



ARTICLE FROM THE BOOK:

Cyclists & Cycling Around the World – Creating Liveable and Bikeable Cities

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Published by Fondo Editorial, Pontificia Universidad Católica del Perú, 2013

ISBN: 978-612-4146-55-8

Planning a Cycling Infrastructure - Copenhagen - city of cyclists

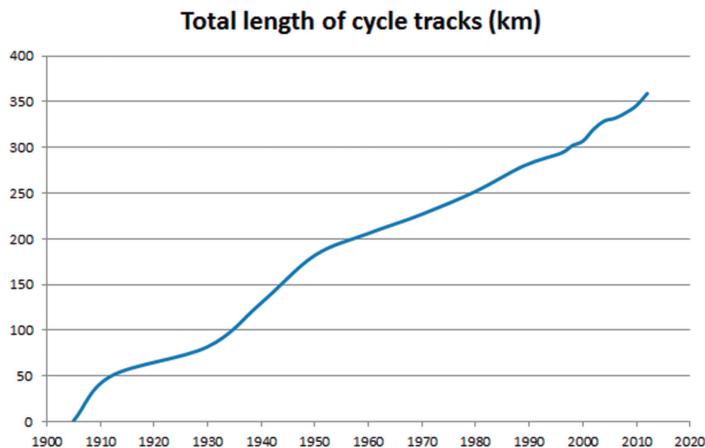
By Niels Jensen, planner, Cycle Secretariat, City of Copenhagen

The simple principle for Copenhagen cycling infrastructure for more than 100 years has been to establish one-way cycle tracks on both sides of all major roads. Cyclists are allotted their own high standard area next to the pavement/sidewalk. Cars are parked on the outside of the tracks (in opposition to what is common in US cities). With a growing interest in cycle planning, this design principle has internationally been baptised "Copenhagenize".

The cycle tracks are the backbone of our cycling infrastructure. In recent years, the emphasis has been on developing safe and secure solutions for cyclists which allow them ease of passage in the intersections.



Traditional Copenhagen cycle track, showing the two kerbs which separate cyclists from both pedestrians and cars.



■ Development of cycle tracks in Copenhagen. New tracks have been added at a surprisingly consistent speed for 100 years.

The very first cycle track in Copenhagen was established in 1905. In the beginning, the main purpose was to offer the cyclists an even surface (in contrast to the cobblestones on the road). A decade later it served as protection from “our new enemy, the car”, as the Danish Cyclist Federation put it.

Here, I'll concentrate on what happened with cycle tracks (using the street Nørrebrogade as an example), planning and policies from the 1950s when cycling peaked in Copenhagen, during the car boom in the 1960s hitting an absolute minimum in bicycle traffic in the 1970s up to the present situation with a new bicycle boom in Copenhagen.

Encouragement of cycling in Copenhagen includes carrots, sticks and tambourines. The Copenhagen cycle tracks are the backbone of the cycling infrastructure and thus the biggest carrot. The green cycle routes offer an alternative to cycling along the major roads. The possibility of taking your bicycle for free any time on the local S-trains supports a car free lifestyle. The most recent initiative is “Cycle Super Highways” linking Copenhagen cycling infrastructure with surrounding suburbs.

A flashback to the 1950s

Nearly half of the present cycle tracks in Copenhagen had already been established as early as sometime between 1945 and 1950, as cycle traffic peaked.

On the busiest streets in downtown Copenhagen, like Nørrebrogade, there were no cycle tracks, as the cyclists were so numerous that, in the 50s, they more or less filled the road and dictated the speed of the few cars.

When the car boom hit Copenhagen

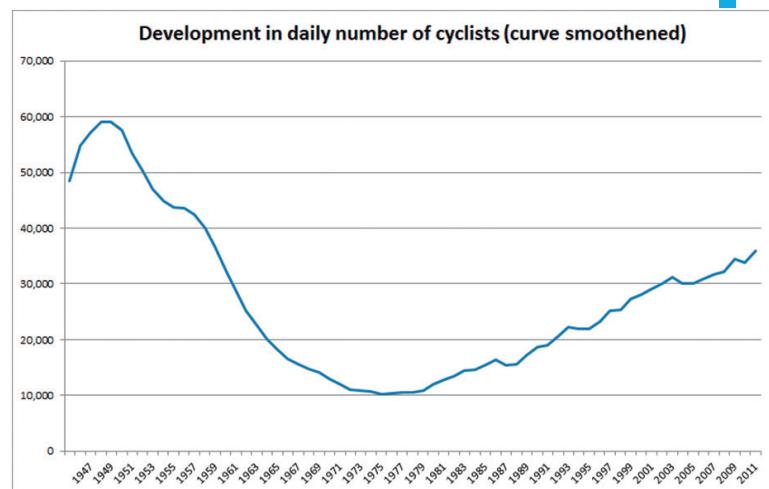
In contrast to many other European and especially American cities, the car boom came late to Copenhagen, not really arriving until the 60s. I remember how people in our street in downtown Copenhagen bought cars and proudly polished them every Sunday! My street was changed into a one-way street and I had to make detours when moving around on my bicycle.

Eventually, all traffic planning in Copenhagen was about car traffic. Many minor streets became one-way streets not only for cars, but also for cyclists. Cycle tracks were shortened at intersections to increase intersection capacity for car traffic. Fortunately, the cycle tracks on the sections were not removed in Copenhagen. And luckily, the shortened cycle tracks proved to be relatively safe.

All this and heavy car traffic meant that cyclists felt unsafe and not welcome. Even though cycling lost a lot of 'street cred' and social acceptance, many Copenhageners quietly kept on cycling and tried to survive in a dangerous traffic environment dominated by cars. Many who could afford a house in the suburbs – including my family – moved out of

Nørrebrogade in the 1950s. Lots of cyclists, no cycle tracks, very few cars. The trams and the cyclists ruled the pace of traffic.
Photo: City Engineers Archive, Copenhagen

Cycling in Copenhagen peaked between 1945 and 1950. Numbers from Nørrebrogade.



town. Traffic congestion increased. Roads were widened and plans for motorways into the very centre were made.

The oil crisis in 1973 was a wake-up-call, which resulted in car free Sundays. This demonstrated how pleasant Copenhagen could be without cars. There were many protests against the motorway plans – and maybe more influential – a financial crisis, both of which meant that neither the national government nor the City of Copenhagen could afford the huge expense. That rescued Copenhagen from being completely destroyed by cars.

Huge cyclists' demonstrations around 1980

In the late 1970s, The Danish Cyclist Federation woke up and arranged demonstrations – basically demanding more cycle tracks. The success was overwhelming and the support from ordinary citizens was massive. Even my parents participated.

The demonstrations addressed both the City Hall and the national parliament, the latter resulting in an investigation into the possibilities of a revitalisation of cycling in Denmark. The point was made very strongly in a film ("Bikepower") which the chairman of the cycling committee created in his spare time: if Amsterdam could provide a bicycle friendly environment, why couldn't Copenhagen also?

Even though Copenhagen politicians were forced into realising that something had to be done, the engineers in the Copenhagen Road Office did what they could to avoid any changes. The head of the Road Office stated that the administration would not work out a plan for cycle tracks for which there was no use! Therefore the Cyclist Federation itself developed a plan for cycle tracks. The municipal planners reluctantly developed it further after pressure from a cycling friendly deputy traffic mayor. But in the end the political majority dropped it, for reasons which were not very clear.

The cycle track plan ended its life in a drawer in the Road Office. But for a couple of decades, it showed that this "drawer plan" was much better than no plan!

Mainstreaming cycling including Nørrebrogade cycle tracks

After massive pressure, cycle tracks were established along Nørrebrogade for the first time in 1982. This was a very difficult task and a turning point in how to address cyclists' problems. Room for two cycle tracks (2 x 2m) was taken from car parking on one side of the street and another 1m was taken from the pavement on both sides of the street. So pedestrians partly paid the price to make room for cyclists!



Cyclist demonstration in Copenhagen around 1980. Tens of thousands of citizens confronting the mayor, ringing their bells and demanding better conditions for cyclists.
Photo: Søren Svendsen

Nørrebrogade first generation cycle tracks being established in 1982.



In the City Council, everyone was now in favour of new cycle tracks, at least in principle. Consensus had gradually developed into an understanding that Copenhagen should be a "city of cyclists". Cycling had again become socially acceptable and cycle planning was mainstreamed.

The first official Cycle Track Priority Plan was agreed upon in 1997. Very sparse financing was available for establishing new infrastructure. In the long run however, it showed once again that planning paid off.

The cycling initiatives now however, were being promoted by the civil servants – not so much by the politicians in the Council – who of course approved both concrete plans and even a "Cycle Policy 2002–12". It took three internal drafts until the Road Office dared to send it to the politicians. The main reason was that it included an ambitious goal of



The Cycle Track Priority Plan in Cycle Policy 2002–12, planning for 51 km of cycle tracks. In 2002, 307km of cycle tracks and 9km of cycle lanes were already in place.

40 % bicycle modal share in commuting by 2012. However, it was passed in the Council without comments!

Shortly afterwards, a delegation of some eight Copenhagen cycle planners visited colleagues in Dutch cities, some of whom had recently given up quantitative goals for cycling modal share – a bit worrying!

The Bicycle Account:

In 1996, the Bicycle Account for 1995 was introduced as part of the material participants received at the 1996 Car Free Cities conference in Copenhagen. It is believed to be the world's first bicycle account.

The next account was for 1996 and since then it was never discussed internally whether or not the biannual series of accounts should be continued. It proved very useful to citizens, politicians and the press. Somewhat surprisingly, it gave a positive focus on cycling internally in the administration. The Account presented citizens' and cyclists' view on cycling conditions, facts on the development of cycling infrastructure, accidents and other key figures. Later, it also followed up on the goals from the Cycle Policy and other policy blueprints.

The series of Bicycle Accounts shows that the bicycle share in commuting developed from an initial 30% in 1996 to 36% in 2010. Whether or not we will reach the original goal of 40% in 2012 we will not know until the end of 2012. We now have a current, politically ambitious goal of a 50% cycling share by 2015. The former goal of a 40% cycling share in Copenhagen commuting may be possible to reach using "carrots" only, but this is probably not the case with the present goal of a 50% share. In my opinion, you need "sticks/whips" as well to reach that goal – not to forget the tambourines!

By the way, our definition of cycling share of commuting is a little tricky, since we are focussing especially on reducing rush hour car traffic: commuting to workplaces and educational institutions situated within the borders of the City of Copenhagen. An alternative focus on what the Copenhagen citizens do, would present a much higher cycling share in the modal split for commuting.

It was a goal in the Cycle Policy to increase cycling travelling speed by 10%. The idea was to focus on the competitiveness of the bicycle as a form of transport, as opposed to always talking about accidents! At the time when the goal was set, the initial travelling speed was not known and a method was developed for measuring it using GPS technique. In the Bicycle Account the development in travelling speed can be followed from 15.3 km/h in 2004, through 16.0 and a promising 16.2 in 2008, to a disappointing 15.8 in 2010, heading towards 16.8 km/h in 2012. Hopefully, you can see what we achieved in the next Bicycle Account which will be published in 2013.

The Bicycle Account has always included the cyclists' feeling of safety. Recently, safety as such has also been included as a goal – an important one, but not the only one.

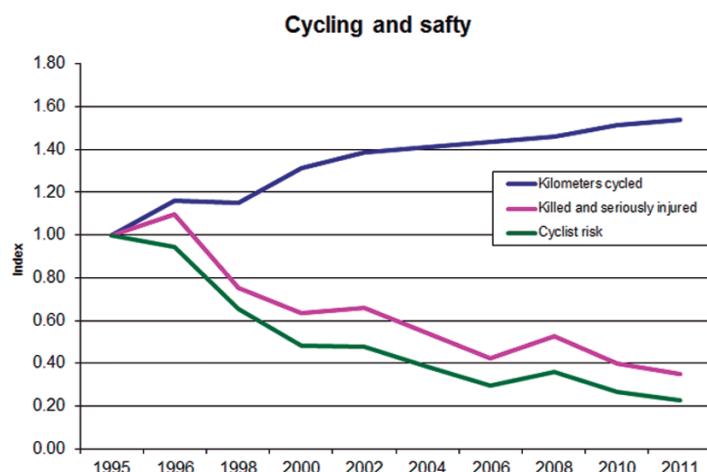
Why establish more cycle tracks?

During the 1990s and the beginning of 00s, cycle tracks were established slowly in Copenhagen, as financing was scarce. I always disliked cycle lanes, as they only mark the cycle area with a white line. Nevertheless I ended up suggesting we tried them out. My bosses were against it in the beginning, but on the other hand lanes are cheap, and in the end it was backed up by the administration and decided by the politicians to mark cycle lanes along five major roads in the inner city. I think the lanes proved better than nothing. These days we are updating the original cycle lanes to proper cycle tracks on most of the five roads.



Safe and secure intersections in Copenhagen also allow easy passage for cyclists. This design shown uses a 1.5m wide cycle lane while another design takes the cycle track right to the stopline.

Development in risk for cyclists in Copenhagen, the more cyclists the lower the individual risk (and even fewer accidents).



The overwhelming demand is still for more cycle tracks. Ask the citizens, the planners and the politicians. Experience has shown that you can't kill the cycle track, even though a couple of Danish accident analyses have shown that establishing cycle tracks may be dangerous to cyclists. If the narrow sighted premises for these investigations were accepted, the result would be that cycle tracks should not be established or at least be shortened at intersections; the philosophy being that "planning by fear" will keep cyclists on their toes in the intersections so to speak.

Cycle tracks, designed so cyclists are safe, feel safe and can maintain a high travelling speed, are what is necessary to convince more citizens to cycle. Experience in Copenhagen has shown, that the more cyclists there are, the higher the safety. Therefore we continue to build more cycle tracks.

It is only true that cycle tracks may be dangerous if you do nothing to prevent accidents in the intersections. These design problems can be solved with a toolbox of solutions including blue cycle crossings, withdrawn stoplines for cars and pre-green for cyclists.

My conclusion, based on my experience in Copenhagen, is that cycle tracks are necessary to encourage cycling and when a "critical mass" of cyclists has been achieved, it makes car drivers realise that they may expect cyclists to be around any time. A win-win situation for cycling.

New and stronger political focus on cycling from 2006

In late 2005, for the first time, an election campaign for the Copenhagen City Council was run partly on better conditions for cyclists. The two politicians mostly involved in the cycling campaigns were elected as Lord Mayor and Deputy Mayor for the Technical and Environmental Administration.

When in office, the deputy mayor invented the "Eco-Metropolis. Our vision for Copenhagen 2015". It included 11 goals, 3 of which affect cycling. The vision focuses on environmental issues and city quality issues and acknowledges that cycling contributes to the city qualities of Copenhagen.

One of the cycling goals was that Copenhagen should aim at getting a 50% bicycle share in commuting to workplaces and educational institutions in Copenhagen. This is very ambitious, as compared to the former goal of 40%. The other two goals were about safety and cyclists' feeling of safety. We should aim at a 50% reduction in accidents to reduce Killed and Seriously Injured cyclists to 59 in 2015 (KSI was 92 in 2010, according to the Bicycle Account). Also 80% of cyclists should feel safe in traffic in 2015 (as compared to 67% in 2010).

The Eco-Metropolis was driven by politicians (in contrast to the earlier civil servant driven policies). It was followed up by substantial financing of new cycling infrastructure – more “carrots” if you like.

Focus on cycle infrastructure and wider cycle tracks on Nørrebrogade

One remarkable example of better cycling infrastructure is the complete redesign of Nørrebrogade. It is not just a project which, by widening the cycle tracks, solved the cycling capacity problems with a growing number of cyclists on the narrow, first-generation cycle tracks. Pedestrians have got their space back and pavements have been widened even more on the sunny side of the street. Also buses got better conditions. No thoroughfare for cars resulted in a 50% reduction in the number of cars. The busiest part of Nørrebrogade now has 40,000 cyclists per day passing through. The first phase was finalised in the beginning of 2012 and the second phase will be realised in a couple of years.

Cycling strategy 2015

In 2009, it was decided that the intensive political focus on cycling issues and a fast growing number of projects e.g. cycle tracks and other cycling infrastructure, should be handled in a new Cycle Secretariat. Besides, the softer cycling issues too, like nursing the Copenhagen cycle culture, running campaigns etc. needed attention. Simultaneously, cycling issues are an integral part of what is dealt with in the Department of Traffic.

On the political level, a new cycling strategy 2011–25, “Good, Better, Best”, decided unanimously by the Copenhagen politicians, has replaced the outdated “Cycle Policy 2002–12”. This strategy further develops the goals from both the Cycle Policy and the Eco-Metropolis, specifically the goal that 80 % of cyclists should feel safe riding in traffic, and is still what we are aiming for by 2015. However, by 2025 it should be 90 %!

A so called “PLUSnet,” with higher standards than the existing cycle tracks is intended to update the major infrastructure and especially the cycle tracks from two to three lanes. This implies widening many existing 2.0–2.2–2.5 m wide tracks to 2.8–3.0 m. This will in time allow “social cycling” on 80 % of the PLUSnet, meaning that two can cycle abreast while a third is overtaking. Cycle tracks even wider than 3.0 m are sometimes necessary from a capacity point of view, resulting e.g. in 4.0 m width on sections of Nørrebrogade.

No city is an island

Study trips to Dutch cities especially, visitors coming to Copenhagen, conferences etc. have given a broader perspective and enabled us to better understand how Copenhagen in some respect is similar to some cities and different to others.



Nørrebrogade second generation cycle tracks (3-4m wide) established in 2011 and 12. As the blue cycle crossing indicates, the cycle tracks have been widened from the first generation standard of 2 m up to the present 3-4 m.

Cities are very dependent on government initiatives, economic incentives and bicycle friendly legislation, Road Standards etc. In Denmark, Road Standards for cycling infrastructure is fully integrated in the overall standards. But Road Standards are by nature conservative. It takes years to change them, even in bicycle friendly Denmark!

National Road Standards are the framework for how bicycle friendly cities are allowed to be. I believe that Road Standards are a national issue and they should not be the same all over, not even in Europe. An example illustrating this is a rule in the Danish Traffic Act, regulating how cyclist must turn left; first go to the opposite corner and then stop before continuing to the left. This of course influences the Danish Road Standards when it comes to intersection design. Therefore we don't use bike boxes in Copenhagen – we won't tempt cyclists to make left turns where they end up in the middle of the road in a signalized intersection.

Bicycle friendly American cities recommend more bicycle friendly solutions, challenging the national road standards in the 2011 "Urban Bikeway Design Guide". So does the Danish Cycling Embassy in the recently updated publication "Collection of Cycle Concepts 2012".



Danish left turning rule keeps cyclist to the right before turning left.

The recent Finnish publication "Best European Practices in Promoting Cycling and Walking" also offers a lot of inspiration. The "CROW Design Manual for Bicycle Traffic" (regularly updated even in English) presents Dutch style cycling infrastructure as an inspiration to others. To conclude, I suggest that you can't just copy-paste solutions but you can be inspired by others.

The ambition of the Copenhagen Cycling Strategy is to make Copenhagen the world's best cycling city. Join the friendly competition!

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