



# Expanding the cycle path network in Copenhagen 1912-2013

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# ***agenda***

**Aim**

**Data and analysis**

**Result 1: when/rates**

**Result 2: where**

**Summary**

**Perspectives**

## **AIM**

The spatio-temporal development of the bicycle network

**when**

**which rates**

**where**

- Did the expansion take place continuously or were specific periods important?
- Was the expansion distributed equally in the city or were specific areas of the city provided with more infrastructure than other areas?

## Methodology and data

Spatial scope: City of Copenhagen, incl. Frederiksberg.  
Temporal scope: 1912-2013.

Records and maps from 1912 (Frederiksberg not included), 1916, 1927, 1934, 1969, 1974, 1985, 1995, 2000 and 2013 – treated as time periods

GIS analysis (ArcGIS 10)



## Sources of maps and records

***Copenhagen City Archive:*** Cykelstier i København og indlemmede distrikter (records of 1912) – Stadsingeniørens Direktorat

***The Royal Library, Department of Maps and Pictures:*** København og Frederiksberg (map of 1916)

***Copenhagen City Archive:*** København og Frederiksberg (maps of 1927, 1935 & 1969) – Stadsingeniørens Direktorat

***Danish Cycling Federation:*** Cykelstier over København og Frederiksberg (map of 1974) – Stadsingeniørens Direktorat

***City of Copenhagen:*** På Cykel i København (map of 1985), På Cykel i København (map of 1995), På Cykel i Kulturby København (map of 1996)

***City of Copenhagen:*** GIS data containing bicycle infrastructure (maps of 2011-2013)



## Records of 1912, Copenhagen City Archive

		overfot 9980 m					
Gadeens Navn	Strækning	fri Bredde	solale Bredde	Længde	Reparations	Profil	Gadeens Bredde
Peter Allé	Tobaksparken - Store Vibeenshus	middel 3,50 m	4,10 m	675 m	overfær		36,10 m (115')
Peter Allé	Triangeln - Store Vibeenshus	middel 3,47 m	middel 4,22	1150 m	overfær		36,10 m (115')
Petersvoldgade	Krokkostellegade - Stokkestrøgade	3,40 m	3,40 m	300 m	overfær		185-2142 (43-50')
Fagtvøj	Tombauer - Sagade)	3,20 m	3,20 m	250 m	overfær		21,47 m (70')
Sidenik den Pto Vij	Nygaardsvøjse - Søvedvej gennem Parken	3,12 m	3,12 m	425 m	grüsch		11,83 m (60')
Petersvoldgade	Mineralogisk Museum - Gethersgade	3,00 m	3,00 m	335 m	grüsch		29,22 m - 41,75 m (95'-133')
Peter Allé	Triangeln - fori Tobaksparken	middel 3,00 m	3,70 m	440 m	overfær		36,10 m (115')
Sabotilværd	Griffesfilstrøgade - Bochsstrøgade	3,40 m 3,00 m	5,25 m	280 m	Overfær		32,65 m (104')
Fagtvøj	Fagtvøj - Nygaardsvøj	3,0 til 2,7 m	3,0 til 2,7	475 m	Overfær		23,55 m (c 76')

# Maps from 1927 and 1935, *Copenhagen City Archive*



## GIS analysis method

Maps and records were geocoded in accordance with newer topographical map

One category: bicycle infrastructure,  
incl. segregated cycle tracks, cycle lanes, green cycle paths

Bicycle infrastructure on one or both sides of the road is digitized as one line

Allows for analysis of:

- the total length of the bicycle infrastructure in each survey year
- the km added and removed
- the spatial development (+BBR) of the bicycle infrastructure across Copenhagen from 1912 to 2013.





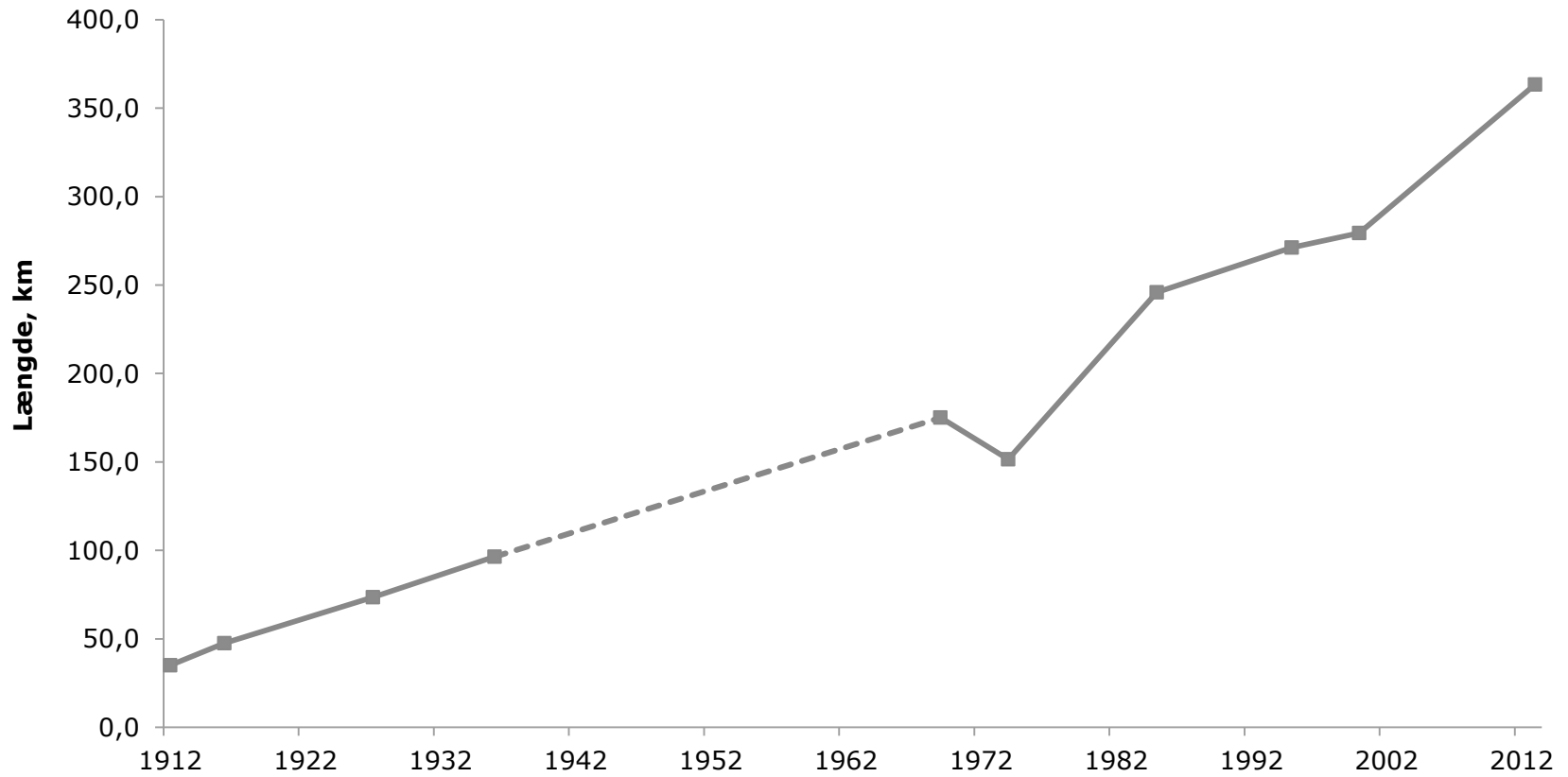
## **Result 1.**

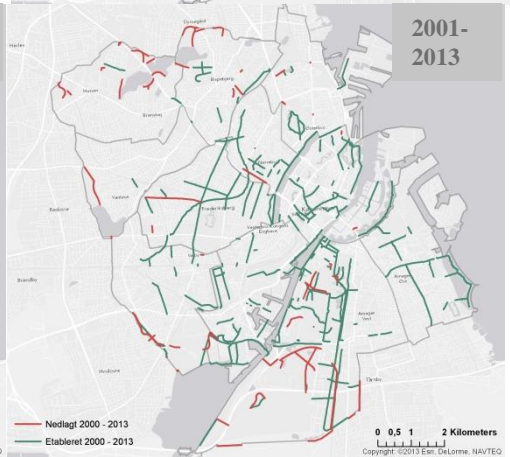
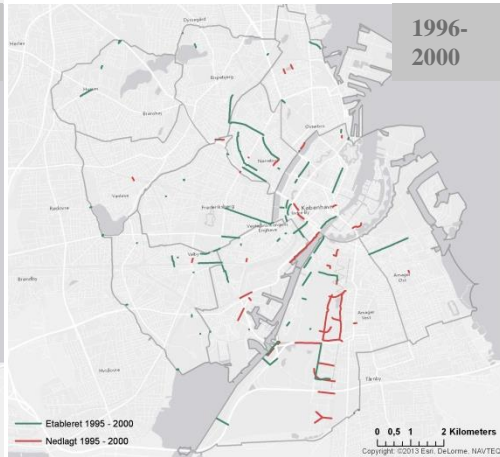
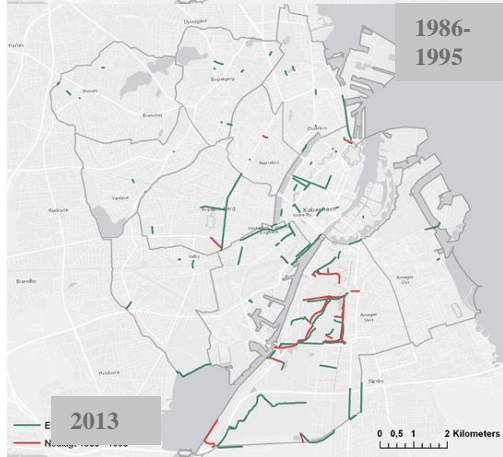
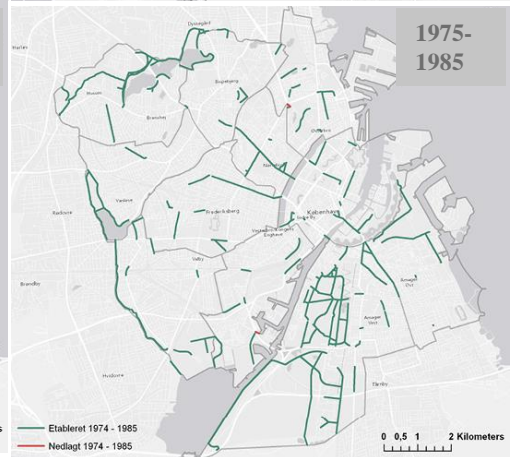
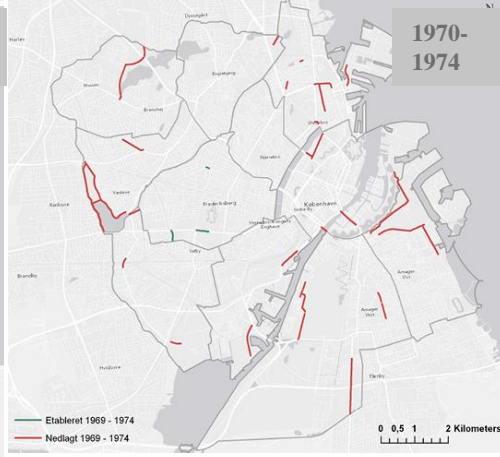
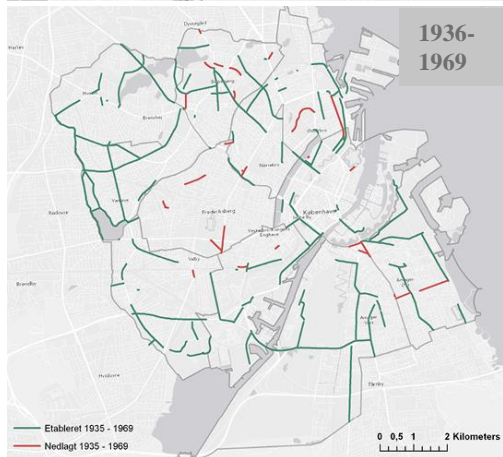
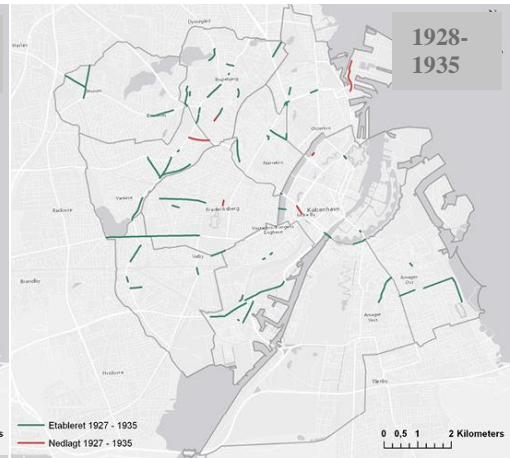
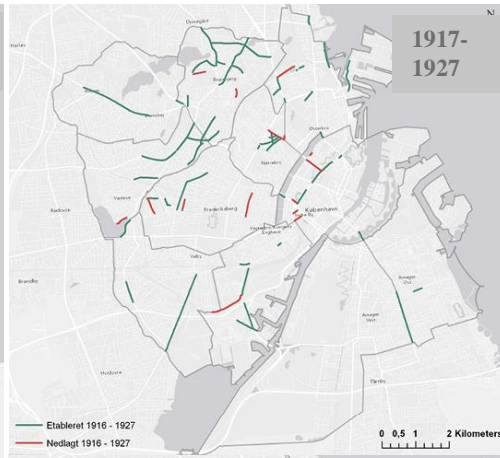
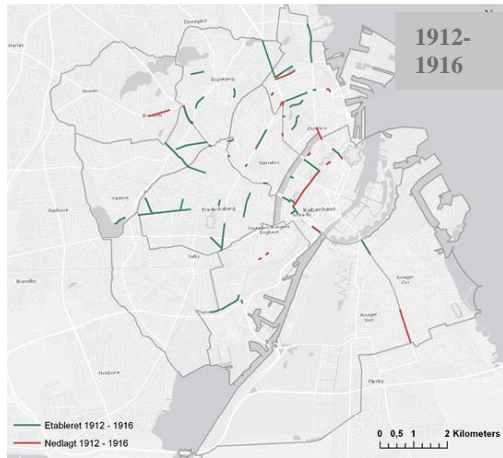
**Temporal rates of expansion of the  
bicycle infrastructure**

## Rates and dynamics of the cycling infrastructure development in Copenhagen 1912-2013

	Total, km	No. of years	Yearly growth, km	Added, km	Removed, km	Net result, km	Relative growth, %
1912	35,0	-	-	-	-	35,0	-
1912-1916	47,6	4	3,2	17,9	5,3	12,6	36,0
1917-1927	73,5	11	2,4	32,0	6,0	25,9	54,5
1928-1935	96,4	8	2,9	25,1	2,2	22,8	31,1
1936-1969	175,0	34	2,3	89,3	10,6	78,6	81,6
1970-1974	151,6	5	-4,7	0,8	24,2	-23,4	-13,4
1975-1985	245,9	11	8,6	94,5	0,2	94,3	62,2
1986-1995	271,2	10	2,5	35,4	10,1	25,3	10,3
1996-2000	279,4	5	1,6	21,8	13,6	8,2	3,0
2001-2013	363,4	13	6,5	111,6	27,6	84,0	30,1
<i>Total, 1912-2013</i>	<i>363,4</i>	<i>101</i>	<i>3,3</i>	<i>428,3</i>	<i>99,9</i>	<i>328,6</i>	<i>938,3</i>

## Development of bicycle infrastructure in Copenhagen 1912 - 2013



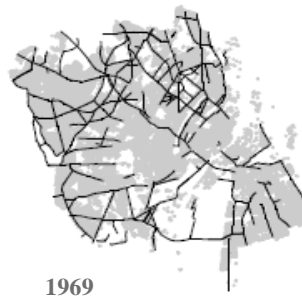
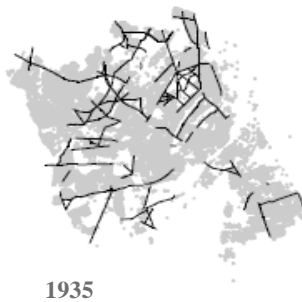
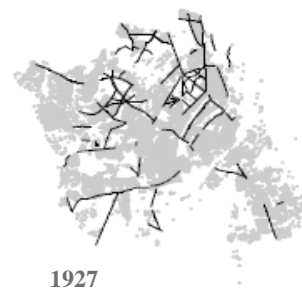
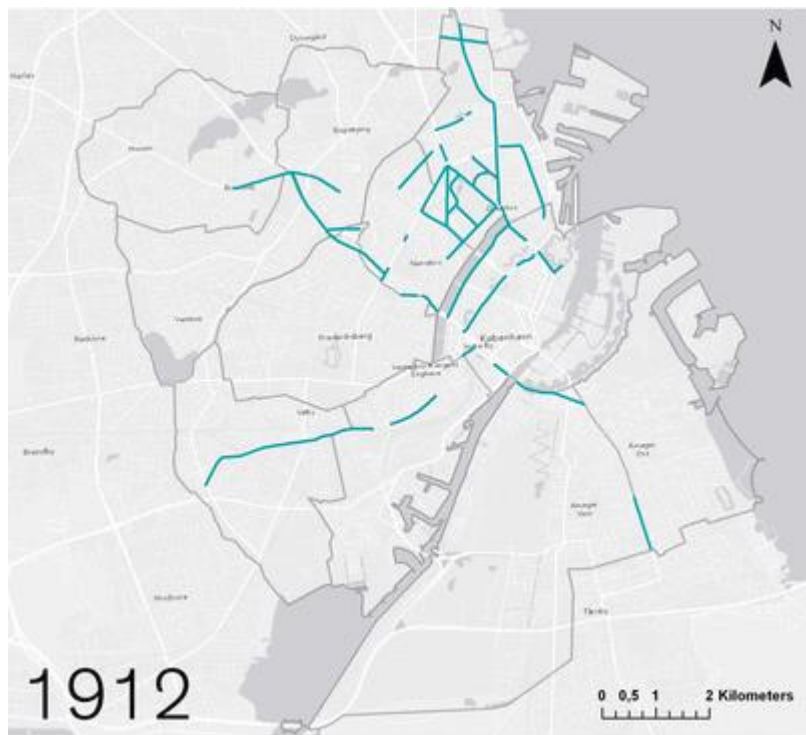


**2013**

— Etableret 2013  
 — Nedlagt 2013

## **Result 2.**

**Spatial distribution of the expansion  
of the bicycle infrastructure**



## Summary

### 1. *Temporal expansion*

- (relatively) continuous.
- two newer periods of steeper expansion: 1970s-80s and in the 2000s
- dynamics in the expansion, removed km

### 2. *Spatial expansion*

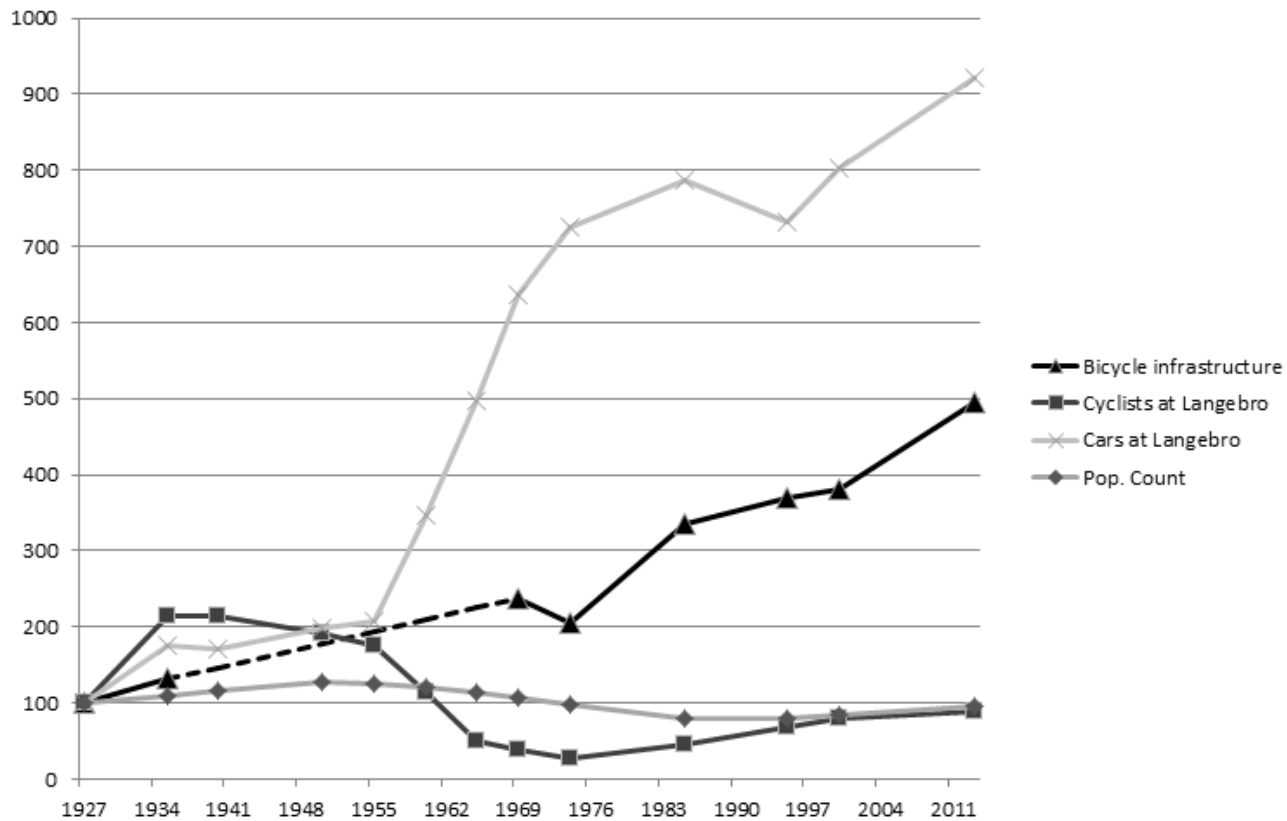
- expansion equally distributed in the city and followed more or less the city's growth.

Exceptions: Inner Frederiksberg and Historic centre did not have much bicycle dedicated infrastructure until the 1980s.



# Perspectives for further investigation

Index numbers of bicycle infrastructure (km); traffic counts of bicycles and cars at Langebro; and population in Municipality of Copenhagen. Base year is 1927. Statistical Yearbook of Copenhagen, Frederiksberg and Gentofte Municipalities.





The background features a light gray grid pattern overlaid on a darker, textured gray area. A large, light-colored, irregular shape, resembling a stylized letter or symbol, is positioned in the upper left quadrant. A semi-transparent gray rectangular box is centered over the lower part of this shape.

***Thank you***