# Collection of examples

Since 1995, the Danish Folketing has allocated money to the Ministry of Transport's Traffic Pool. This money has been spent on initiating and supporting demonstration projects that can make traffic safer and less harmful to the environment.

The knowhow and experience deriving from 8 demonstration projects under the theme Safer Bicycle Traffic have been described. The projects show that road safety for cyclists can be improved and car trips changed into cycle trips.



OTO: AAL



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# Introduction

The projects share the two overall goals of changing car trips into cycle trips and of improving road safety for cyclists. As indicated in the examples, more specific goals have been set up for the individual projects. If you wish to know more, further information is available at the Road Directorate's website www.vd.dk under Trafikpuljen [Traffic Pool].

Examples of bicycle traffic are to be found in a number of other publications. Flere på cykel [More cyclists] written by the Danish Cyclists Federation and published in the year 2000 is an excellent supplement to this collection of examples.

The Traffic Pool was established to support the Government's policy in the field of transport. During the period 1995-1999 a total of ca. DKK 350 million was distributed in support of projects relating to public transport, limitation of the environmental load caused by traffic and the improvement of road safety and conditions for pedestrians and cyclists. A major part of the money was used to promote safer bicycle traffic. An annual sum of DKK 50 million has been set aside for the Traffic Pool in the period 2000-2003.

The projects presented all show new ways of promoting bicycle traffic and/or making it safer. One direct impression is that the work on campaigns, bicycle parking, company bikes etc, is interesting and exciting, and quite different from the establishment of cycle tracks. The Traffic Pool also supported projects in the municipalities of Nakskov, Copenhagen, Frederiksberg, Århus, Nykøbing F and Frederikshavn under the theme: safe bicycle traffic.



OTO: Municipali

*Employee bikes is an effective measure to get more people to cycle.* 

Project	Project periodBudget	DKK million	Contact person in the municipality
Næstved bridges, bicycle and train	1997-2001	27.44	Anders G. Petersen
Cycling town 1999 – Karlebo	1998-1999	0.35	Kjeld Gammelgaard
The ABC-project in Aalborg	1995-1999	10.80	Henrik Nyrup
Shopping bikes in Præstø	1997-2001	1.40	Bo Vilberg Nielsen
Safe cycling in Herning	1996-2000	8.80	Martin Pape
Odense – Denmark's National Cyclecity	1999-2003	20.00	Troels Andersen
Safer Cykling in Randers	1995-1999	2.13	Birgit Berggrein
Svendborg Safe Cyclecity	1995-1999	12.00	Klaus Johannesen

## Næstved bridges the gab between bicycle and train

#### Town and background

With well over 46,000 inhabitants in the municipality, Næstved is the regional centre of southern Zealand. Many people commute from Næstved and the surrounding area to Copenhagen – and many take the train. The town is good for cycling, but it can become even better. One in five trips in Næstved is made by bicycle.

In Markkvarteret there is a concentration of traffic problems, such as accidents, barriers, perceived risk, noise and a visually poor environment. Especially cyclists have difficult conditions.

#### Planning

An architectural competition for a combined foot and cycle bridge across the railway at Næstved Station was won by the architects Andersen & Sigurdsson. The wish to have a foot and cycle bridge is due to the fact that the existing connections from the 1920s are badly designed and unsafe. At the same time the foot and cycle bridge will reduce the effect of the railway ter-



Cramped space on the old bridge over the railway in Næstved.

rain as a barrier, which is broadest in the very centre of town.

In order to strengthen the work to make bicycle traffic safer and to get more people to use a bicycle for trips in Næstved, the municipality drew up a cycle action plan in close co-operation with representatives from local organisations and other authorities. The intention of the plan is to contribute to improving the urban environment and public health.

#### Foot and cycle bridge

The foot and cycle bridge connects the 9,000 inhabitants of Markkvarteret with the station and the centre of town. At the same time the bridge improves access from the station to the platforms, especially for the disabled. The winning project became too expensive, and a number of changes were therefore carried out in co-operation with the architects.

Approaching Markkvarteret, the cycle and pedestrian parts diverge, so that cyclists are led along a circular slip path while pedestrians are led to a stairway. The cycle ramp is 2.5 m broad and about 130 m long with a slope of 1:15.

Cyclists feel unsafe in the viaduct under the railway.





Computer-visualised foot and cycle bridge.



Existing bicycle parking conditions at Næstved rail station.

A number of different features have been established on the bridge to give the traveller various experiences. Thus, the bridge changes appearance along the route. At the platforms there are covered stairways and lifts. The bridge is 4.5 m broad with 2.5 m for cyclists and 2 m for pedestrians, who are separated from the cyclists by an extruded kerb and a differently coloured pavement.

#### Multi-storey bicycle park

At the station apron the bridge ends at a multi-storey bicycle park with space for 500 bicycles. Here bicycles can be parked on three floors. The bicycle park will be manned so that the bicycles on the two lower floors will be supervised. Bicycles can be repaired in the park while the travellers are at work. It is planned to try out a scheme with bicycle hire, commuter bikes etc, in the bicycle park.

There are already 1,169 bicycle stands on the station apron. During peak loads these are more than full. There are all standards of bicycle parking available, from wheel stands in the open air to underground lock-up bicycle parking.

The foot and cycle bridge will improve access to the station by bicycle and will thus increase the pressure on the parking situation. There is therefore a great need for further parking facilities, especially of the type where commuters can safely leave their bicycles.

#### Cycle action plan

The local authorities in Næstved have drawn up a cycle action plan as part of the work to improve traf-



Facadeopstalt nod Farinagsvej

SKETCH: Andersen & Sigurdsson

Sketch of the multi-storey bicycle park.

fic conditions in the town while at the same time complying with national transport targets. An analysis to identify bicycle traffic problems has ascertained that ...

- accident figures are unacceptably high,
- there is insufficient accessibility due to few fast and safe cycle routes between the different parts of the town,
- the parking conditions, especially in the town centre and at the station, is unacceptable,
- private car traffic is extensive, resulting in congestion and pollution.

The goals of the cycle action plan are to increase the number of cycle trips by 30% over the period 1998-2009, and at the same time to reduce the number of cyclists killed and injured by at least 15%.

These goals are being pursued by systematising the work on a number of important themes. Within each theme, projects are being carried out, and effects are assessed and priorities set up according to a phased plan. The themes are:

- Main cycle routes
- Bicycle parking
- Safety
- Delivery of goods
- Driving pupils to school
- Co-operation with companies
- Cycle audit in planning, construction and maintenance
- Communication strategy

With the theme *Delivery of goods* the idea is to give Næstved's inhabitants better possibilities for largescale shopping by bicycle. Trips to and from work by car take up much space in the town of Næstved. In *Co-operation with companies* the municipality therefore wishes to suggest target-oriented initiatives



for making car drivers shift to cycling.

Cyclists are more affected than other road users by details in the design of roads and paths. Therefore, the municipality is going to draw up some practical and easy-toremember rules that will ensure a greater focus on the needs of cyclists in local planning, building and construction projects and the maintenance of roads and paths. The *Communication strategy* is intended to strengthen the impact of the other initiatives, and information and campaigns will be organised to influence road user behaviour.

#### Main cycle routes

The expression main cycle route is used about a route where a special effort has been made to enable cyclists to travel between urban districts in a fast, direct and safe manner. Together with other cycle routes the main cycle routes form a coherent network for the whole of the municipality.

Based on a number of design principles a quality lift is planned for 11 main cycle routes. The quality is improved by establishing cycle tracks, raised junctions, path lighting and signing. The strategy is to offer cyclists a uniform network of high-quality main cycle routes.

Future structure of main cycle routes in Næstved.





Future bicycle parking facilities at bus stops will be covered racks.

Destination	Parking space wishes
Workplaces and institutions	Bicycle racks, covered and lockable
Public buildings, visitors	Bicycle racks, prefered covered
Traffic terminals	Bicycle racks, covered, lockable, service at the station
Sport and other leisure activities	Bicycle racks, prefered covered, possibly lockable and possibly supervised in con- nection with special events
Shops and minor shoppiing centers	Bicycle racks, prefered covered
Næstved town center	All kinds: Bicycle stands/racks, lockable spaces, covered spaces, on the basis of an overall assessment
"Nightlife" locations	Specially locked/supervised bicycle parking
Special events	Temporary bicycle racks, possibly super- vised



MAP: Municipality of Næstved

#### **Bicycle parking**

Counts have shown that there are insufficient parking facilities for cyclists at a number of locations in the town centre, and that the quality of certain racks is poor. As a consequence of these two factors bicycles are parked outside the racks to the inconvenience of other road users.

A bicycle parking policy should especially consider the purpose of the parking and should draw up and implement guidelines for parking for different purposes. The table below presents a rough overview, which the municipality will plan its efforts.

A number of measures have been planned, for instance, more bicycle parking places at bus stops and in the town centre. In addition, a design policy for bicycle parking is to be formulated specifying requirements for appearance and function depending on the location and purpose of the parking.

#### Safety

The municipality of Næstved has a long tradition for working systematically on accident prevention. This theme is intended to strengthen that work and will focus on accidents involving cyclists.

Analyses of bicycle accidents show that by far the major part of the accidents involve cars. The accidents are spread over many locations and only in a relatively few locations are there so many accidents that reconstruction of the road and possibly new signal systems can be expected to reduce the accident figures.

1169Antal pladser i stativer1180Maksimal talt belægning930Gennemsnitlig talt belægning

Bicycle parking in the centre of Næstved.



7 bicycle accidents with turning motor vehicles have occurred during 5 years at this driveway to a petrol station. The turning motorists have difficulties in seeing the quick cyclists riding downhill because of the bend and the bus stop. A truncation of the cycle track before the driveway is expected to prevent half of the bicycle accidents.

The work to promote greater safety for cyclists therefore focused both on the prevention of accidents in places with many bicycle accidents and on measures, such as campaigns and traffic signing, directed against certain types of accident.

7 black bicycle spots have been identified in Næstved. The estimated savings from the lower number of accidents and injured persons indicate that the black spot method is an appropriate way of bicycle accident reduction. Thus, the expected first year returns on investments are all over 75%.

#### Driving pupils to school

In May 1998 the municipality carried out a questionnaire study of the travel patterns of children at three schools in Næstved. The results show that a little less than one out of every five children from preschool grade up to 5th grade is brought to school by car. The parents state perceived risk as the reason for about 40% of this car driving, whereas 25% is due to time pressure or convenience. On the basis of replies from the parents the municipality is contemplating launching campaigns directed towards parents and improving conditions for cyclists near schools and school routes to get more children to cycle to school.

#### The future

It is the intention to continue the foot and cycle bridge across the railway terrain towards the centre of town so that cyclists avoid slip paths and hills.

The cycle action plan up to the year 2010 has a budget of about DKK 16 million. Almost 60% of the expenses have been set aside for a quality lift of the main cycle routes.





Travel patterns of children to and from school

#### Results of questionaire survey at 3 schools in Næstved



What conditions should be changed in order that your child will more frequently walk or cycle to school?

# Cycling town 1999 – the municipality of Karlebo

#### Town and background

The municipality of Karlebo is a suburb in the Metropolitan Region with close on 20,000 inhabitants. In and around the urban districts of Kokkedal and Nivå there is an independent network of cycle paths. According to a analysis carried out by the municipality, it is a problem for users that it is difficult to find one's way around in the network. Similarly, safety conditions for cyclists can be improved along the roads that cyclists use anyway and at junctions between paths and roads.

#### Planning

The goal of the project was to promote cycling in the municipality especially with respect to short car trips and at the same time to improve signing on the cycle path network in order to increase its user friendliness. All in all, the intention is to reduce the emission of CO<sub>2</sub> and improve cyclist safety.

A campaign consisting of a variety of events and elements was carried out over a period of 5 weeks. The campaign was directed towards cer-

Compaign activity	Date
Get your bike ready	28 April – 7 May
Opening event- cycle trip with the town council	8 May
Cycle far competition	8 May – 12 June
Cycle to the baker's	15 May – 16 May
Can you use the cycle network?	8 May – 31 May
Tresure hunt - use the cycle network	19 May – 31 May
Accompany your child to school	2 May – 4 June
Conclusion - presentation of prizes	12 July

tain target groups among the public. The first phase was to ensure that as many people as possible would become aware of the campaign. Then to arouse their curiosity and build up a positive impression and expectations that would make as many people as possible participate in the events. Competitions/draws formed part of all activities. The campaign received intensive coverage in the local press.

#### Get your cycle ready

As a prelude to Cycling town 1999 two bicycle dealers offered to check bicycles for free and to oil them and pump them up. At the same time customers were given a special offer on any recommended repairs. The first two hundred customers received a set of reflectors and a puncture kit. Far more than 200 came to have their bicycles checked, and a lot of repairs were carried out as well.

# Opening event – cycle trip with the Town Council

The official opening was formed as a communal cycle trip on which about 100 persons together with the town council cycled around in the municipality. Before starting there was breakfast for all laid out, and after the trip, there was a herring and salad lunch in Nivå centre, where booths had been set up. All

A cycle booth at the opening event.



<sup>PHOTO:</sup> Municipality of Karlebo

Breakfast was part of the opening event.





in all, it was a really good day in which about 250 people participated. The Danish Cyclists Federation and Karlebo Touring Cyclists did much of the practical work.

#### Cycle far competition

Companies, institutions, associations, individuals etc, were invited to take part in a competition to cycle the greatest number of kilometres in the period 8 May – 12 June. In order to participate, bicycles had to be equipped with a cycle computer. The participants were mainly individual persons, and that there were only 40 participants was disappointing.

#### Cycle to the baker's

"Why not take your bike when you're going to the baker's? If it's not more than 1-3 km to the baker's, it's probably quicker than driving." This was part of the message to persuade people to avoid unnecessary short car trips. Two local bakers handed out 2,100 "bicycle buns" to about 320 persons who either cycled or walked to their shops. Considerable practical support was afforded by the local Agenda 21 group and The Danish Society for the Conservation of Nature.

Talking before the final of the cycle far competition.

#### Treasure hunt on the cycle network

A treasure hunt route was marked on a map of the cycle network. The route map was obtainable at municipal offices and in a number of shops. On the reverse side of the map one could write the answers to questions on local history at 6 posts along the route. Lots were drawn among the correct answers for a prize of DKK 1,000. There was also space to express one's opinion of the cycle network. Cyclists had a 2week period in which to participate, and even experienced cyclists discovered new shortcuts thanks to the treasure hunt.

A total of 110 people completed the treasure hunt, and many good proposals and views, such as are not normally encountered in approaches from the public, were submitted. The proposals will be incorporated in the work on future cycle route planning for, among other things, new paths and signing.

Accompany your child to school About 1,200 pupils from pre-school

grade to 3rd grade took part in a competition to collect the greatest number of accompanied-to-school points. The class at each of the municipal schools that gained most points received DKK 1,000. Information material on the competition was distributed to class teachers and to all the children/parents. The children fought hard not to be driven to school and put pressure on their parents to cycle. The children were very involved in the competition and actually began to mob children who didn't cycle. A drawing competition was held as a supplement.

#### Conclusion – presentation of prizes

Unfortunately the event attracted only 50 participants. The day marked the conclusion of the Cycle far competition and offered, in addition, musical entertainment, presentation of prizes, booths and grill food. There was also a cycle triathlon in cycling slowly, slalom cycling and track cycling. The day was a success but had deserved a greater number of participants.



# The ABC project in Aalborg (*Aalborg - Bicycle - Commute*)



#### Town and background

With its 160,000 inhabitants Aalborg is the fourth largest town in Denmark. The town on the Liim Fiord is situated on 4 hills, which can make cycling fairly demanding. The Liim Fiord Bridge is the only cycle connection across the fiord, so north-south bicycle traffic is concentrated on very busy roads. The university and the town's function as a regional centre mean that there are both many bicycles and many cars.

#### Planning

The goal of the ABC Project is to get more people to cycle and to improve road safety. A package of measures for more and better cycle routes, company bikes and activity plans at workplaces together with various campaigns were implemented in 1995-98. The measures were Cycle routes on busy main roads (green), cycle routes on paths and traffic calmed residential streets (blue) and participating workplaces (red).

concentrated within a 12-km corridor between Skalborg and the airport.

In the first phase of the project a users' panel was established with representatives from, among other things, interest organisations and workplaces. The panel was quite active and assisted in developing the project. It also contributed to a useful exchange of information.

#### New and better cycle routes

A number of missing links in the cycle network have been filled in with the construction of cycle tracks on Vestergade, Vesterbrogade and Thistedvej in Nørresundby and on Vesterbro in Aalborg. The new routes have given the network greater cohesion, a greater sense of comfort and lower perceived risk for cyclists on routes with direct access to the centre of town. The routes have speed reducing exit constructions at side roads and signal regulation or roundabouts at major junctions. Some side roads have been closed.

#### Vesterbro – A lot of space here.



Vesterbro – Cramped space there.





Vesterbrogade - Not all parking bays were abolished.

The new cycle tracks reduced parking possibilities and ease of passage for motorists, but at the same time gave calmer driving conditions and fewer lane changes.

Parallel with the new and existing cycle tracks along busy roads, cycle routes were established on paths on traffic calmed residential streets. These cycle routes were carefully inspected for holes, problematic gully gratings and other nuisance factors for cyclists.

Foot and cycle bridge across the Lindholm Stream.





A new slip path on one of the cycle routes offers new possibilities.

A new path connection on the north shore of the Liim Fiord gives improved access to commercial and recreational areas. A 50 m long foot and cycle bridge was established here.

On the basis of bicycle counts, an increase of 5-20% in bicycle traffic has been registered. Whether this is due to the construction of cycle routes or to the protracted bridge and tunnel works on the Liim Fjord links is an open question. On the south shore there are several alternative cycle routes to those that form part of the ABC Project, which makes it difficult to assess the development of bicycle traffic.

A couple of practical things could have gone better. For example, it is not a good idea to hold the official inauguration of cycle routes in winter, and for a couple of months the cycle routes lay without a smooth wearing course of asphalt, which gave rise to complaints. These complaints could have been avoided with a little information and signing, or if the wearing course had been laid with less delay.

#### Company bikes and activity plans

In the autumn of 1995 the municipality of Aalborg sent a letter to the managements at a number of workplaces in order to involve them in the project. The letter described the



*Use the company bike – a folder to employees.* 

#### PARTICIPATING WORKPLACES

- Berner Ltd
- Rambøll Ltd
- College of Handicraft and Design
- Tecnical School Skole
- Aalborg Hospital
- Aalborg Post Office
- Central Administration, Municipality of Aalborg
- Technical Administration, Municipality of Aalborg
- Social and Health Administration, Municipality of Aalborg

project and invited the workplaces to participate and to appoint an enthusiastic contact person. The workplaces could expect a good deal of media coverage, a green image, better health and a greater sense of wellbeing among their employees. As a trial project the workplaces drew up activity plans for bicycle traffic with the help of a handbook. The plans described activities that could motivate employees to use bicycles at work and to cycle to and from work.

In May 1996, 35 company bikes were handed over to the workplaces at an official presentation of the tri-



al project. After the trial period the workplaces were allowed to take over the bikes without any charge provided that at least 300 km had been ridden on each bike.

Kilometres ridden were documented in a travel diary. All in all, the 35 bikes covered a total of almost 22,000 km in the 6-month period. For the most part, the cycle trips replaced trips by private car, taxi and company car (57% in all) and bus (21%). Almost half the trips were between home and work. Each company bike had on average saved the company DKK 600 in taxi expenses alone. Since the expiry of the trial period the 9 workplaces have financed a further 40 company bikes themselves.

A questionnaire study showed that 9% of the employees have changed travel patterns by cycling more to work and generally cycling more.

"The absence due to illness has dropped in the trial period ... We have established a cycle shed ... We do not need more investments in car parking."

Economy Director Morten Boldvik, Berner Ltd



*Company bikes are tax-free as well as company coffee in Denmark.* 

#### The company bikes were spectacularly presented from the start.

30% more parked bicycles were counted at Aalborg Hospital. These are significant changes in relation to the relatively small number of company bikes among 12,000 employees, of whom just under half had cycled to work prior to the trial. Only every fourth employee has tried using a company bike. Nevertheless almost all employees think that company bikes and activity plans are a good idea.

Company bikes have led to changes at the workplaces. For example, Berner Ltd has joined the Danish Federation of Company Sport, and Aalborg Hospital has started a cycling club. The contact persons found it fun and different to take part in the project. It has been fun even though the process has led to the production of many internal notices, letters etc, at the workplaces. All in all, the company bikes have contributed to a greater sense of solidarity at the workplaces, and company bikers have formed the habit of greeting one another.

Company bikes are not taxed, even though transport between home and work is in principle taxable for the user of a company vehicle. The explanation is that the bicycles are placed at the disposal of the entire staff, and any employee is entitled to use them. Company bikes can therefore be compared with general human resources management of an insignificant economic value – just like the provision of free coffee at work.

The trial with company bikes has been a visible element of the urban scene, and at the same time it has been followed with great interest by the press. A number of other workplaces have contacted the municipality concerning the possibility of



obtaining company bikes, and the municipality has made 12 more bikes available outside the project.

#### Information and campaigns

In the spring of 1997 a bicycle newspaper and a route map presenting the ABC Project and current traffic policy were sent to all 75,000 households in the municipality of Aalborg. The motivation parameters for cycling were health, exercise and the environment together with the fact that it is easy to get around on the relatively well developed cycle network. At the same time some good advice concerning cyclist safety was given.

The bicycle newspaper contained a general invitation to the inauguration of the new cycle routes. More than 500 people came to an event in Lindholm Strandpark, where the then Minister of Transport Bjørn Westh cut the ribbon. Caps, t-shirts and reflectors with the project logo were distributed at the various events. In addition, the contact persons at the workplaces received gifts in recognition of their efforts. Cycle route maps were posted to all households.

While it was running, the project received a lot of column space in various newspapers and local radio and TV have also brought spots.

#### **Commuter bikes**

A trial project introducing commuter bikes at Aalborg station and at the bus terminal was started in May 1999. For those arriving by regional bus or train, a commuter bike is an ideal solution if the bus or train do not stop close by their workplaces or educational institutions. At the same time the bicycle can be used at work.

Commuter bikes are hired out for DKK 100 per month or DKK 1,000 per year. The hire charge covers a bicycle in a smart, anonymous design and a service guarantee, so that there is always a ready-to-go bicycle waiting.

The bicycles are parked in a locked basement less than 50 m from the station and coach and bus terminal. Here the commuter can access the bicycle with a magnetic card. The goal is to hire out 50-60 commuter bikes throughout the year.

Inauguration of the cycle route 7 June 1997.



Reserved space for commuter bike.



### Shopping bikes in Præstø



#### Town and background

The municipality of Præstø has almost 7,500 inhabitants. Præstø's shopping street was reconstructed as an attractive shared-use street with sett paving. The bicycle stands look good – but do not function well.

#### Planning

The goal of the project is to get more people to shop by bicycle in Præstø by initiating a number of activities, eg a delivery scheme, making baggage equipment for bicycles available, road construction and campaigns.

A pilot study showed that 85% of the municipality's inhabitants shopped primarily in the town of Præstø. 25-30% of the customers came on foot, while 15-20% came by bicycle and 55-60% by car. This was so despite the fact that 60% of the catchment area is within 3 km of the shops, and 93% of the customers came directly from their homes and returned home immediately after shopping. Of the vulnerable road users 37% were not content with traffic conditions, while

Test pilots fit trailers to their bicycles.

#### Adelgade, shopping street in Præstø.

only 6% of motorists were dissatisfied with parking conditions. It seemed therefore that there was a considerable potential for improving conditions for cyclists, possibly at the expense of motorists.

#### Test pilots - baggage equipment

The subproject of making baggage equipment available was divided into two phases, a first phase in which test pilots tested different types of equipment, and a second phase in which the best equipment was made available to a larger number of people.

Through advertisements in the local press a total of 20 test pilots were found to try out 4 types of bicycle trailer and 1 type of collapsible bicycle basket. The equipment was tested for 4 months from August 1999. Free fitting of equipment and



repairs, if necessary, by the local bicycle dealer formed part of the subproject.

Experience was exchanged at a series of dialogue meetings. The colour and appearance of the equipment had a certain influence on whether the test pilots wished to use it. The "Donkey" bicycle trailer from Winther got high marks, and a Burley bicycle trailer also passed muster. The collapsible bicycle baskets functioned well. The test pilots were pleased with the equipment, and for some it has become almost indispensable.

The test pilots felt safer in traffic with a bicycle trailer, because motorists attentively. The test pilots functioned at the same time as a reporting corps who reported unsatisfying and unsafe conditions for cyclists.

In the spring of 2000 a further 50 test pilots will be given the baggage equipment that the first test pilots have indicated as being the best for a period of one year. In this way the equipment will be spread to a



Test pilot with groceries.

greater number of cyclists. Test pilots are selected only from among people who previously habitually shopped by car.

#### **Delivery scheme**

A delivery scheme was started in November 1999. The idea is that cycling customers can have their purchases delivered to their homes. With participation by the Præstø Chamber of Commerce the scheme

Do you want your purchases delivered?



has been ensured a large customer base. To date 8 shops have joined the scheme. The customer fills in a form saying where and when the purchases are to be delivered. The form is sent to the delivery centre, which is run by the municipality's transportation manager, who arranges and co-ordinates the trips made by the delivery personnel.

In 1999 deliveries under the scheme have been free - as a come-on. The price is at present DKK 20 per delivery, and at a later date may come to depend on the amount delivered. Two school pupils have been hired to deliver the purchases between 3 and 7 p.m. three days a week.

#### The future

Besides continuing its activities with baggage equipment for bicycles and the delivery scheme, the municipality of Præstø plans to improve parking conditions for cyclists and at the same time to improve road conditions at spots where conditions are perceived as unsafe by cyclists.

# Safe cycling in Herning

#### Town and background

The municipality of Herning has close to 58,000 inhabitants. Founded a century ago, Herning is a relatively new town. It is dominated by its textile industry and is the largest trade fair centre in Scandinavia. In the years prior to the project, traffic counts showed a fall in bicycle traffic while car traffic had increased significantly. At the same time the accident frequency for vulnerable road users had begun to increase. Today there are major congestion problems during rush hours.

#### Planning

The point of departure was the high frequency of accidents involving vulnerable road users and the heavy pollution from motor traffic. The municipality of Herning therefore set itself the goals of raising moral standards in traffic and reducing average car speeds on three roads. Other goals were to shift 5% of the trips between home and work from cars to bicycles for selected firms and to move 4% of passenger kilo-



metres from cars to bicycles, for instance, in order to reduce CO<sub>2</sub> emission. CO<sub>2</sub> problems received extensive press coverage at the start of the project.

The project was divided into two phases. First, cycle tracks were established to fill in missing links in the cycle network, thereby making it more coherent. The second phase was to get inveterate car drivers to shift to cycling, so that more people would use the cycle tracks. **Logo competition**  To start the project, a logo competition was arranged. The logo helps to make the project visible and easily recognisable. The competition helped to boost media coverage, and the project received mention at the same time as the name of the winner, Michael Møllegaard, was published.

#### New and better cycle routes

The cohesion of the cycle network has been improved by the establishment of 3 new cycle tracks in an industrial, a residential and an educational area, a total of 7,2 km of cycle tracks. The cycle tracks were inaugurated at an evnett where over 80 people cycled through the trough the routes at a sedate speed. A number of main and cable works were carried out at the same time as the cycle tracks were established.

Birk Centerpark became a beautiful road. Later a train station was established at the end of the road with a link to the town bus system. Despite a relatively large volume of pedestrian traffic the road was not provided with a footway.

A diving verge was preferred instead of a footway.



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Good friends accompany each other on H. C. Ørstedvej.



The dividing island prevents accidents with open car doors on H. C. Ørstedvej.

At H.C. Ørstedvej, several raised surfaces were established at junctions, which contributed to a marked fall in car speeds. A dividing island has been established between the parking bay and the cycle track so that car doors can be opened more safely. The cycle track is designed as a separated cyclefootway without a kerb. At bus stops, a bus-boarder ensures safer boarding and alighting.

#### New and better cycle routes

The cohesion of the cycle network has been improved by the establishment of 3 new cycle tracks in an industrial, a residential and an educational area, a total of 7.2 km of cycle tracks. The cycle tracks were inaugurated at an event where over 80 people cycled through the routes at a sedate speed. A number of main and cable works were carried out at the same time as the cycle tracks were established. The cycle tracks along Vesterholmvej have been interrupted at the side roads so that, among other things, the many trucks in the industrial area find it easier to turn. The dividing verge makes cyclists feel more secure on this road section, where speeds are quite high. Average car speeds have not changed on Vesterholmvej.

#### Cyclist morals in traffic

10-15% of cyclists violate the Road Traffic Act at a normal signalised junction. Herning Police have carried out ongoing control of car speeds and traffic violations by cyclists. Neither the establishment of cycle tracks or police checks have resulted in changes in the number cyclists violating the Road Traffic Act.

Roller-skating in western Jutland – on Vesterholmvej.







Questionnaire to the employees.

#### **Employee bikes**

171 inveterate car drivers in Herning have chosen to leave the car at home and borrow an employee bike when travelling to and from work. Employee bikes have been introduced in 7 firms in Herning. The concept for introducing employee bikes was largely formulated by the Municipality of Herning and Herning Central Hospital, which was the first workplace to introduce employee bikes.

To begin with, an agreement was concluded with the workplace about how many bicycles they wanted to buy. The project and the workplace each paid half the price of the bicycles. These are 5-gear city bikes painted in the colours of the logo of the workplace.



Employees who wish to use an employee bike are found on the basis of a questionnaire. Typically, the firm's internal newsletter or paper publishes a notice about the questionnaire, which brings the response percentage to over 50%. In order to borrow a bicycle the employee must be a car driver and have between 2 and 8 km to work.

5-20% of the car drivers was interested in an employee bike, and men and women are equally interested. If there are more employees interested than there are bicycles, lots are drawn. The employee can buy the bicycle for DKK 500 after one year. If it turns out that an employee only uses the bicycle rarely, it will be given to another employee.

A service agreement means that the employee almost always has a bicycle ready for use. After repair, the bicycle shop normally returns the bicycle to the firm on the same day. Service under the agreement is paid for by the firm.

Employee bikes at Customs & Tax.



Interview of employee cyclist.

The handing over of employee bikes to the staff takes place with the greatest possible media coverage to give the participating firms and institutions a green and healthy image. At the same time this gives the local authorities an opportunity to tell the citizens that they are making an effort to reduce pollution from car traffic. A number of press conferences have been held and press statements issued. And the press has, in fact, published a lot of articles, interviews etc, about employee bikes. Leisure cycling among employee cyclists has tripled. If employee

bikes were introduced in all firms

and institutions in Herning, this initiative alone would almost fulfil the goal of shifting 4% of passenger kilometres from cars to bicycles.

Experience from Herning Central Hospital shows that an increasing number of employees wish to have bicycles. The experiment has thus proved to have started a positive development. A brochure about the results from Herning Central Hospital and Job Training Centre has been given to all employees at workplaces in Herning with a staff of more than 50 employees. This got another 4 workplaces to join the project. It takes about one and a half months from the first contact with the workplace until the employees have started to use the bicycles. Employee bikes must be considered as a cost-efficient measure. At the beginning of the project an attempt was made to get the workplaces to formulate transport action plans, but this was rejected by workplaces as too time-consuming.

Firm	No. of employee bikes	New bicycle km/day	Transferred car trafic
Herning Central Hospital	100	1,119	4%
Job Traning Center	11	78	6%
Trade Fair Center	13	145	8%
Cimbria Herning Ltd.	11	55	6%
Erik Roug Ltd.	16	160	6%
Customs & Tax	10	138	9%
Herning Congress Center	10	_	-

# **Odense – Denmark's National Cyclecity**

#### Town and background

With its 185,000 inhabitants the municipality of Odense has a long tradition of planning for cyclists. More than one in every four trips in Odense is by bicycle. The main cycle network is well developed and comprises more than 350 km of cycle tracks and paths. In addition, there are internal paths in residential areas and minor recreational paths.

Together with the increasing number of cyclists, the road safety of the individual cyclist in Odense has been significantly improved over the last 10 years.

#### Planning

The well-developed cycle network means that further investments in cycle track and paths etc, will yield only limited results. The role of the traffic planner has therefore changed from providing a good infrastructure to a broad portfolio of tasks, including campaigns, co-ordination, schemes etc.

By bringing together experiments on how to influence choice of transport, accumulate knowledge about choice of transport, road safety and testing new initiatives in one city a National Cyclecity - a shop window for bicycle traffic has been

established. The project takes its point of departure in the fact that it is the individual who chooses his/her transport mode.

In Odense, the idea is that 5 factors influence the distribution between bicycle and car traffic:

- The house in which people live
- The man, the individual and his social relations
- The horse, transport mode, the bicycle
- The road, the infrastructure, roads and paths
- The field, destinations, eg work and shopping



MAP: Municipality of Odense

Cycle network plan, Municipality of Odense, 1997



Poster - Ride bike, Odense is ready.

The cyclecity is founded on about 50 subprojects, each of which has a certain weight in relation to 3 development stages, namely *knowledge*, *known methods* and *laboratory*.

*Knowledge* covers the collection, analysis and processing of information with a view to improving the knowledge basis for the other projects.

*Known methods* cover wholly or partly tested and evaluated initiatives, which are incorporated in new contexts.

The *laboratory* covers initiatives that have never, or only to a limited extent, been tested.

Not all subprojects are necessarily implemented. New subprojects may be added and implemented. The major part of the subprojects takes place in the laboratory. 6 subprojects will be described in more detail in the following. Data from emergency wards Traffic behaviour of cyclists Studies on transport surveys Registration of stops on routes The Parks and Roads Department internally The effect of cycle tracks on the number of cyclists Development of the cycle network Cycling in pedestrian streets Cycle-to-work campaign Traffic and parking plan Safe cycle routes Park-and-bike

**Bicycle day** Cycle events **Commuter bikes Transport solutions** Bicycle parking in the city centre Influencing attitudes and campaigns Workplace visits, transport plans etc Car-free residential area/association/district Cycle route map in waiting-rooms, bicycle shops etc Physical improvements and shortcuts - "Give & Take" Slot machines with equipment and compressed air More visible cycle routes in the centre of Odense Police bikes and doctors' bicycles Changed parking standards etc Cyclist of the year in Odense Loaning out bicycle trailers VIP bicycle parking Tour de France Better bicycles

Mobility centre High speed cycle routes Replacement of access barriers Easier passage at priority junctions Lights on bollards for green wave for cyclists Company bikes with service concept Tax rules for employee bikes Road maintenance quality Safer priority junctions Mobility insurance Bicycle service Bicycle taxis

LABORATORY

SUOHLEIM NIVONN

KNOWLEDGE





Sketch of the square at Asylgade.

SKETCH: Municipality of Odense

#### Information strategy

Extensive communication to and from the project via the internet, TV, radio, newspapers, magazines, newsletters and lectures is in itself an effective way of putting bicycle traffic on the agenda. The general public, journalists, traffic planners etc, are continuously fed with new stories and information.

#### Bicycle parking in the city centre

Parking facilities for cyclists in the centre of Odense are being developed step by step. In 1999, for instance, a square at Asylgade was converted from car parking to bicycle parking, creating an attractive, beautifully designed urban environment. The square is located close to the newly established ring of cycle routes in the city centre.

A module system of automated bicycle parks will be established at several sites in the city centre, although its financing through user payment and advertisements may raise problems for the scheme.



Plates on cycle route.

#### Making cycle routes more visible

On the main cycle routes in the centre of Odense, plates bearing a bicycle route symbol have been inlaid in the pavement at all junctions. The plates are intended to promote bicycle traffic and make it easier for cyclists to find their way around in the central streets of the city.



The fascinating Trial show on the bicycle day in Odense 1999.

#### **Bicycle day**

On a rainy day in June, the annual bicycle day was held with an exhibition of both conventional bicycles and less conventional bicycles, such as electric bicycles, half bicycles, carrier bicycles and of bicycle trailers. One of the main attractions was the Trial show by Martin Mikkelsen and the European champion Henrik Rivold.

In a fun draw, with children acting as goddesses of fortune, eight lucky participants won a bicycle in the day's competition. The bicycles were donated by the exhibitors. At least 450 people visited the event.

#### **Mobility centre**

The mobility centre opened on 1

October 1999. Its purpose is to promote pro-environmental transport behaviour. One of the main tasks is to promote car-sharing, while another is to establish a regional centre to co-ordinate and harmonise commuting and commercial passenger transport.

The centre will also be a publicly accessible service function which informs and gives advice on less environmentally burdensome forms of transport. The various transport proposals are to be made more individually oriented so that the individual road user/customer is offered a personal package solution.

**Experiments at priority junctions** In close co-operation with the Road Directorate, experiments are being carried out at priority T-junctions on roads with mixed traffic. 5 junctions will be converted into mini-roundabouts. At 15 junctions, a cycle lane is to be established over the last 20-40 m before the junction and 10 m after the junction, while the junction area is provided with a harlequin pattern.

Behavioural studies before and after reconstruction of the junctions will form the basis for an evaluation of the safety effect.

#### The future

The goal for Odense is to be the best cyclecity in Europe. Hopefully, the many projects will make more people use their bicycles and lead to a reduction in the incidence of bicycle accidents. The inhabitants of Odense, according to what they themselves say, are experiencing their city as a better place for cycling, and this gives them a greater sense of well-being and satisfaction.

In order to strengthen the evaluation of the project, a Ph.d. student has been attached to the project. With its many new initiatives for promoting more and safer bicycle traffic, the project will contribute much valuable new knowledge.



Is Odense going to be the best cyclecity in Europe?

### Safer cycling in Randers



#### Town and background

The municipality of Randers has a population of some 62.000 inhabitants. The town on Randers Fiord and the river Gudenåen has two links across the water for cyclists and one for motorists, which means that traffic is concentrated on a few roads near the centre. On the steep hills, cyclists can be seen moving at high speeds. People in Randers use their bicycles for one out of every five trips. The police have recorded approx. 120 injured persons in traffic per year in the municipality of Randers, about 30 of whom are cyclists.

#### Planning

The project was a large-scale experiment with certain forms of marking at bus stops and at junctions. Prior to the project the markings had been tested in a few places at other locations in Denmark. The project was carried out in co-operation with the Road Directorate, Århus County, Randers Police, the Danish Cyclists Federation and the municipality of Randers. The marking pro-

#### Randersbro in the centre of Randers.

ject places a focus on the "meeting" between cyclists and other road users. In 1995-97, 120 bus stops, 18 signalised junctions and 115 priority junctions were marked. As a result of this very comprehensive project a reduction in the total number of accidents involving cyclists may be expected.

#### **Signalised junctions**

Stop lines for cars in all traffic lanes have been recessed 5 m in relation to the stop line for cyclists, enabling motorists to keep a better eye on cyclists from the beginning of the green phase. This has made it possible for an extra car to turn left in each yellow/red phase when clearing the junction during peak hours.

The rumble strips on the cycle tracks ensure that at first cyclists come closer to the cars to make road users more aware of each oth-



Truncated cycle track continued in a cycle lane.



Busy traffic at priority junction with interrupted cycle track.

er. Then the rumble strips make cyclists keep to the right side of the cycle track, thus increasing their distance from cars turning right. An international cycle crossing is marked in the junction area.

Owing to detectors for controlling the traffic lights, the stop line has in some places been recessed only 3 m. It takes two men 5-6 hours to mark an entry and costs DKK 3,500, excluding milling the existing marking and removing the detectors. It costs DKK 4-5,000 to move detectors in an entry. Behavioural studies show that speeds have been reduced by 11% among cyclists who do not have to stop at red. It must be expected that these reduced speeds will make cyclists more visible for motorists. No changes in the behaviour of motorists have been recorded. They were thus just as bad/good at paying consideration to cyclists before as after the new marking.

#### **Priority junctions**

In continuation of the cycle track, bicycle symbols and international cycle crossings have been marked at side roads without speed-reducing exits. Just as at signalised junctions a slalom lane of rumble strips has been marked. This first takes the cyclist close to cars – then further away. It takes two men 5-6 hours to traffic sign at a side road and costs DKK 3,500, excluding milling, which costs DKK 500. Behavioural studies show a clear improvement in motorist behaviour - they are much better at observing their duty to give way and more rarely drive through the junction without a reaction.

On side roads with speed-reducing exits, for instance, a continuous cycle track, harlequin patterns are used instead of cycle crossings and bicycle symbols. The pattern is a further warning of conflict between cyclists and motorists. Experience has shown that the harlequin pattern marked with 4 mm of thermoplastic is exposed to wear by motor vehicles so that after six months it does not feel uncomfortable for cyclists to cross it, but complaints may be expected initially. On side roads with less than 300-500 cars per day,



The Harlequin pattern is very visible.



Zebra crossings guide bus passengers across the cycle track and accentuate give-way conditions.

it is sufficient to paint the harlequin pattern. 3M tape is destroyed by large vehicles and should not be used for the harlequin pattern. It takes 5-6 hours for two men to mark with thermoplastic and costs DKK 4,000. The harlequin pattern can be easily seen in the dark and clearly shows the location of the side road.

#### Bus stops

At all bus stops in the town of Randers where there is a cycle track but no bus-boarder, the cycle tracks were marked with zebra crossings and rumble strips in thermoplastic. Three zebra crossings at the doors of the bus steer the bus passengers to and from the footway. The rumble strips make cyclists keep to the right and thereby increase the distance to boarding and alighting bus passengers. A stop line reminds the cyclists that they have a duty to give way.

It takes about 2 hours to mark a bus stop and costs DKK 2,000. If the strips are laid out in frosty weather, there is a risk of condensation under the marking compound, which will therefore come loose in the spring. Winter maintenance should be handled with a sweeping machine. A snow plough could otherwise easily remove all the rumble strips.

Information was given about the project in the local newspapers. Road posters were also displayed. Posters showing the markings at bus stops were distributed to schools together with leaflets illustrating the 4 types of markings at bus stops and junctions. Sign boards with information about markings at bus stops were hung up in buses.

Almost 500 stop interviews with bus passengers and cyclists showed that the markings gave 42% a

Two men for two hours and the marking of a bus stop is finished.





Students performed the stop interviews.

**Questionnaire study** 

All 30,000 households in the municipality of Randers received a leaflet about the project in October 1996. The leaflet contained a questionnaire, which was answered by 1,847 persons. The low percentage of replies means that they should be interpreted with some caution.

Almost all the respondents had noticed one or more of the markings. 70% believed that both they and their fellow road users have changed their behaviour at places with markings. 9 out of 10 found that they improve road safety, and 94% thought that they should be introduced in other towns. In order to increase the percentage of replies, the respondents had the opportunity to participate in a competition for a bicycle and accessories.

#### The future

A study of road safety will be carried out in the year 2001, when accident statistics for 3 years after the new markings will be available.

greater sense of security. 60% had noticed the campaign about new markings at bus stops. 3 out of 4 knew that cyclists had to give way to boarding and alighting bus passengers. Only 23% of the road users believed that the markings had changed their behaviour at bus stops, while only 13% had noticed a change in the behaviour of other road users. Most pedestrians and cyclists prefer bus stops with a busboarder.

The winner of the competition won a bicycle and a bicycle helmet.

Municipality of Randers





# Inauguration of the new cycle path and bridge.

and a high perception of risk by cyclists. Despite the fact that cyclists have been given low priority for many years, bicycles are extensively used. The goals for the project were thus to improve the safety of cyclists by reducing the number of injuries by 5% per year, to increase bicycle traffic by 10% over 3 years and to give cyclists a greater sense of security in traffic.

The project was realised in the form of an improvement of the cycle route between Svendborg and Thurø, which had been perceived as very unsafe and exposed to accidents. In addition, a number of campaign activities were arranged.

#### **Cyclist studies**

Questionnaire studies concerning, for instance, choice of transport, choice of cycle route, the identification of places where there was a high perception of risk and reasons for this perception, and proposals for improvements for cyclists were

## Svendborg Safe Cycle Town

Town and background

The municipality of Svendborg has about 42,000 inhabitants. Svendborg is the retail trade centre of south Funen and is situated in a beautiful hilly landscape on Svendborg Sound. Prior to the project "Safe Cycle Town", several of the town's central squares and streets were redesigned, which has reduced car traffic in the town centre. In Svendborg more than one out of every four trips is by bicycle.

#### Planning

The point of departure was an unacceptably low level of road safety, poor road maintenance and paths Identification of cyclists' perceived risk in Svendborg 1999.







Collision diagram for junction before reconstruction.

New signs and more secure cyclists.

There is great coincidence between cyclist route choices on trips to and from school/work and trips in their leisure time. Despite this, the background for the choice of route is different inasmuch as the shortest route has first priority when it comes to trips to work whereas the most beautiful route is chosen for cycle trips during leisure time.

Risk perception among cyclists is primarily caused by high car speeds and heavy traffic. Poor pavements on roads and paths and many trucks also have a strong impact on cyclists' sense of security. Both in 1994 and in 1999 cyclists especially wanted more cycle tracks and paths, and they believed that such facilities are the most important factor in improving road safety.

#### Svendborg-Thurø cycle route

The cycle route between Svendborg and Thurø posed four special problems. Cyclists were mixed with cars on the causeway and bridge to Thurø. This was remedied by the

carried out in 1994 and 1999. The questionnaire was each time answered by about 1,000 members of the Danish Society for the Conservation of Nature and the Danish Cyclists Federation.

On the basis of the replies in 1994, cyclist route choices were recorded on digital maps. The traffic figures that emerged can be used to make a comparative analysis of the various routes chosen. By comparing a few bicycle counts with the digital map, traffic volumes on all roads and paths can be described. The study can also be used to predict the use of new cycle routes. Some cyclists still – illegally – turn using the left-turn lane at the junction of Nordre Havnevej with Nyborgvej and Østre Havnevej.





The path in the harbour and through the forest is a delightful experience on bicycle.

building of a foot and cycle bridge and by widening the causeway. At the same time the dilapidated old bridge was renovated.

Another problem was the junction of Nordre Havnevej with Nyborgvej and Østre Havnevej, where cyclists felt at risk and where many bicycle accidents occurred, especially with cyclists turning to the left. This was remedied by establishing cyclist signals and a short cycle track. However, the cycle track was too short so that some of the cyclists still used the carriageway and the traffic lights for cars.

The third problem was that cars and bicycles on Østre Havnevej were not separated. After some disputes with the harbour committee a nextbest solution was arrived at, namely cycle lanes.

On the path in the harbour and through the forest the route had a gravel pavement and no lighting. The new asphalt pavement and the lighting of the path made it possible to use the route in all weathers and

Cyclists received a warm welcome outside the baker.





at all hours - under far more comfortable conditions. A section of the cycle route passes along one of the best beaches of southern Funen. A comparison between the cyclist studies from 1994 and 1999 shows a significant fall in the number of cyclists who feel at risk on the cycle route, especially on the bridge to Thurø, at the dangerous junction and on Østre Havnevej. Telephone interviews before and after establishment of the route showed that the number of cyclists was unchanged. Even thought the cycle route has not made people change mode of transport, the route has attracted cyclists from other roads and paths. Therefore more people cycle on the route.

#### Com a puter on your bike

In May 1996 the Com en' puter on your bike campaign, targeting people over 18 in the municipality was carried out. The idea was to motivate people by giving them a cycle computer if they cycled not less than 250 km in the month of May. The Danish Cyclists Federation and the Danish Society for the Conservation of Nature arranged several cycle trips in support of the campaign. The press coverage was good, as the regional newspaper



The winner of Com a puter on your bike.

Fyns Amtsavis followed five of the participants.

Despite bad weather, 446 Svendborgians participated, and 373 received a free computer. The total number of kilometres cycled was equivalent to three times round the earth. The 67-year-old winner cycled 2,363 km.

#### Mobile without a car

The Mobile without a car campaign was held on a September weekend in 1999. About 400 people came to the Centre Square, where several activities and competitions were arranged, eg cycling at the ring, banana cycling, HPVs etc. The production folk high school served delicacies from Funen and thus set focus on the transport advantages of using local products. A wall newspaper in which citizens could express their views on traffic in Svendborg worked well. The event also dealt with the topics of animals killed in traffic and exhaust gases from cars.

In addition, the campaign included free ferry trips and free rides on town buses and trains. On Sunday

about 600 cyclists and pedestrians were given free rolls, and folders on the pro-environmental use of cars were handed out to car drivers outside 4 of the town's baker's shops. As the bakers did not wish to discriminate between people, the rolls and folders were distributed outside the shops.

#### Company and employee bikes

In connection with the We cycle to work campaign the local authorities distributed a folder in 1999 to the

51 new company and employee bikes ready for use.

200 largest workplaces in the municipality of Svendborg, offering company and employee bikes at half price. A member of staff was employed on the project for a week to telephone the firms and awaken their interest. Nevertheless only 12 workplaces reacted positively, buying a total of 51 bicycles.

Among the good arguments in the folder for company and employee bikes were happy and healthy employees, environmental and economic benefits, speedy transport in town and a green image. For instance, reference was made to a study from Saab-Scania where nonphysically active employees had 30 days lost through sickness per year while those physically active only had 8 days annually.

Car commuters who cycled to and from work 4 out of 5 days a week were given a free employee bike. The company bike was transferred to the firm at half price if it had been used for at least 350 km within 12 weeks.

The municipality of Svendborg spent a total of about 150 hours on the company and employee bikes project.

