



Elements of Mobility Strategy:
Integrated Planning and Finance
in
Copenhagen
- and other places

Japan International Transport Institute
Washington DC
March, 2015

Per Als
Copenhagen



Copenhagen

Copenhagen,

Capital of Denmark

**550,000 inhabitants in City
1.8 mil inhabitants in Region**

**City growing 100,000 over
next 10 years**

**Growth and economic
development put pressure
mobility**

Denmark

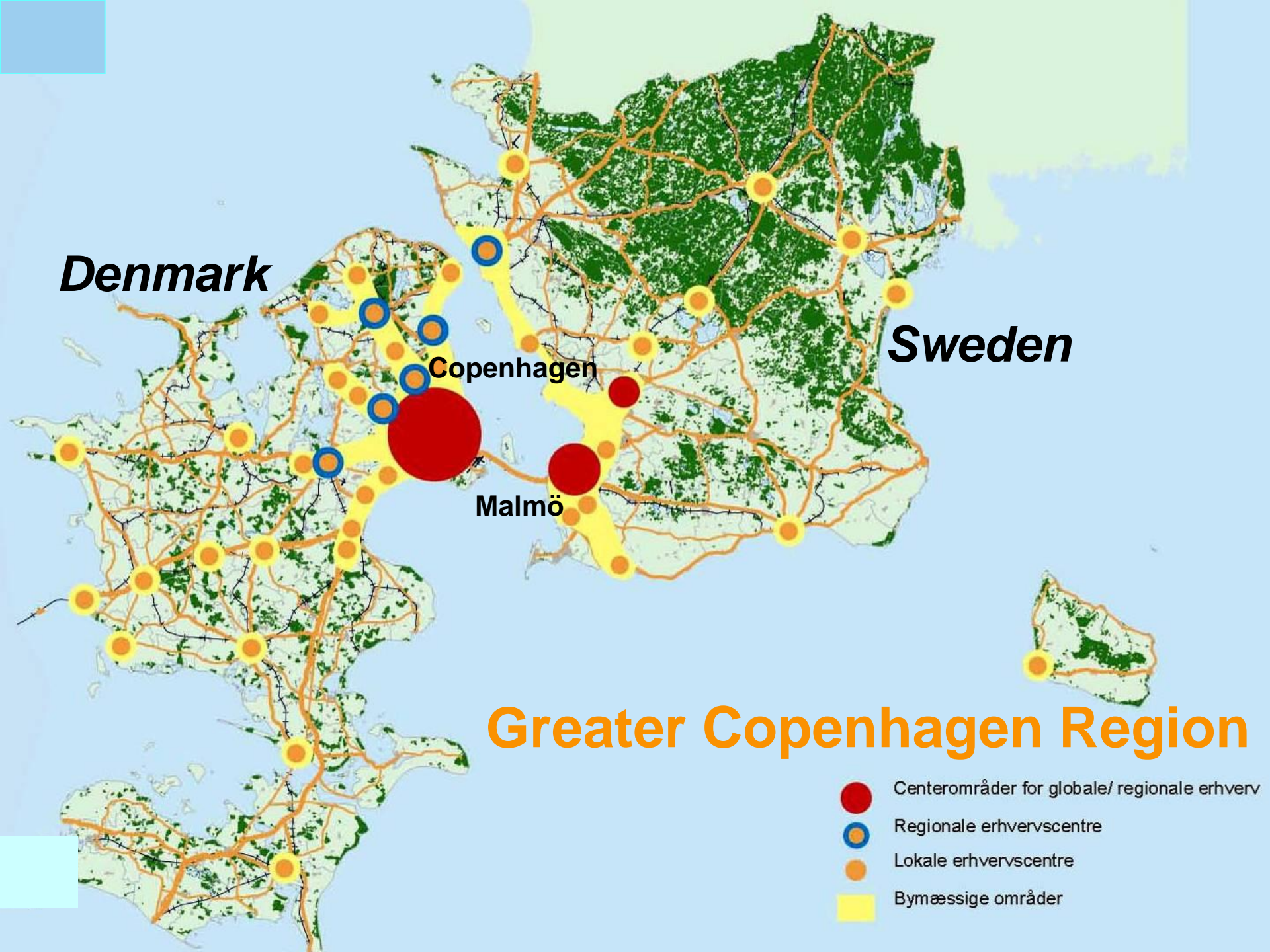
Sweden

Copenhagen

Malmö

Greater Copenhagen Region

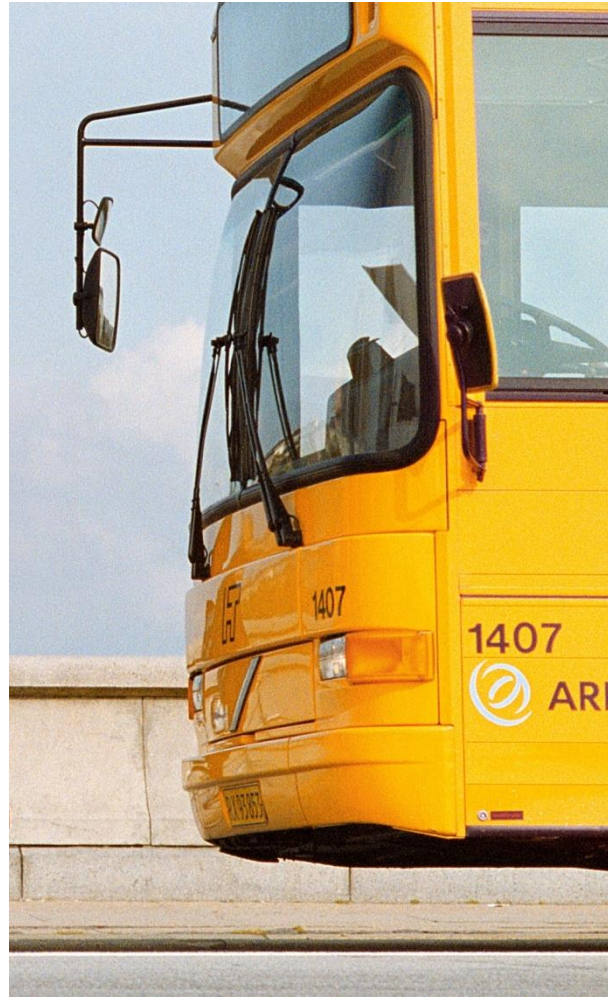
-  Centerområder for globale/ regionale erhverv
-  Regionale erhvervscentre
-  Lokale erhvervscentre
-  Bymæssige områder



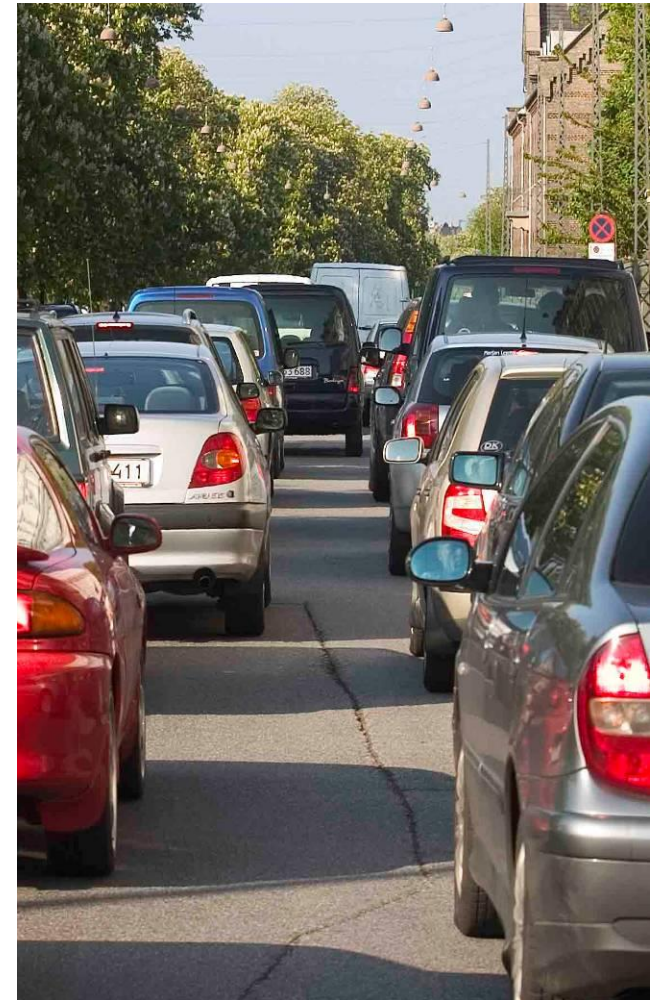
COPENHAGEN TRANSPORT GOALS: SUSTAINABLE MODAL SPLIT



Min 1/3 BICYCLE TRAFFIC

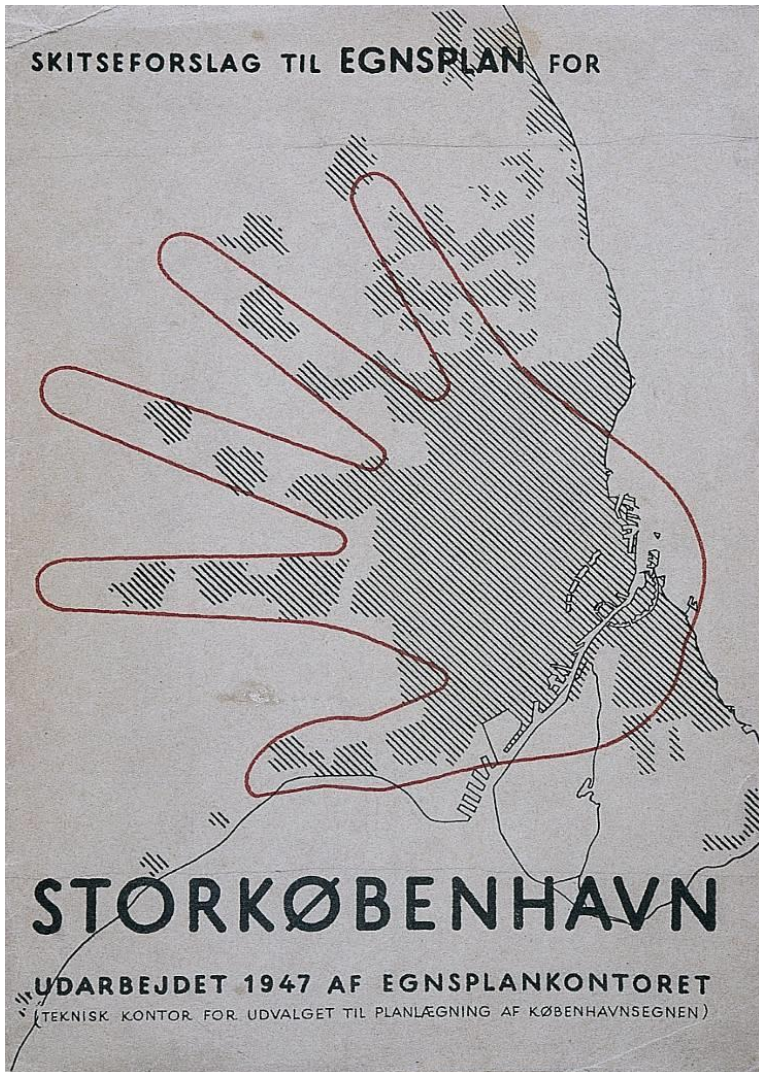


Min 1/3 PUBLIC TRANSPORT



Max 1/3 CAR TRAFFIC

FINGERPLAN 1947- 2007





**A Sustainable City
is a
Dense city**

...but how high ?



Density, Modal Split & Cost of Mobility

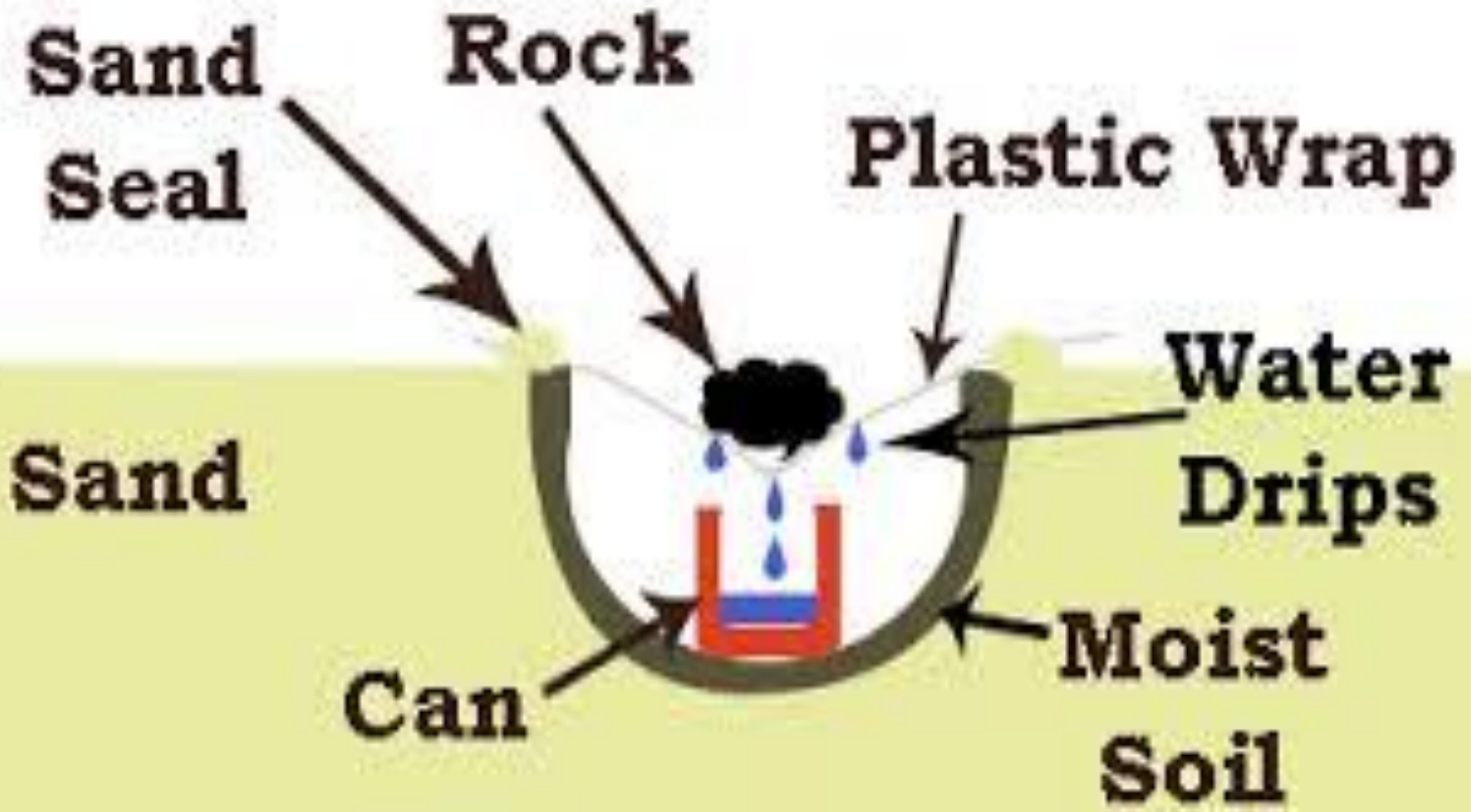
City	Density	Soft and PT Modal Share	Cost of Mobility
	Inh/ha	% Walk, Bike + PT	% of GDP
Houston	9	5	14
Sydney	19	25	11
London	59	51	7
Paris	48	56	7
München	56	60	6
Tokyo	88	68	5
Hong Kong	320	82	5

Higher densities > lower total costs of transport – to a certain point



The Metro: automatic, short, fast, frequent, reliable – and expensive to build

Q: How to get Water in the Desert ?
A: Build a Pit Solar Still !



Pit Solar Still



Q: How to get Money for Transit ?
A: Use Value Capture Financing



Key Elements in Integrated Planning and Finance

Since:

Effective transit supports intensive land use.



Intensive land use supports effective transit.

You need:

Strong and stable spatial planning

Strong legal and organizational structure

...and most of all, you need:

***A strong and broad
based political, popular
and business
foundation with an
effective first mover***

Value Capture in Practice: Orestad Development Corporation: Copenhagen Metro and New Town Orestad

Owner: Copenhagen City and Danish State

Tasks:

Develop a new neighbourhood in Copenhagen,
Orestad

Build and operate an efficient, railbound

new transportation system for Orestad and the City,
Copenhagen Metro



— Bane over jorden
- - - Bane under jorden

- Vanløse
- Hjortholm
- Lindevang
- Søbjerg
- Frederiksberg
- Forum
- Nørreport
- Kongens Nytorv
- Christianshavn
- Amagerbro
- Islands Brygge
- Lergravsparken
- (v. Dresundsvej)
- (v. Italiensvej)
- (v. Hedegaardsvej)
- (v. Allégade)
- (v. Lufthavnen)
- Universitetet
- Østerby
- Østella Center
- Ørestad
- Østamager

Choice of System: Tram, Light Rail, Metro, Aut.Metro

- **Best Choice: Driverless Metro**
- **Attracts most passengers due to operational characteristics – high speed and frequency.**
- **Transportation System somewhat expensive to build because of operational and safety issues.**
- **Cheaper Stations because of denseness due to operational characteristics.**
- **Cheaper to run**
- **Overall best B/C ratio**

The Value Capture Principle

Undeveloped, public land given free of charge

Take up loans

Build the Metro

The Metro raises value of land

Develop and sell the land

Pay back loans

Everybody is happy !!

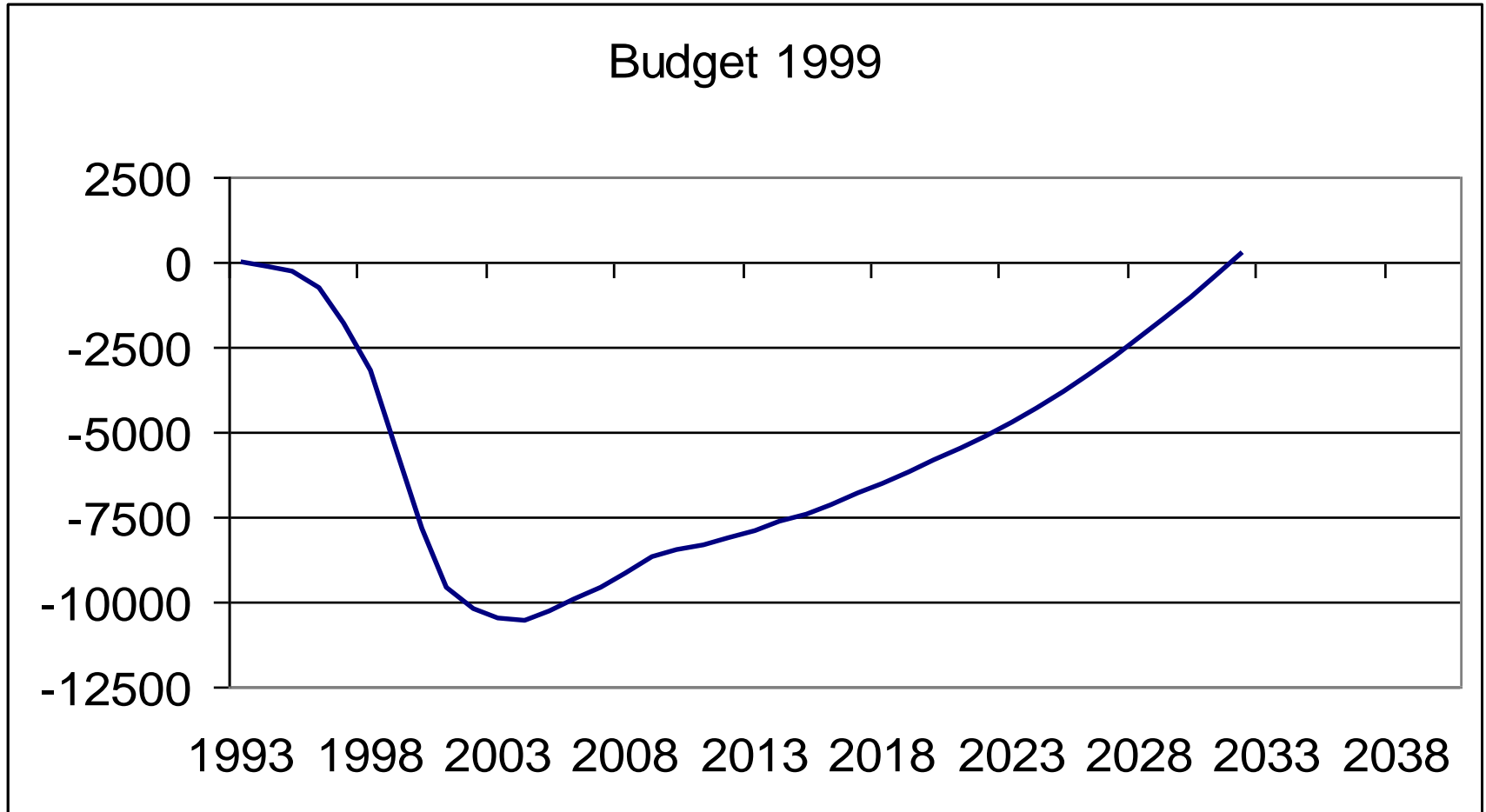
The Contract Principles for Construction and O&M

Spilt of contracts into two:

- **Traditional Construction Contract with fixed price and handover**
- **Dynamic Operation/Maintenance Contract with special features:**
 - **Provider of Transport System (Trains, fixed system) also responsible for O&M for 5/8 years**
 - **O&M contract with price for delivery and bonus/malus system.**
 - **System Availability better than 98 %**

Everybody became happy - after a while !!

Copenhagen Metro – pay back of the debt



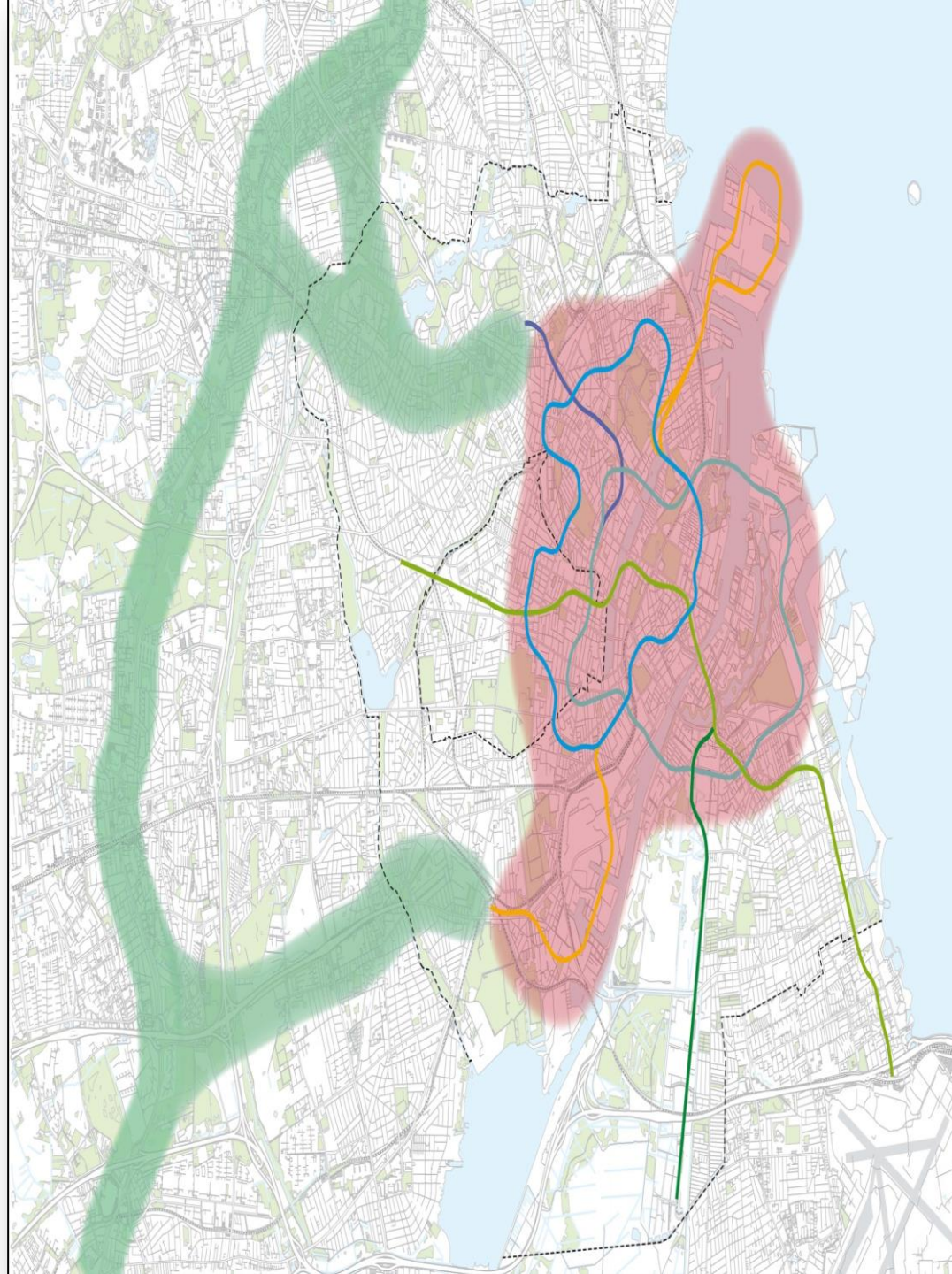




**PT Analysis:
Grand
Conclusion:**

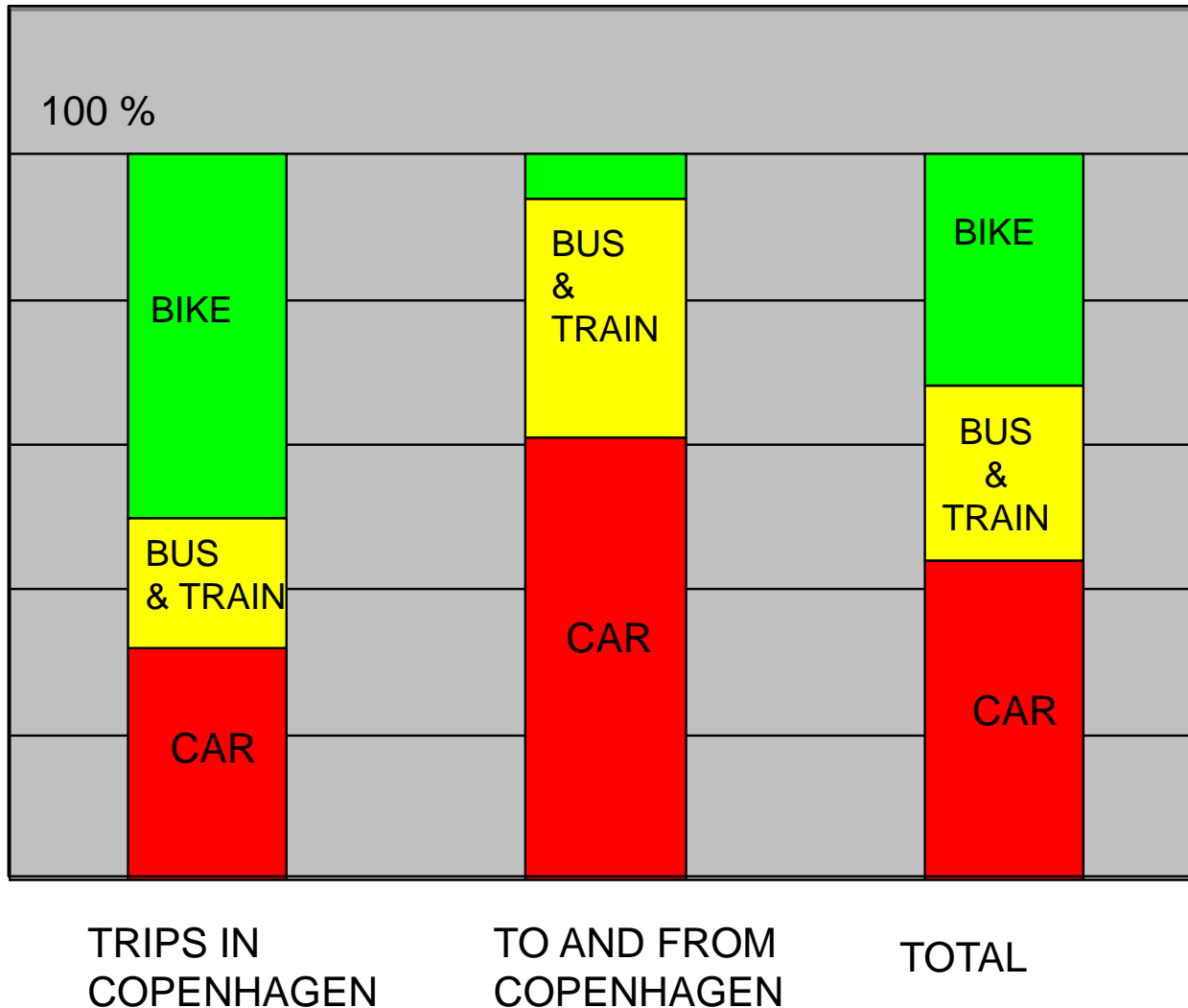
**Metro in inner
parts of the City**

**Lightrail/BRT in
outer parts**



Will we reach the goal ?

A sustainable modal split ?



•Despite the introduction of the City Ring Metro, the goal of 1/3 PT will not be reached.

•Too many people commute to and from Copenhagen by car.

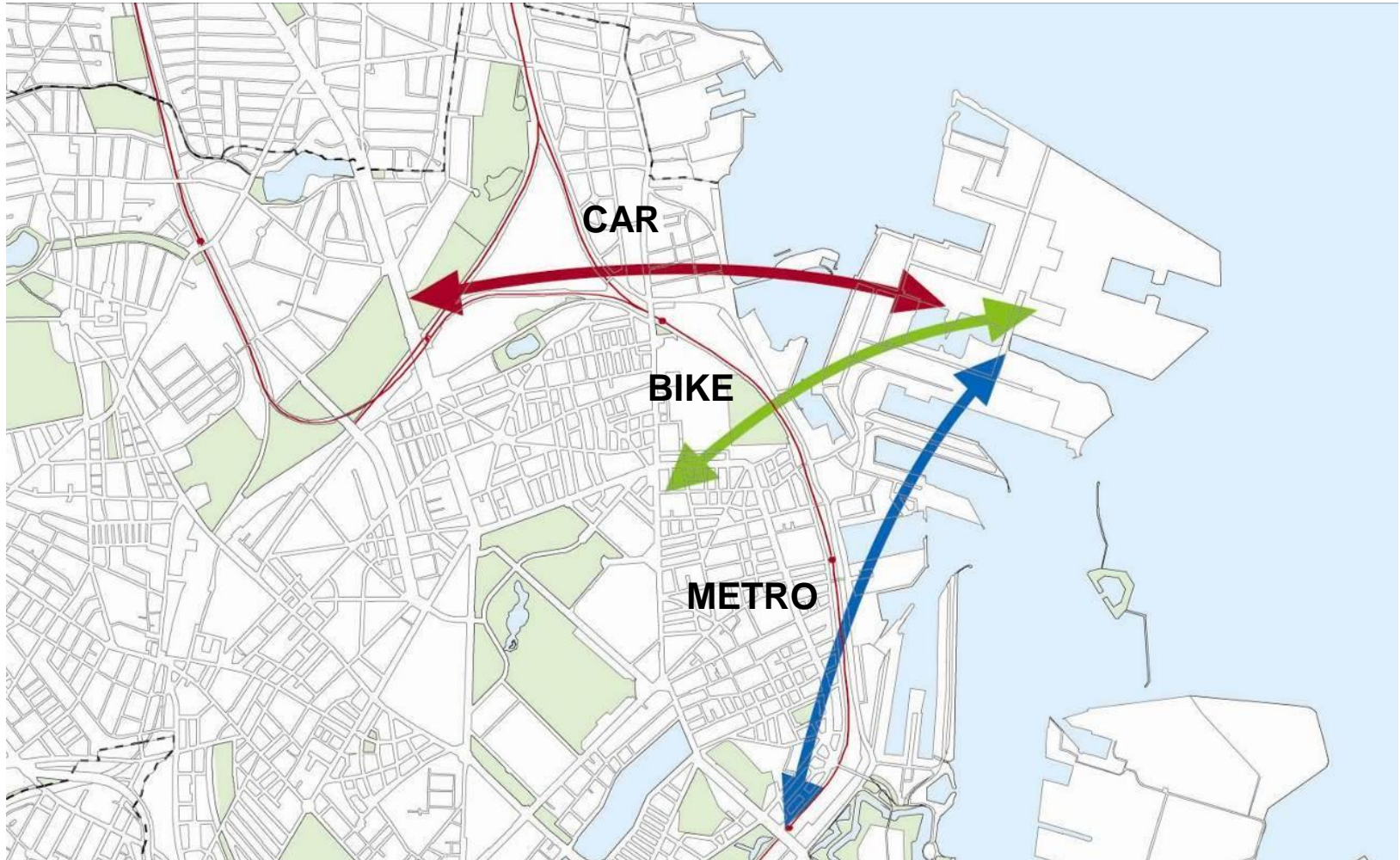
•Stronger regional mobility policies are needed-

•Broad based Copenhagen Strategy is needed



**FUTURE CITY GROWTH
IN THE NORTH
HARBOUR AREA**

- SUSTAINABLE TRANSPORT TO THE NORTHERN HARBOUR



Funds Raised for Selected Large Value Capture Projects

City	Value Capture Financed Project	Funds Raised or Projected	Percent of Project Cost or Budget
London	Crossrail	£4.1 billion (BRS) £0.6 billion* (CIL)	32%
Paris	Grand Paris Express	€21.8 billion*	80%
Washington	New York Avenue Metro Station (2001)	\$25 million	28%
Washington	Dulles Metrorail Silver Line Expansion	\$400 million (Tyson's Corner SAD) \$330 million (Reston/Herndon SAD)	14%
New York	Subway 7 Line Extension	\$2.1 billion (Hudson Yards TIF-like)	88%

London Cross Rail: Wider Economic Benefits Business Rates Supplement



- Bikes in Copenhagen: Greener transport opportunities

The World's best city for cyclists:

- make it easy and safe to bike.

- The PLUS-net
- Shunts for cyclists
- Cycle super highways
- New services for daily cyclists
- Renewed rental CityBike system

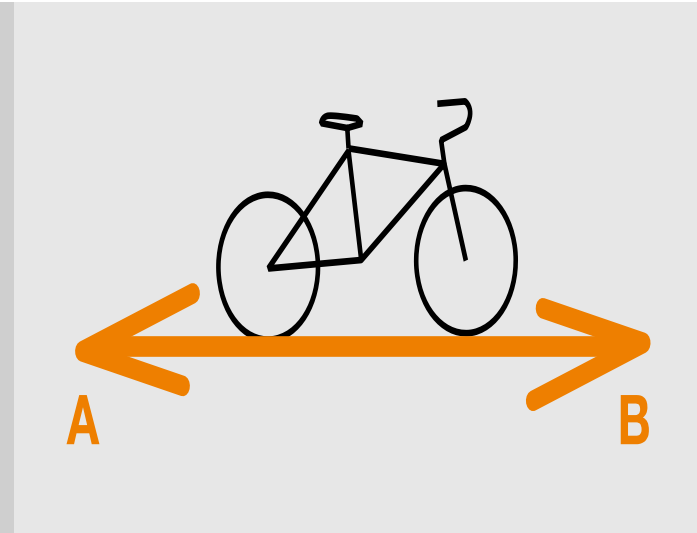


Cycle Super Highways - A serious means of transportation



Parameters:

1. Accessibility
2. Speed & Directness
3. Comfort
4. Safety & Security



“Cycle Super Highways”

High volume design
High comfort design
Long distance users



Green wave - for cyclists 2.0

- Adaptive traffic signals – extend green time for cyclists in rush hour
- Adapt traffic signals to actual speed of cyclists





Crossing water barriers

Crossing Road Barriers



Little things count too: Safety for bikeriders



Special blue lanes for bikes



The bike gets a head start



2 out of 3
Copenhageners with
job in Copenhagen
use the bike on their
daily commute

Urban Rail Development and Finance

Urban Rail is an investment – not a cost.

Rail and Urban Development support each other

- Secure long term planning and stability
- Create a strong organizational structure
- Secure public and business understanding
- Find and promote an effective First Mover



COPENHAGEN – THE FRIENDLY METROPOLIS