outlay of the specific parking structure in the cities and the relation to the commercial centres. The chosen cities should also be (as far as possible) representative for Swedish city and town centres. The cities are therefore of different sizes, medium size and small (in Sweden; in general international and European

comparisons the cities would probably be considered as small). The city characteristics are given below.

Södertälje

Amount of inhabitants:	in the city:	81770
	in the county:	1669840
Distribution of ages:	- 17	21 %
	18 – 64	65 %
	65 -	14 %
Distribution of working population:	workers	48 %
	office employees	40 %
	self employed	3 %
	sundry	9 %
Relative income level: (country index = 100)		100
Amount of accessible parking places		
in the city centre:		1220
Parking spaces per inhabitant:		0.015
Total turn around, retail dealers:		2540 MSEK
Turn around, retail dealers		
within city centre:		700 MSEK
Position among cities in the region (retail dealers):		4
Performed city centre organisation renewal in 1996		

Örebro

Amount of inhabitants:	in the city:	123188
	in the county:	274325
Distribution of ages:	- 17	19 %
	18 – 64	60 %
	65 -	21 %
Distribution of working population:	workers	57 %
	office employees	33 %
	self employed	4 %
	sundry	6 %
Relative income level: (country index = 100)		98
Amount of accessible parking places		
in the city centre:		2800
Parking spaces per inhabitant:		0.025
Total turn around, retail dealers:		4890 MSEK
Turn around, retail dealers		
within city centre:		1300 MSEK
Position among cities in the region (retail dealers):		1
Performed city centre organisation renewal in 1996		

Karlskoga

Amount of inhabitants:	in the city:	33451
	in the county:	274325
Distribution of ages:	- 17	19 %
	18 – 64	59 %

	65 -	22 %
Distribution of working	workers	49 %
population:	office employees	40 %
	self employed	3 %
	sundry	8 %
Relative income level: (country index = 100)		100
Amount of accessible parking places		
in the city centre:		1300
Parking spaces per inhabitant:		0.035
Total turn around, retail dealers:	1020 MSEK	
Turn around, retail dealers		
within city centre:	500 MSEK	
Position among cities in the region		
(retail dealers):		4
Performed city centre organisation renewal in 1996		

Other relevant criteria for the choice of cities were the existing obtainable data regarding the city centre's physical layout and commercial structure and also

- travel and shopping habits
- behaviours within the city centre
- public opinion concerning the city centre and the accessibility

Methodology for the survey

The data collection was carried out as interviews with single visitors to the commercial centres, which have parked at a certain parking space. The interview survey should give a fair description of the visitors (customers) behaviour and cover typical Swedish city centres. Sampling was done taking in consideration basic facts for giving a sufficient spread in time and space, e.g. interviews during Saturdays and other commercial peak hours and interviews with customers in the city centre's main commercial area.

Sample size and statistical relevance

This type of interviews generally needs a sample size of >500. For part segments of the total sample the sizes should not be less >100. Statistical accuracy is not guaranteed for a wider generalisation, but is sufficient for describing the result as such within an interview category. It is more important, though, to estimate errors due to non-quantitative values and factors, which vary because of special circumstances, such as weather conditions and local incidents.

Amount of interviews (sample size) is described below for different cities.

	Spring	Autumn	Total
Örebro	565	-	565
Karlskoga	253	256	509
Södertälje	153	621	774
Total	971	877	1848

What was the result?

Obtained results

Estimating the "value" of a car parking space

The study has given “values” for the existing car parking spaces. The definition of “value” is here income for the shops etc in the centre, calculated per single parking space. The performed interviews have also given the distances from the parked car to the special shop, where the customers have made their shopping for a certain amount. The figures in the table are only from real cases of a used car space and a related shopping activity. See the table below.

	Walking distance in minutes	Income per in the interview de facto used car space. In MSEK /car space and year
Total average in the three studied city centres		0.28 MSEK
Average within a certain walking distance from the car park	0 – 1 min	0.32 MSEK
	2 – 3 min	0.19 MSEK
	4 – 7 min	0.29 MSEK
	> 7 min	0.28 MSEK

Author’s comments: “The figures are average values for the three city centres. The variation between city centres is fairly large. There are also reasons for assuming that extremely well situated car parking spaces have larger income, than the here (in the table above) presented average values within the shown distance categories.

Effects of a “car free centre”

In the extreme case of a “closed” city or town centre for private cars, the results would be devastating for the commercial activities. The Swedish test cases give an approximate reduction of the income from commercial activities and services in the city centres of three chosen medium and small cities. The results are as follows, see the table below.

City	Population	Income reduction in %
Södertälje	81770	20 %
Örebro	123188	25 %
Karlskoga	33451	50 %

Customers’ transportation in a “car free centre” is assumed to be by bus or by walking. The study does not include any estimation of “environmental benefits” from a “car free centre”. The author concludes: “Taking in consideration the special background and hypothesis of the performed test cases, there are reasons for carefully balancing the advantages and disadvantages before closing the whole centres or parts thereof for private cars. This applies at least for smaller cities and towns.”

Conclusions

General

The title of the work gives an indication of both the objectives and the presentation of the obtained results from the study, viz. "Parking as an Income Generator for the Commercial Activities in a City Centre".

Specific conclusions

--- A car parking space in a city centre (average from this study) is "worth" about SEK 300.000:- (about EURO 35.000:-) per year, calculated as income (purchase) within the centre's commercial activities

--- The "value" of a car parking space is decreasing in proportion to the increasing walking distance to the centre of the commercial activities

--- Customers arriving by car and staying shorter time in the commercial centre than 30 minutes are spending the largest amount of money per minute

--- Customers staying between 1 and 4 hours at the commercial centre are contributing to 65 % of the total commercial income, which indicates, that it is more profitable to let customers "buy calmly", and low parking fees up to 4 hrs could therefore be convenient (and profitable)

Case Study 2 - Assessment of P-In. Parking Information System in Göteborg. After Study.

Swedish title:

”Utvärdering av P-In. Parkeringsinformationssystem Göteborg. Efterstudie”

Author: City of Göteborg, Department of Traffic

Translation, synthesis and comments by Paul G Höglund

Publishing data: City of Göteborg, Department of Traffic (Göteborgs stad, Trafikkontoret), January 2000. Project leader Björn Frederich.

Report Summary

(Direct translation to English text with a few minor changes in the Swedish text, which will facilitate the understanding of the context):

“P-in is a parking information system, which became operational in Gothenburg during May 1999. Signposts direct traffic to a number of larger car parks in the city and include about 100 signs situated in some 60 locations. The objective is to contribute to reducing the amount of vehicles searching for parking spaces, and thereby also reduce noise and exhaust emissions. Further, it is hoped that it will result in a more efficient use of the car park sites. This report is a review, carried out when the system had been in operation for about five months. A before study entitled “A Before Study - Evaluation of P-In” was prepared in June 1999. A longer after study will be carried out during the autumn of 2000. The objective of this report is to evaluate the effects the Gothenburg system gives on motorists’ behaviour, the amount of vehicles searching for parking places etc. The results presented in this report are based partly on a field interview survey of 300 people, who parked in Heden (a large parking area, located in central Göteborg; translator’s comment) and partly on a focus group discussion. Additionally, data from the P-In system’s database has been analysed. This report has been limited to the calculation of *some* of the effects caused by the P-In system. Concerning the environmental impact, the report shows the results of the reduced volume of vehicles searching for parking spaces within the car park sites, but also within the P-In system. Further effects can be observed but have not been calculated herein.

The field interview survey gave answers to such questions, as which approach roads motorists use, when they drive to Heden. In the after study, it was demonstrated that 66% enter via the approach roads, which are the most suitable for reaching the car park. This should be compared with 57 % in the preliminary study. A change in the travelling patterns can thus be noted. Nevertheless the motorists seem to have the same primary target points, when they park in Heden as in the before study.

As in the preliminary study, the majority (90%) finds a parking place on their first attempt. The remaining drivers have an average “searching distance” of about 585 metres, which should be compared with 750 metres in the before study.

The motorists have a very good knowledge of the system; only 6 % replied that they were not aware of the system at all. About half of the total amount said that they used the system, when they were looking for parking spaces. About 85% of the drivers feel that the system is good or very good.

The focus group discussion revealed, that more detailed information is needed on the information signs themselves. It is difficult to know what ‘Centrum S’ and ‘Centrum N’

actually mean, and, as a result, people are not confident enough to trust the system fully and to let it take them to their wanted destinations. Price is a very important factor, when it comes to choosing a parking space, and information about prices is asked for as well.

Calculations and analysis of data from the P-In database as well as from the field interview survey, indicate that the annual fuel saving is roughly 125 m³. Of this amount of fuel, 106 m³ is based on the reduced number of vehicles searching for parking spaces within the car park sites, and the remaining 19 m³ depends on the reduced number of vehicles within the search area, i.e. the area that comprises the P-In system. Therefore it appears, that the reduced volume of traffic from searching vehicles within the car park sites is the greatest saving from an environmental point of view.” (End of direct translation from author’s own text.)

What was the problem?

Background

The main problem to solve, when creating the parking information system for Göteborg, was to reduce the searching traffic (for free parking spaces). This could mean reduced noise and exhaust pollution disturbances, and the environment in central parts of Göteborg can remedy from that. Improved information regarding parking possibilities will also give an improved traffic situation for car drivers, searching for a parking space. This will increase the accessibility to the city centre, shorter queues at the parking establishments, and that those establishments can be more efficiently used.

What were the objectives and targets?

Main aim

The specific aim with this study is to evaluate the effects the parking information system P-In has given on the drivers’ behaviour, searching traffic etc, after the use of the P-In system for about five months. An additional target is also to compare the achieved results from this after study with those from the before study.

Evaluation of effects

When evaluating effects of here described art, many different factors and variables could be used, and the problems could be looked upon from various angles. It is not possible to analyse and evaluate all aspects within the limits of the here described project. Some possibilities are given in the list below. This survey was limited to evaluate the following effects and effect relations.

Drivers

- Drivers’ knowledge regarding the parking possibilities
- Which decision criteria are important for the specific choice of parking location
- Drivers’ self imagination of finding, searching and waiting for a parking space

Parking establishment

- Counting of occupancy rate

- Queues

Way to parking

- Different driving distance because of choice of a specific parking establishment
- Longer driving distance because of searching for free parking spaces
- Waiting time, queuing time

Environment

- Influence on exhaust emissions
- Influence on noise
- Aesthetical values

What was done?

Studied city and specific site

The city of Göteborg (Gothenburg), and specifically the inner most central areas, have been studied. The P-In system indicates routes to the larger parking establishments, both garages and parking houses, as well as larger open air off street parking areas. The total amount of information signposts is 100 in 60 locations. The parking system includes totally 5300 parking spaces and was inaugurated in May 1999. The road network with the information signs has good capacity, and the dynamic signs have been given both an aesthetic and an easy understandable design.

Methodology for the survey

In the survey three different methods have been used, viz. interview survey, focus group discussion and analysis of data from the P-In system database.

Interview surveys

The overall concept of the here described project is to make three similar surveys, one before study (already done), one after study (this report), when the system has been in operation for about five months, and one coming after study a “long time” after the P-In system has been in operation. The study was first aimed to be done by performing field interview surveys on five different parking establishments. Totally 511 interviews were done. Some of those parking establishments were too small and had too few customers for giving a sufficient amount of interviews. The decision was therefore to concentrate on Heden, a large open air parking area, located in central Göteborg. In the before study most of the interviews had been done at the Heden parking area. The final amount interviews performed were 300 at Heden. Most of the questions were done the same way as in the before study, which gives the possibilities of comparing results and describing the efficiency of the parking information system.

Sample size and statistical relevance

No detailed description of statistical sampling techniques or other information regarding the statistical methods are available in the report, why no comments will be given about the statistical relevance for the performed surveys.

Focus group discussion

A “focus group discussion” is a special group interview, where a group (here 8 persons) is discussing a certain topic. This method is often used in many different areas for trying to describe users’ requests concerning a certain product or special habits when using a certain product. The results should not be interpreted as the participants’ average values, but more as quantitative descriptions of specific items or circumstances. This method can be used in combination with ordinary interview surveys in order to better understand what are behind the given interview answers.

Analysis of data from the P-In system database

The P-In system is generating data to a database. This is done by the system’s counting of the amount of entering and exiting vehicles in all parking establishments, which are parts of the information system. Collected data could e.g. be statistical information regarding occupancy rates for different time periods, how many hours per year the establishment is full, average values for how many vehicles are passing in and out for different time periods etc. Basic data from the system has, together with video filming and with data from the interviews, been used for the environmental survey within this project.

What was the result?

Obtained results and conclusions

General

The parking information system has been well received by the car drivers. The knowledge of the system is very high and only 6 % of the answers in the interview survey expressed a total ignorance of the system. The drivers have not only noticed the signs, but they have also a correct understanding regarding the contents of information the signs are giving. In the interview survey 51 % answered, that they have used the information system when searching for a parking space, which could be considered as a high value. In the before study, though, 68 % were answering, that they would probably use an information system if it was existing. There is evidently still a certain “potential” for a future increased use of the system. A basic condition for a common use is that the information is reliable. The accuracy of the Göteborg system regarding true indication of free spaces is 99 %, but technical maintenance is demanding with nearly weekly disturbances in the communication network.

The result from the focus group discussions shows, that the drivers are missing some information on the signs. Some specific information (the indication of centre North and centre South) is not enough clearly understandable, which means less response to that information. The price for parking is also an important factor, and drivers tend to get into parking establishments, where they know the price of parking instead of driving further on to other establishments (with free spaces), where they do not know the cost of parking.

Comparisons between results in the before and after study

There has been no change in the reasons for parking at Heden (a large parking area, located in central Göteborg; translator’s comment) or other destination areas. The central main street, “Avenyn” (the Avenue), is still the main destination for those, who park at

Heden, about 41 %. In the before study the drivers stated 600 m as an acceptable walking distance to their final destination, which in reality means a longer walking distance than stated “as accepted”.

There has been a change in choosing access streets to Heden. In the before study 57 % were coming from the access streets “Korsvägen” and “Ullevivägen” but the amount in the after study was 66 %. This means a change in travel patterns because of the P-In system.

Search traffic is in the before study defined as “the distance a driver has driven from the parking space he/she had as the first choice to the parking space, where the driver finally will park. In the before study the average search traffic distance was 750 m. In the after study the distance had decreased to 585 m.

Environmental effects

According to the hypothesis stated and the assumptions made, the annual fuel consumption reduction, because of the reduced searching traffic within the parking establishments and in the P-In information system, are about 125 m³ per year. The main part of the reduced fuel consumption, about 85 %, relates to decreased search traffic within the establishments.

The reduction of CO₂ (carbon dioxide) emissions is about 300 tons per year. The reductions of other emissions are relatively small because of well functioning modern car engine catalysts.

Further studies

As mentioned before a second after study will be performed in order to find out if the obtained effect of the P-In parking information system is the same after a longer time of operation. The obtained data within the P-In database will then contain a large amount of statistical information about occupancy rates etc, why an analysis of possible changes could be done. Maybe also Stated Preferences technique will be used for analysing the drivers’ compliance with the system’s information. The intention is also to study curb side parking in the coming survey in order to see if the drivers in any greater extent will use street parking instead of parking in parking establishments.

Case Study 3. - The Effects of “No Square” Parking

Swedish title:

”Effekter av rutlös parkering”

Author: City of Göteborg, Department of Traffic

Translation, synthesis and comments by Paul G Höglund

Publishing data: City of Göteborg, Department of Traffic (Göteborgs stad, Trafikkontoret), March 2000. Project handled by Christer Olsson and Charlotte Berglund.

Report Summary

(Direct translation to English text with a few minor changes in the Swedish text, which will facilitate the understanding of the context):

Explanation: The meaning of “no square parking” is that the borders of the parking space in the street are not painted on the street surface.

Göteborg (Gothenburg) has during the last years introduced a new way of marking curbside parking spaces on which are levied a parking fee. The painted squares and the small posts, that have carried a ticket machine beside each parking space, are removed. It is instead permitted to park anywhere alongside the street within a certain stretch, except in front of gates etc. The different parking regulations are also united within continuous sections. A large and clearly visible sign in the beginning of the street section nowadays shows which rules are valid within that section.

These change of rules and physical street marking give a more efficient use of the street area. About 14 % more cars can be parked alongside a street, where no squares have been marked and painted. The parking behaviour, though, slightly differs at different types of streets. The car drivers are parking with more space between the vehicles at streets, which are combined residential and business activities streets than at purely residential streets. This behaviour is not varying very much between central streets and other non central residential streets.

The survey, based on interviews, which have been carried out, shows a great uncertainty among the motorists about the valid specific parking regulations. 20-30 % of the interviewed persons felt uncertain, who were allowed to park or where they are permitted to park within the street section, where they just have parked. Especially the rule with a ten meters parking distance from an intersection seems to cause problems for the motorists. (Translator’s remark: In Sweden you are not allowed to park within a distance of 10 m before the intersection in the car moving direction.) Doorways and gates, where parking is prohibited, seem easier to perceive.

About one third of the interviewed persons consider the marking of the parking area has been more visible and clear after the change, while one third of the interviewed persons do not think there is any difference at all. 70 % of the interviewed consider, that there is space for more cars, and nearly the half amount of the interviewed persons think, that it has become easier to find a parking space. The motorists do not think, there is any problems with blocked parked cars, but on the other hand many motorist felt, that the

parking is done with too big spaces between the cars, and that this is generally not efficient and “uneconomical”.

The numbers of "tickets" and parking fines at intersections and on pedestrian crossings have increased dramatically. It is uncertain, though, how much of this increase depends on that the marked squares have been taken away. Irrespectively of the reason for that, this is a problem, which must be taken in consideration. Therefore the work to make the parking rules and regulations more clear and easy to understand and also the marking with yellow hooks, especially at intersections, should continue.

(End of direct translation from author's own text.)

What was the problem?

Background

Previously, metered parking places have been marked by means of a white painted square direct on the street. A small decal showing the applicable regulations was situated on the parking meter post. During past years, the parking requirements have changed, resulting in the streets being divided up into more and more sections, each with their own separate regulations, even within the same stretch of the street. Consequently it has become difficult for motorists to park correctly. But it is also very important, that existing parking regulations are clear and uniformly defined, so that it is easy for motorists to park correctly avoiding unnecessary parking tickets.

The parking fee system was introduced on the streets of Gothenburg in 1955. During the first 25 years ticket machines were raised beside each parking space. Information regarding the parking rules in operation was given by means of stickers at the pin that carried the ticket machine. Ticket machines, which served many parking spaces, were used in large parking areas, and not for curbside parking.

During the eighties it was the start of a few ticket machines being used for many parking spaces along the streets. The reasons were primarily of economic art. The change began in a small scale in 1997 on one stretch of a street and was developed to a whole area in 1998. During 1999 there has been a total break through, because a whole range of a street or a whole area is considered to be one unity. That means that if one or several rules are changed, they are changed on a whole range of a street or a whole area.

As a consequence, there was therefore a definite need for a more clear and up to date marking and parking information system, which were practised in many other cities. The painted squares and the small posts have been removed, and the applicable regulations are indicated instead by a large, clear sign at the beginning of each stretch of the street. Additionally, the various parking regulations have been gathered together in connected stretches.

What were the objectives and targets?

Main problem

The main problem was that there were too many cars at too few parking spaces, which had to be changed somehow. It was necessary to find a solution that could solve this problem rather permanently.

Main aim

The main aim with the survey was to find an appropriate solution from a technical point of view. The aim with this change was to find out if it was possible to ease and make the marking of the valid rules better with studying the effects of “no square parking” with reference to accessibility and visibility.

Evaluation of effects

When evaluating effects of here described art, many different factors and variables could be used, and the problems could be looked upon from various angles. It is not possible to analyse and evaluate all aspects within the limits of the here-described project. Some possibilities are given in the list below. This survey was limited to evaluate the following effects and effect relations:

1. Will there be more or less parking spaces?
2. Will it be easier or more difficult to park?
3. Will it be easier or more difficult to understand the marking?
4. Will there be more or less parking fines?
5. How large will the cost savings be?

What was done?

General

Gothenburg has during the last years introduced a new way of marking paid and a long side the street parking spaces. The painted squares and the pin that has carried a ticket machine beside each parking space have been removed. It will instead be permitted to park anywhere a long side the range, except in front of gates etc. The different regulations are collected all together at coherent stretches. A large and clearly visible sign in the beginning of a stretch of the street nowadays shows which rules there are a long side the range. The changing to the new system of street marking was started in a small scale in 1997 and was continued for a larger area during 1998. During 1999 the new marking system has been accepted as a rule and is implemented everywhere a new area is going to be changed.

Methodology for the survey

The survey consists of four different parts:

- Quality assessment of the parked vehicles' manoeuvring space
- Measurement of the number of parking spaces before and after the change
- Interviews with parking vehicle drivers
- A counting of the number of parking tickets issued before and after the change

The quality assessment of the parked vehicles' manoeuvring space was done following certain criteria of how difficult it was to leave the parking space, and how many times the vehicle had to be moved backwards. This was done by video filming. Three different kinds of streets have been looked at, viz. central, semi central and suburban streets with a combination of living and commercial activities.

Interview survey

A little more than one hundred motorists have been interviewed in the field on three different streets, where the changes have been made. The questions asked were mainly concerning how well the motorists could perceive the new signs and the markings of the new regulations. They were also asked how they subjectively feel the new parking system is functioning.

Sample size and statistical relevance

No detailed description of statistical sampling techniques or other information regarding the statistical methods are available in the report, why no comments will be given about the statistical relevance for the performed surveys. The interviews have been done both during daytime and during evenings in order to get a broad variety of residents and visitors.

What was the result?

Obtained results and conclusions

General

This report is a study of the effects of this "no square parking". The study shows the result of four different street sections. Partly from the measurement of the manoeuvring space of a number of different vehicles in order to get an assessment of the chances of getting in and out of the parking spaces easily. Additionally, the number of possible parking places on some stretches has been measured, both before and after the change. To be able to ascertain what the views of the motorists are about the system, a hundred or so field interviews were undertaken. Finally, statistics are presented about the number of parking tickets issued in connection with various violations which are interesting in this context, together with the financial effects in the form of reduced maintenance costs etc.

Parking space and parking capacity

The changes imply that the street is more effectively used. About 14 % more cars in average can be parked a long side a range of a street, where no squares have been marked. The streets are thus more efficiently used. The parking behaviour, though, slightly differs at different types of streets. The motorists park with more space between each other at streets, that are for combined residential and business purposes, than they do at regular

residential streets. The pattern does not however differ particularly much between streets, that are more centrally situated and streets that are more peripherally situated.

The parking pattern differs from different types of streets. At streets that are combined business and residential areas the cars are parked with much more space between the cars than at streets, that are solely situated in residential areas. However, the pattern does not appreciably differ between streets located in the town centre and less centrally located streets. This implicates that the measure six metres, that is used today for calculating how many vehicles could be parked at a certain stretch, should be reduced with about 10 % at a first step, at least at streets that are solely used for residential purposes. At residential streets should rather the measure of 5.5 metres be used, while 6 metres should still be used at combined streets. That is to better reflect how the motorists really are parking, and how the different types of streets are used.

Blocked cars do not seem to be any major problem. It appears to be the case only exceptionally, and then at residential streets on which a certain amount of “packing together” and partner parking is more accepted. Just one percent of the measured vehicles were considered to have such little space that it was very difficult to get out of the space. In the interview survey there were just 7 %, who have the opinion, that they have had problems some time to get out of the space. In average every car has a parking space in front of and at the rear of the car, that is 70 % longer than the car itself, and that must be considered as spacious. That also implies, that a car of 4,5 metres (e.g. Volvo S 40) has a total parking area of 3,2 metres. At combined residential and business streets the same car has an average space of 3,8 metres, while it is 2,9 metres at residential streets.

Difficulties in understanding the new regulations

The survey based on interviews, which has been carried out, shows a great uncertainty among the motorists about the existing parking regulations. 20-30 % of the interviewed persons felt uncertain, who was allowed to park or where they are permitted to park alongside the street section, where they have just have parked. The motorists especially have problems with the 10-metres rules at intersections (In Sweden you are not allowed to park within a range of 10 metres before the intersection in the car's moving direction.) Gates where parking is prohibited seems easier to perceive.

About one third of the interviewed persons think, that the marking has become more visible and clear after the change, while one third of the interviewed persons do not think there is a difference at all. 70 % is of the point of view, that there is space for more cars and nearly half of the interviewed persons think, that it has become easier to find a parking space. The motorists do not think that is a problem that the cars are blocked, while many motorists park with too large spaces and “uneconomically” between one another.

The number of parking fines at intersections and on pedestrian crossings has risen dramatically. It is not clear, how much of the increase depends on that the marked squares has been removed, but this is this is a problem, that has to be observed. It should

therefore be pointed out, that the work to make the parking rules more clear by means of yellow hooks marked at intersections should continue.

The interview survey also shows, that there is a lot of uncertainty among the motorists about where they could park, and who is allowed to park along the street. 20-30 % of the interviewed persons felt uncertain on who is allowed to park or where one is allowed to park at the street section where one has just parked! Some interpret the signposting “P – Fee – Residents” as that just residents are permitted to park at the range.

Otherwise the motorists are overall in favour of the changes. About 1/3 do think that the marking is more obvious, but just as many do think that it is less obvious. The fact that 1/3 do think, that it is less or much less obvious can be considered as serious. A certain amount of those opinions could be because it takes some time for the motorists to get used to the new way of signposting, something that is confirmed by the traffic warden. The experience from the traffic warden is that there is certain bewilderment among the motorists, just when the change has been carried out in an area, but after while it tends to work out in a good way. A clear majority is of the opinion, that there is space for more cars, and nearly a half of the respondents think, that it has become easier to find a space. Just 9 % are of the point view that it has become more difficult. The motorists think consequently that there are no major problems with too little space to get out of the space. It is rather a problem that people do park with too much space between each other and that the street therefore is not fully used. This is especially what occurs at combined residential and business streets.

The number of parking fines made on “the 10-metres rule” in intersections, at pedestrian crossings and in front of gates, have risen dramatically, while the total fine level has fallen. It is unclear how much of the increase, that can be directly referred to the removal of the painted squares, but it is although a problem that should be observed. These rules do not seem to be enough clear to the motorists, especially at intersections. The prime measure is to continue to mark the worst affected crossings with “yellow hooks”, which marks the 10-metres’ borderline. The observance of those is very good. The fact that it is intersections, which have to be given the highest priority is totally obvious, because they have the clearly highest level of fines, nearly 10 times higher than number two, which are pedestrian crossings. However, the reduction of the fines outside parking squares is too small in order to be a fully compensating factor for the motorists.

Summary of obtained results

Summing up the situation it could be said, that the advantages outweigh the disadvantages, because the street spaces overall are more effectively used, and the new system is a significantly more flexible system. It is much easier to change the regulations on the street, if there is just a sign to be changed, especially the time wasting handling of stickers. There is also a great point in that the signposting will be more homogenous. The economic gain of maintenance is relatively small. The sole drawback is the motorists lack of knowledge about general rules (i.e. the 10-metres rule etc.), but it is possible with simple means to increase the observance of those rules dramatically. The experience from the areas where “yellow hooks” have been painted is that the motorists at a large

extent respect them. The new information signs that will be raised on the ticket machines, will probably also increase the respect for the new valid rules and regulations.