

# SPOT in the Nordic countries:

How successful has it been?  
How successful could it have been?  
How successful can it be?

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# ITS in the Nordic countries

- Which ITS solution is most important in the Nordic countries?



In 1930 the controller was an ITS milestone.

In 2007 the controller is still important, but there is a large potential for development.

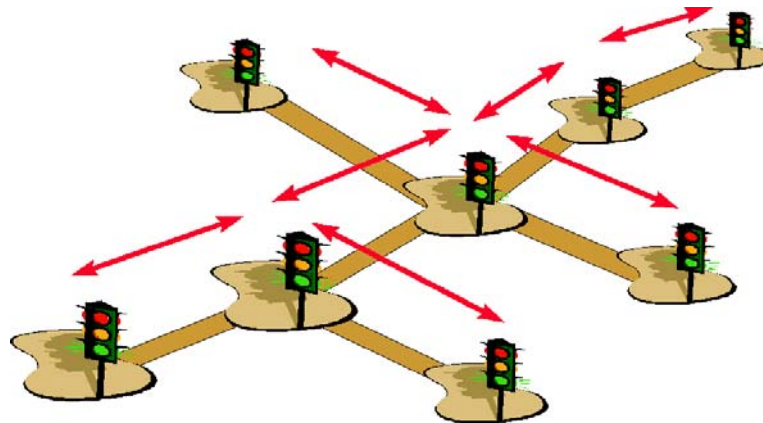
# SPOT in the Nordic countries

Benefits for traffic

Different approaches signaling in city centre

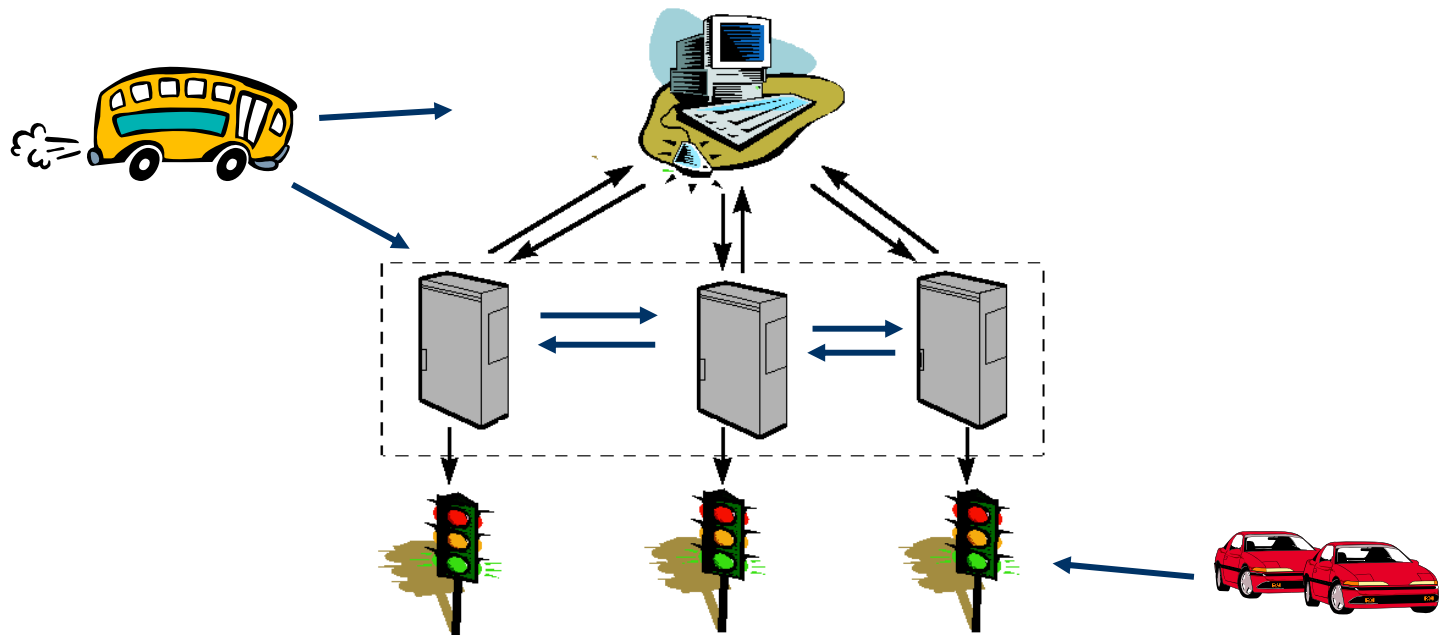
- Local traffic actuated signaling
- Fixed timings (Plan selection)
- Fixed timings with modification (Motion)
- Coordinated traffic actuated signaling (Scoot, SPOT/Utopia)

Work needed for  
maintaining the  
system



# SPOT/UTOPIA concept

SPOT/UTOPIA is an UTC system that produces co-ordination within an area without neither a common nor a fixed cycle time for each intersection.



# SPOT/Utopia concept

Aim of SPOT/Utopia at a principal level:

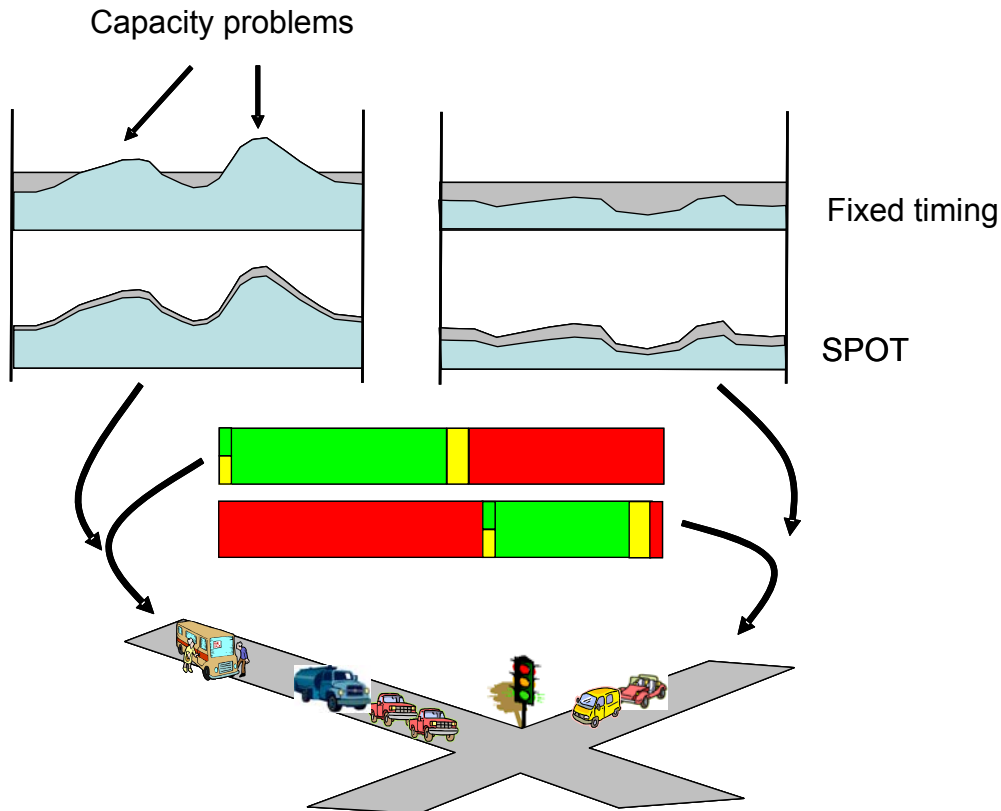
- Public transport is given high priority at the intersections
- All other traffic shall have equal or better travel time as before

If such a goal shall succeed there has to be a «spare capacity» in the net, that the other systems are not able to use.

... Signal priority does not mean that you gets automatic green when arriving at the stop line, but rather that you get green signal quicker when arriving at red!



# Capacity within SPOT/Utopia



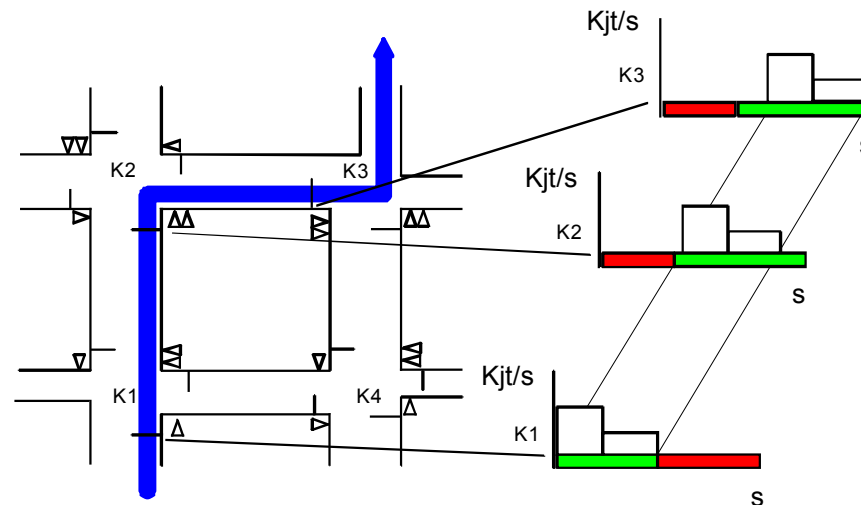
Theoretical capacity depends of chosen phases, cycle time, green split and lost time.

By adjusting the signaling to the present traffic we gets a better capacity utilization.

SPOT tends to serve more traffic while the average cycle time actually is lower.

# Signal priority of public transport

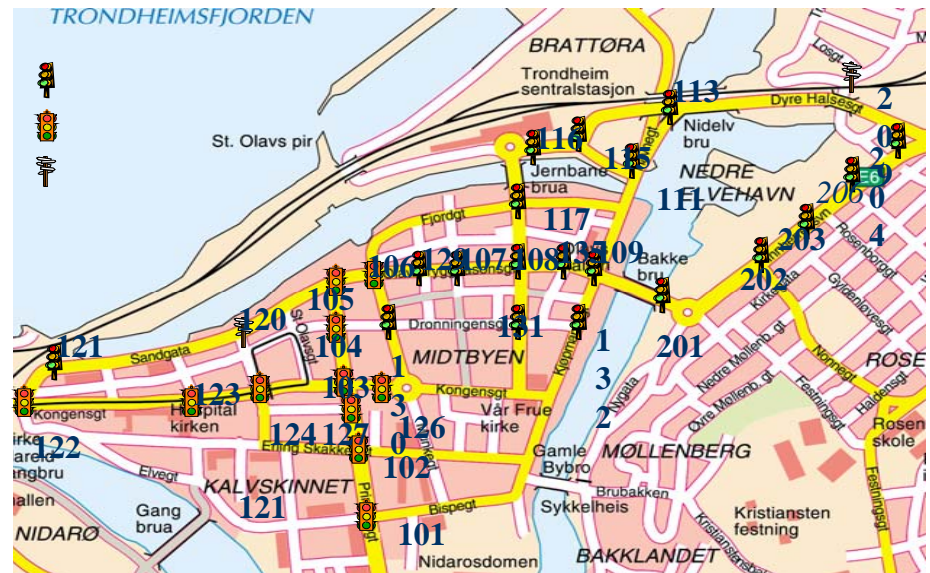
- An normal bus route will pass 40 to 60 signalized intersections on each lap.
- A coordinated priority is therefore necessary.



# SPOT in the Nordic countries – Installations

## ■ Norway

- Oslo: Many local installations – 80 intersections  
Has system for priority of public transport
- Trondheim: City center managed by SPOT – 40 intersections  
Lack system for priority of public transport
- Bergen: Test installation with 10 intersections in 1995



# SPOT in the Nordic countries – Installations

## ■ Sweden

- Malmö – 20 intersections
- Stockholm – 10 intersections (non running?)
- Göteborg – 20 to 30 intersections (15 running?)

## ■ Denmark

- Køge – 5 intersections
- København – 10 intersections

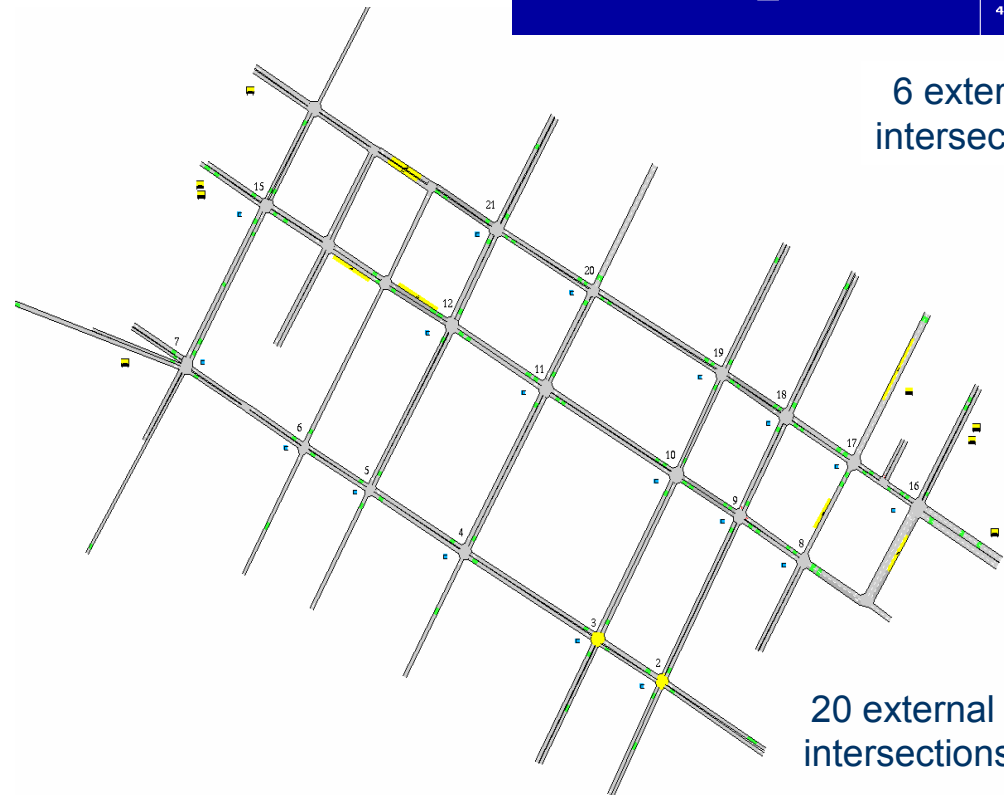
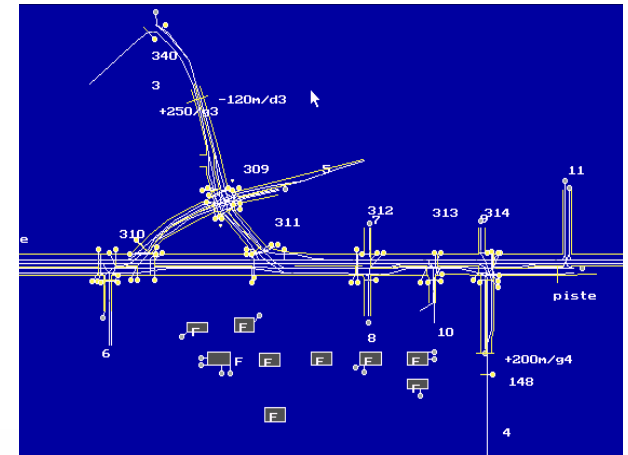
## ■ Finland

- Tampere – 8 intersections

# Results – Research

SINTEF has simulated SPOT in several areas

- HUTSIM (1997 – 1998)
  - Christies gate, Bergen
  - Tampere, Finland
  
- NETSIM (1999 – 2002)
  - Ila, Trondheim
  - Majorstua, Oslo
  - Bystasjonen, Bergen
  - Chicago Avenue, USA
  - Kvadraturen, Oslo
  
- AIMSUN (2003 →)
  - Fredriks gate, Oslo
  - Kvadraturen, Oslo
  - Grünerløkka, Oslo
  - Elgeseter gate, Trondheim
  - Oslo sentrum nord, Oslo



6 external intersections

20 external intersections

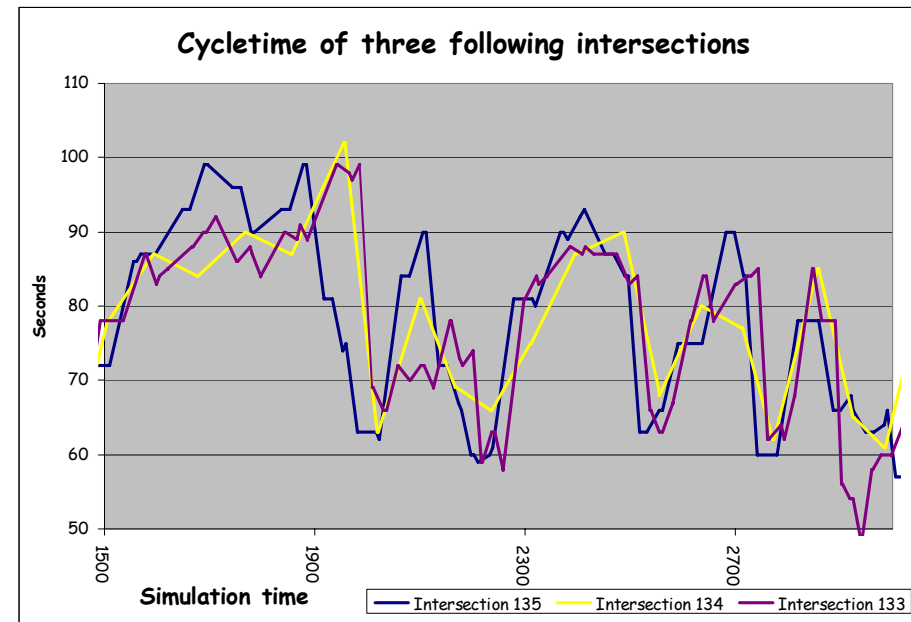
# Results – Research

The results from installations depends on both earlier signalling as well as the traffic.

- Normal fixed timing:
  - Normal traffic : 10 - 15 % reduction
  - Public transport: 15 - 25 % reduction

All results in travel time.

- Surveys has shown that the payback time for SPOT installations is less then 6 months for Norwegian installations.



# Results – Good colleagues



# SPOT in the Nordic countries – Typical test installations

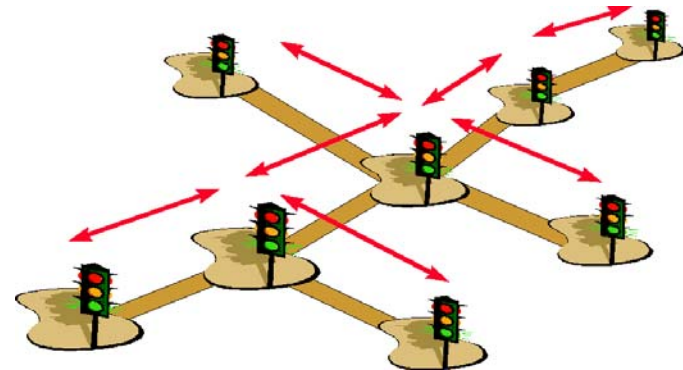
How has the typical test installations been:

- Norway
  - Bergen: Christies gate - 10 intersections
  - Oslo: Grunerløkka - 4 intersections
  - Trondheim: Ila - 10 intersections
- Sweden
  - Malmö: - 4 intersections
  - Stockholm: - 4 intersections
- Denmark
  - Køge: - 4 intersections
  - København: -
- Finland
  - Tampere: - 7 intersections



# SPOT in the Nordic countries – Years to come

- Test in the Nordic countries as well as in Netherlands and Italy has been beneficial for traffic flow. The possibilities for giving priority to public transport is especially important. The concept is regarded as positive and promising.
- New installations should be based on documentation and references, not new local tests.
- The SPOT concept was introduced in Sweden in 1992 and in Norway in 1995. There has been no coordination from the central road authority. This must be adjusted.



# SPOT in the Nordic countries

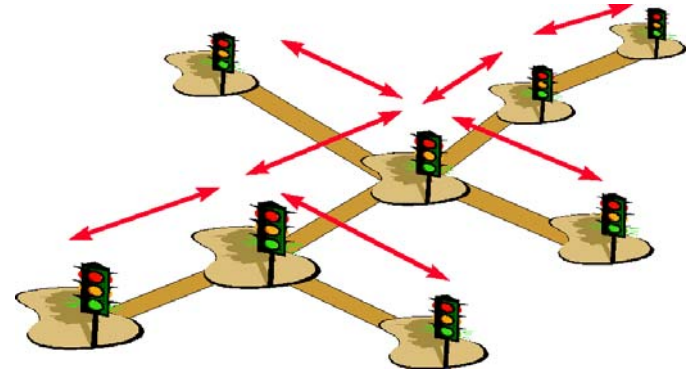
- How successful has it been?  
Small test installations has lead to a time consuming process.

Low success rate.

- How successful could it have been?  
Test shows good effects versus fixed timing:
  - Normal traffic : 10 - 15 % reduction
  - Public transport: 15 - 25 % reduction

High potential

- How successful can it be?  
Problem with earlier sale process:  
SPOT/Utopia is not a Turn Key System  
– it needs maintenance



Success potential depend on willingness to alter the organization.

# SPOT in the Nordic countries

To options:

## ■ 1. Local and uncoordinated deployment

- Small test installations
- Good local test, but problems with the maintenance of the system
- None or few coordinated initiatives

No success – the system will die or be replaced sometime in the future

## ■ 2. Central coordination

- Evaluation of strategies
- Larger areas are developed each time
- Coordination of public transport detection and signaling system.

Success – improved travel time until the system will be replaced sometime in the future