

IMPACT OF COPENHAGEN'S PARKING STRATEGY



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Strategy background

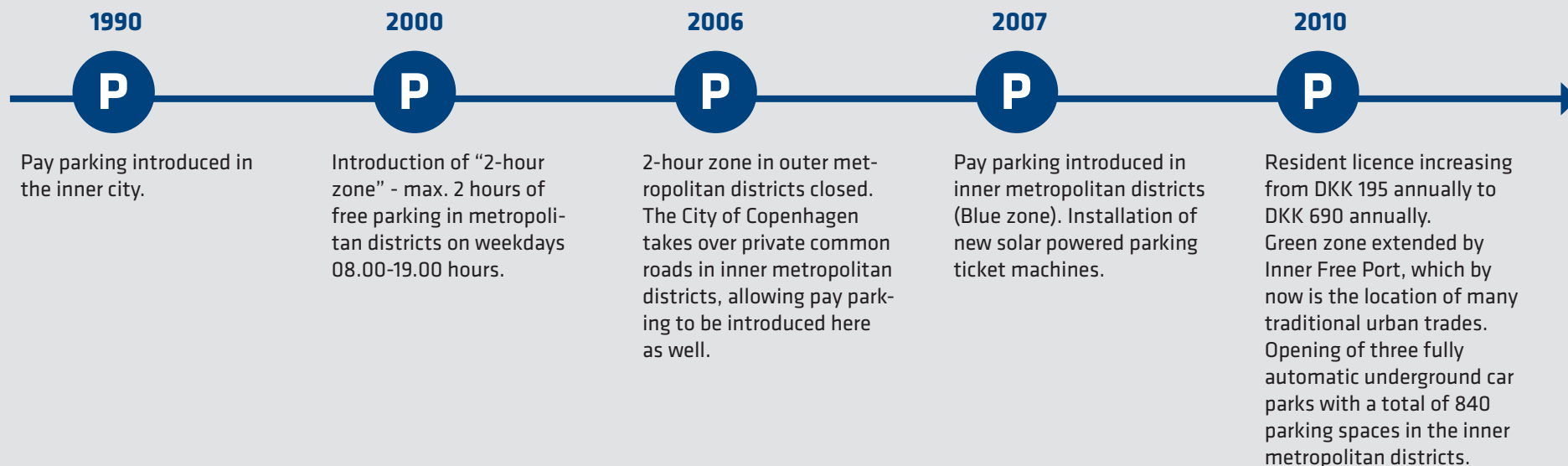
From the 1950s, a marked increase was seen in car traffic, and streets and squares in the centre of Copenhagen soon filled with cars to the point of bursting.

As a countermeasure to the almost chaotic car traffic, a shopping street in central Copenhagen known as "Strøget" was converted into a pedestrian street in 1962, and the conversion quickly became popular. This conversion was the beginning of a long process where cars had to give way in the medieval part of the city in favour of pedestrians.

From 1995 to 2005 alone, the number of parking spaces in central streets and squares was reduced by 12%, from 3,100 to 2,720.

Simultaneously with the increasing car traffic from the neighbourhood of the city, the number of cars owned by Copenhageners rose by 28% during the same period. So it got increasingly difficult to find a free parking space, especially for residents in the inner metropolitan districts during the evening and night hours.

PARKING CONDITIONS IN COPENHAGEN YEAR BY YEAR



PARKING STRATEGY 2005

P-strategy 2005

In 2005, the Copenhagen City Council adopted its first parking strategy, 'P-strategy 2005', in order to reduce commuter traffic, improve parking facilities for citizens, and make room for more recreational urban spaces.

The strategy consisted of three focus areas:

- 1.** Increased pay parking, notably to reduce commuter traffic by car.
 - 2.** 4,000 new parking spaces, mostly underground, for resident parking in the inner metropolitan districts.
 - 3.** Improvement of urban spaces and traffic environment by closing 1,000 on-street parking spaces in the inner metropolitan districts.
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1. In 2006, parking charges were raised by about 50% on average. In 2007, the pay parking area was extended from applying only to the inner city to including the inner metropolitan districts as well. The increased pay parking rates have resulted in a fall in car traffic to and from the inner city of about 18,000 cars a day, equal to 6%.

2. In the spring of 2008, the City of Copenhagen began building three fully automatic underground car parks in the inner metropolitan districts. Altogether these facilities can accommodate 840 cars, and they will open some time during 2010. Residents and businesses with a licence will be able to park free, while others must pay as when parking in streets. It has been more expensive than expected to build these parking facilities. It has therefore been necessary to adopt a new p-strategy.

The City is also planning to open existing car parks, which are often not used optimally, to public parking. The City has therefore bought two private car parks in the inner metropolitan districts with 300 parking spaces.

Here, residents and businesses with a licence for the area can now park free of charge, while others must pay as when parking in streets. The City has also negotiated an agreement with a shopping centre so that residents with a licence can park free of charge in the multi-storey car park of the centre outside the centre's opening hours.

When the three fully automatic underground car parks open, a total of 1,335 new parking spaces will have been established in the inner metropolitan districts since 2005.

3. Up to now, only about 200 of the agreed 1,000 on-street parking spaces have been closed. 150 spaces have been closed in connection with the establishment of the three fully automatic parking facilities, where green recreational urban spaces will be established on top of the facilities. In addition, 50 parking spaces have been converted to bicycle parking in a square where both a metro station and a shopping centre are located.

Solar powered parking machines

Since 2007, the parking ticket machines run by the City of Copenhagen have been powered exclusively by solar energy.

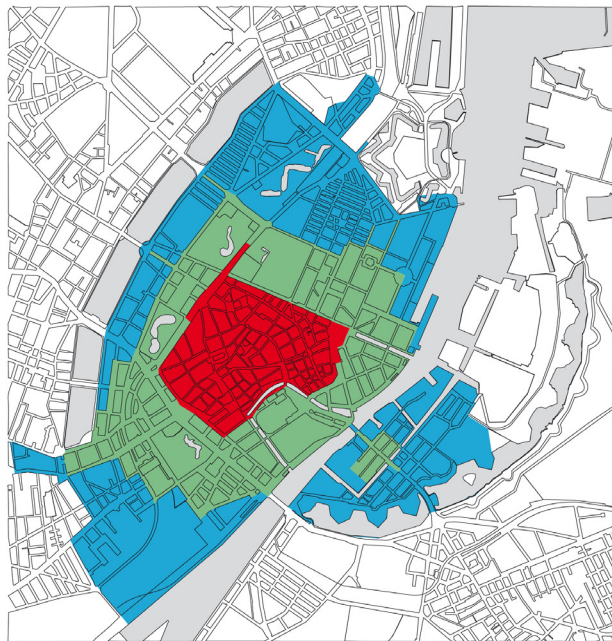
The machines are equipped with solar cells, and when the sun is shining, energy is stored in a rechargeable battery. In this way, the machines can operate for a full month without sunshine. As the battery is supplying the necessary energy to the ticket machine, it is not necessary to lay electric cables underground. If the stored solar energy is exhausted, the machine will send a message itself to the Centre for Parking.

The solar cell panel has been developed by Siemens. In 2006, the ticket machine received the 'Solar Award 2006 - Special Prize' from Solar City Copenhagen.



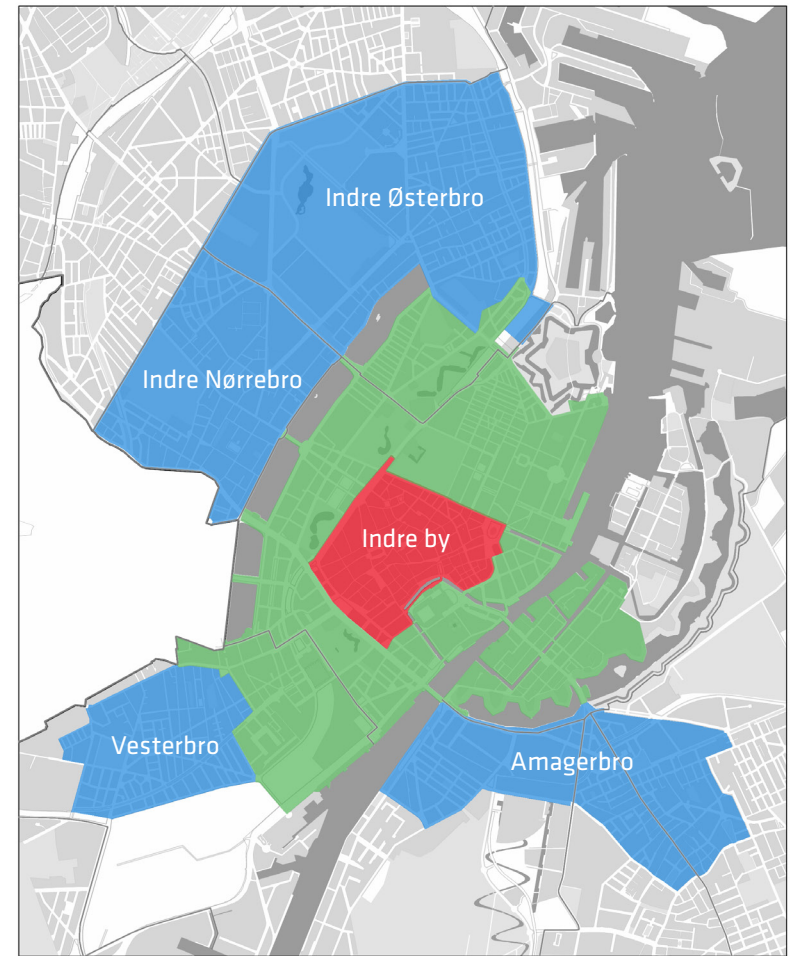
2005

Blue zone: Low charge
Green zone: Medium charge
Red zone: High charge



2007

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Extension of the pay parking area with the inner metropolitan districts.

RENEWED P-STRATEGY 2009

In September 2009, the Copenhagen City Council adopted 'Renewed P-strategy'. The goal to establish 4,000 new parking spaces and close 1,000 on-street parking spaces in the inner metropolitan districts has been modified to 3,000 new parking spaces being planned in the inner metropolitan districts before the end of 2014.

Closing of on-street parking as an element in improving urban spaces and the traffic environment has been left out from the P-strategy. The policy has now been modified in the way that on-street parking is to be increased in places where there is a documented need for more parking. This will notably be made by allowing angle parking.

Besides the plan to establish 3,000 new parking spaces, a new principle will apply in future as replacement capacity will be added at the ratio of 1:1 for the parking spaces to be closed down as an element in establishing bicycle paths, bus lanes etc. in the inner metropolitan districts.

2009-2012

Up to 2012, 640 new on-street parking spaces will be established by means of angle parking and rebuilding street corners. Resident parking will also be allowed in the evening and night for a total of 200 parking spaces in the inner metropolitan districts in areas that are private today. Up to 2012, about 740 additional parking spaces will thus be established in the inner metropolitan districts. This means that by 2012 about 2,000 new parking spaces will have

been established since 2005. A resident licence will increase from the present DKK 195 annually to DKK 690 annually from 1 January 2010.

2012-2014

In the longer term, the City of Copenhagen is working with several ideas to improve parking conditions in the inner metropolitan districts, including better utilisation of already existing parking facilities by opening these to the public.



Electric and hydrogen cars enter Copenhagen

The City of Copenhagen wants to reduce CO₂ emissions from traffic by 5,000 tonnes from 2005 to 2015. It is a key condition that more Copenhageners choose to replace their petrol and diesel powered cars by electric or hydrogen powered cars as these emit much less CO₂ and can also run on sustainable energy. The batteries of the cars may even be used as a store for surplus energy. The City of Copenhagen is working to develop an infrastructure for electric and hydrogen cars in Copenhagen. In autumn 2009, charging stations were set up in the inner city, and more stations are under way. Unlike petrol and diesel powered cars, electric cars may park free of charge in the City's pay parking spaces.

The City of Copenhagen has taken the lead itself by setting a good example. In 2009, the City bought 33 new electric and hydrogen cars, and from 1 January 2011, all the passenger cars bought by the City will be either electric or hydrogen cars. Before 2015, 85% of the City's passenger cars will run on electricity or hydrogen.

However, in the next few years CO₂ emissions will notably be reduced when Copenhageners replace old petrol and diesel powered cars with more energy-efficient cars.



FOTO CLAUS PEUCKERT

IMPACT OF PARKING STRATEGY ON CONGESTION IN COPENHAGEN

Congestion developments

During the period from 2000 to 2004, congestion developments in Copenhagen were measured by means of special GPS equipment, determining the position of 35-50 test cars every second.

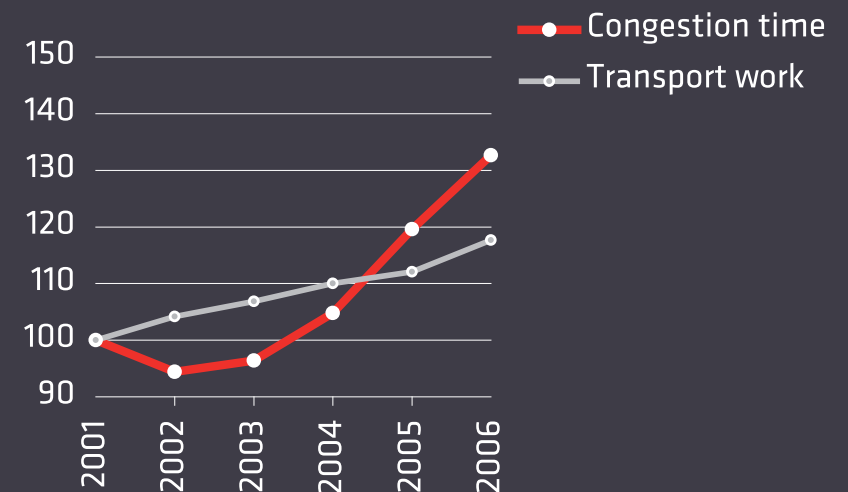
The overall result of these measurements shows that congestion rose by about 20% in Copenhagen and about 35% in the entire Greater Copenhagen area from 2000 to 2004.

The increasing congestion leads to a decline in driving speed for the traffic. From 1985 up to 2005, the City of Copenhagen measured the driving speed once a year on 12 road sections during the rush hours. These measurements showed that there was an annual fall in driving speed over the years, from 34 km/h in 1985 to 27 km/h in 2005.

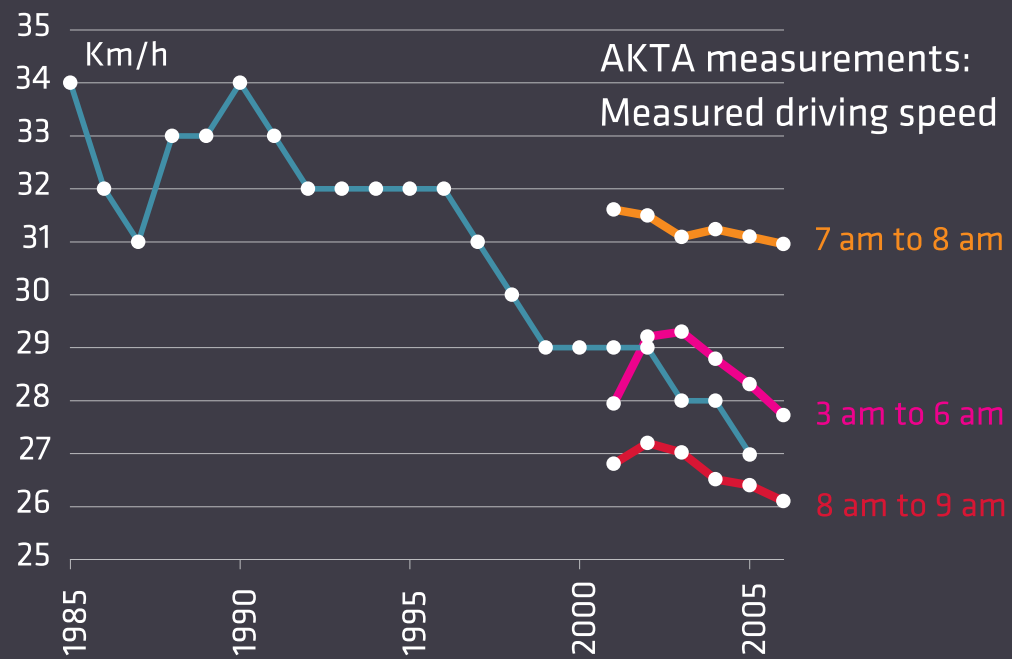
The data collected by means of GPS measurements refers to the whole road network, thus giving a more differentiated picture of developments in driving speeds than previous measurements. The GPS measurements have confirmed earlier speed measurements.

Since 2001 there has been a steady increase in transport work. The first year we managed to avoid the rise in congestion because of the opening of a new motorway. Since 2003 there has been a marked increase in congestion, which is now growing faster than the transport work.

Congestion in Greater Copenhagen area



Speed of car traffic during rush hours in Copenhagen



For a number of years, there has been a reduction in speed of car traffic in Copenhagen. This has now been further documented through detailed GPS measurements.

Traffic developments after implementation of P-strategy 2005

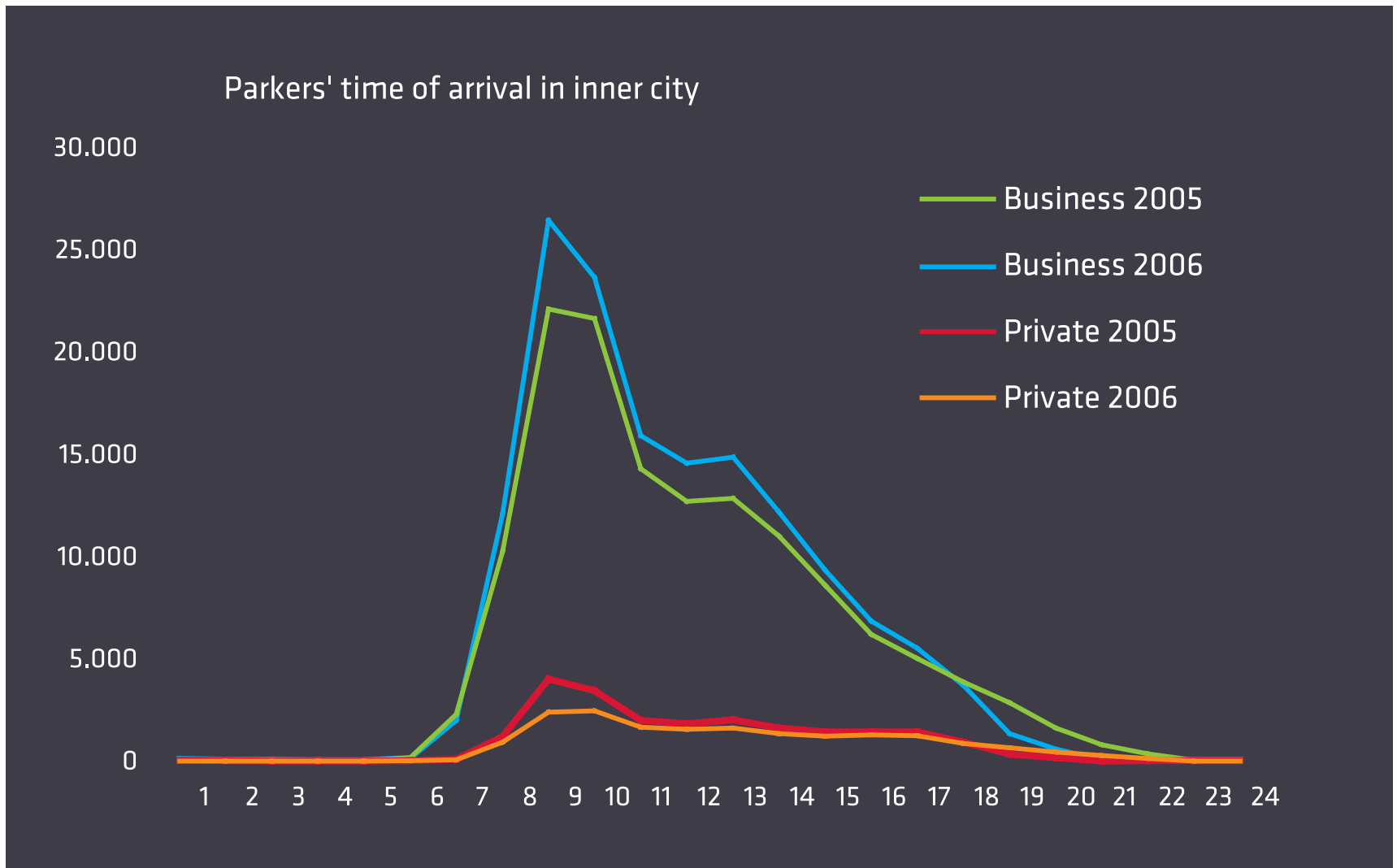
Since 2006, there has been a reduction in car traffic in comparison with previous developments. This is documented by car traffic counts through the lake fringe surrounding the inner city. Car traffic through the lake fringe has fallen by about 6% since 2005.

The reasons for the fall in car traffic can be illustrated by registering parking times for parkers in the inner city who paid their parking fees via mobile phones. Registrations were made for parkers who pay as private persons for their own parking and parkers who are registered as business customers under a private firm.

Business parkers show a fall in parking time during the morning rush hours of about 15%, while private parkers show a fall of about 40% during the morning rush hours. Thus there has notably been a fall in commuter traffic by car. The underlying reason is that private parkers are more susceptible to higher payment than business parkers.



Copenhagen's parking strategy has resulted in a decrease in the number of parked cars in morning rush hour. The percentage decrease is greatest for those citizens who have to pay for parking themselves.



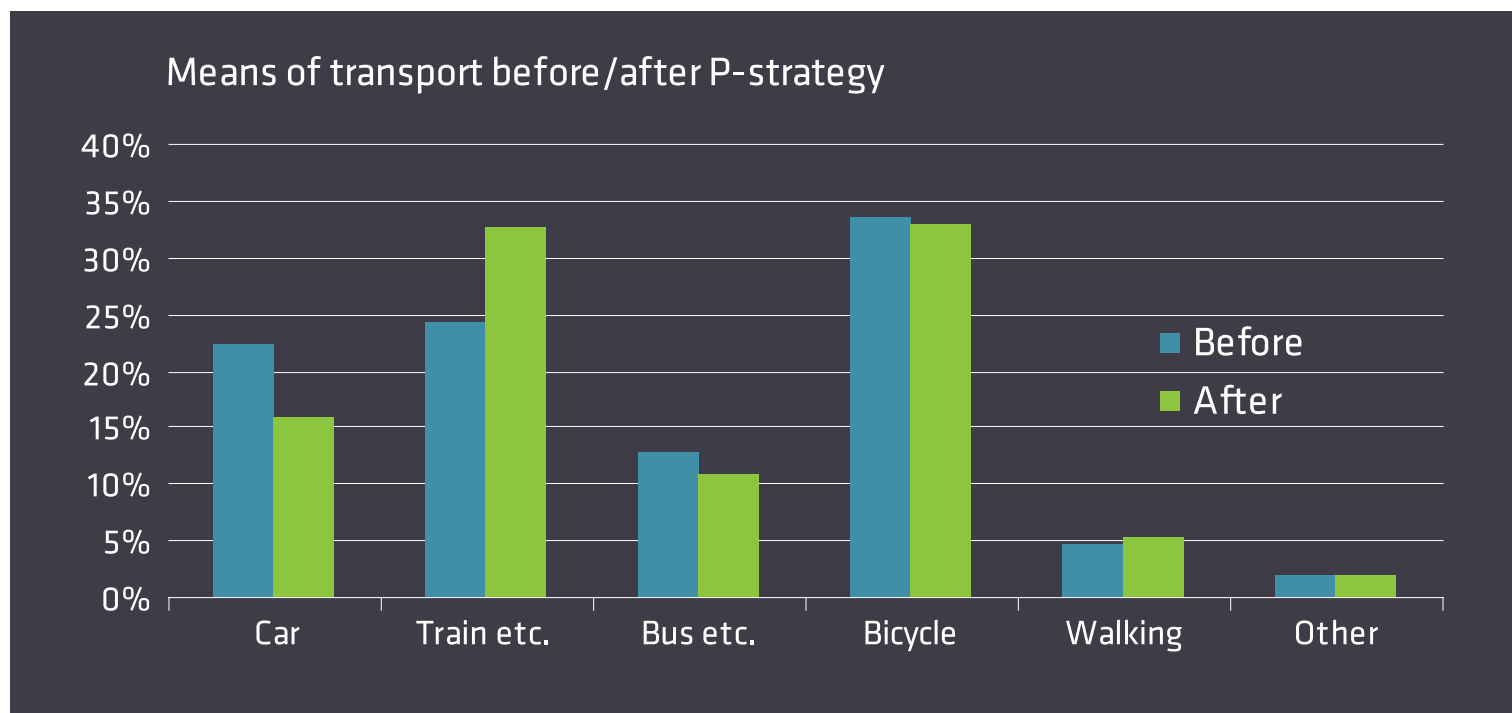
IMPACT OF PARKING STRATEGY ON TRANSPORT HABITS

Analysis of transport habits November 2009

In November 2009, 1800 employees in 48 different enterprises in Copenhagen were asked about their choice of transport to their work before and after implementation of P-strategy 2005. The main result of the analysis shows that the proportion going by car to their work has fallen from 22% to 16%. On the other hand, the proportion going by train for a certain part of the journey has risen

from 24% to 33%. The proportion using bus and bicycle or walking to their work has only changed little.

Somewhat surprisingly, the analysis shows that only about 50% live and work in the same place as before P-strategy 2005 was implemented. The great dynamic in the home to workplace pattern is the main reason why cars are used for transport to work to



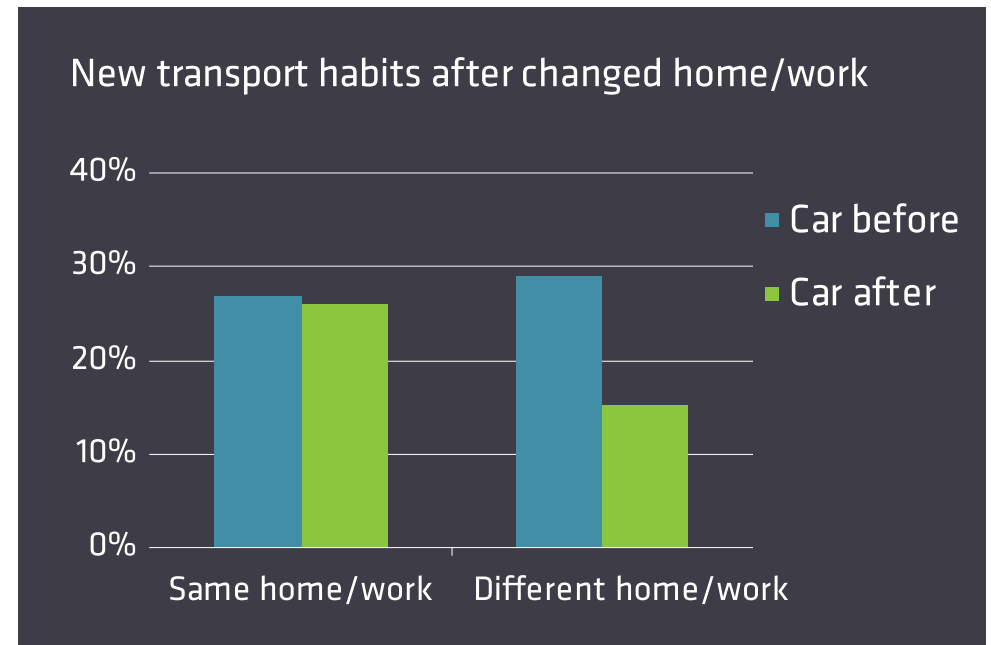
The parking strategy has led to markedly fewer in car travel to work and more use of train. The changes for the other transports are not significant.

a lesser extent than before the parking strategy was implemented. One half of the road users have the same residence and workplace as before, and the transport habits of this group have not changed. Accordingly, nearly all persons who have taken part in the analysis believe that the change in parking rules has not in itself resulted in changed transport habits.

On the other hand, those who have changed their residence, place of work, or both, use their car much less. So it must be assumed that transport habits can be influenced especially when people make important changes in their everyday life such as moving to a new residence or place of work.

Although the transport habits remain stable when people live and work in the same place, developments in car technology mean that the environmental impact is reduced all the same. From the answers to the analysis it can be concluded that fuel consumption per kilometre driven has fallen by 6-7% since 2005.

It is citizens who have either changed jobs or residence that have also reduced their use of car transport to work.



CITY OF COPENHAGEN

THE TECHNICAL AND ENVIRONMENTAL ADMINISTRATION

TRAFFIC DEPARTMENT

PARKING SECRETARIAT

trafik@tmf.kk.dk

+45 3366 3500

www.kk.dk/parkeringsprojektet

DECEMBER 2009

**COPENHAGEN
TOGETHER**

CITY OF COPENHAGEN

The Technical and
Environmental Administration

LAYOUT **TMF-DESIGN**

FOTO **TROELS HEIEN**