



STUDY TOUR COPENHAGEN

WEST LONDON TRANSPORT PLANNERS LEARN
FROM DANISH CYCLING & TRANSPORT INITIATIVES

REPORT OF OBSERVATIONS

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Front cover Images:

*Top left – Cycling for all ages
(www.flickr.com/photos)*

*Right – Green; Copenhagen's favourite colour
(www.cruisecopenhagen.com)*



Lessons from COPENHAGEN

Report of the Study Tour 01- 02 November 2012

Overview

This report aims to summarize a recent study tour to Copenhagen which was organized to enable engineers and planners working in West London to see what Copenhagen has achieved, and to discover how elements can be replicated.

Over the past couple of decades Copenhagen has not only won awards as one of Europe's greenest cities by reducing carbon emissions, but also is classed as one of the most attractive to visit. Much of the appeal stems from work by the City Council to make the streets safe and attractive to walk and cycle. These apply many of the ideas put forward by Jan Gehl, Professor of Urban Design, whose consultancy practice is based in the City, such as treating a street as if you were a guest at a party. Cycling now accounts for 37% of trips to work in the city, and the goal is to raise that to 50%. Many residents own a number of bikes, which they use to reach the train, and trains and offices are designed to make cycling easy.

What the group discovered was that almost all of Copenhagen's segregated cycle tracks and painted cycle lanes have been made on a politically approved project and budget. The last few years the annual budget has included a bicycle package of around 10 million Euros with a list of specific facilities in the city that has to be delivered. On top of this there are usually also other infrastructure investments that include bike facilities. For example, during the last 10 years, three cycling bridges have been financed.

In the dense part of the city and on the busy cycle routes the Danes prefer to build the segregated Copenhagen

design with a raised curb towards car traffic and also a raised curb towards pedestrians (see Figure 1 below). This design is of course more costly – but it is also much more effective in attracting cyclists. The philosophy is that you have to build cycle facilities, not just for existing cyclists, but for the not already convinced users. This is backed by the belief that the high perceived safety and comfort on a segregated solution will attract more users and be worth the money if the potential is there.

On less busy routes the Danes sometimes introduce painted bike lanes such as in Artillerivej. Often these are on the list in the initial budget “bicycle package” and changed into segregated solutions within a few years. This happens because whilst painted lanes work reasonably well, they do not really offer the comfort and safe-feeling that the more sensible bike-users are asking for.

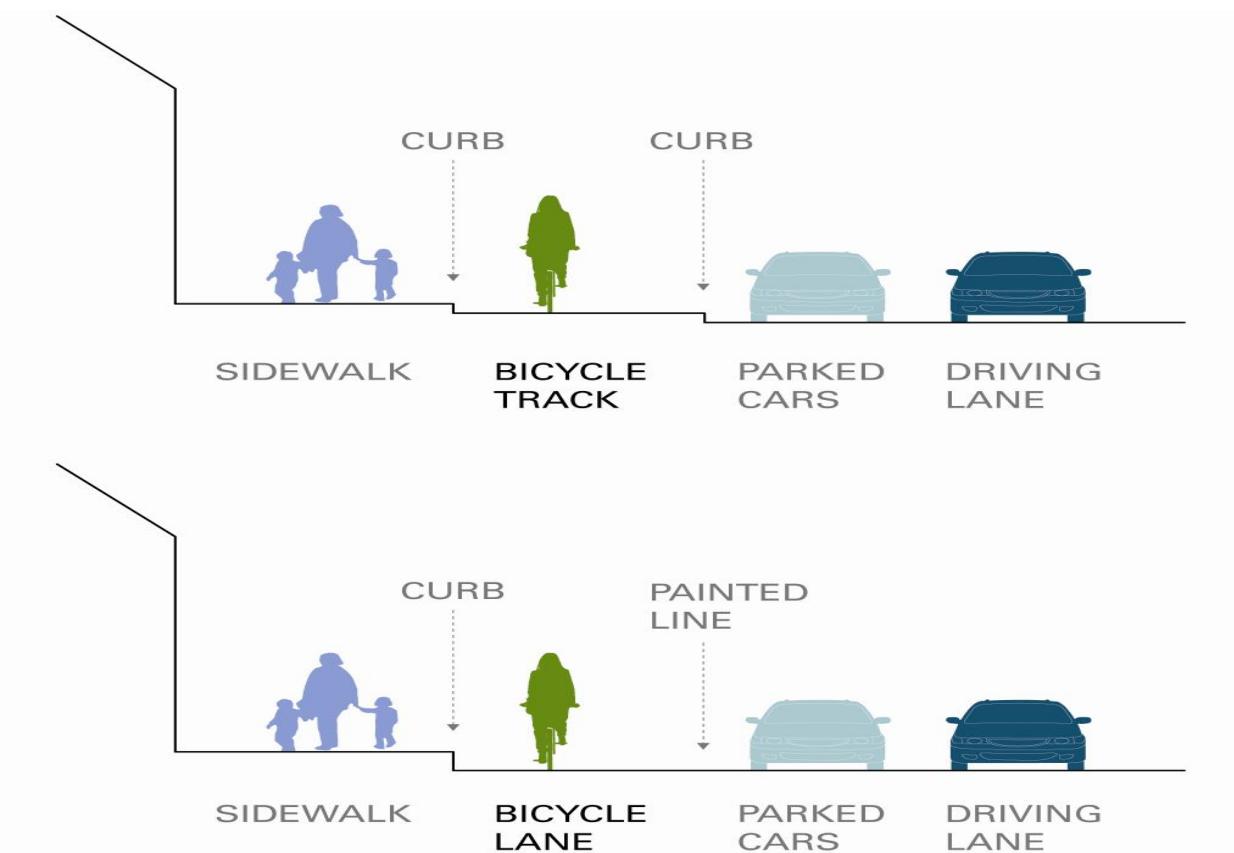


Figure 1 - The Danish Model (Illustration from Danish Cyclists federation slideshow)

1. Where does London stand?

- a. Aspiration to be a 'leading world city'
- b. Quality of life and mobility are key
- c. Commitment to 'cycling superhighways'
- d. Enjoying boost in cycling popularity on the back of Olympics and high profile 'superstars' such as Bradley Wiggins
- e. Yet as a normal mode of transport cycle mode share in UK lags far behind Europe
 - i. (UK 1.5%, Sweden and Finland 9%, Germany 10%, Denmark 18%, Netherlands 26%)
 - ii. London lags far behind Copenhagen (2% vs. 37% conurbation, and 59% in the centre)
- f. The challenges lie in the suburbs
 - i. Relatively low population densities
 - ii. Car dominated life styles
 - iii. Poor orbital public transport routes
 - iv. But most trips are quite short
- g. The obstacles are known
 - i. London Cycling Campaign's vision is to create 'world-class cycling city'
 - ii. Yet people think cycling is 'Unsafe, unwelcoming, too much effort, abnormal' (*Understanding walking and cycling*, EPSRC)
 - iii. Lots of negative press over cycle deaths in London

Cycle trips as % of total trips

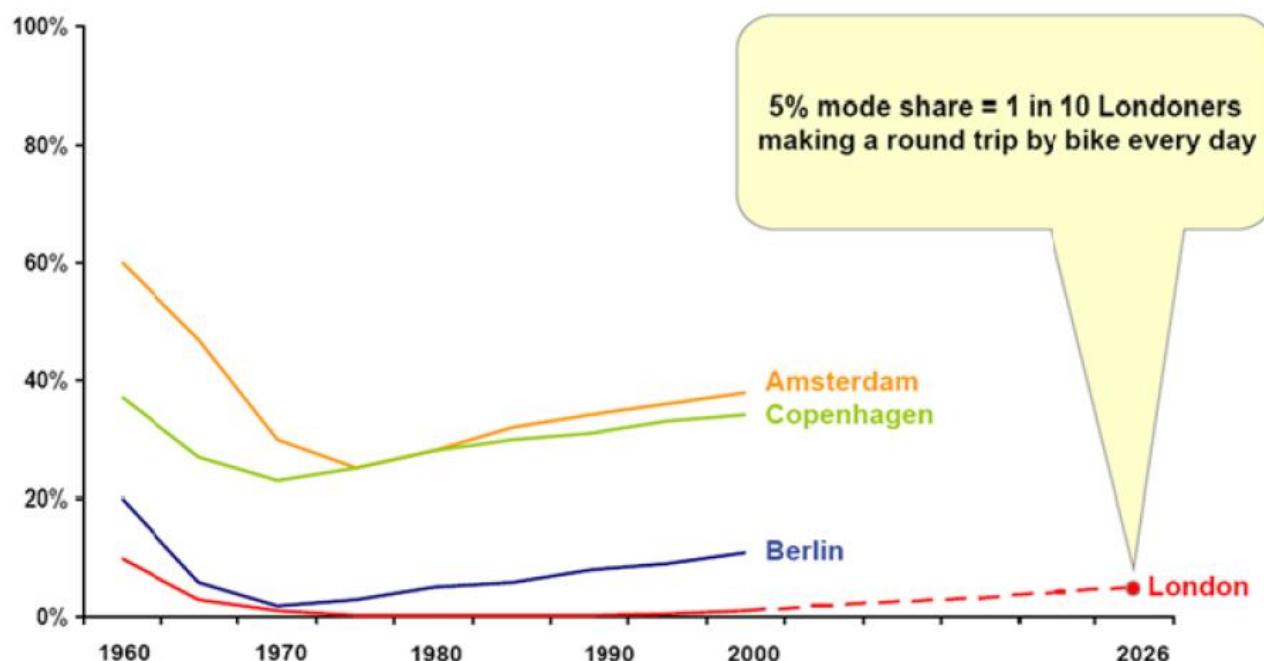


Figure 2 - London compared to other European cities (Illustration TfL)

2. Why look to Copenhagen?

- a. Main city in Denmark with 1.8m residents in Greater Copenhagen and most of the new jobs
- b. Environmental capital e.g. 65% of homes are on district heating
- c. Voted top city in the world to live (with Vancouver)
- d. Since 1968 held car use constant, while boosting cycling
- e. 'Cities for people' and Project for Public Spaces
- f. Project started in 1962 by pedestrianising part of Stroget (foot traffic accounts for 80% of movement in the inner city)
- g. Parking progressively removed and space given to people
- h. Now closely linked to Sweden and the Oresund Region
- i. Inspiring other cities e.g. Odense, New York



Figure 3 & 4 - The preferred mode of transport is cycling. People still cycle in the dark or even when it is snowing.

*(Top Illustration; Nick Falk,
URBED*

*Bottom Illustration: Jeff Risom,
GEHL Architects)*



*Figure 5 & 6 - Cycling for everyone from parent with children to the visiting tourist
(Illustrations Nicholas Falk URBED)*

3. How has cycling been made ‘normal’?

- a. Cycling is for everyone e.g. shopping with ‘cargo bikes’ (25% of families), getting to school, commuting, enjoyment
- b. People cycle in Copenhagen because it makes more sense for them
 - iv. Easy and Fast 55%
 - v. It’s more convenient 33%
 - vi. Healthy 32%
 - vii. Financial reasons 29%
 - viii. Good way to start the day 21%
 - ix. Shortest route 10%
 - x. Environment 9%

Copenhagen City of Cyclists Bicycle Account 2010 was given to the group by the Cycling Embassy on tour. The document highlights the following main points¹:

- a. Streets and public spaces enrich ‘common wealth’ and lifestyles
- b. Cycling is promoted as a ‘selling point’ for the City

¹ A PDF version of this document can be downloaded at <http://www.cycling-embassy.dk/2012/05/10/cycle-concepts2012/>

- c. ‘A bicycle friendly city is a city with more space, less noise, cleaner air, healthier cities and a better economy’ City of Copenhagen Bicycle Strategy
- d. Sixteen municipalities are working together to create Cycle Super Highways

4. What does Copenhagen do better?

- a. Ample cycle lanes protected by kerb side parking



Figure 7 - Priority (Illustration: Simon Franklin, LB Hammersmith and Fulham)

- b. Raised cycle tracks along main roads



Figure 8 – Raised tracks(Illustration: Nicholas Falk, URBED)

c. Routes through parks



Figure 9 – (Illustration: Niels Tørsløv, City of Copenhagen)

d. Priority at junctions



Figure 10 – The bike has priority. (Illustration from Copenhagen City of Cyclists Bicycle Account 2010 pg 67)

e. Motorists give way



Figure 11 - (Illustration: Simon Franklin LB Hammersmith and Fulham)

f. Consistently smooth surfaces



Figure 12, 13 - Rainwater gullies built into the curb to create a smoother, more bikeable path (illustrations from Copenhagen City of Cyclists Bicycle Account 2010 pg 66)

g. Attractive pavements

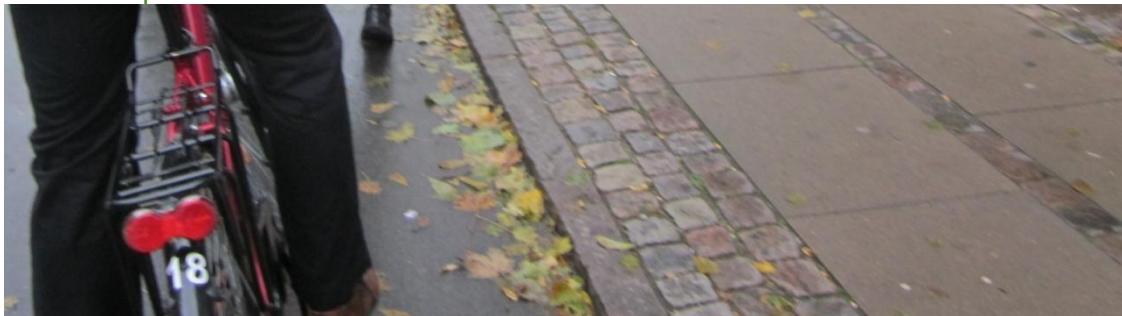


Figure 14 - (Illustration: Nicholas Falk, URBED)

h. Integrated with other modes



Figure 15 - In Copenhagen it is easy to take your bike on the train
(Illustration; Jeff Risom, Gehl Architects)

i. City design has cyclist at forefront of thinking



Figure 16, 17, 18, 19 - (Illustrations Niels Tørsløv, Director of Traffic, Copenhagen City)

- j. Promotion and support e.g. Cycling Embassy 'Come Out and About' Cycling Map



Figure 20& 21 - (Illustration: Nicholas Falk, URBED)

- k. Starting at primary school



Figure 22 - (Illustration Niels Tørsløv, City of Copenhagen)

- l. Gritting in winter prioritizes cyclists



Figure 23 - (Illustration: Niels Tørsløv, City of Copenhagen)

- m. It's not all perfect though! e.g. chaotic bike parking



Figure 24 - Amargatorv square – bikes everywhere! (Illustration: thenational.ae)

- n. Lots of dialogue in planning changes



Figure 25 - The group visits the Cycling Embassy (Illustration: Nicholas Falk, URBED)



Figure 27 - The group visit Gehl Architects (Illustration: Nicholas Falk, URBED)

5. What are the lessons for London?

- a. Start with a common challenge e.g. accident rates
- b. Promote a strong vision e.g. 'eco metropolis' and liveable cities
- c. Ensure municipal leadership e.g. global ambitions
- d. Use an incremental approach over many years e.g. gap filling
- e. Run experiments backed up with evidence e.g. turning main roads into streets
- f. Show visible results e.g. traffic lights for cyclists
- g. Join up development and infrastructure e.g. Oresrad new town and the Metro
- h. Introduce innovative funding e.g. land taxes
- i. Seek to improve planning process and reduce over reliance on impacts to road network where enhancement to overall urban environments should be the key
- j. Dedicated investment in road surfaces make cycling safer and more enjoyable
- k. Wider education to all road users to lead to a culture change in how cyclists are viewed and treated is needed
- l. Review road user priority? This could include trialing cycle 'green waves'

Observations

The following table outlines comments from Nick O'Donnell, Assistant Director - Strategic Transport, London Borough of Ealing, in response to some of the observed and informed aspects of Copenhagen from on the study tour.

Observed or Informed	Comments
Lots of cyclists on main road cycle facilities. These are universally one-way, on the normal (right) side of the road.	<i>Lanes and tracks are always on the right hand side. Such consistency and clarity aids all users.</i>
Cycling modal share clearly very high even in awful weather.	<i>Cycling levels drop far less in adverse weather than in UK. Key is to understand why.</i>
There are crude gutter ramps in many places to let cyclists get onto and off cycle tracks between junctions.	<i>These can be hazardous if cycled over lengthwise.</i>
Cyclists feel safer on facilities, and the feeling of safety has improved recently.	<i>Cyclist numbers seemed much lower where there were no facilities - but perhaps they are less useful routes.</i>
Cyclist mode share has not increased significantly in the last 10+ years, though numbers of cyclists and average distances cycled probably have.	<i>It is possible that helmet promotion is responsible for this.</i>
Plenty of small children in freight bikes. But this creates congestion as they're slow, and many cycle tracks are too narrow for them to be passed easily.	<i>Cyclists generally pass unsafely if there's no room to pass safely.</i>
On principal cycle routes, cycle 'green waves' are being implemented, set for a speed of 20kph.	<i>An excellent idea, but our SCOOT system works by responding to drivers' actual speeds, so would have to be replaced. Green waves at cycling speed reduce the incentive for drivers to pass cyclists, promoting both lower speeds and safer overtaking. We should have them - they don't affect motor vehicle capacity unless set for very low speeds.</i>
Wide range of people cycling, but not many older children and teenagers.	<i>Maybe I was in the wrong part of the city - but I did see this age group walking or waiting for buses, so they seem to be cycling less than other age groups. For this age group helmets may effectively be compulsory, and this may be putting them off.</i>
Overall cycle casualty numbers have dropped at least 60% since 1996. No rate-based figures, but cycling has increased by at least 10% over that time. Relative cyclist and pedestrian casualties fluctuate rather a lot from year to year.	<i>Good figures - but likely to be general road safety improvements rather than cycle-specific. UK figures also show similar improvement, but in our case cycle safety is improving more slowly than pedestrian safety.</i>
The council reckons regular cycling increases life expectancy by several years.	<i>As it's safer to cycle than not to, anything that puts people off is to be avoided.</i>
All official cycling organisations (cycling embassy, city council, etc) promote cycle helmets. Wearing is near-universal among	<i>There remains inconsistency on this matter.</i>

children, and about 10-20% for adults.	
Drivers turning left give way to straight-on cyclists, often having to wait until the lights change. Sometimes the green light for cyclists goes off early to allow more drivers to turn. After that drivers are quite assertive in pushing across the cycle track.	<i>How do we get there from here? Danish drivers are used to this, and cyclist numbers are high enough to remind them if needed. The rule that turning road traffic gives way to crossing pedestrians, even at traffic lights, helps to instill the right habits.</i>
To turn left at a crossroads, cyclists cross over and wait with traffic on the other road, crossing the road they were originally on when the lights change. Often there isn't room for them all on the cycle track, and they end up in front of the motor traffic lanes.	<i>This is slower than a direct left turn by crossing motor traffic lanes, but generally there are two or more such lanes, and cyclists opt for (or are required to use) the slower but easier method. There are no formal markings for this way of turning - cyclists just swing round and stop wherever there's room.</i>
There are no ASLs as we know them, and I saw no shared bus/cycle lanes. There is often coloured surfacing (blue!) where cycle tracks cross junctions.	<i>Clearly, even here, driver awareness of cyclists when turning across their path is a significant safety problem. I can't recall seeing any bus lanes.</i>
Cycle tracks are between the footway and any car parking spaces, segregated from parked cars by a white line or a kerb. There is no buffer space for opening doors, and the tracks are usually only just wide enough for two cycles, which means overtaking cyclists on the cycle tracks are right in the danger zone. Dooring casualties are quite common.	<i>This is a problem they have to solve, but even on their spacious streets there isn't room for everything, and this seems to be what they skimp on. With car occupancy rates typically 1.2, nearside doorings may be rarer than driver's side.</i>
Actual safety of cyclists reduces at junctions but improves between them, when cycle tracks are put in ('junctions' includes entrances and driveways). As a high proportion of collisions are at junctions, overall safety gets slightly worse when cycle tracks are installed.	<i>Despite the well-trained drivers, adding conflict points increases collisions. It's the age-old question: is it acceptable to make cyclists less safe, if they feel safer and therefore cycle more (which makes them safer again due to safety in numbers)? Where is the cross-over?</i>
There are an increasing number of cycle routes away from roads, including cycle-only bridges and cycle/pedestrian routes across green spaces. These seem to be popular with everyone. Routes shared with pedestrians are generally segregated.	<i>Segregated routes tend to be too narrow, like ours. On the other hand, there are enough cyclists to keep most pedestrians off the cycle side.</i>
There are plenty of roads without cycle facilities. Drivers seem to behave similarly to British drivers on these, overtaking cyclists too close rather than waiting for a better chance to pass.	<i>Most cyclists ride in the door-opening zone rather than trying to prevent drivers overtaking where there isn't room to do so safely. I got the impression that drivers don't expect cyclists to delay them if they are not crossing cycle tracks.</i>
In icy weather, cycle tracks are top priority for gritting - level with motorways (or equivalent),	<i>We should do the same. In our case, the lengths of cycle track and path to be treated would be relatively short, so it wouldn't delay gritting roads</i>

and ahead of other roads.	<i>much. The willingness of Danish cyclists to ride in all weathers was impressive. In London, the summer peaks in cycling have been rising much faster than the winter troughs, and this is something we have to change if cycling is to reach its potential. Our climate is better than theirs, too.</i>
Cycle mode share falls off very quickly as you get further from the centre and as journey length goes over 10km.	<i>Over longer distances, trains take over. There are huge amounts of cycle parking at stations, not very well managed.</i>
Bus mode share (for journeys to work or school) is less than a fifth of the bicycle share. This makes it easier not to provide bus lanes!	<i>A major difference from London. I think our bus mode share justifies our policy of providing bus/cycle lanes on busy roads.</i>
Cycles are (almost?) universally allowed on Metro and mainline trains, with no peak hour restrictions. The attitude is to provide more space, rather than impose restrictions, if demand increases.	<i>We should do this too. As a first step, we must ensure cycle carriage on Crossrail to and from Paddington. Second step is to allow it under central London, but with no getting on/off between Paddington and Liverpool St.</i>
Mopeds and scooters share cycle tracks. This does not work too well as the limited space means they overtake too close.	<i>They seem to get away with it, but this policy is not justified. Motorcycling confers no health or environmental benefits.</i>
Cyclists clearly get training, and signal much more than British ones - including holding up a hand to warn that they're stopping.	<i>An interesting idea, though not possible for emergency stops. It also relies on one hand being free while braking, because of the back-pedal brake.</i>
Overall KSI rate is about 1 per 4 billion passenger km - about a quarter of ours - with about 1 to 4 fatalities a year.	<i>About the same as the Netherlands. I am convinced that the principal explanation for this is more careful driver behaviour around cyclists.</i>
Speed and convenience are the main reasons people give for cycling. Very few cite environmental reasons.	<i>Copenhagen cycle tracks have enough priority to make them fast. Ours, on the whole, don't, which is why people cycle on-road here even when off-road facilities are provided.</i>
The Jan Gehl people were passionately pro-segregated infrastructure - "build it and they will come".	<i>Not in Stevenage. Or Milton Keynes. Whereas in Cambridge.... It's all about a cycling culture.</i>
Over the last few years, length of cycle track/path has increased much faster than cycling mode share.	<i>It's clear further increase in cycling mode share is going to be hard. More restrictions on cars, and further improvements to perceived safety, will be required.</i>
They are planning to introduce faster, somewhat more direct cycle super-highways along main radial routes and a couple of orbital	<i>They are probably more comparable to LCN+ than our Superhighways. Copenhagen is much smaller than London. However, such an</i>

alignments. These are being done by improving and joining up existing routes rather than starting from scratch. They are spending much less on them per mile than London is on its Superhighways.	<i>approach is under active consideration with a WestTrans brief out on this.</i>
Cycle parking is often no more than a designated space to park your bike on its kickstand. If stands are provided, they're likely to be wheel-benders.	<i>Has the advantage that you can have dual-purpose car/bike parking. However, very poor cycle security.</i>
Bikes are usually fitted with 'nurses' locks' - devices that immobilise the back wheel. Few people attempt to lock bikes to something solid. Theft is a problem, but the level seems to be low enough to be tolerable.	<i>I can't see London getting back to a point where there's no need to lock your bike to something fixed. We're way ahead of them here – though only because we have fewer bikes and more cycle theft.</i>
Bikes generally have back-pedal brakes on the back wheel, and a hand-operated brake on the front wheel.	<i>Makes signalling (one way) while braking easier, but otherwise makes cycling slightly harder. Not an idea to copy.</i>
The police have a veto on all highway schemes. They are pro-cycling (they say) but are reluctant to approve cycle contraflows without full segregation, or speed limit reductions.	<i>We really are ahead of them on contraflows, and I think in risk assessment. Danes seem reluctant to look beyond feelings to get real data. Police are probably reluctant to be seen to be placing restrictions on motorists.</i>
Until fairly recently (80s?) there was actually a law that cyclists should give way to motor traffic.	<i>Presumably this only applied when sharing the carriageway. It may be one reason why Danish cyclists feel unsafe when not on cycle facilities.</i>

Comparing Impressions

“My first impression of cycling in Copenhagen” – Nick O’Donnell, London resident

I was impressed by the ease of which one could hire a bicycle from our hotel at no cost and the simple locking mechanism of the bike. Despite it being a cold, windy and wet evening in November, the sheer volume of cyclists was striking. Compared to cycling in London, five main differences really stood out for me:

1. There is a more leisurely pace of cycling. During rush hour in London, everyone seems to be intent on cycling as fast as they can and the speed of cyclists is a lot higher than observed in Copenhagen. There is a slower overall pace of cycling and very few cyclists going full speed.
2. The high quality and well maintained roads and surfaces, along with the wide lanes meant cycling was a very comfortable and relaxing experience. Despite having cycled around the city for over two hours, there was no fatigue or discomfort and at times I found myself “switching off” as it was a secure and relaxing experience.
3. The behaviour of fellow cyclists and car drivers was very polite. Car drivers regularly gave way to cyclists and there was no sign of aggressive behaviour. On the odd occasion where I

was in the way of a fellow cyclist, a gentle bell ring saw me move over and no words were exchanged.

4. Most people rode very standard bicycles and wore “normal” clothing. There were very people with expensive bikes and specialist bike clothing.
5. The range of people who cycled. All ages, and a very strong parental take up of cycling with their children.

“My first impression of cycling in London” – Henriette Lund, Copenhagen resident

Whilst planning my stay in London, I intended to use a bike as often as possible, as I love to cycle. However, seeing the traffic in London and the people on their bikes I began to think slightly different. For example I found the way in which cyclists have to negotiate junctions as quite different to Copenhagen and also a little scary.

My first impression of cyclists in London was that everyone is a committed racing cyclist, because they look like Danish racing cyclists, and they must be dedicated to buy all the equipment. For instance, I hardly saw a single cyclist in their normal clothing happily taking their bike for a short run to the supermarket.

An intimidating thing about cycling here in London is that cars don't necessary hold back for cyclists. I was told by colleagues that the drivers would see me as an irritating cyclist that is here to provoke and slow down traffic. I now understand that the law does not take into account that the cars should look out for cyclists as is the law in Denmark.

I chose to get some cycle training to help become a more confident cyclist.

My first cycle training experience was a little frightening. My cycle trainer told me just before the first junction, where I was to go right, that I should place myself in the middle of the road just as the cars and ‘take the lane’. This is of cause for my own ‘safety’, but as I came up to the junction ready to take the lane, I felt quite intimidated. I told him “I hear what you are saying, but I don't want to cycle in the middle of the road as it is dangerous”. With the help of the trainer I slowly rode through that junction and many others on my two hour trip around the city. Afterwards I was kind of on a high, feeling the adrenalin in my body. I was feeling alive and happy because I was learning how to be able to get around London on my own.

I come from a culture where I can cycle wherever I like, on safe roads and with flexibility where I don't even need to think about safe cycle parking and the cars holding back for cyclists.

One of my greatest fears of cycling in London is going through junctions, because it is not unequivocal how you go through them. This means that as a new citizen in London, not knowing the difficult junctions from the easy ones, I find myself having to prepare my trips around the city. I have discovered that even experienced cyclists sometimes have to do the same, or stop before some junctions to found out how they want to approach them.

Being a cyclist in London is not at all bad. As an employee at TFL I have learned that many different people cycle and that all the work going on around cycling is amazing and working very well. I am

really impressed about the commitment from TfL and the Mayor to make cycling a travel solution for everyone.



Figure 28 - The tour group on their bikes (Illustration; Simon Franklin, LB Hammersmith and Fulham)