



RAMBOLL

Bright ideas.
Sustainable change.

COPENHAGEN BIKE PLANNING

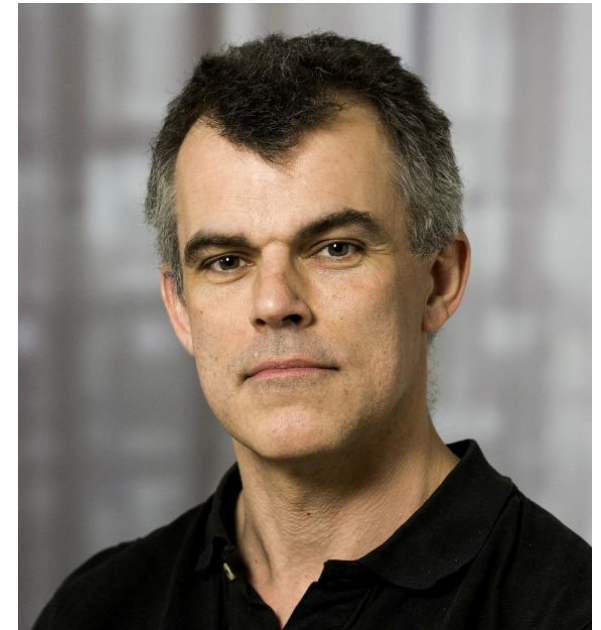
Bellevue and King County, October 17th, 2022

AGENDA

- Short introduction to Ramboll
- Cycling in Denmark – history and policy
- Planning and physical solutions
- Cycle Super Highways
- Short introduction to afternoon's bike tour

JACOB DEICHMANN

- Graduated from School of Architecture, Royal Academy of Architecture, Copenhagen, 1993
- Employed at Ramboll since 1995 (27 years!) in Traffic planning department, Copenhagen, since 2020: Department of Smart Mobility
- References in traffic planning and urban design from planning to detailed design, with a focus on the “soft” modes of transportation, including cyclists, pedestrians and people with physical impairments
- Teaches DGNB auditors sustainable traffic planning
- Certified Accessibility Auditor and Master of Universal Design and Accessibility



RAMBOLL IN BRIEF

- Independent engineering and design consultancy and provider of management consultancy
- Founded 1945 in Denmark
- 16,500 experts
- 300 offices in 35 countries
- Particularly strong presence in the Nordics, the UK, North America, Continental Europe, Middle East and Asia Pacific
- Owned by The Ramboll Foundation

RAMBOLL

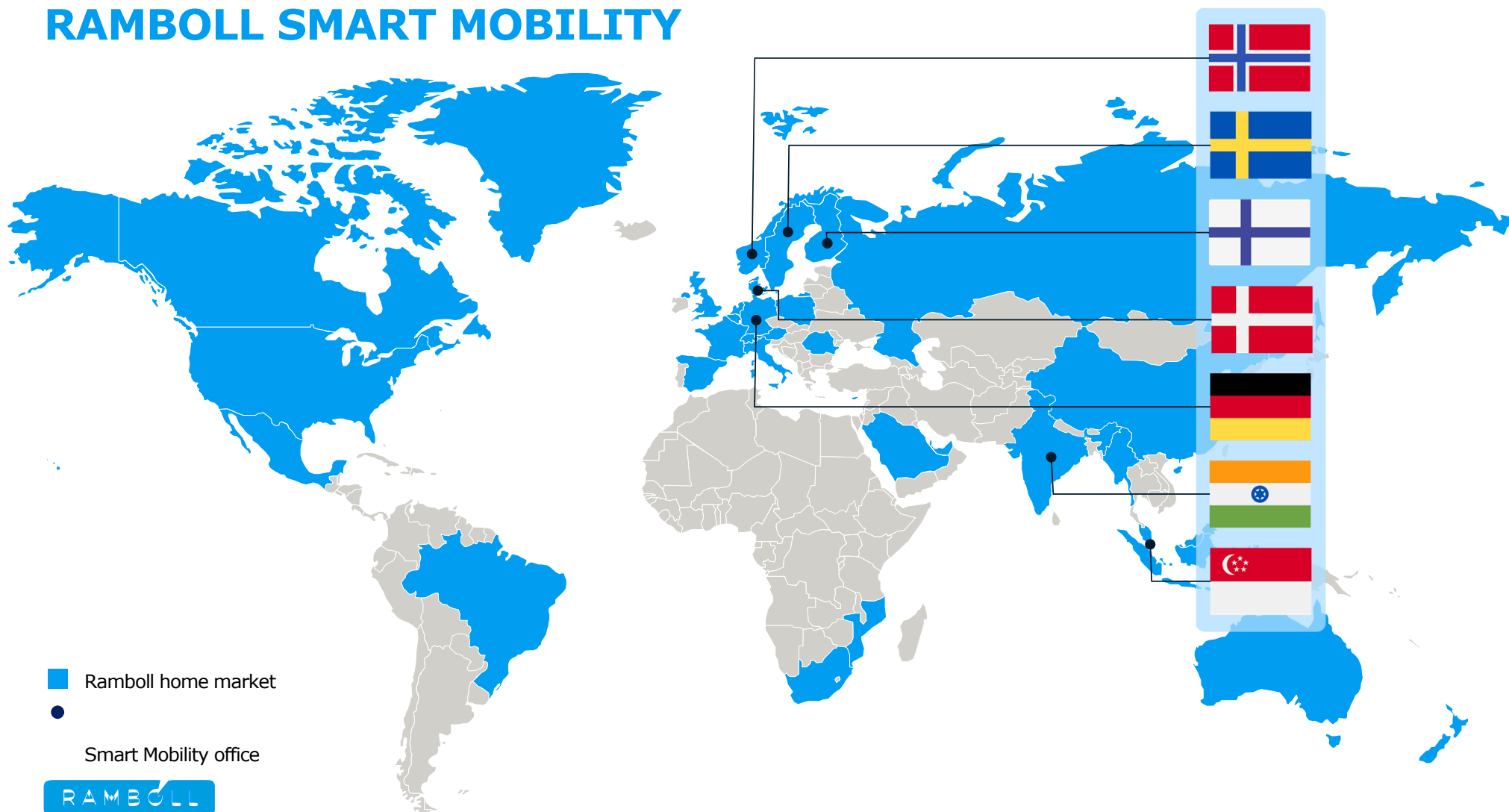
SMART MOBILITY AT A GLANCE

- Ramboll offers world leading expertise in holistic mobility planning via innovative teams working at the cutting edge of pivotal areas such as Mobility as a Service (MaaS), e-mobility, autonomous vehicles, strategic parking, and sustainable, holistic planning.
- Our approach is inclusive, progressive, and dialogue based, working side by side with stakeholders in cities around the world for a better future.

Services:

- Holistic Mobility Planning
- Pedestrian Prioritization
- Cycling Policy & Planning
- Public Transport
- Modelling & Simulations
- Transport Economics
- Strategic Parking
- Digital solutions and Intelligent Transportation Systems (ITS)
- E-mobility
- Mobility-as-a-Service (MaaS)
- Autonomous Vehicles

RAMBOLL SMART MOBILITY



Ramboll and cycling

- We understand cycling and view cycling as an **integrated and important part of a sustainable transport system** and of liveable cities.
- We have a **holistic view on cycling** and acknowledge that to become a successful cycling city you need **more than infrastructure**.
- Our cycling planning and designing roots are in Denmark and Copenhagen, but our team also draws on experience from The Netherlands, Sweden, Finland, Norway, and Germany. In short - we **combine international best practice experience with local knowledge**.
- **Sustainability is an integrated part of our DNA** and solutions as the Nordic countries are leading the way when it comes to creating efficient, safe, and green mobility for all.



Photo: Arild Vågen, CC BY-SA 4.0,

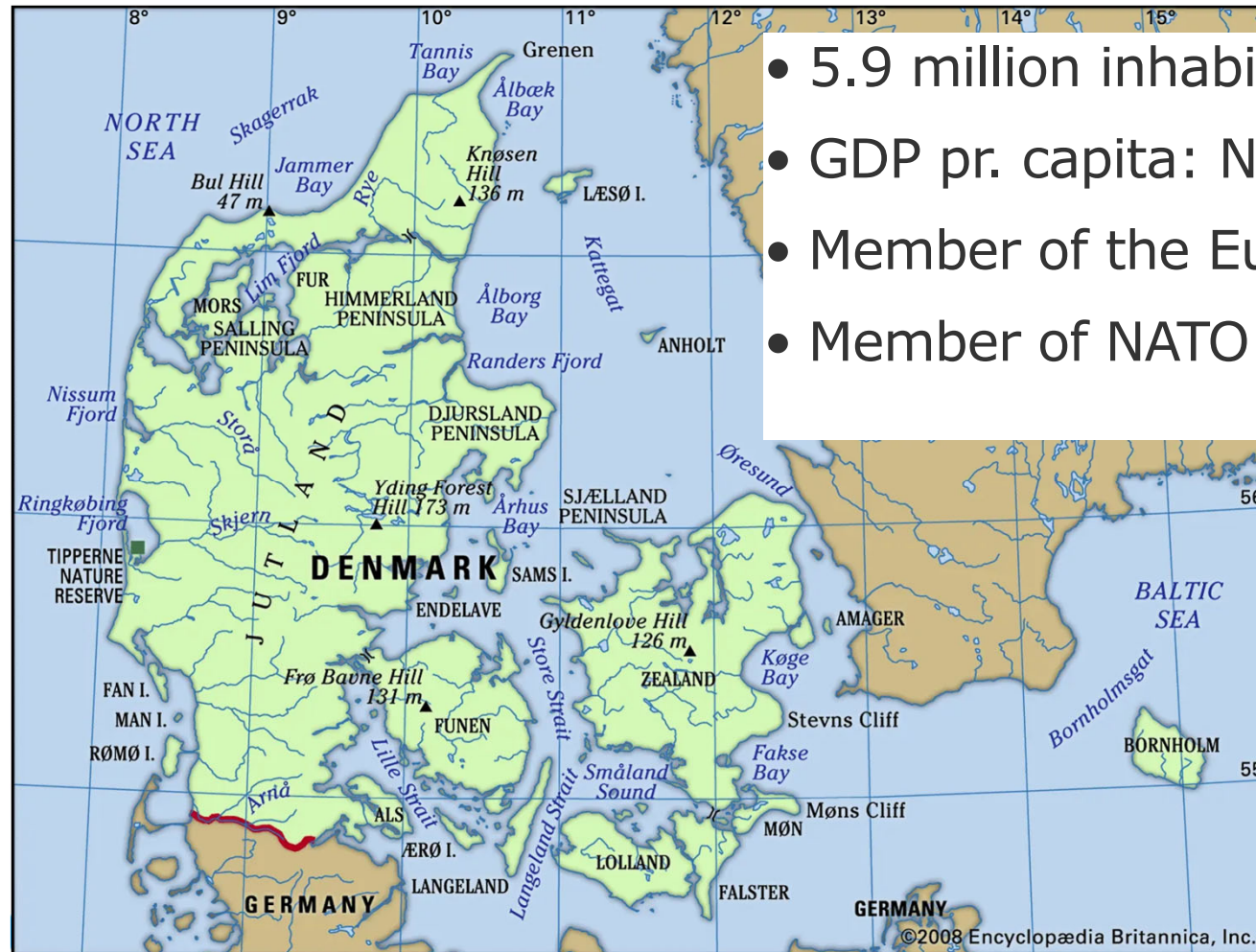
Slide 7

AK1

We would like to use this graphic but I think we need to find better pics. I found some examples in Image Bank but we also need better ones for Sweden and India/Singapore.

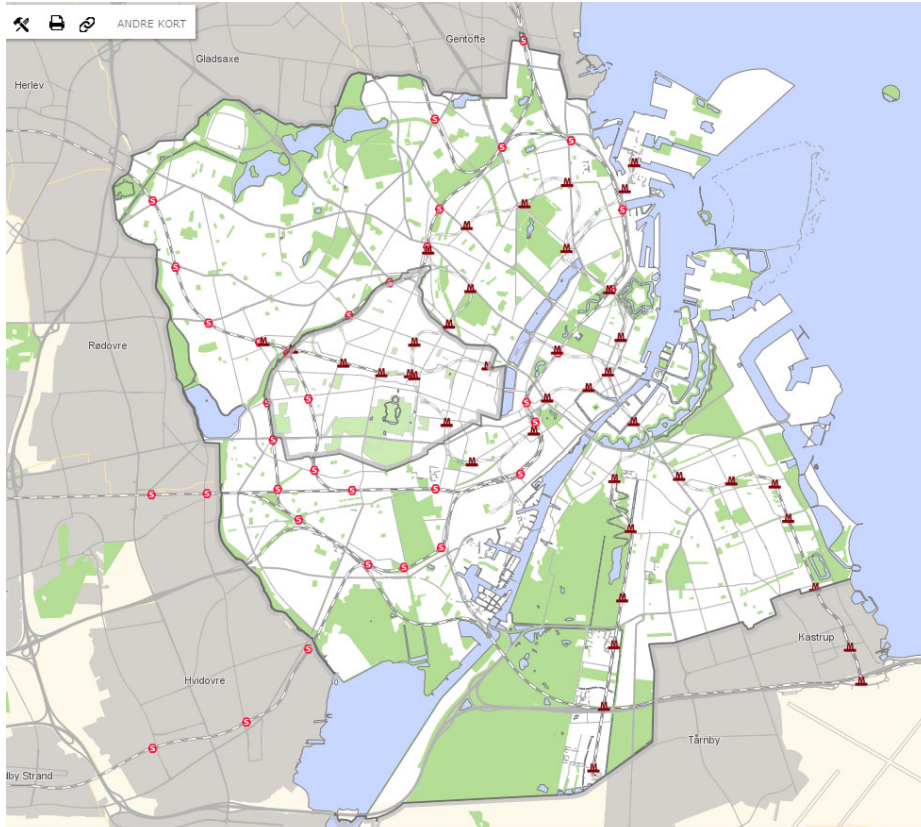
André Kingstedt; 04-10-2021

DENMARK



- 5.9 million inhabitants
- GDP pr. capita: No. 11 in the World
- Member of the European Union since 1972
- Member of NATO since 1949

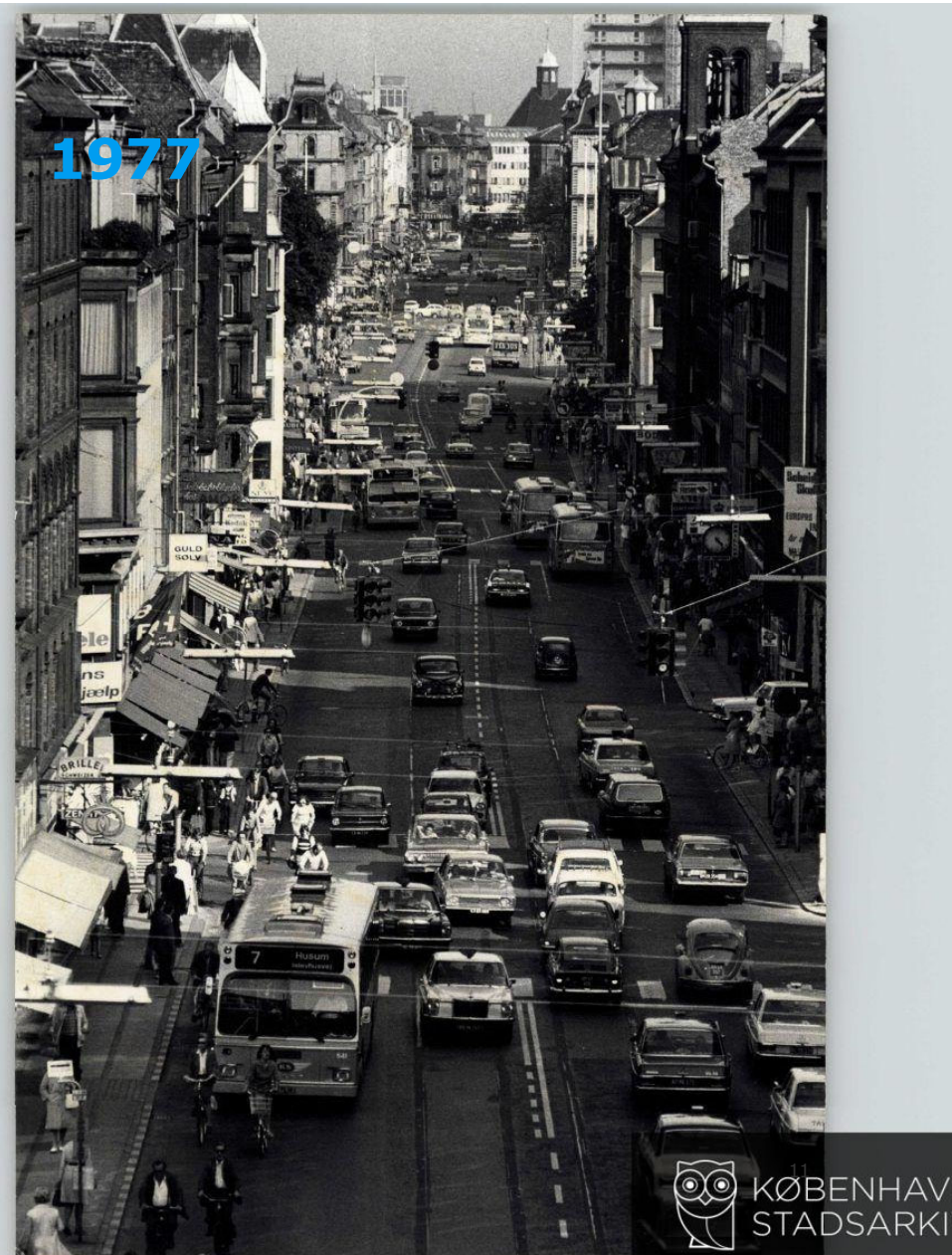
CITY OF COPENHAGEN



- 650,000 inhabitants (2030: Expected app. 700,000)
- Capital of Denmark
- Ruled by the "Citizen's representation" with 55 members
- Day-to-day administration handled by the Lord Mayor and 7 "discipline" mayors. Urban and traffic planning is handled by the Mayor for Technical and Environmental issues



CYCLING IN COPENHAGEN



SOME NUMBERS....

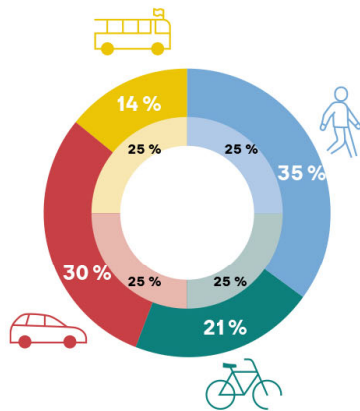
Cycling infrastructure in the City of Copenhagen, 2022

388 km cycle tracks

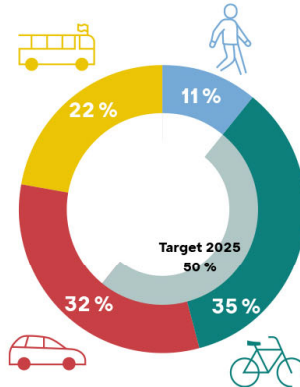
33 km cycle lanes

65 km Green Cycle Routes

60 km Cycle Superhighways



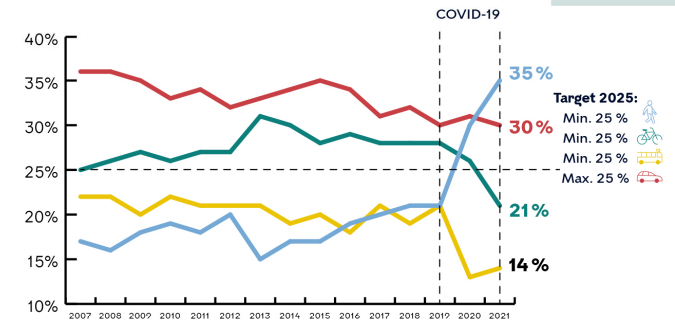
↑ All trips to, from, and in Copenhagen in 2021. Based on TU data. The inner circle shows the 2025 targets



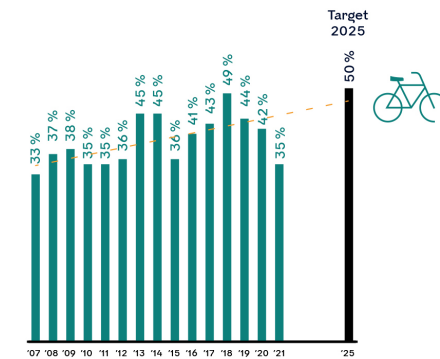
↑ Trips to and from work and education in Copenhagen in 2021. Based on TU data. The inner circle shows the 2025 target



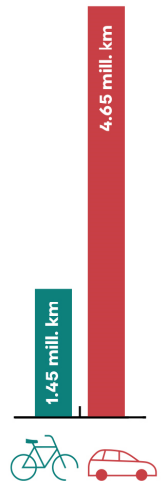
1.44 mill. km were cycled daily in 2019 prior to the COVID-19 pandemic
- In 2021 the figure was 1.45 mill. km



↑ Development in modal share over the past 15 years. Based on TU data



↑ The bicycle share of trips to and from work and education in Copenhagen over the past 15 years. Based on TU data



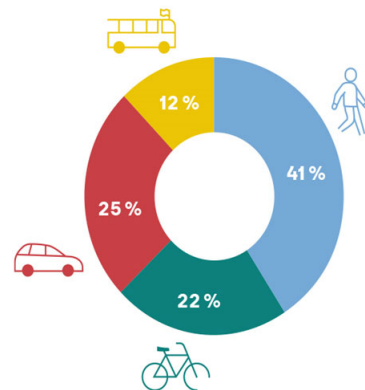
↑ Kilometers traveled daily per weekday in 2021. Based on traffic counts

WHAT DO COPENHAGENERS THINK ABOUT CYCLING?

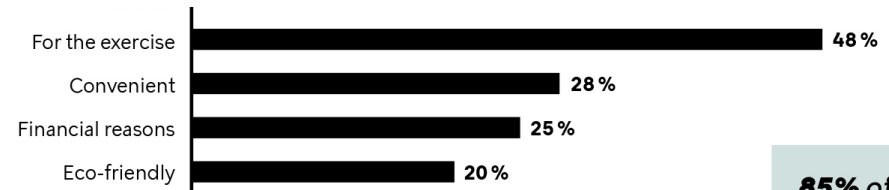
48% of Copenhageners say the bicycle is their preferred transport mode

97% of cycling Copenhageners are generally satisfied with Copenhagen as a bicycle-friendly city

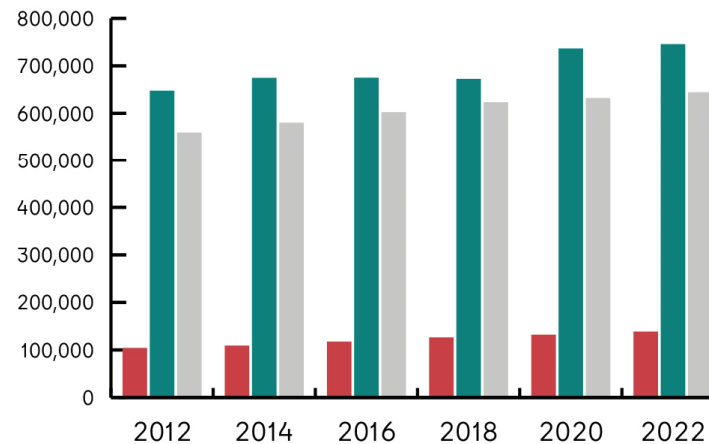
75% of Copenhageners feel the cycling culture has a positive impact on urban life in Copenhagen



↑ Copenhageners' modal share in 2021.
Based on TU data



↑ Copenhageners' reasons for cycling in 2022



↑ Bicycles, cars and citizens in Copenhagen 2012-2021

85% of Copenhageners have access to a bicycle

Copenhageners own a total of 745,800 bicycles, which is **more than 5 times as many bicycles as cars**

Copenhageners own approx. 40,000 cargo bikes, which is **more than twice as many as in 2020**

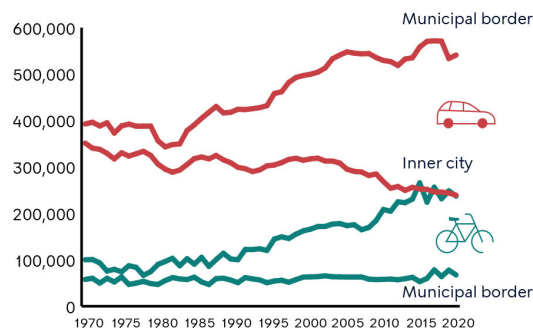
Copenhageners own approx. 26,800 e-bikes, which is **12 times as many e-bikes as e-cars**

NUMBERS OF CYCLISTS

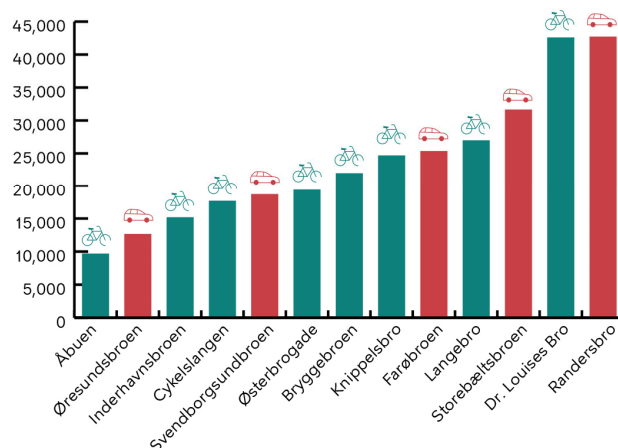
48% of cycling
Copenhageners feel
there is not enough
space on the cycle
tracks at peak hours

The estimated average
cycling speed was
16.2 km/h in 2021, the
same as in 2020

Every day **42,600** cy-
clists cross Dronning
Louises Bridge, - more
than three times as
many as cars crossing
the Oresund Bridge
between Denmark
and Sweden



↑ Development of car and bicycle traffic through the inner city and across the municipal border from 1970-2021. Based on traffic counts

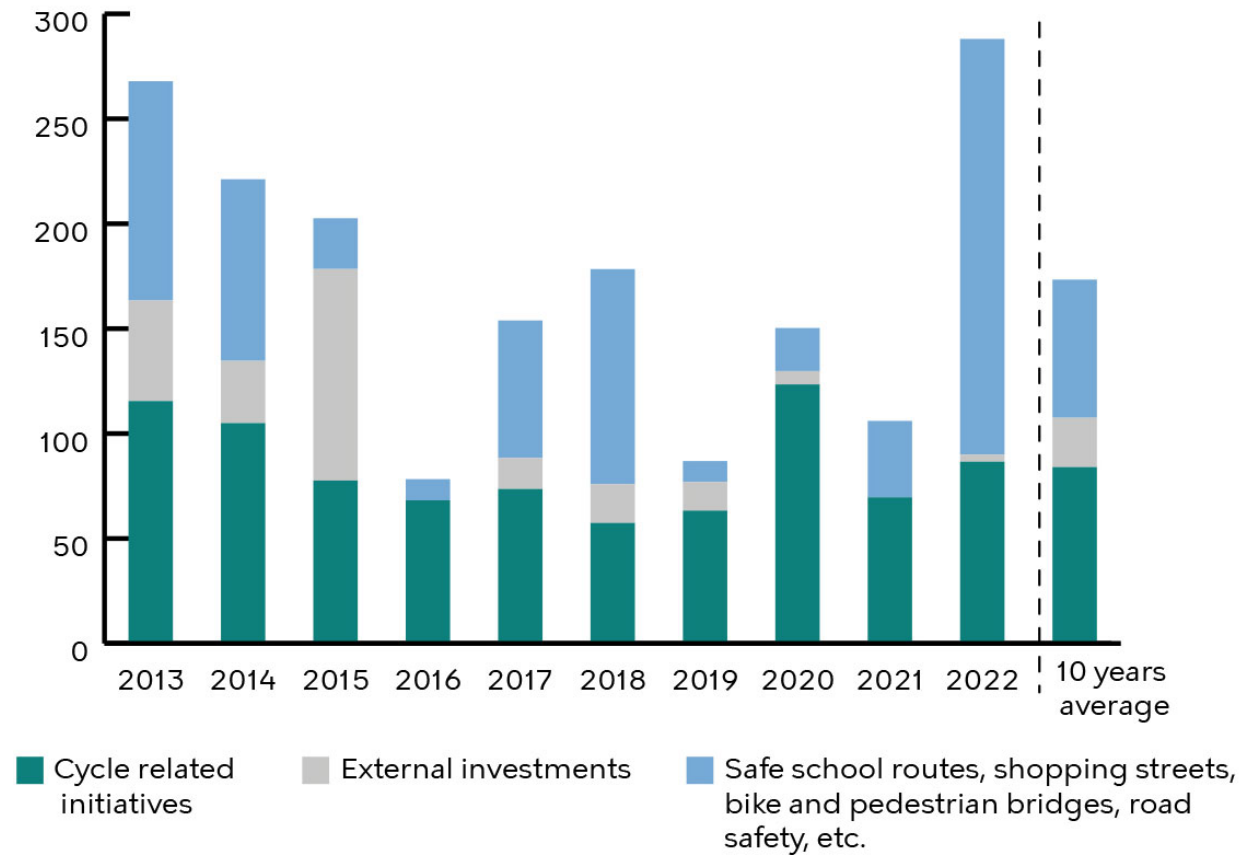


↑ Numbers of bicycles and cars per weekday on selected streets and bridges 2021



INVESTMENT

1 mio. DKK ≈ 130,000 USD



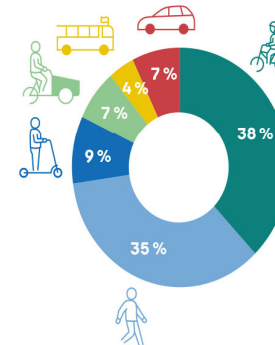
GETTING CHILDREN TO CYCLE...



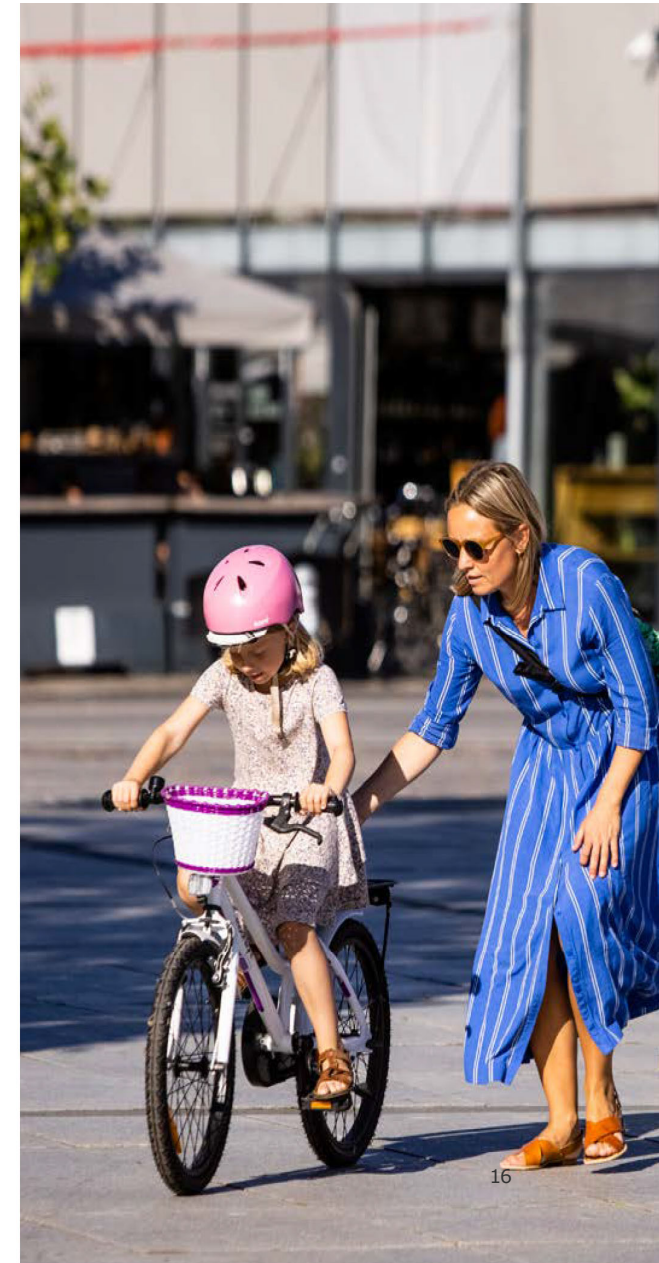
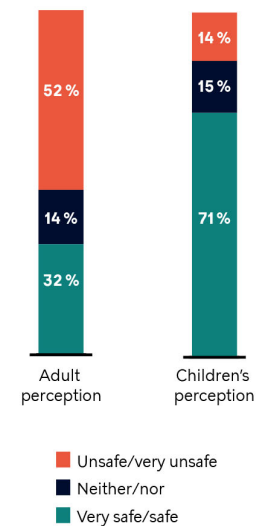
"Traffic playground"



↓ Copenhagen school children's transport mode to school. Based on a survey with parents and children 2020



↓ Adult's and children's perception of children's school route safety 2020





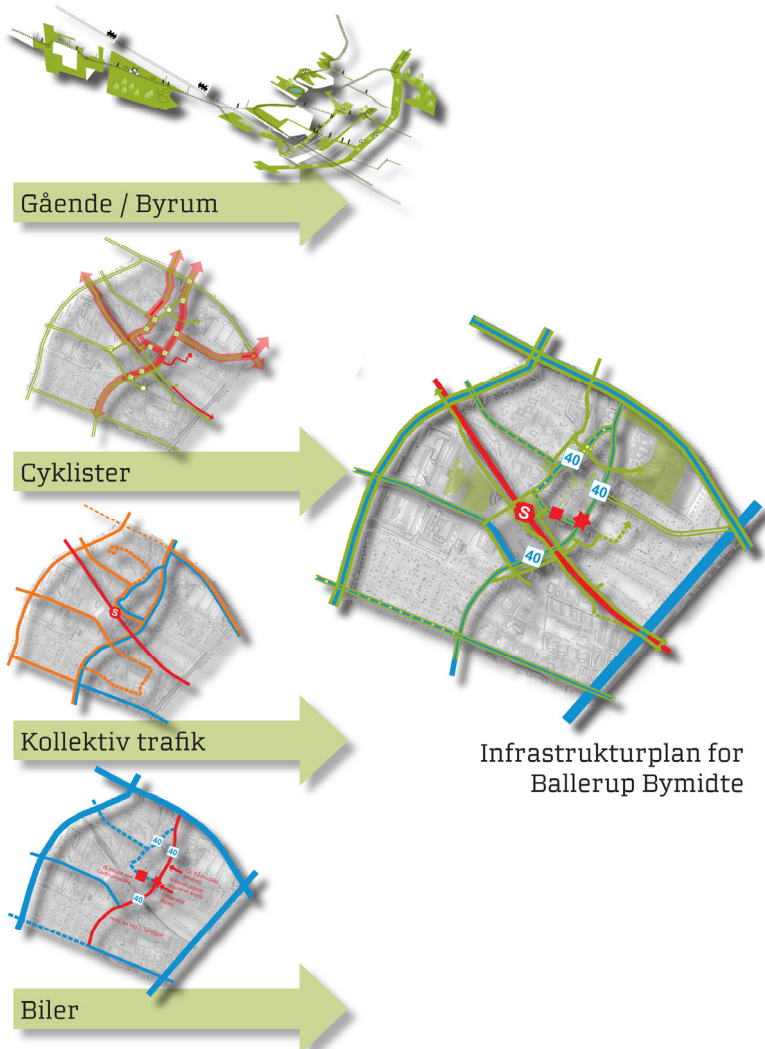
Life cycling



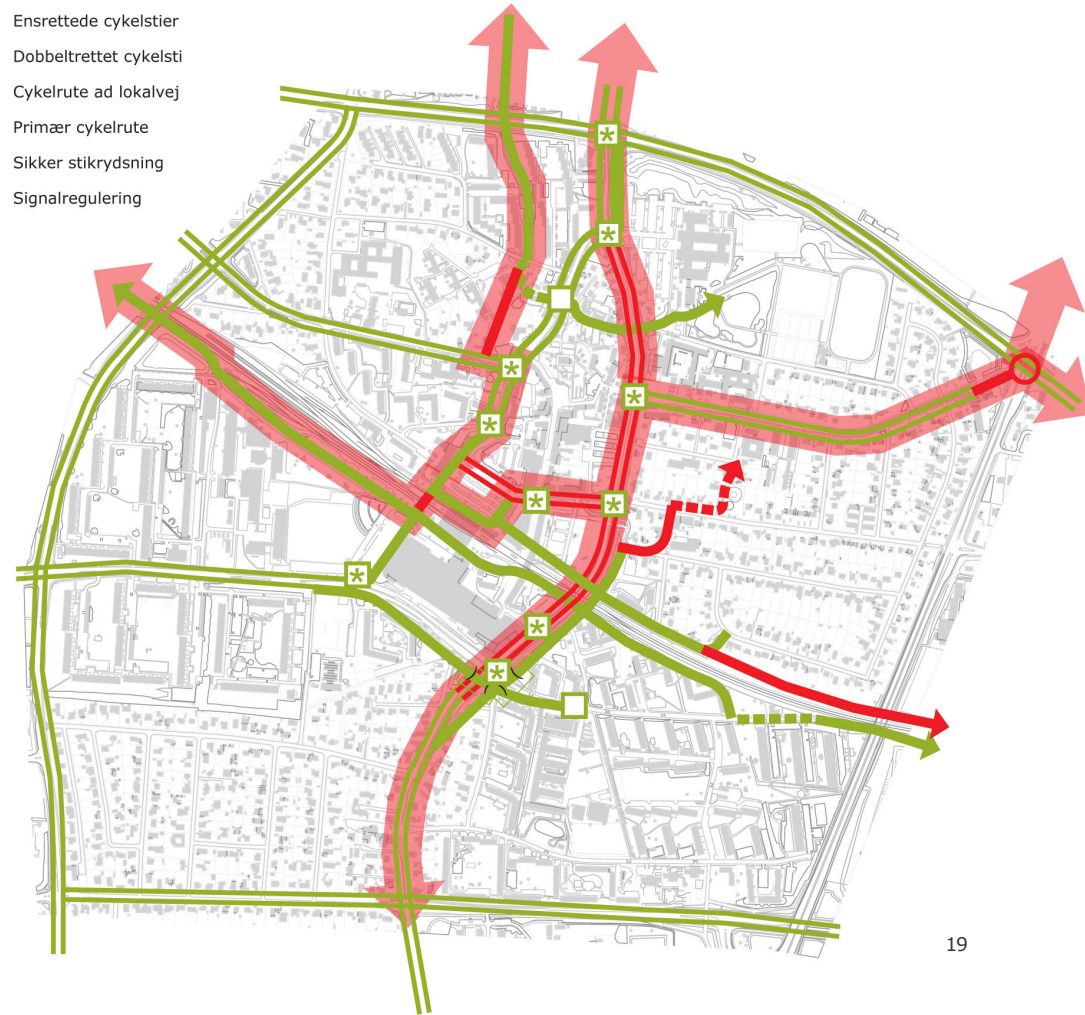
PLANNING FOR BIKE TRAFFIC



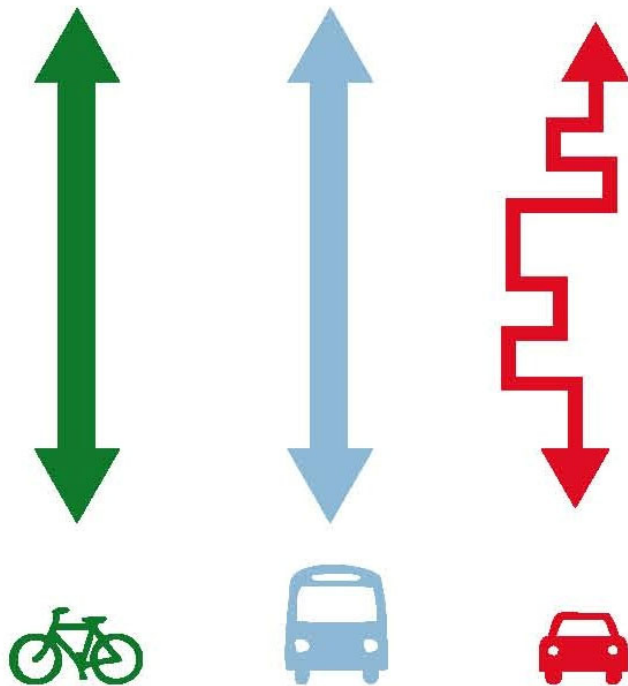
TREAT THE CYCLISTS EQUALLY WITH OTHER MODES



Nuværende	Forslag	
		Ensrettede cykelstier
		Dobbeltrettet cykelsti
		Cykelroute ad lokalvej
		Primær cykelroute
		Sikker stikrydsning
		Signalregulering



PLANNING MEASURES

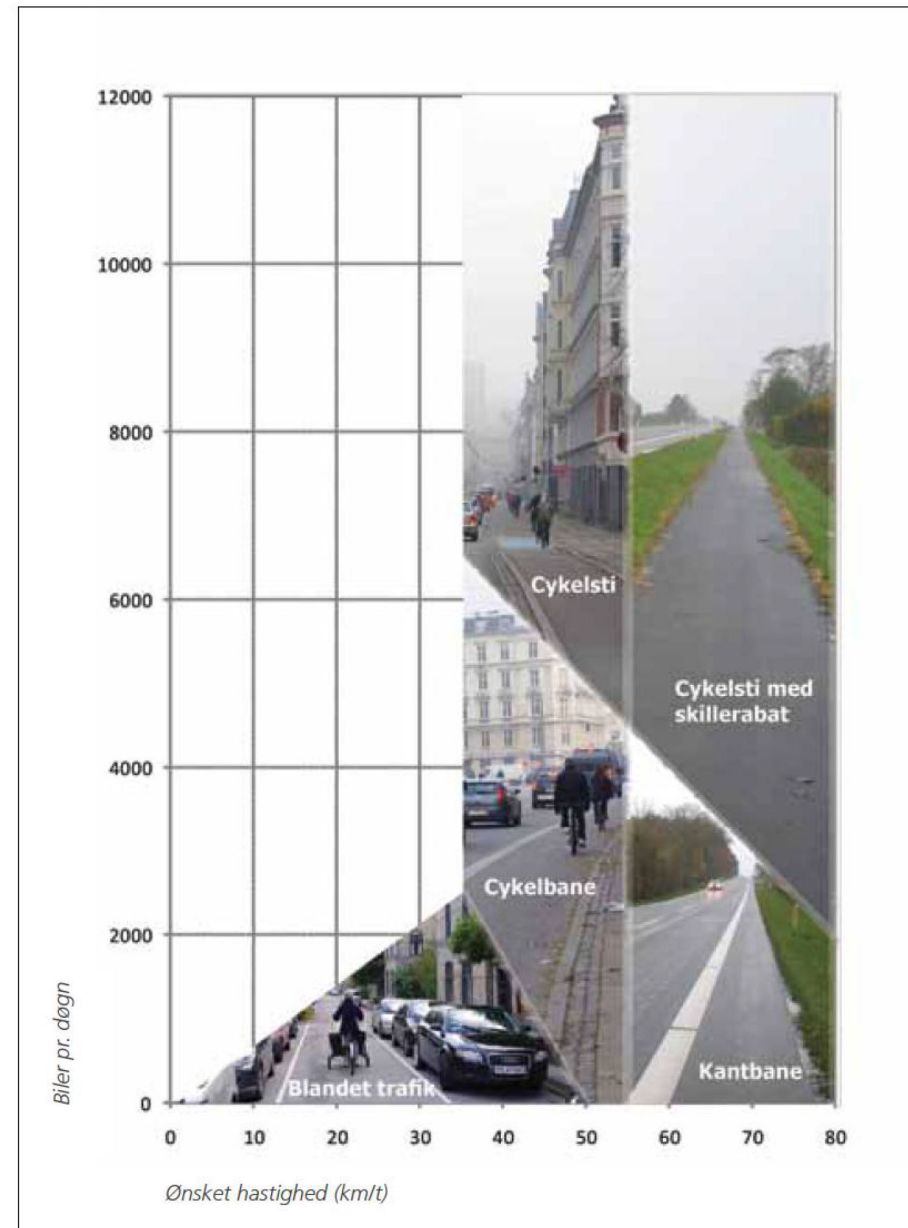


- Shortcuts
 - Cycling and pedestrian bridges over e.g. water
 - Streets closed to cars but open to bikes
 - Counter-flow cycling in one way streets

INFRASTRUCTURE FOR CYCLISTS

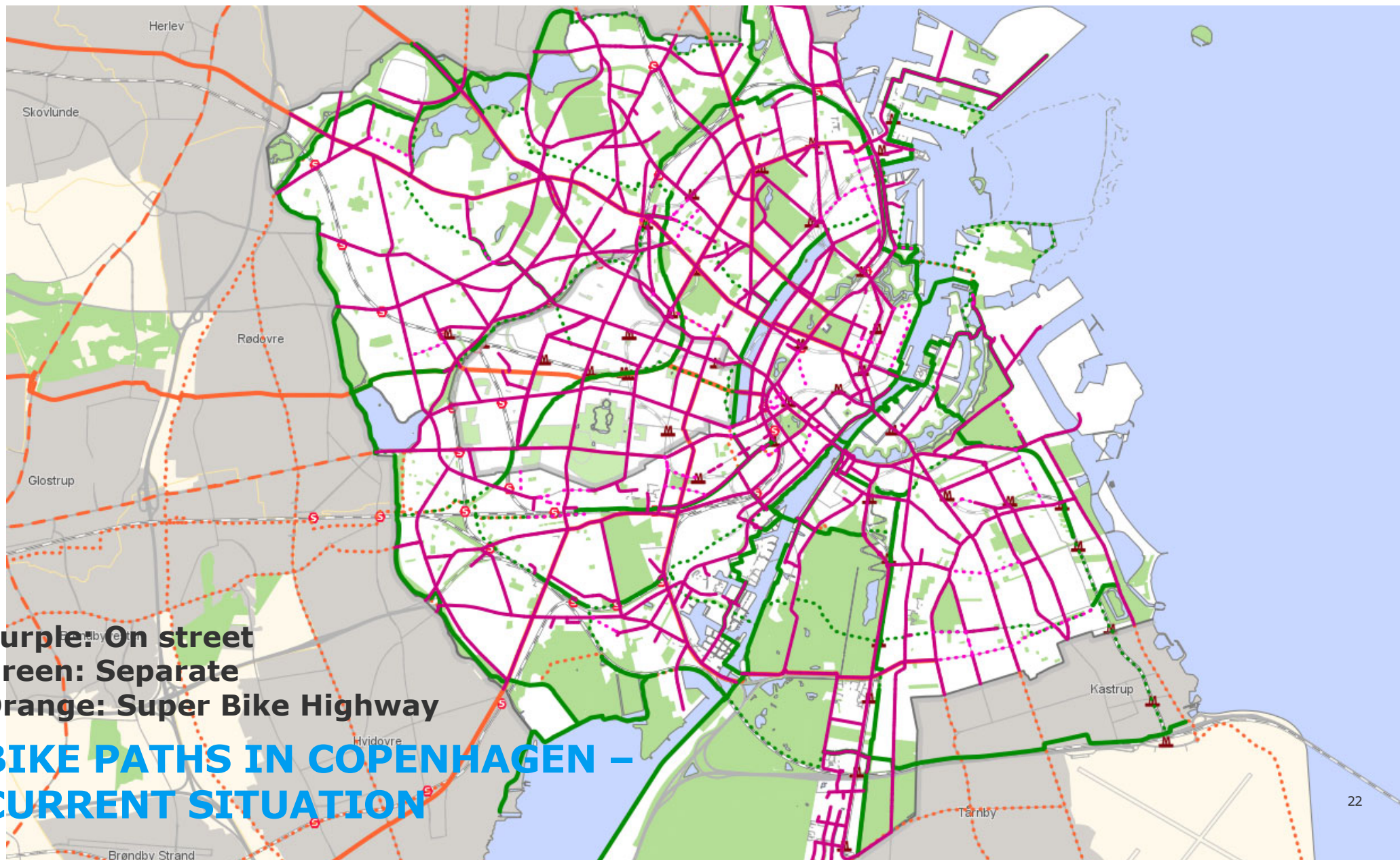
DANISH BEST-PRACTICE

- Bike paths along streets (one-way, both sides of street)
- Separate bike paths
- Streets with few cars and low speed: Mixed traffic
- Bike streets: Bikes have priority
- ITS and signalling solutions
- Bike parking



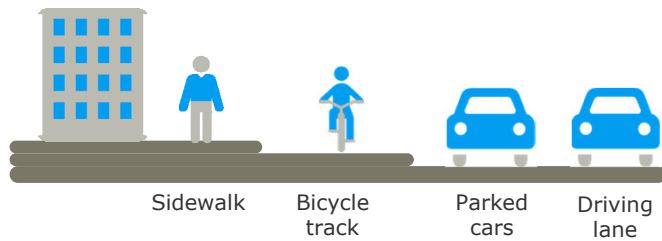
Purple: On street
Green: Separate
Orange: Super Bike Highway

BIKE PATHS IN COPENHAGEN – CURRENT SITUATION



Protected cycling network

- Safe
- Direct
- Convenient
- Coherent



Typical solution – two kerbs



Solutions in intersections



Copenhagen, Hovedstaden

Google

Street View – nov. 2021

Solutions in intersections – tight space



Solutions in intersections



Solutions in intersections



Solutions in intersections





Two-way bike path

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Counter-flow bike path



Bike street



ITS



RAMBOLL





Drive-by waste basket

Even pavings for cyclists





Maintenance





High quality solutions

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“

Women are considered an “indicator species” for bike-friendly cities for several reasons. First, studies across disciplines as disparate as criminology and child rearing have shown that women are more averse to risk than men. In the cycling arena, that risk aversion translates into increased demand for safe bike infrastructure as a prerequisite for riding.

Dr Jan Garrard, Deakin University, Melbourne

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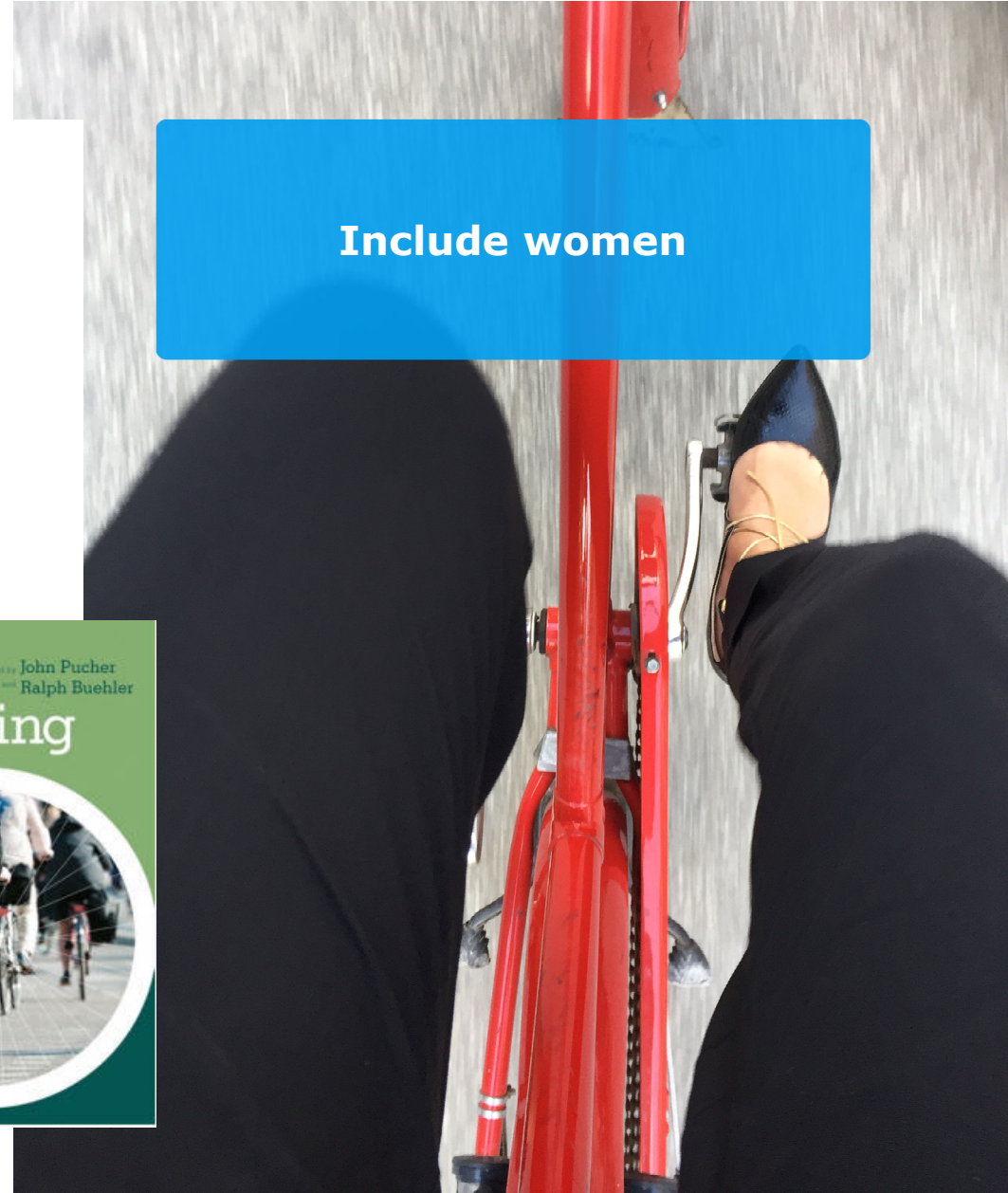
Ask women what they want and give it to them!

Professor of Transport Policy at Rutgers university John Pucher

Include women



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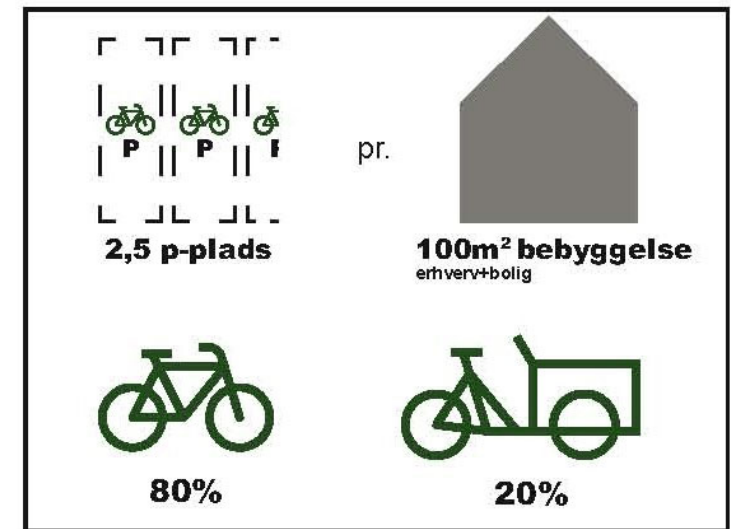


Bicycle parking

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QUANTITY – HOW MUCH?

- The needed quantity depends on the **function** the parking serves
- Housing, work places, schools etc: number of bike parking pr. person or area
- Public transport terminals: share of passengers
- Shopping streets, malls, sports facilities, libraries, etc...



LOCATION – WHERE?

- **Cyclists are lazy!** (at least in Denmark)
- On the route to the target!
- As close to the target as possible!

Korrekt placering af cykelparkering i forhold til mål

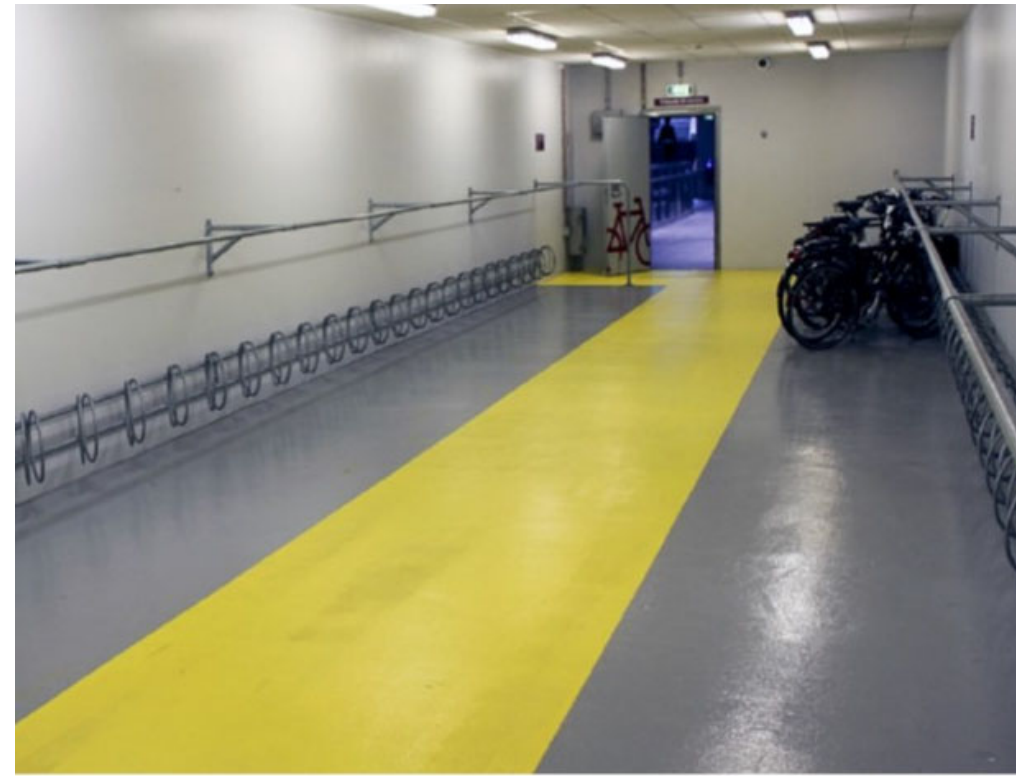


Hellere hér...



end hér

EXAMPLE (NOT TO BE FOLLOWED!): COPENHAGEN METRO



NØRREPORT STATION NOW – 2.100 BIKE STANDS



DESIGN OF THE BIKE STAND – TRY SOMETHING NEW?



ROOF / SHELTER / INDOORS



ROOF / SHELTER / INDOORS



PARKING FOR CARGO AND 3-WHEEL-BIKES



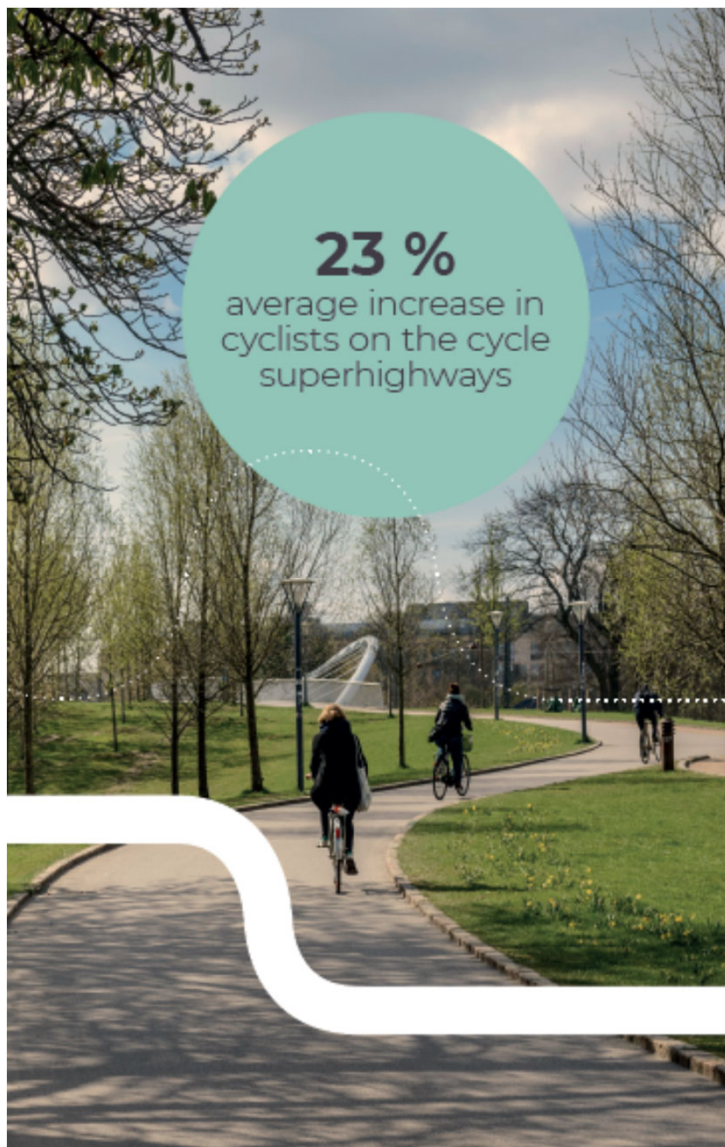
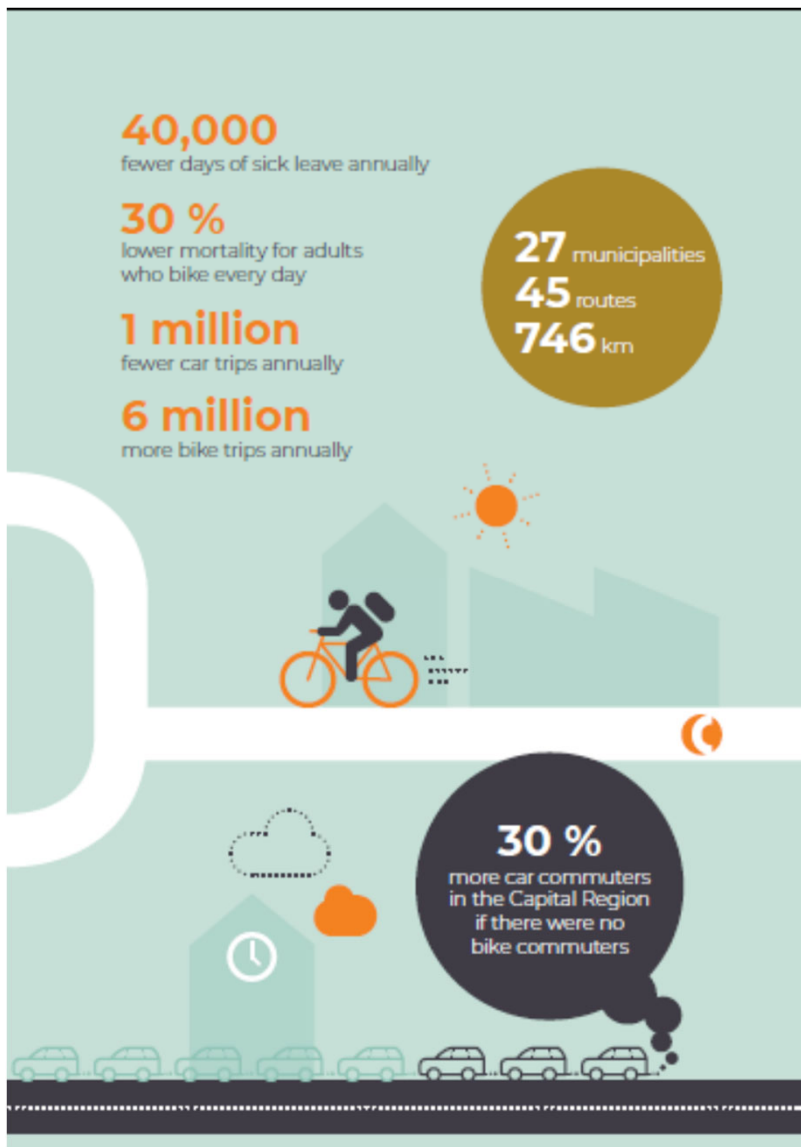
CYCLE SUPERHIGHWAYS

- Purpose: Extend the range of possible commuting from 5 km to up to 30 km
- Means: Lower travel times on bike > better infrastructure
- A combination of existing and new infrastructure
- Branding, signs, street markings, foot rests, pumps etc.
- Planned and built in cooperation by **27** municipalities and the Capital Region
- **Existing app. 850 km**

- Accessibility
- Directness
- Comfort
- Safety

CYCLE SUPERHIGHWAYS





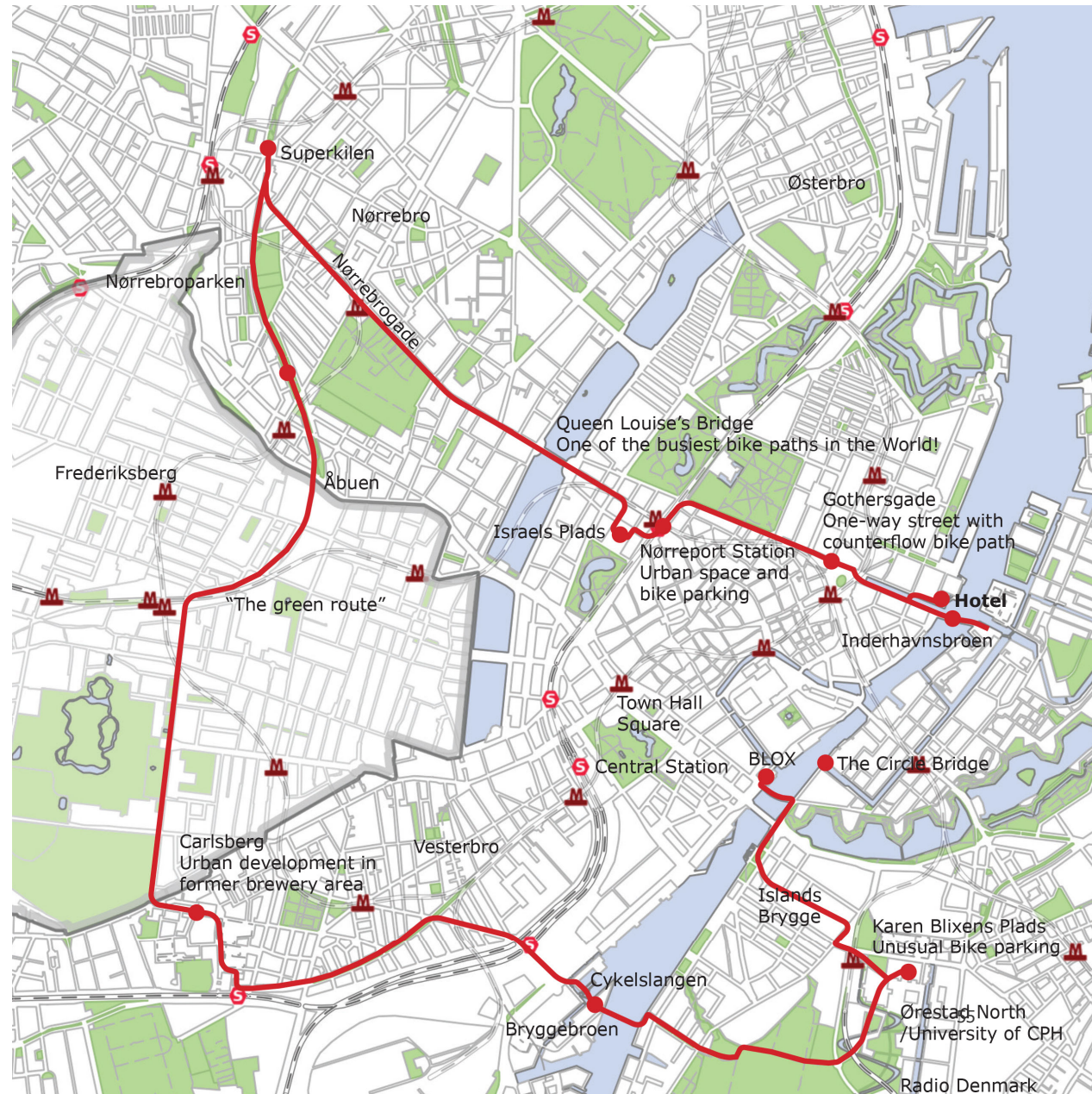
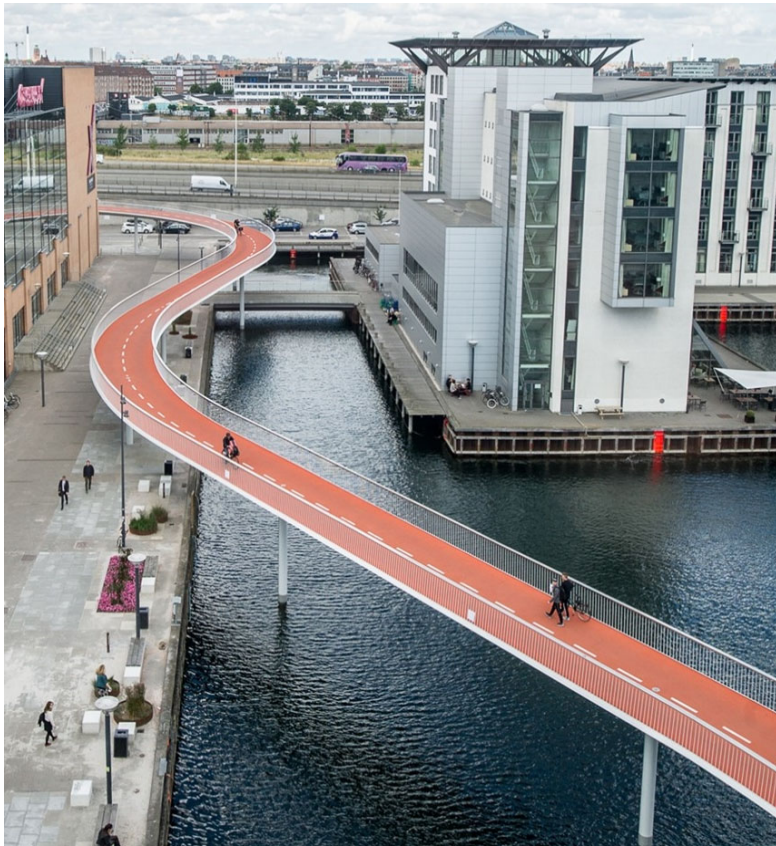
SIGNS AND STREET MARKINGS



Foot rests



SHORT INTRODUCTION TO OUR TOUR



GROUND RULES FOR CYCLING I COPENHAGEN

- Keep right, drive single file
- Stop for red and yellow lights
- Yield for white triangles and when crossing a pavement
- Don't cycle on the pavement – but we can cycle in pedestrian streets if is permitted by sign
- Extend arm to indicate turn, raise hand to indicate stop
- At bus stop directly on bike path: Yield for bus passengers
- Left turn in signalized intersection: Go to the opposite corner and wait for green in the other direction, and try not not to be in the way
- When we stop to look at things: Get off the bike path as quickly as possible

Bright ideas. Sustainable change.

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