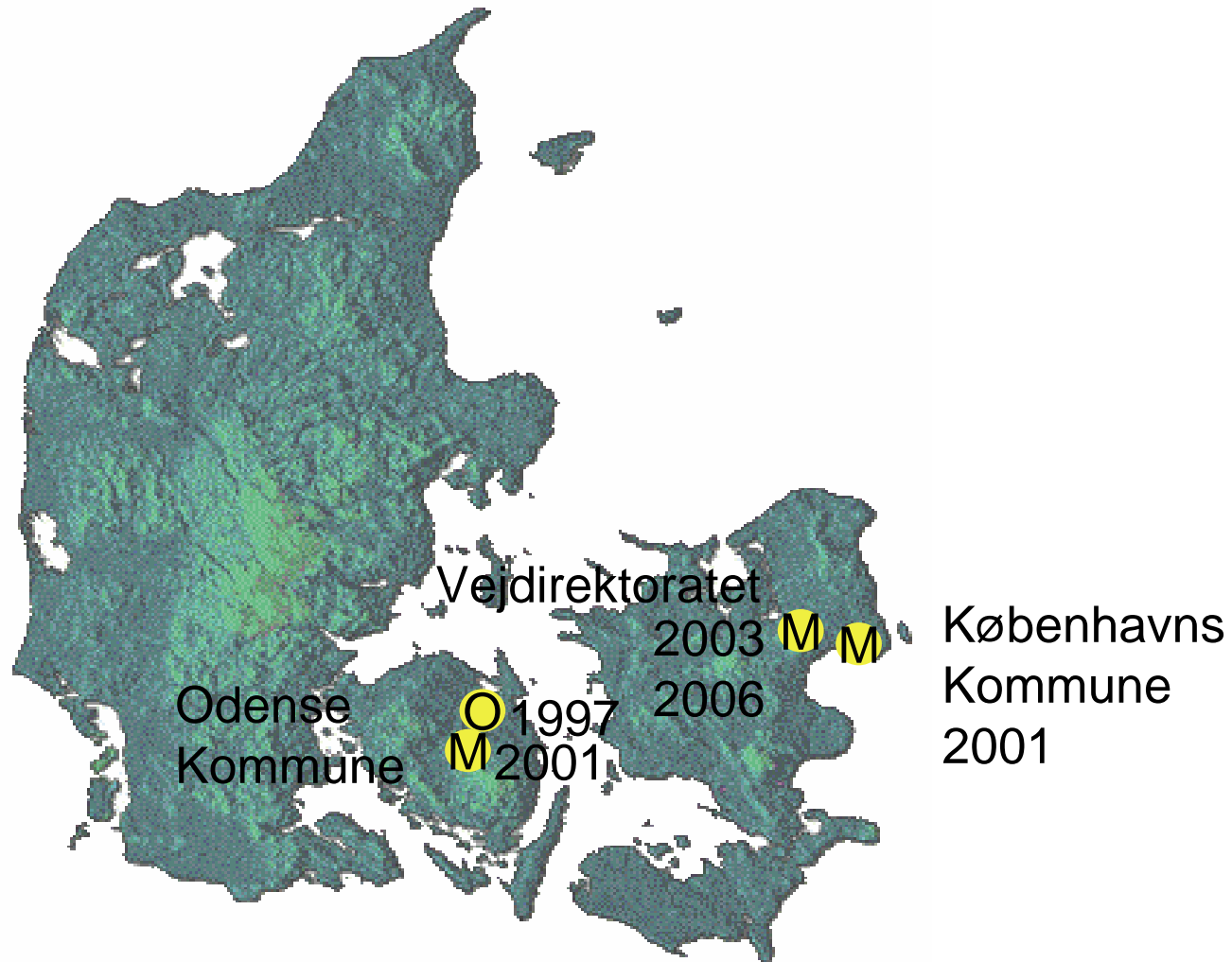


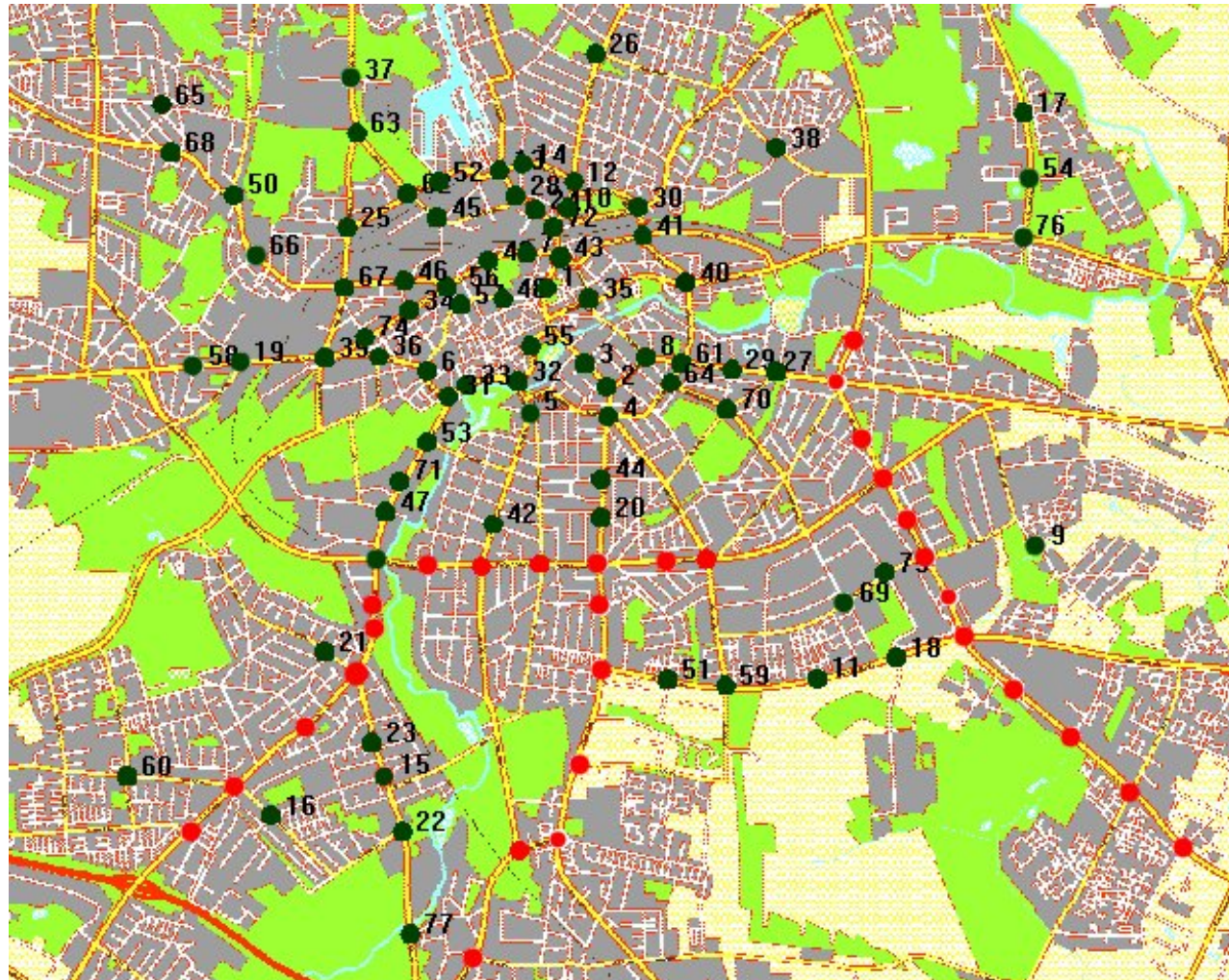
Adaptive Traffic Light Control in Denmark



4 Network Control Systems - 3 with MOTION



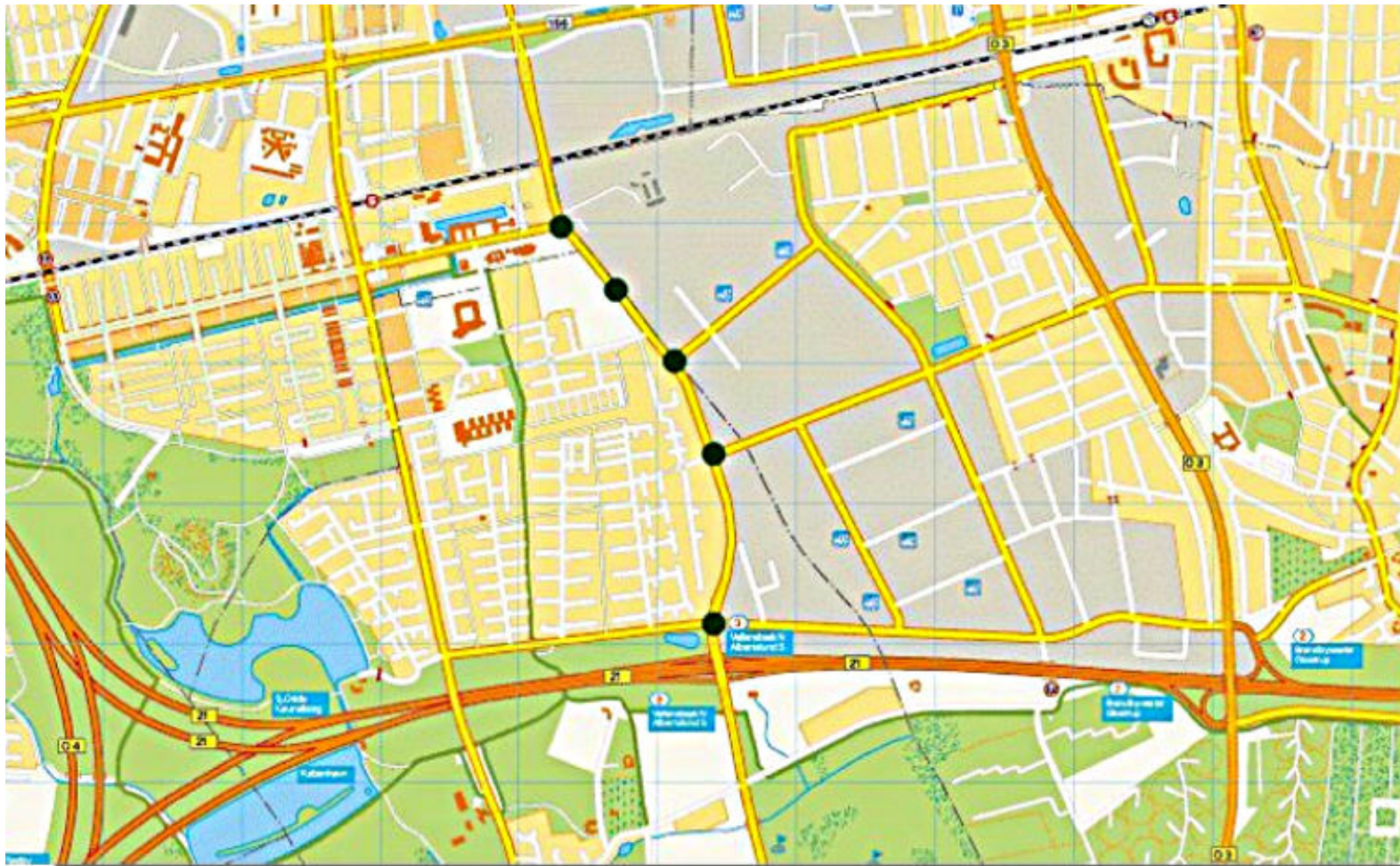
Odense 30 (+78) Traffic Lights, 2001 (1997)



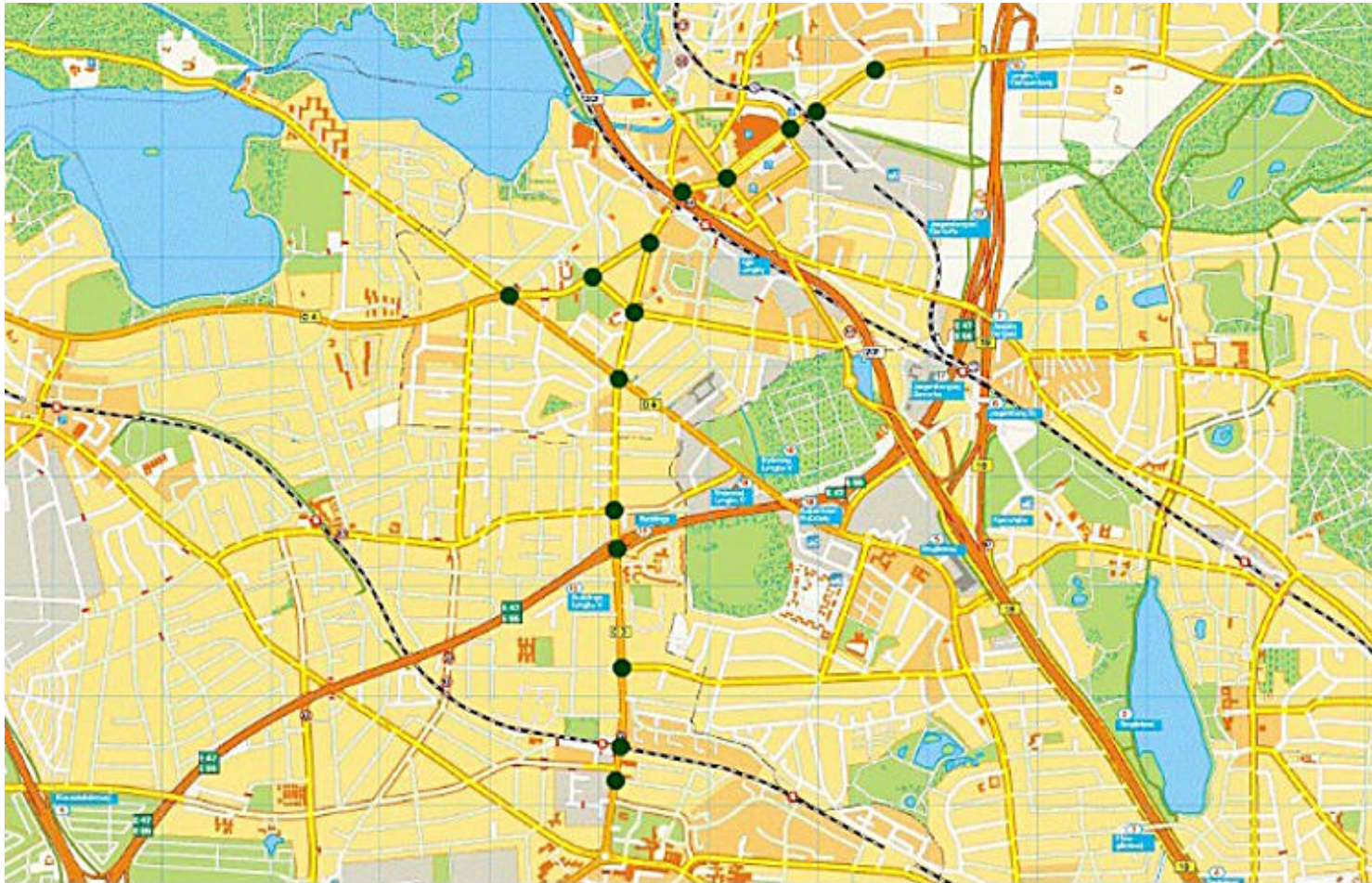
Valby – 10 Traffic Lights (2001)



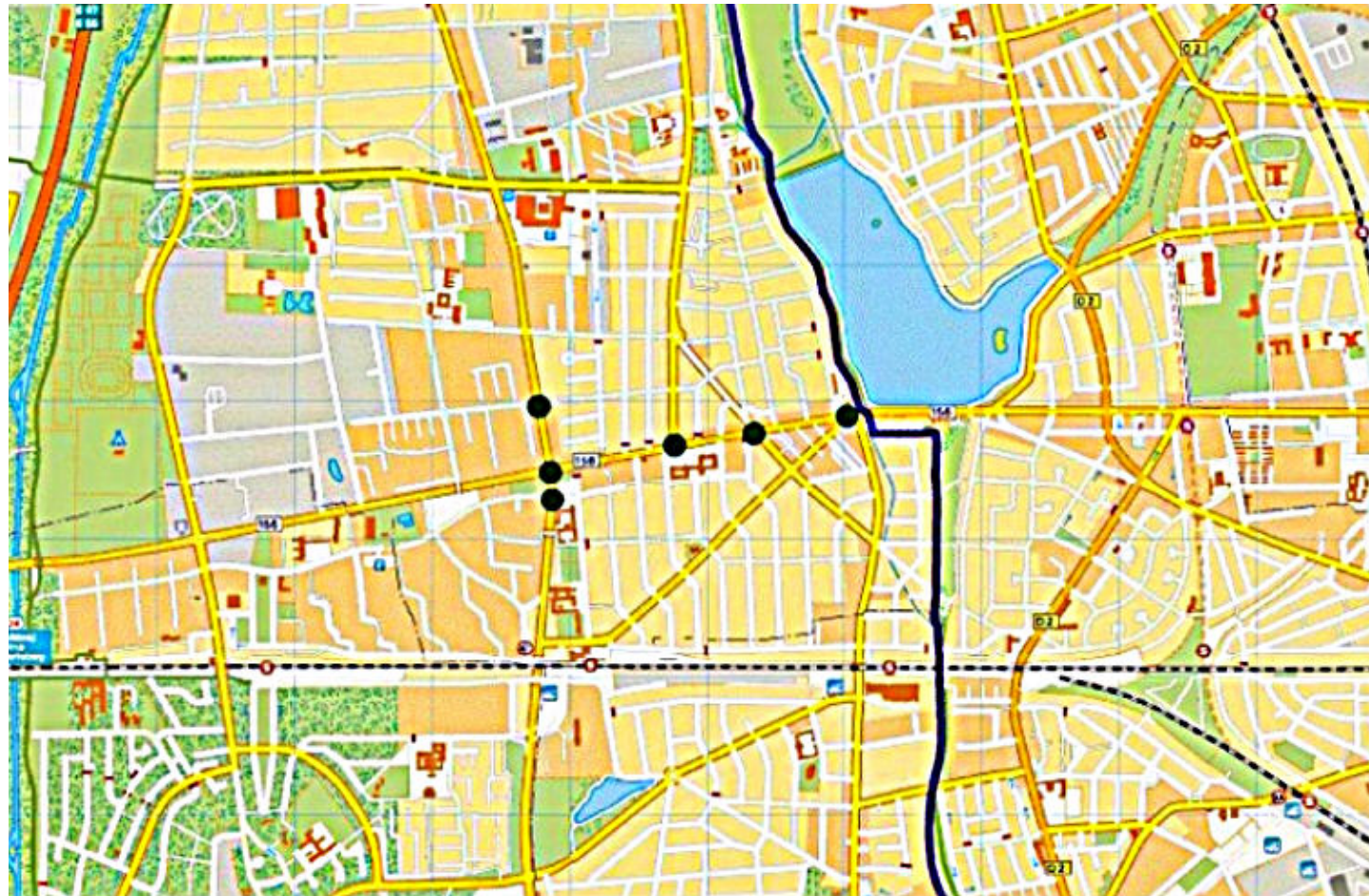
Vallensbæk – 5 Traffic Lights (2003)



Lyngby – 15 Traffic Lights, 2004



Rødovre – 6 Traffic Lights, 2004

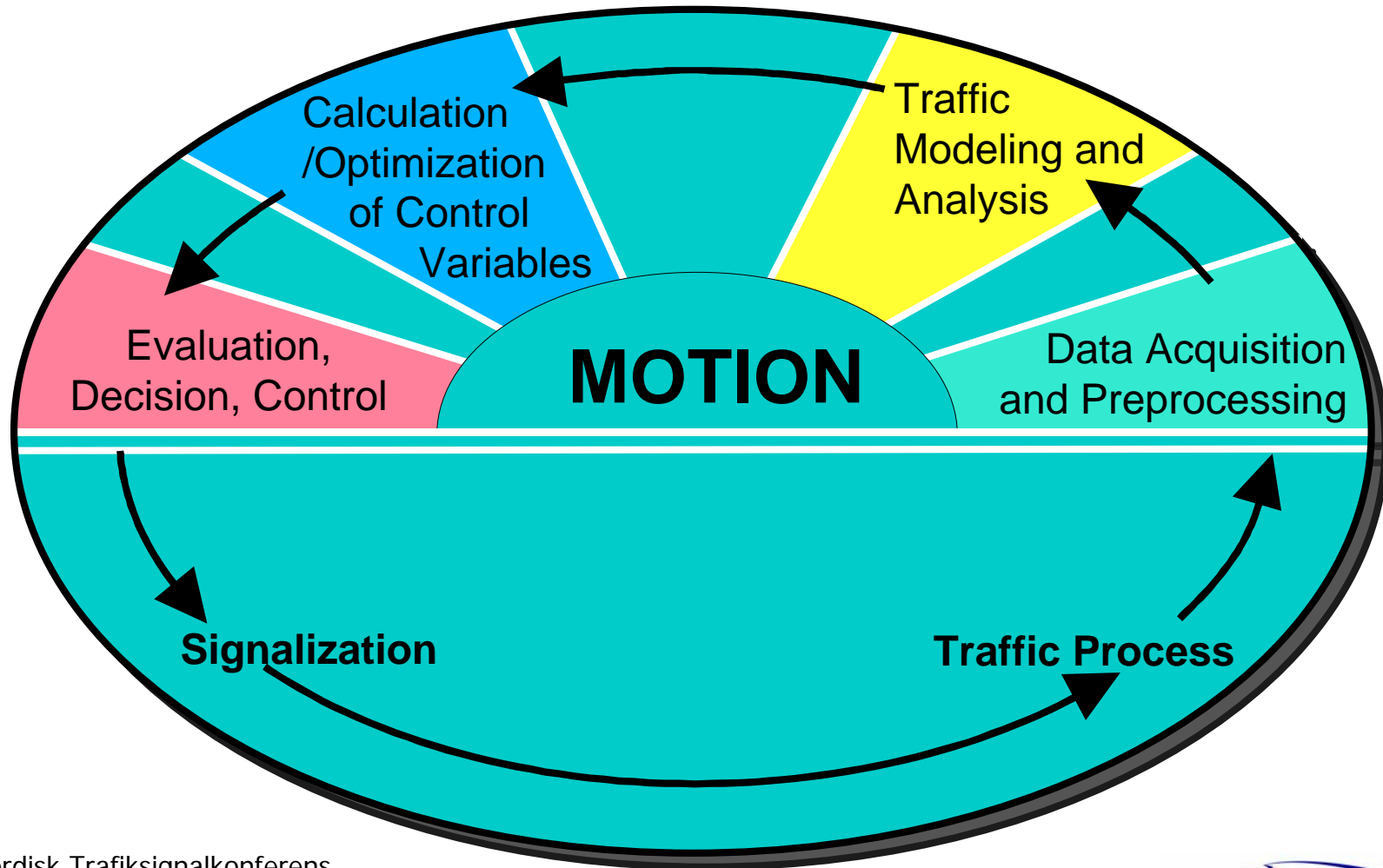




The reason for adaptive Control

- Cycle time = $2 \times \text{Distance} / \text{Speed}$
- Uniform distances between traffic lights is necessary for a good co-ordination in both directions
 - Hard to achieve.
- Higher traffic load Increased cycle time
 - Result: Lower speed
- Need for a better adaptation of the control of the traffic lights to the variations in the traffic load

Adaptive Control is a cheap Solution





Optimization of Control Variables

Network Cycle Time

Necessary for coordination of traffic signals

Green Time Split

Adapted to the traffic load of the network, prevents congestion

Phase Sequence

Relevant for security and optimization aspects

Off-set

Important for Green Waves and minimization of delays and stops



The abilities of MOTION

Improvement of Capacity

Incident and Congestion Management

Green Waves for Main Streams

Public Transport Priority

Network optimum of Delays and Stops

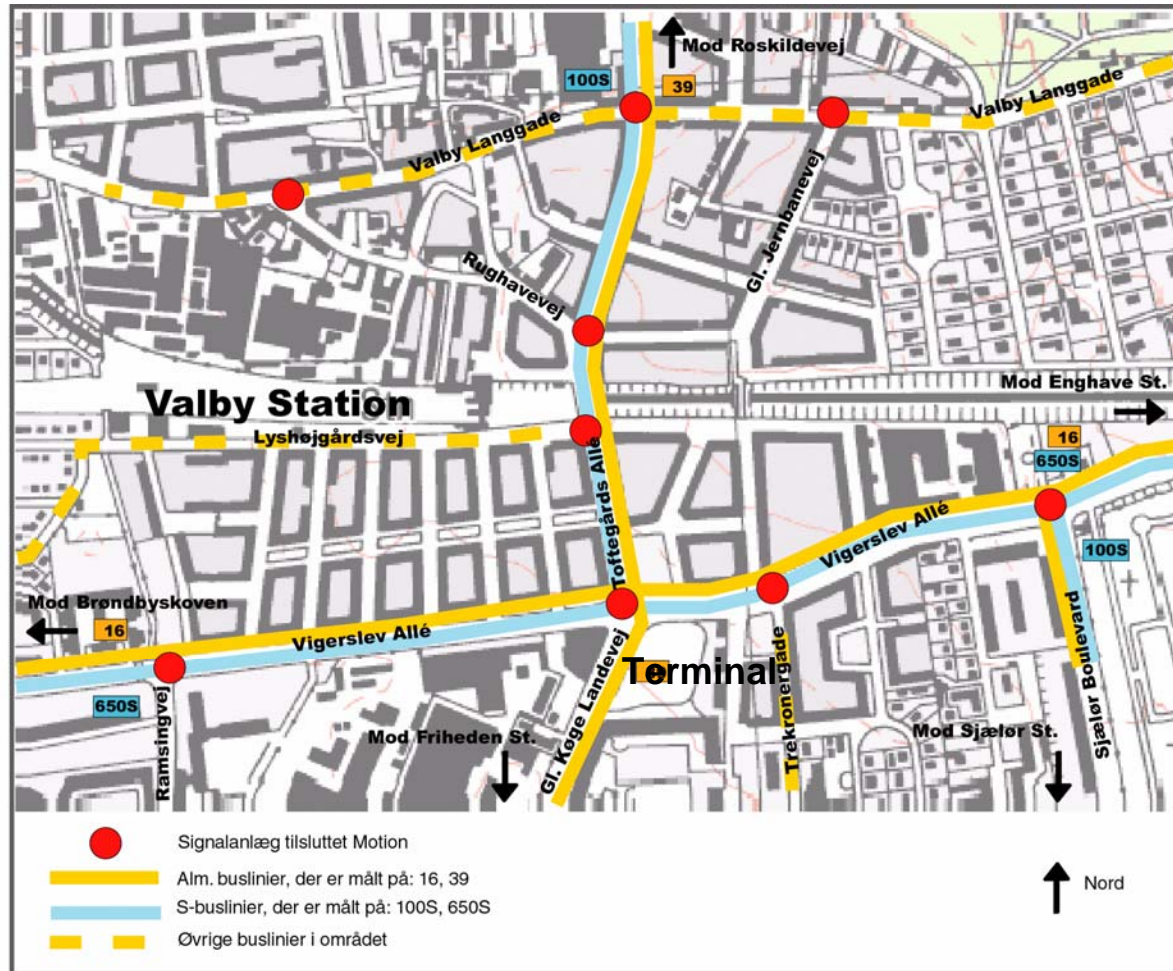
Environmental Control



Effects

- Report from Valby
- Report from Lyngby
- Supplementary Results from Lyngby
- "Floating Car" in Odense

MOTION in Valby – adaptive traffic light control system





MOTION in Valby

Reduction of bus travel times

morning / afternoon

<i>Motion</i> with light bus priority:	16,7% / 26,8 %
<i>Motion</i> with bus weights:	8,9% / 10,3%
<i>Motion</i> standard:	12,6% / 18,6%

Higher vehicle speeds (all vehicles)

<i>Motion</i> with light bus priority :	0,9% / 5,8%
<i>Motion</i> with bus weights :	5,4% / 6,1%
<i>Motion</i> standard:	2,1% / 1,4%

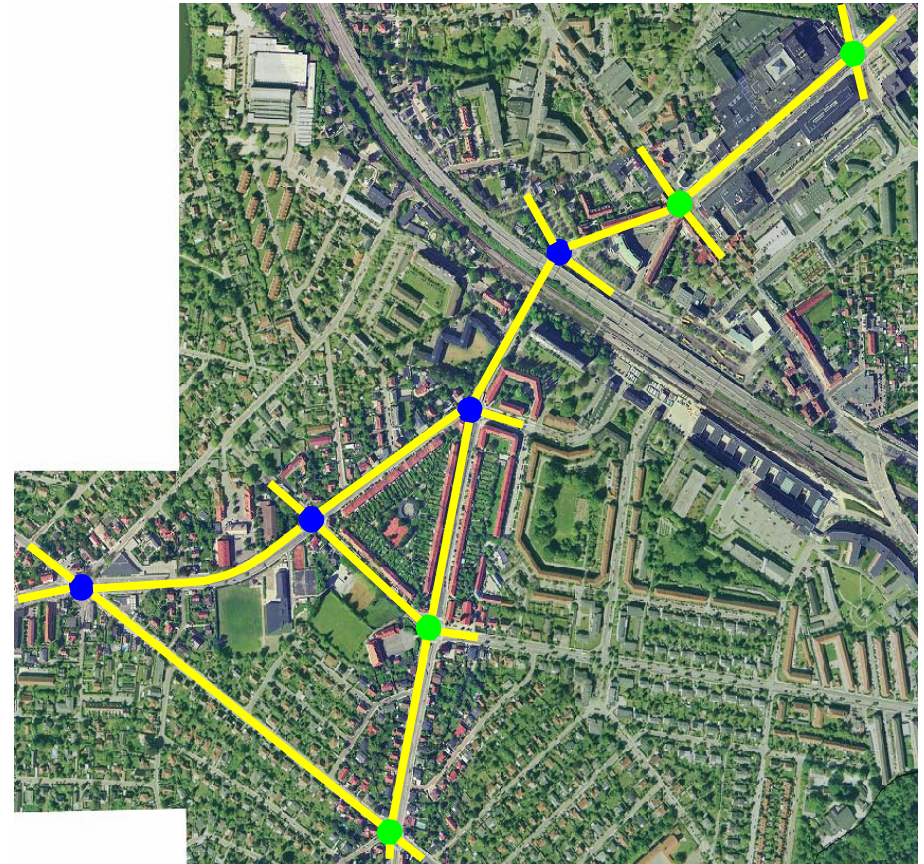
Evaluation of MOTION in Lyngby

Results from VISSIM:

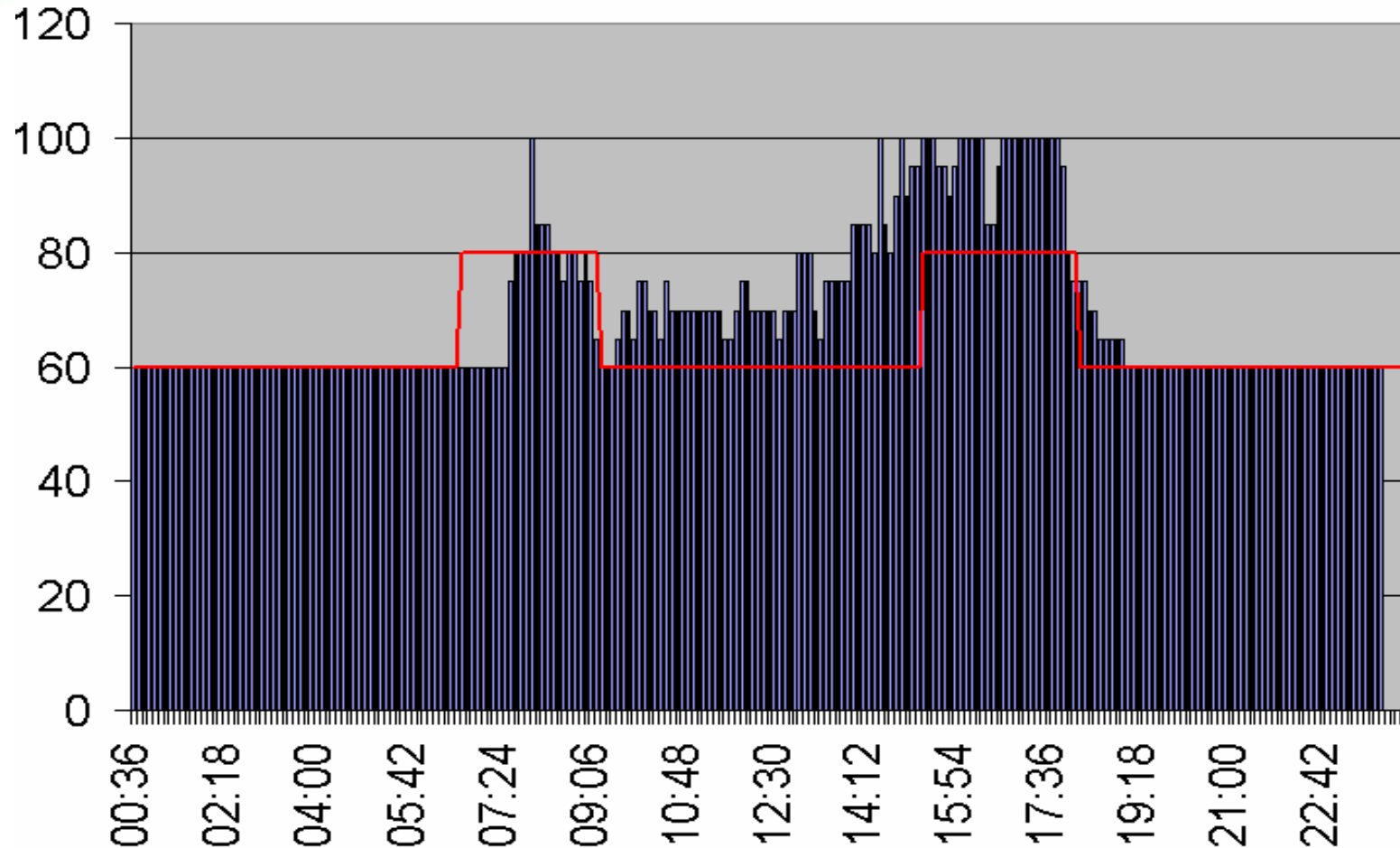
Every year the road users save
4,7 mio. DKK by less wasted time

- 21% less wasted time per vehicle
- 5% more vehicles through the network
- 18% higher travel speed
- 29% fewer stops

According to a report from nctrafik.



Supplementary results from Lyngby



Adjusted cycle times

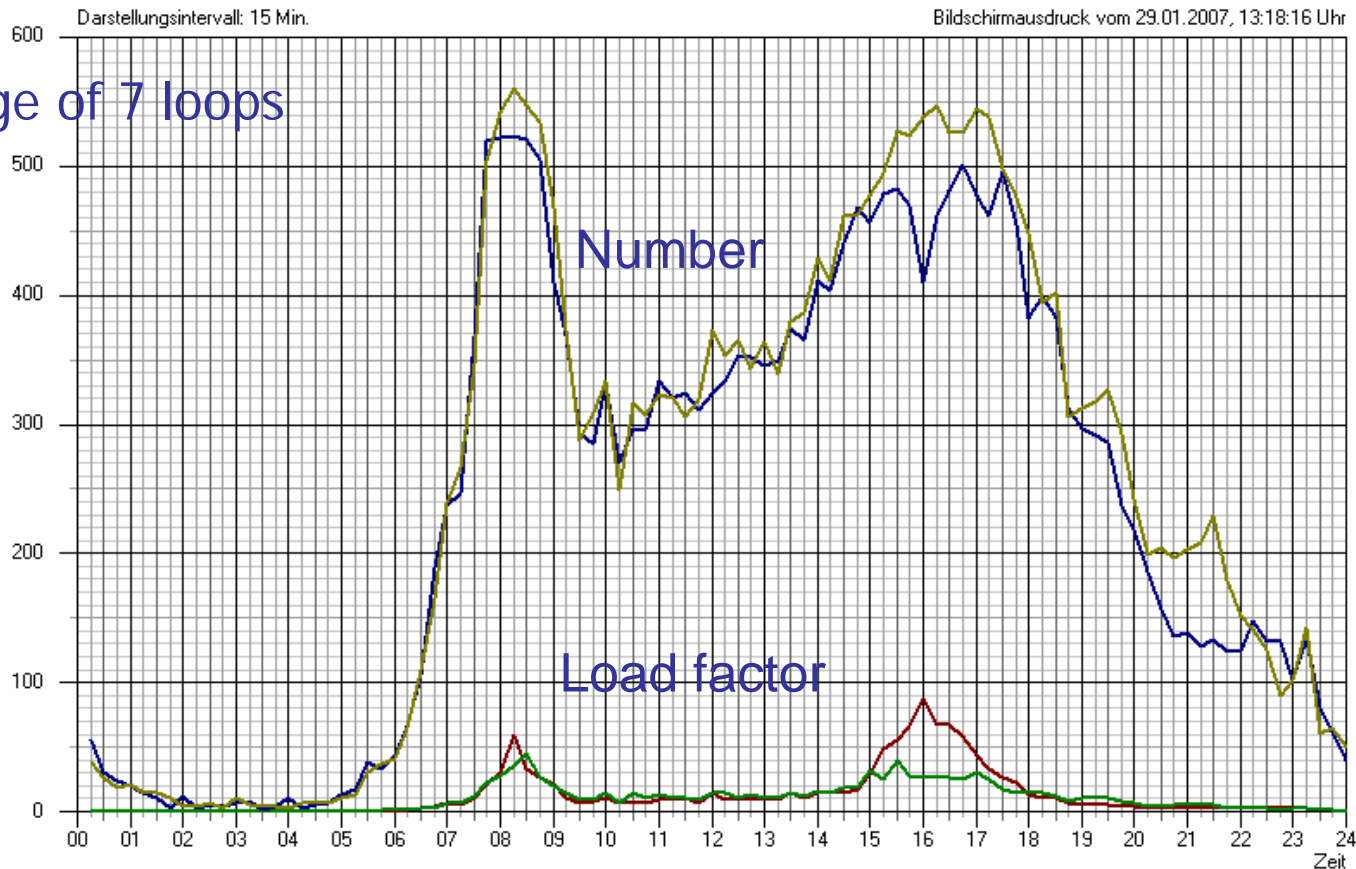
Supplementary results from Lyngby



Adjusted split times

Supplementary results from Lyngby

Average of 7 loops



Legende

— B um 21092005
Mittel (88.54% OK)
— C um 2192005
Mittel (100.00% OK)

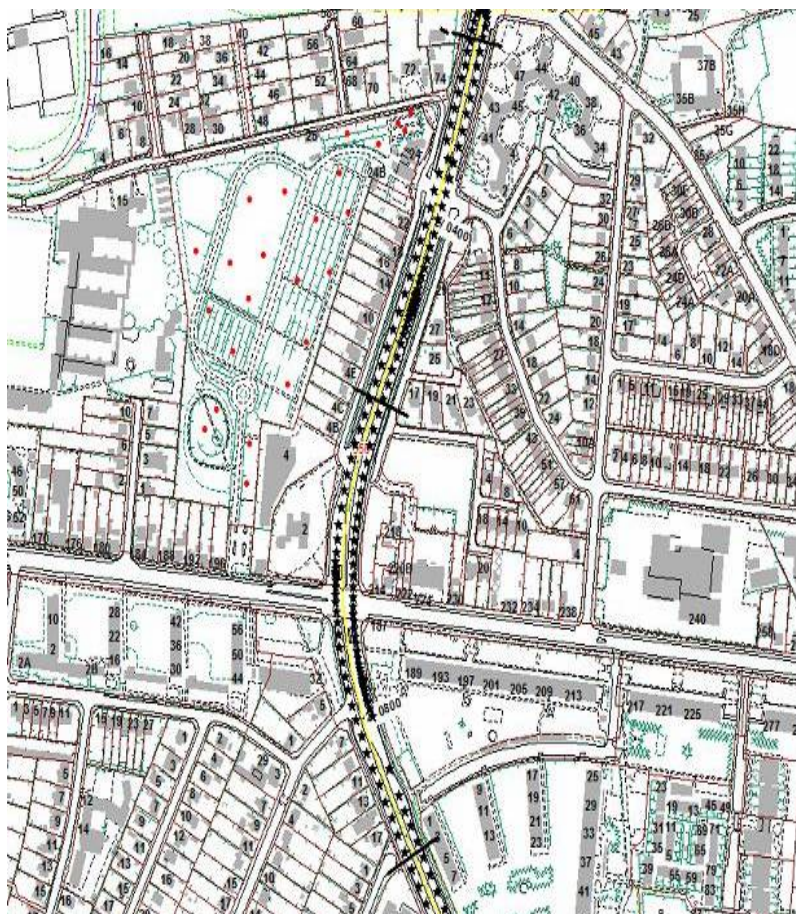
Without
MOTION

— B mm 28092005
Mittel (97.92% OK)
— C mm 28092005
Mittel (100.00% OK)

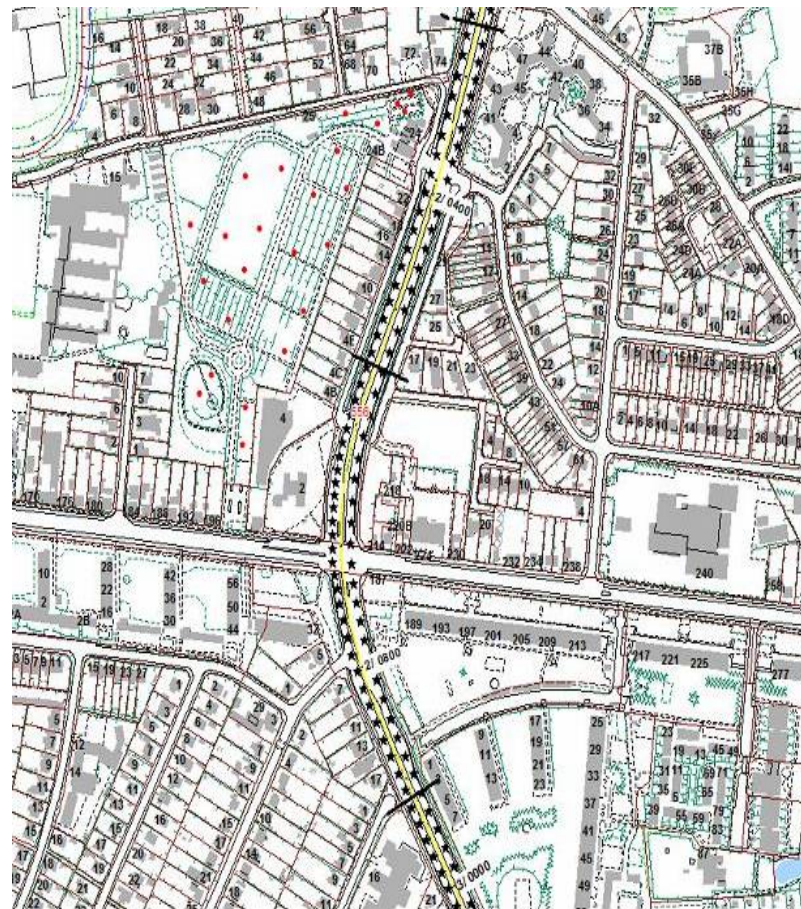
With
MOTION

GPS recording before and after, Odense

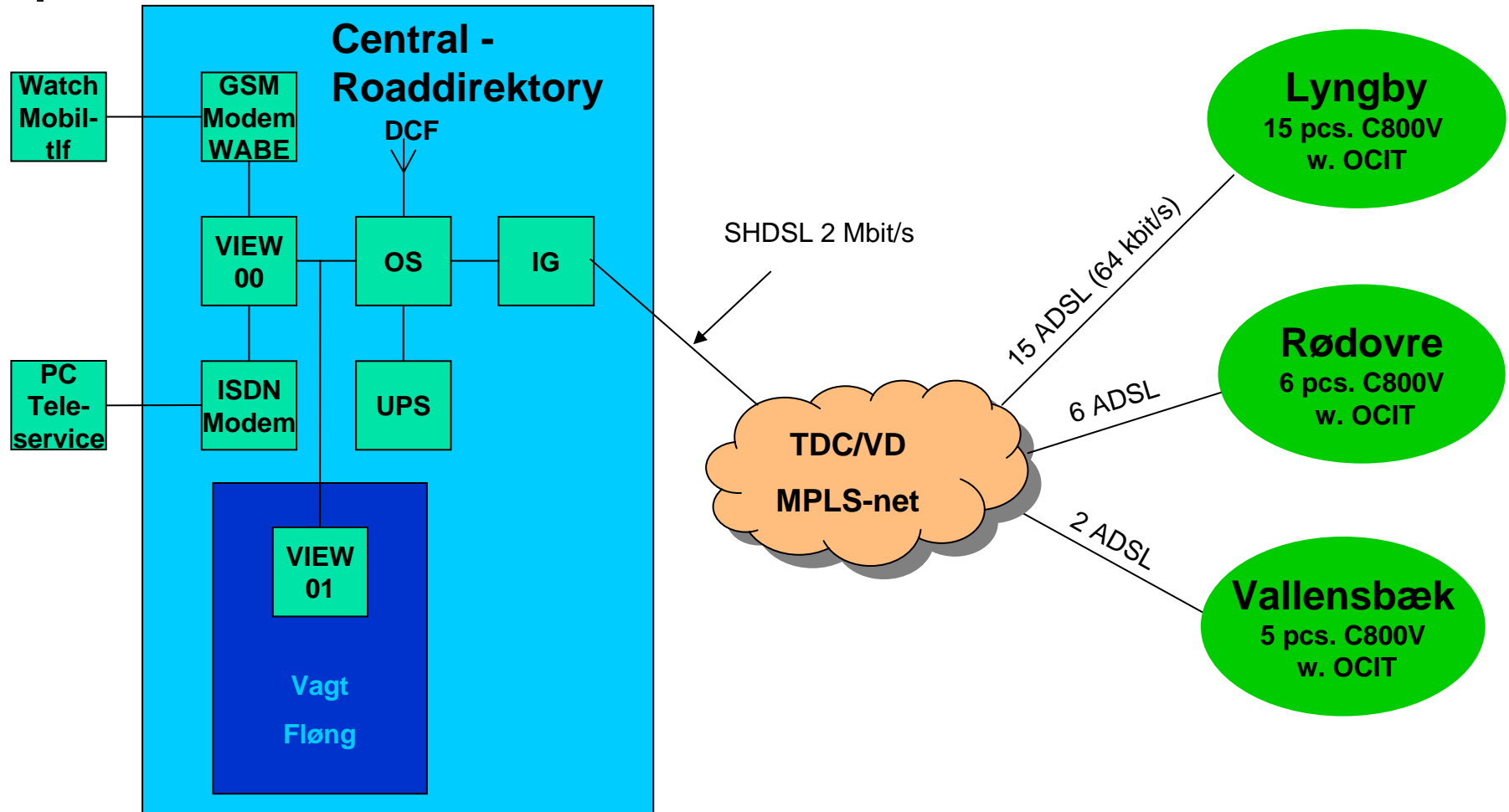
Before



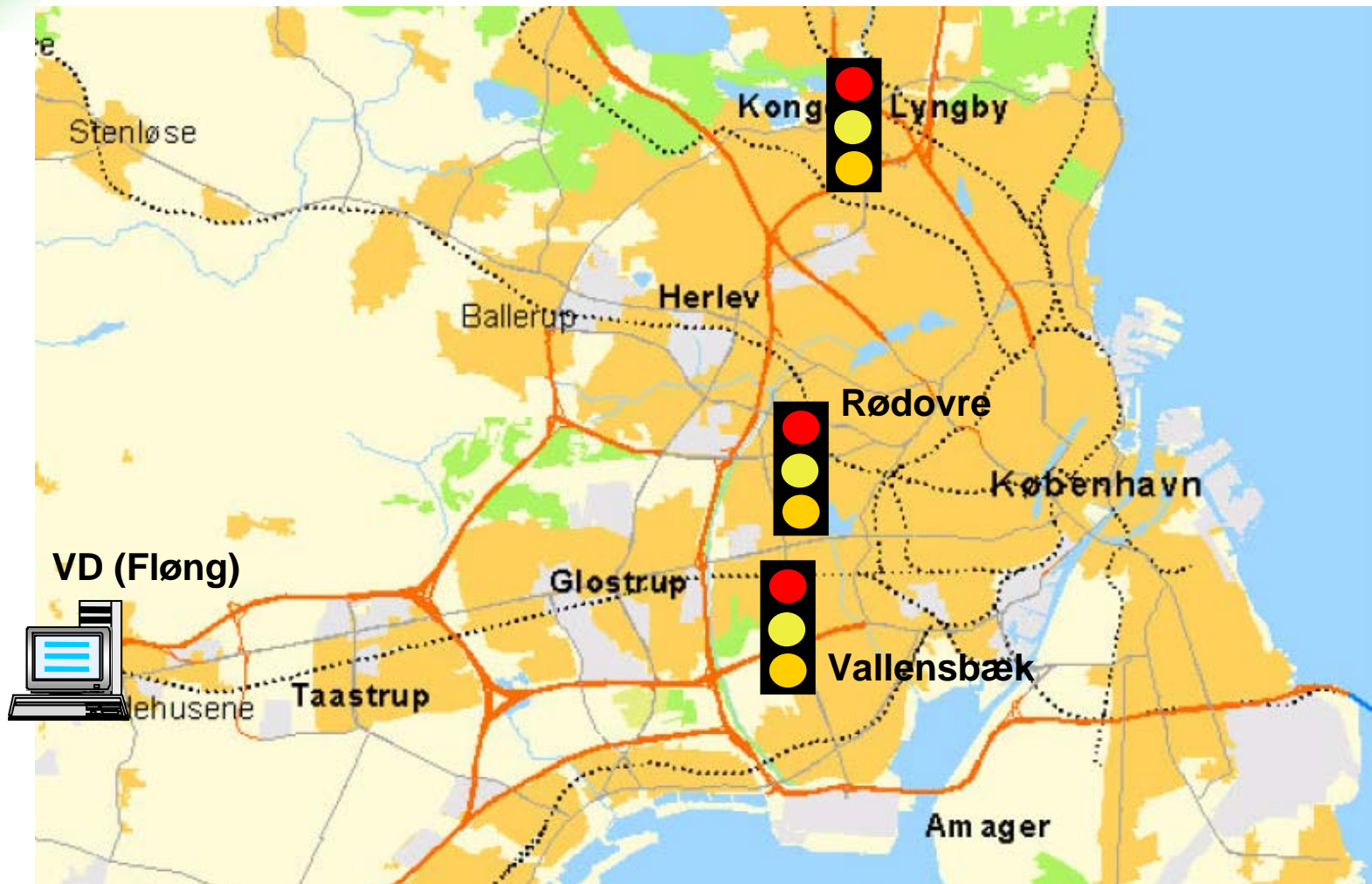
After



System architecture – an example



Dispersed localities





The End

Links to reports on:

www.DanskTrafikTeknik.dk