

Luca Bertolini
Integrating transport and
urban planning

Why necessary? Why complex?
How to cope?
Amsterdam, for example

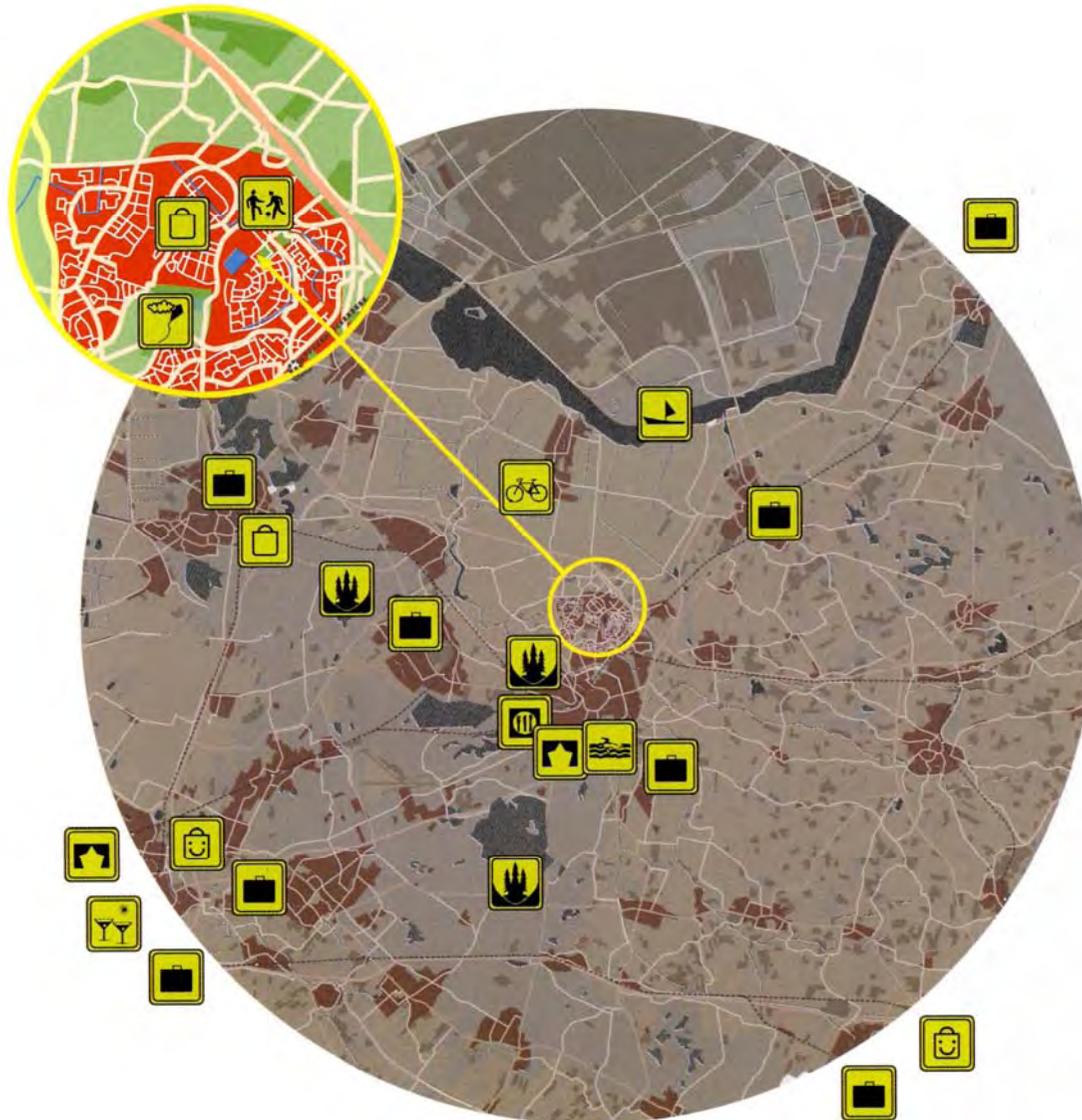
University of Amsterdam



Why necessary?

A mobile society, borderless cities

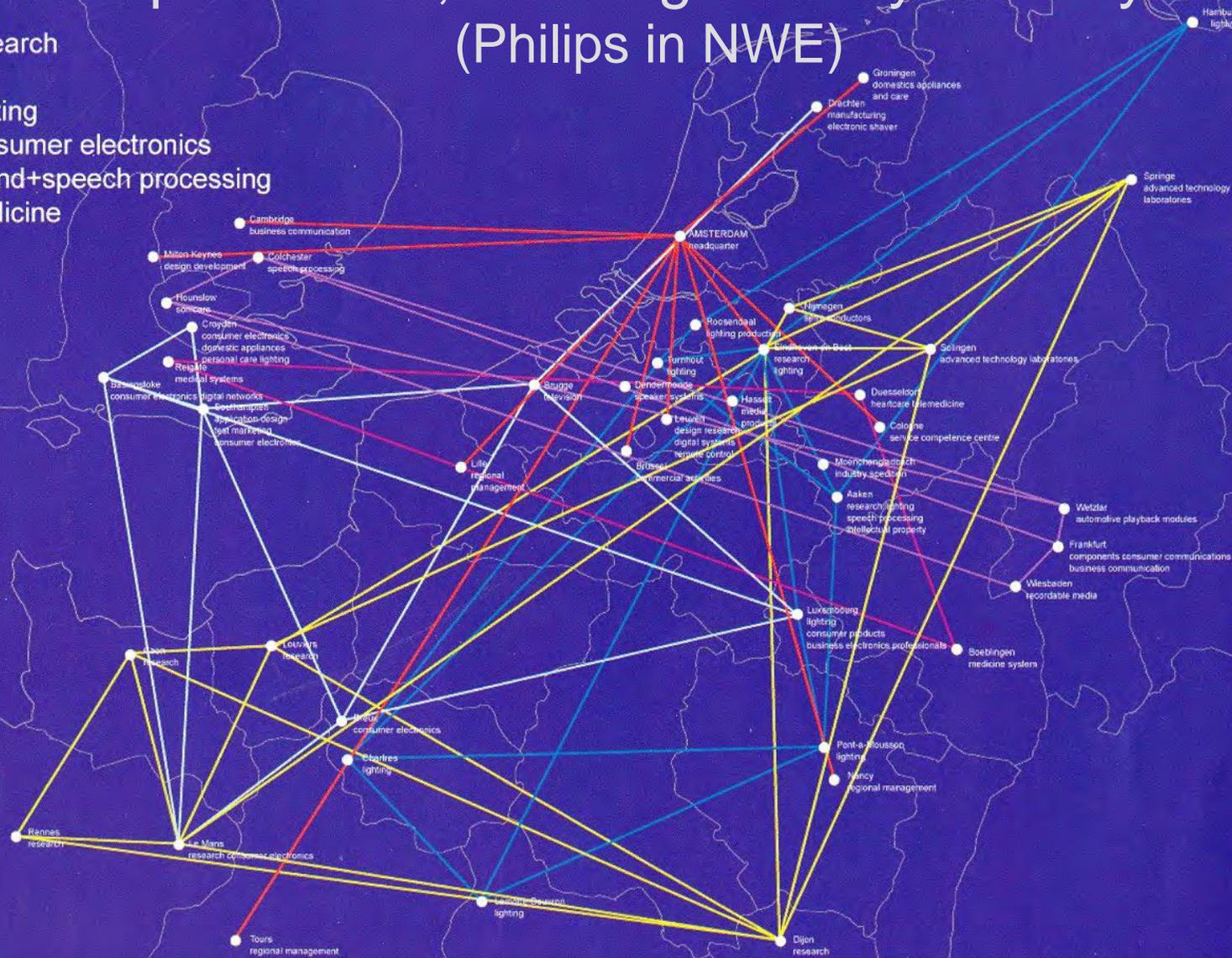
A mobile society: dispersed activity places, held together by mobility (Kattenbroek, NL)



(Reijndorp et al.)

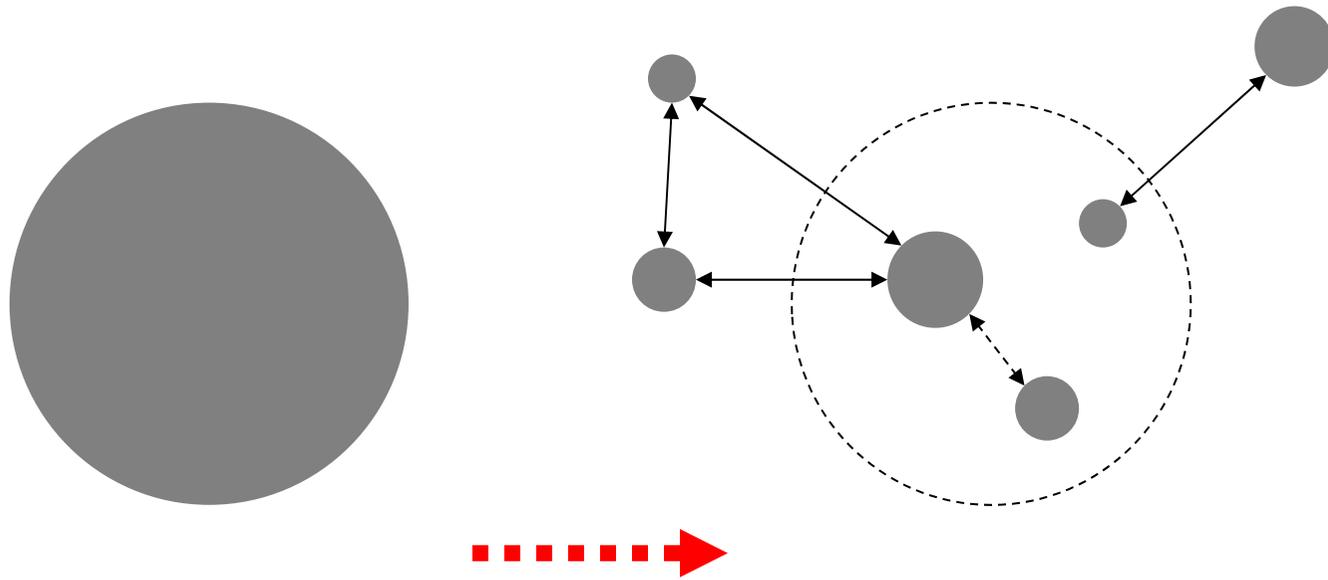
A mobile society: multi-sited production processes, held together by mobility (Philips in NWE)

- management
- research
- lighting
- consumer electronics
- sound+speech processing
- medicine



(Boelens)

Cities: from self-contained and compact to borderless and networked



Then: self-contained, compact cities (Amsterdam, 1538)



(Cornelis Anthonisz)

Now: borderless, networked cities (Amsterdam, 2012)



Image © 2012 TerraMetrics
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2012 Cnes/Spot Image
Image © 2012 Aerodata International Surveys

© 2009 Google

Datums van beeldmateriaal: 5 Mrt, 2005 8 Mei, 2008

52°21'53.53" N 4°52'49.33" O verh. 0 m

Ooghoogte 4.96 km

Why complex?
A core dilemma

We depend on mobility ...



... but mobility is not sustainable

Measures to be increased

Access to means of personal mobility	Light Blue	+
Equity in access	Dark Blue	-
Appropriate mobility infrastructure	Dark Blue	-
Inexpensive freight transportation	Light Blue	+

Measures to be reduced

Congestion	Dark Blue	-
"Conventional" emissions	Dark Blue	+
Greenhouse gas emissions	Black	-
Transportation noise	Dark Blue	+
Other environmental impacts	Dark Blue	-
Disruption of communities	Dark Blue	-
Transportation-related accidents	Dark Blue	+
Transportations' demand for nonrenewable energy	Black	=
Transportation-related solid waste	Dark Blue	+

Key:

■ the particular measure is at an unacceptable and/or dangerous level

■ the level is of concern and needs improvement

■ the level is acceptable or shows signs of becoming so

+ indicates that the situation appears to be moving in the desired direction

- suggests that the situation appears to be deteriorating

= no clear direction is apparent

? available information is not enough to make a judgment

(WBCSD)

- Dilemma: dependency vs. sustainability
 - No more ‘predict and provide’
 - No more ‘predict and prevent’

How to cope?
Finding a balance

Balance

- “For mobility to be sustainable, it must improve accessibility while avoiding disruptions in societal, environmental, and economic well-being that more than offset the benefits of the accessibility improvements” (WBCSD)

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Accessibility

- In the large majority of cases people travel in order to get access to something or somebody, not just for the sake of it
 - Accessibility is the goal, mobility is a means
- What matters is:
 - What can be accessed (which jobs, shops, friends, etc.) = places of activity
 - How it can be accessed (how fast, cheap, etc.) = travel conditions

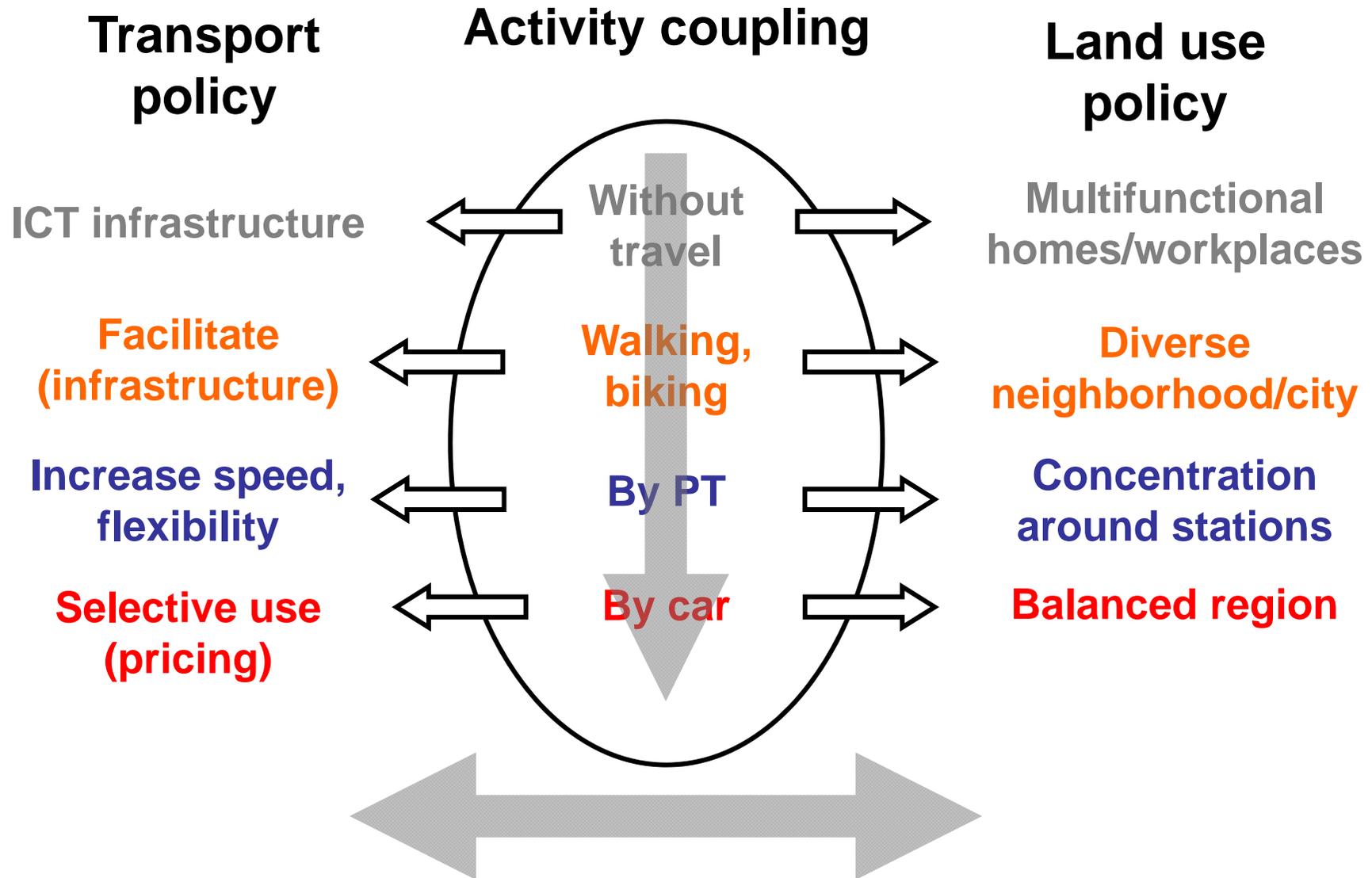
“improve accessibility”

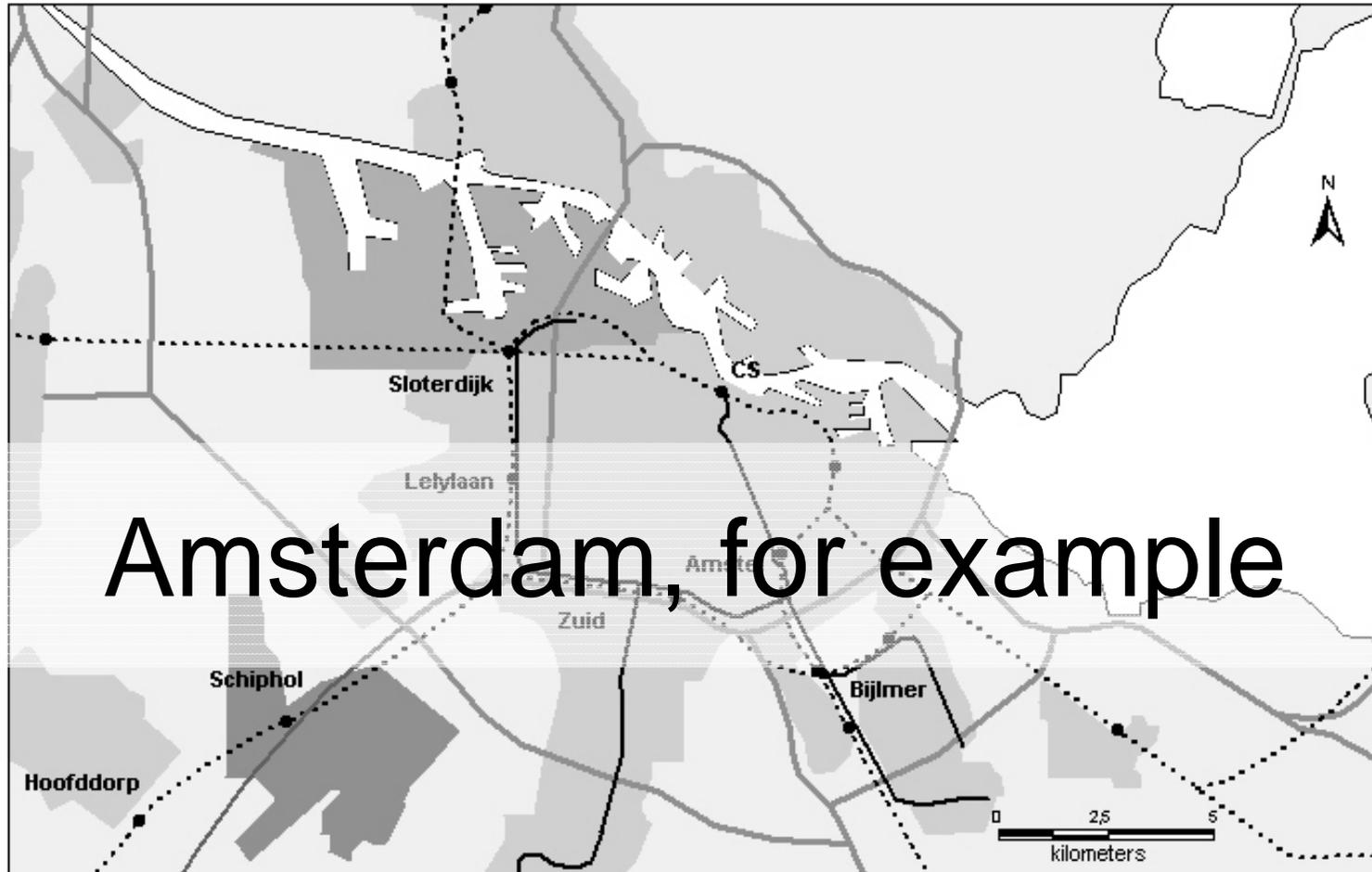
- Increase the amount and diversity of places of activity (e.g. workplaces) within an acceptable travel time/cost/etc. ...
 - ← Land use density and functional mix (proximity)
 - ← Transport speed and network form (mobility and connectivity)

“avoid disruptions”

- ... with no more use of resources (e.g. energy) than what is sustainable
 - ← Share of resource-efficient transportation means
 - ← Average distance traveled

Solution space ('mobility environments')





Amsterdam, for example

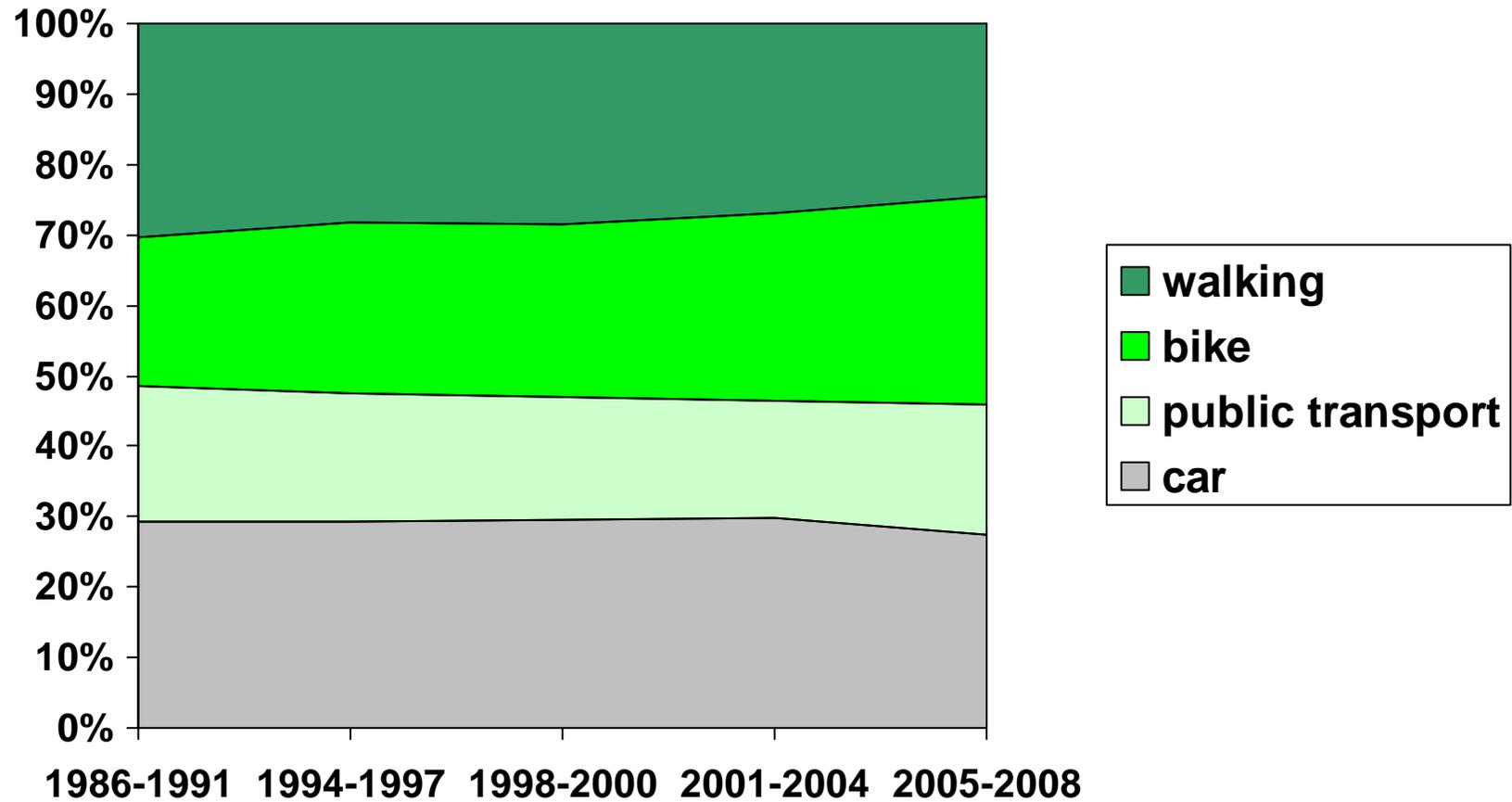
- | | | |
|---|--|--|
|  Built-up area |  Railway |  Railwaystation |
|  Seaport |  Metro | |
|  Airport |  Motorway | |

World cities: modal split, emissions, income (1995)

	Car (% all trips)	Public transport (% all trips)	Biking and walking (% all trips)	Per capita transport emissions (kg/p)	Per capita transport CO ₂ emissions (kg/p)	Per capita metropolitan income (USD)
North American	88,5	3,4	8,1	265	4.405	31.386
Rich Asian	41,6	29,9	28,5	37	825	31.579
Western European	49,7	19,0	31,3	98	1.269	32.077
Amsterdam	31,3	17,2	51,4	38	1.035	28.322

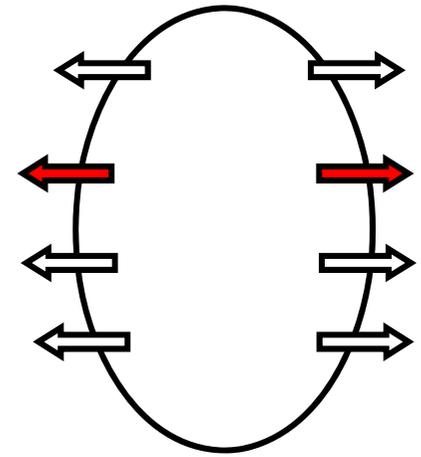
(Kenworthy & Laube)

Amsterdam: modal split 1986-2008



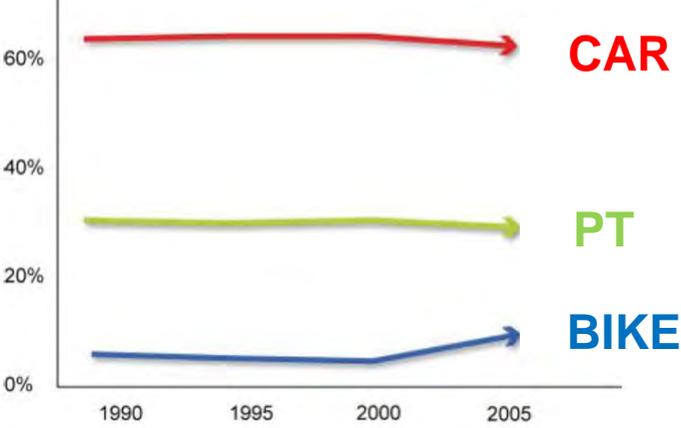
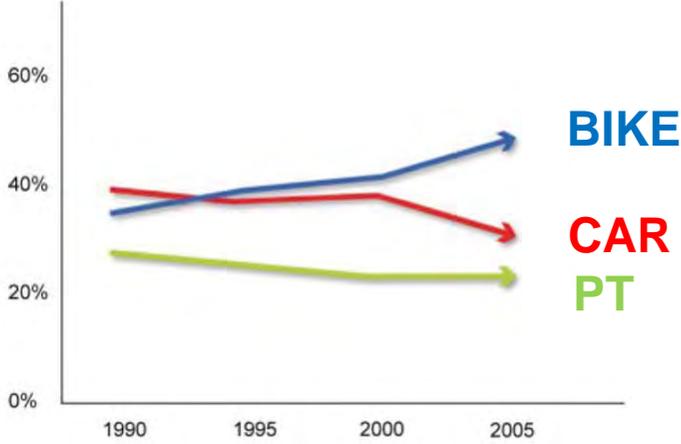
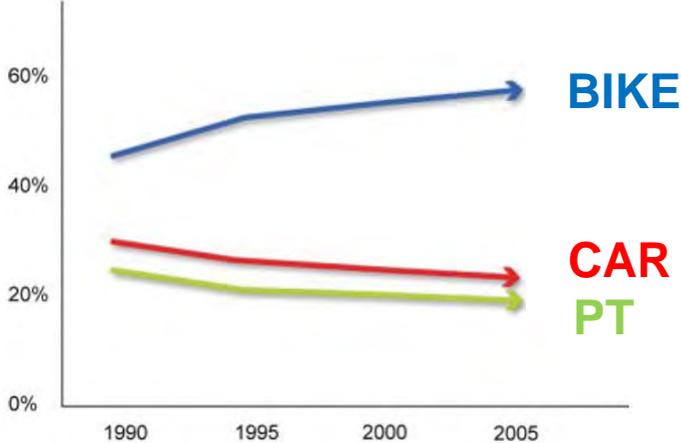
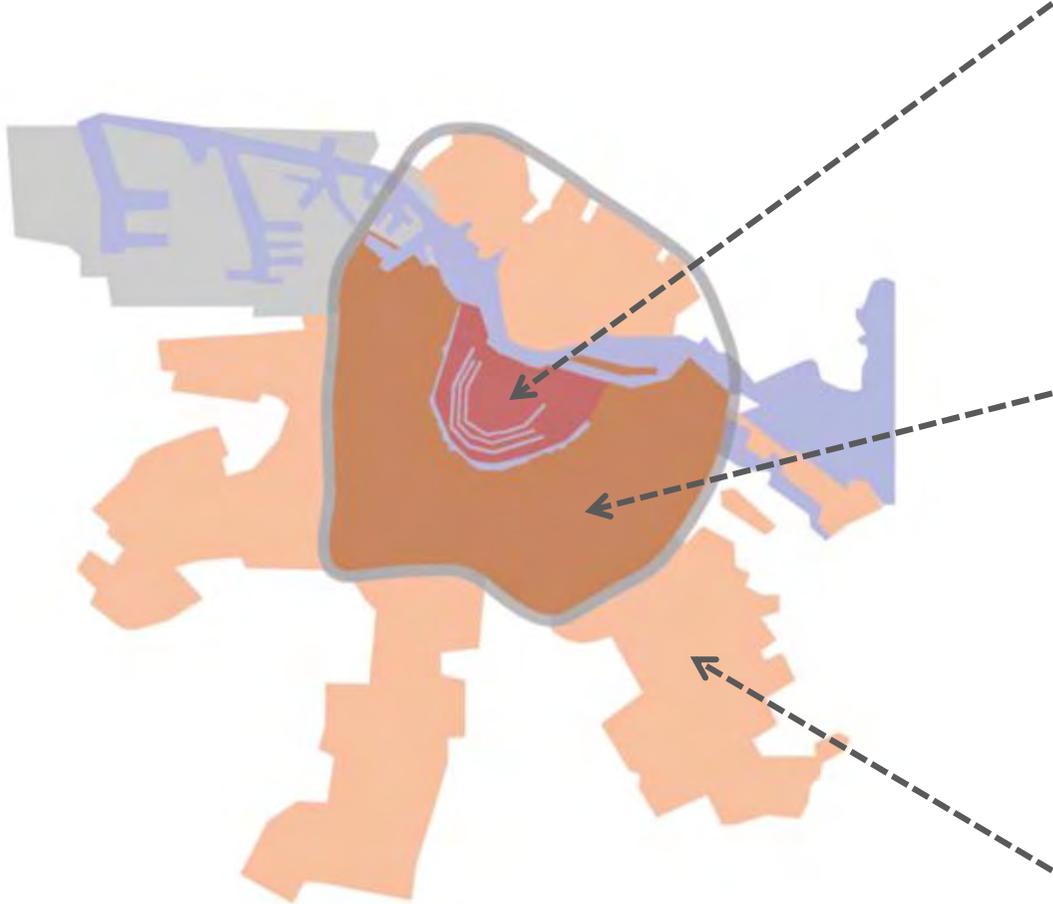
(O+S Amsterdam)

Biking and walking environments? Historic city: 'within the motorway ring'

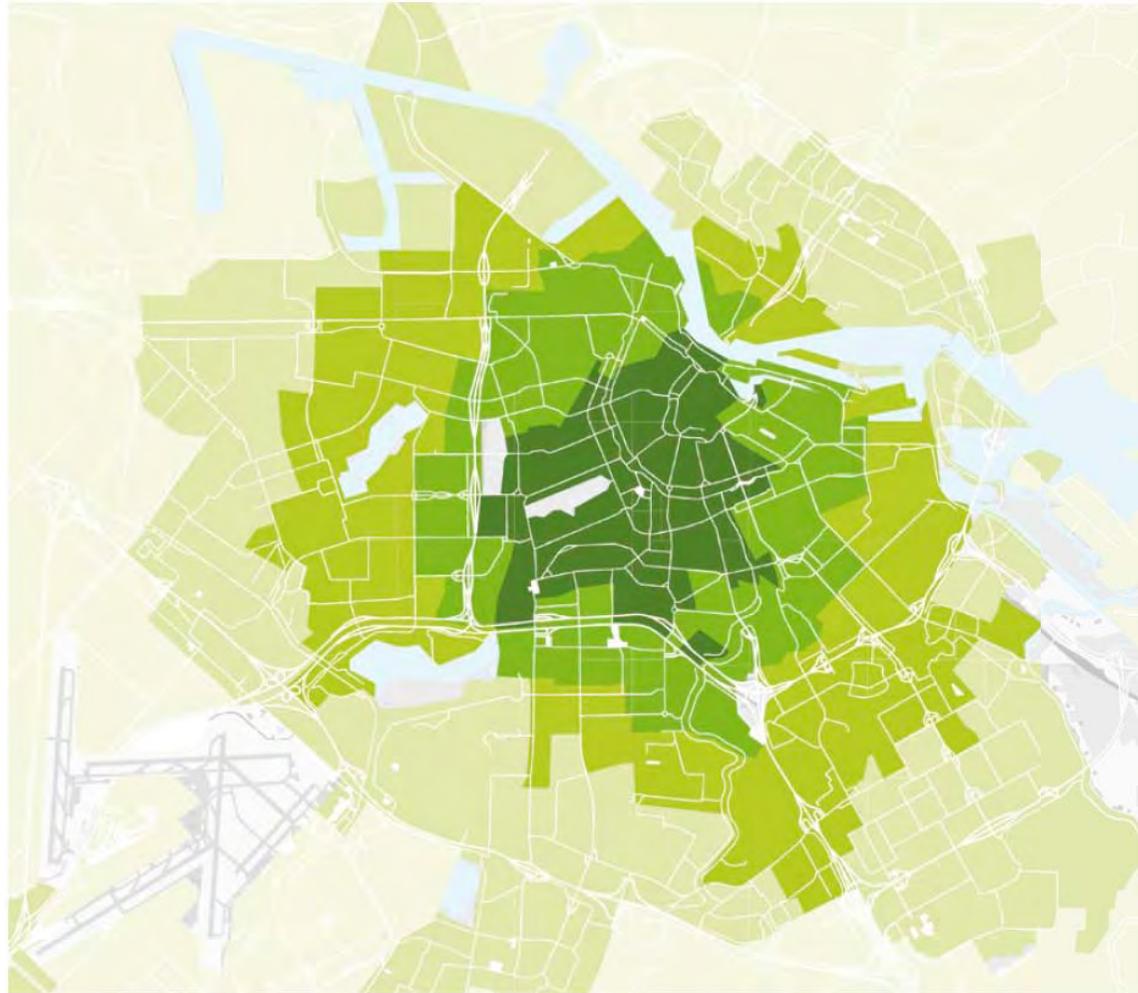


Modal split by area

(dRO Amsterdam, MON)

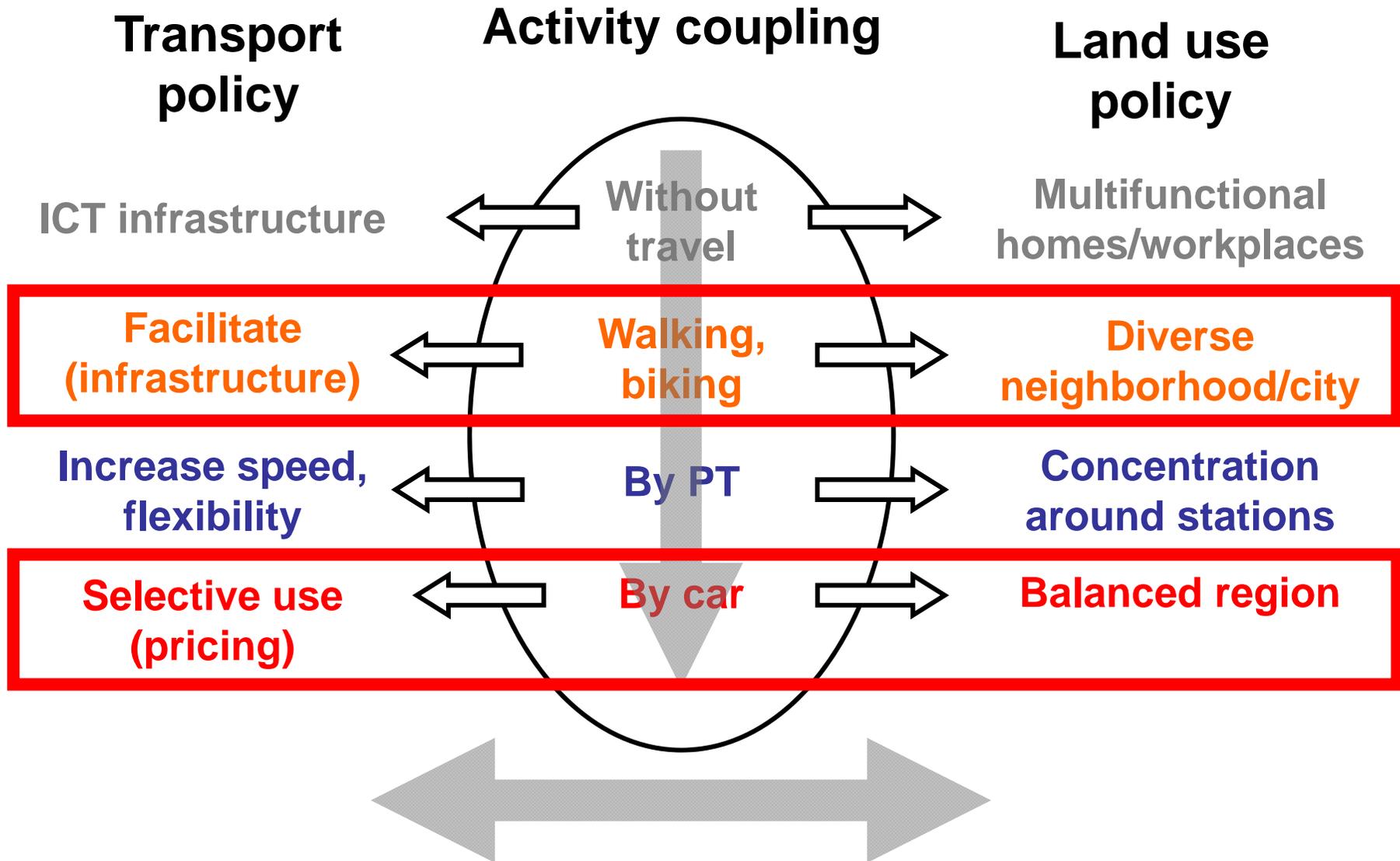


Accessibility by bike (people and jobs within 30 minute travel)



(dIVV Amsterdam)

Solution space ('mobility environments')



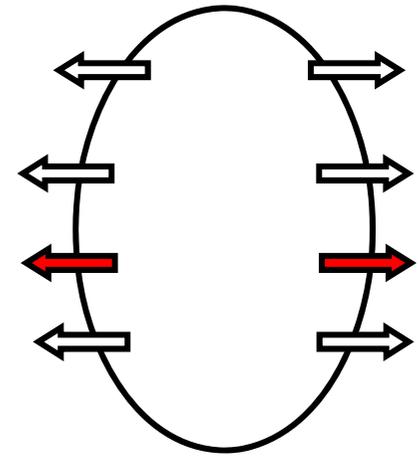
Policy change: from facilitating the car and pursuing functional separation (up to the '70s) ...



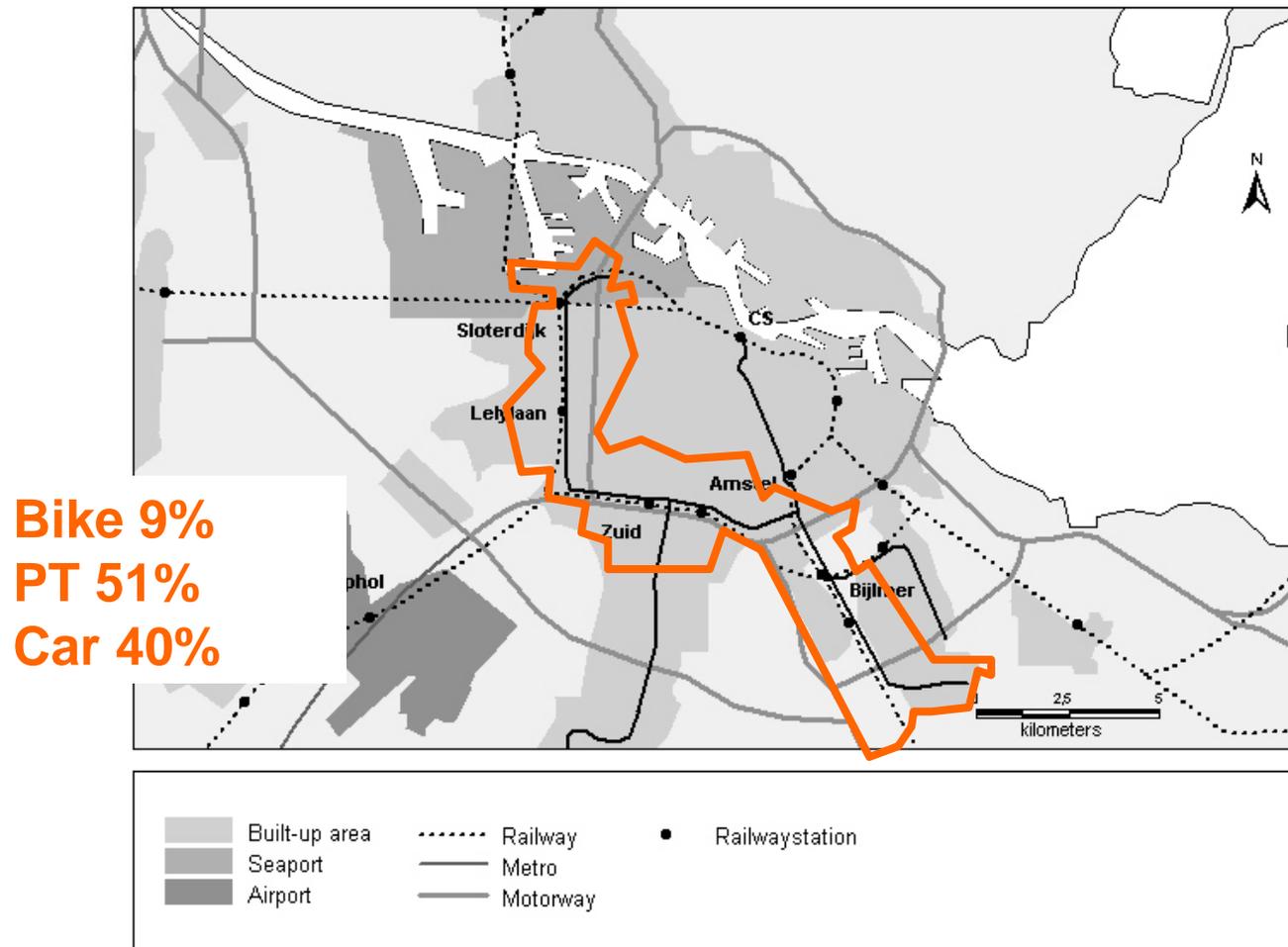
... to constraining car use, facilitating alternative modes, and preserving the functional mix (since the '70s)



Public transport environments? Railway station areas along the ring line

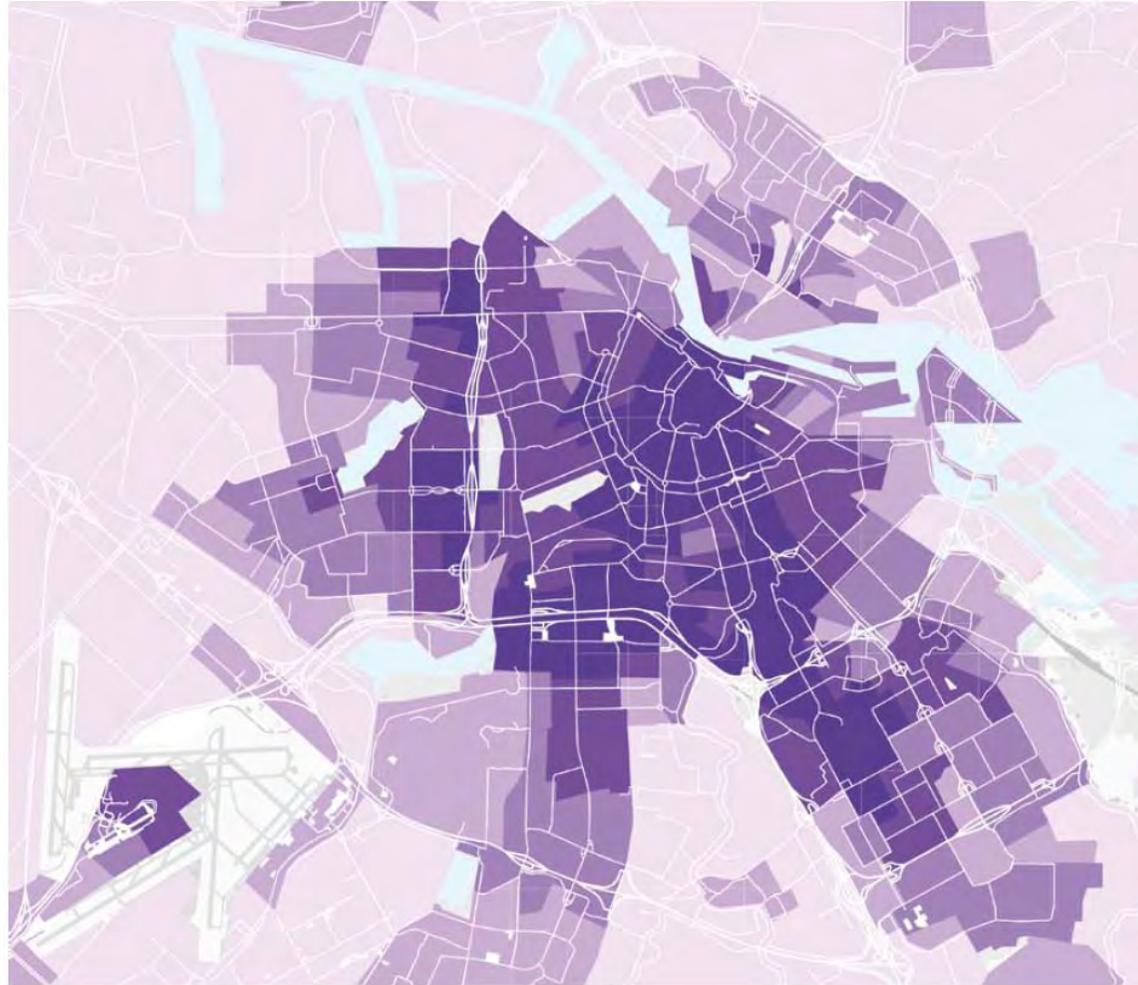


Modal split workers ring line corridor (home to work trips)



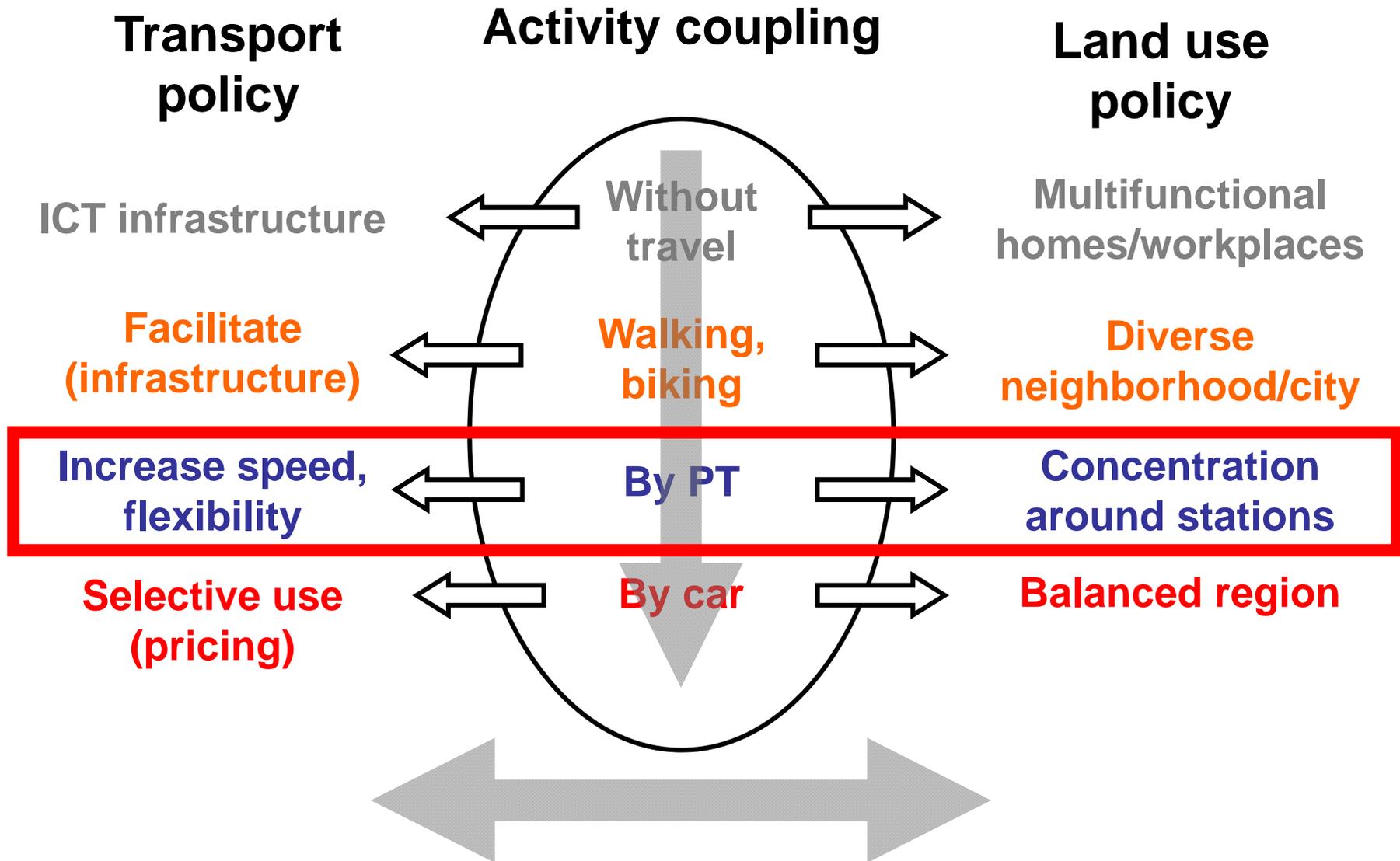
(dIVV Amsterdam)

Accessibility by public transport (people and jobs within 30 minute travel)

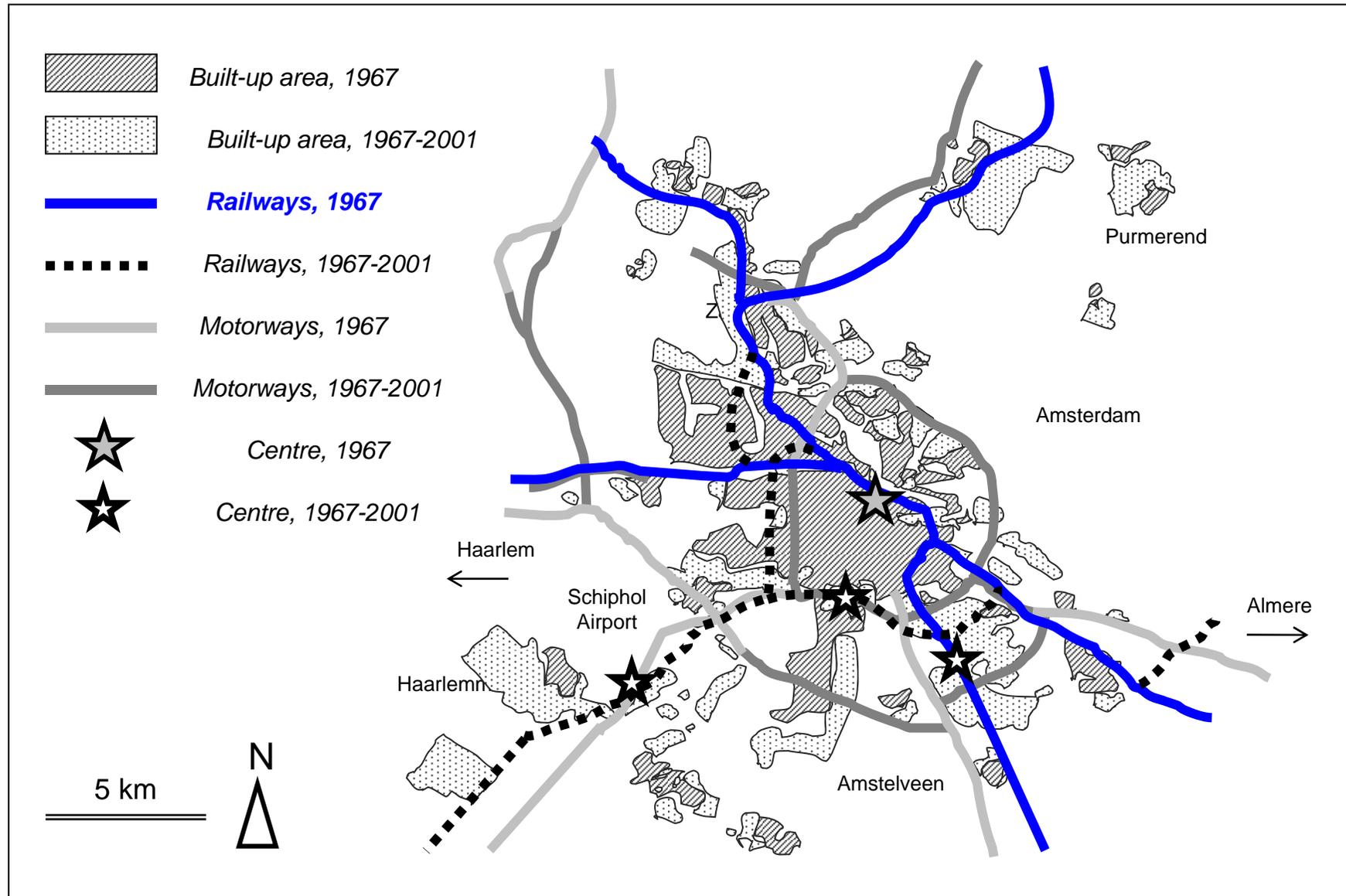


(dIVV Amsterdam)

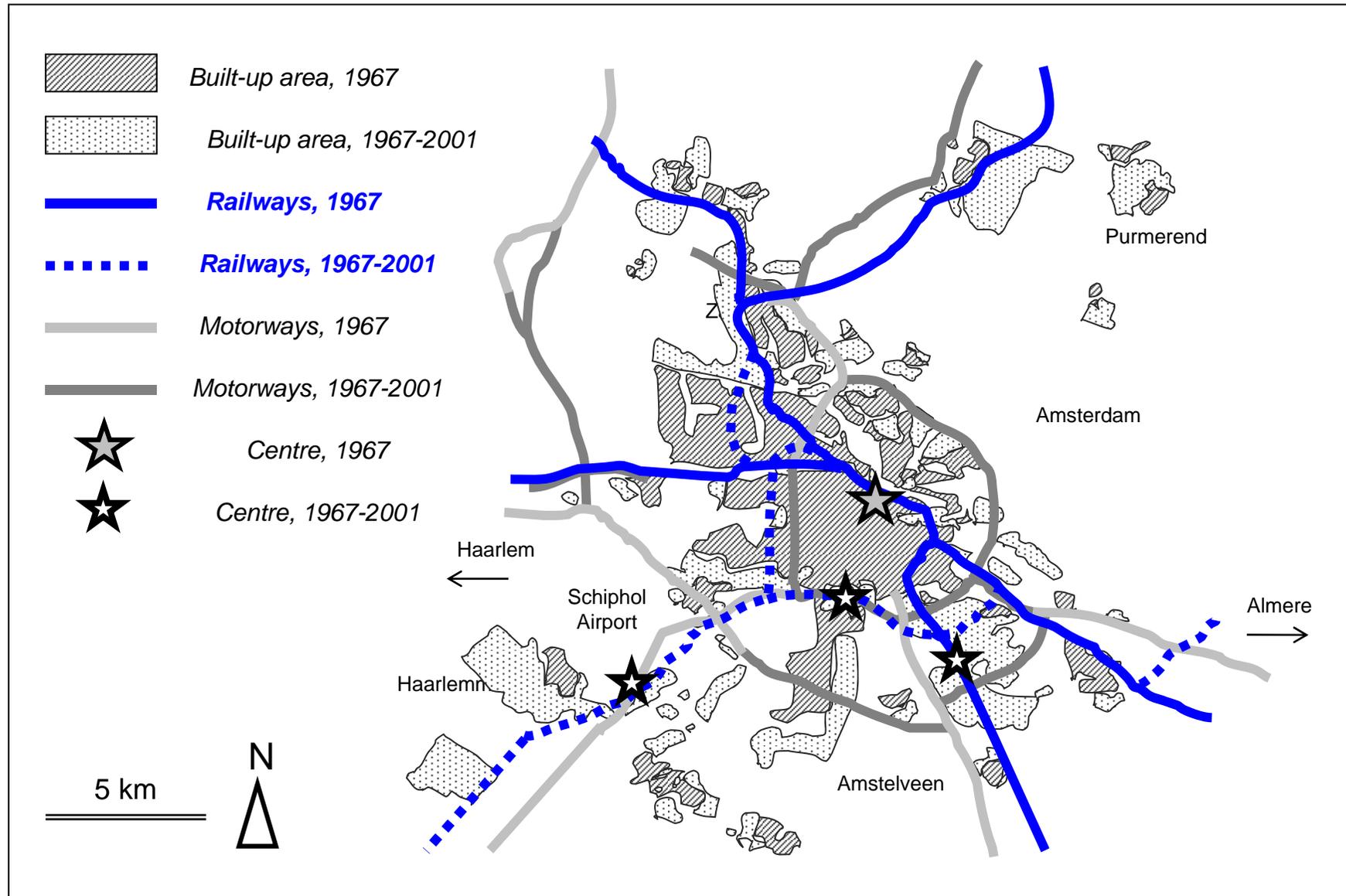
Solution space ('mobility environments')



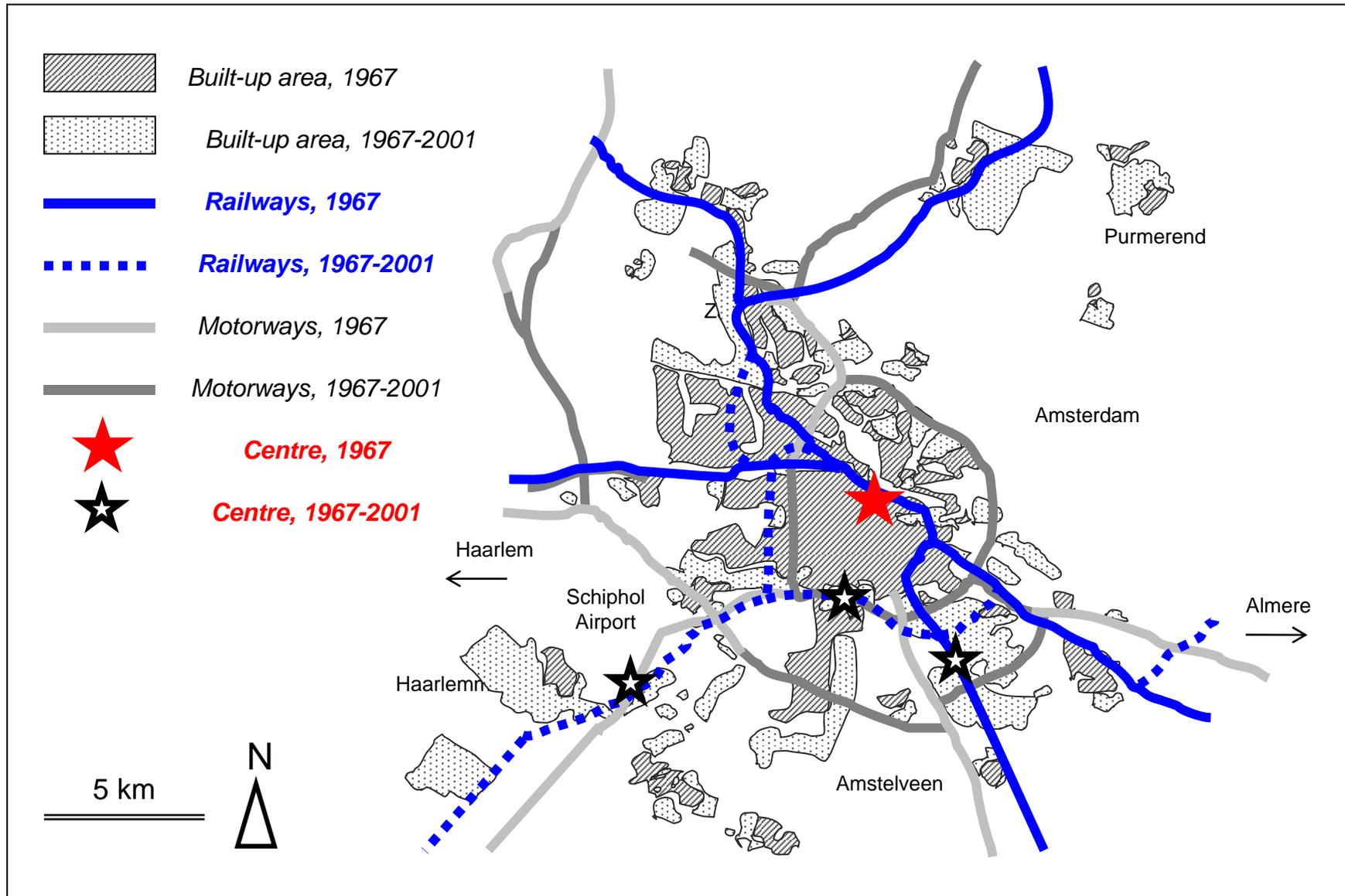
Developments in the railway network



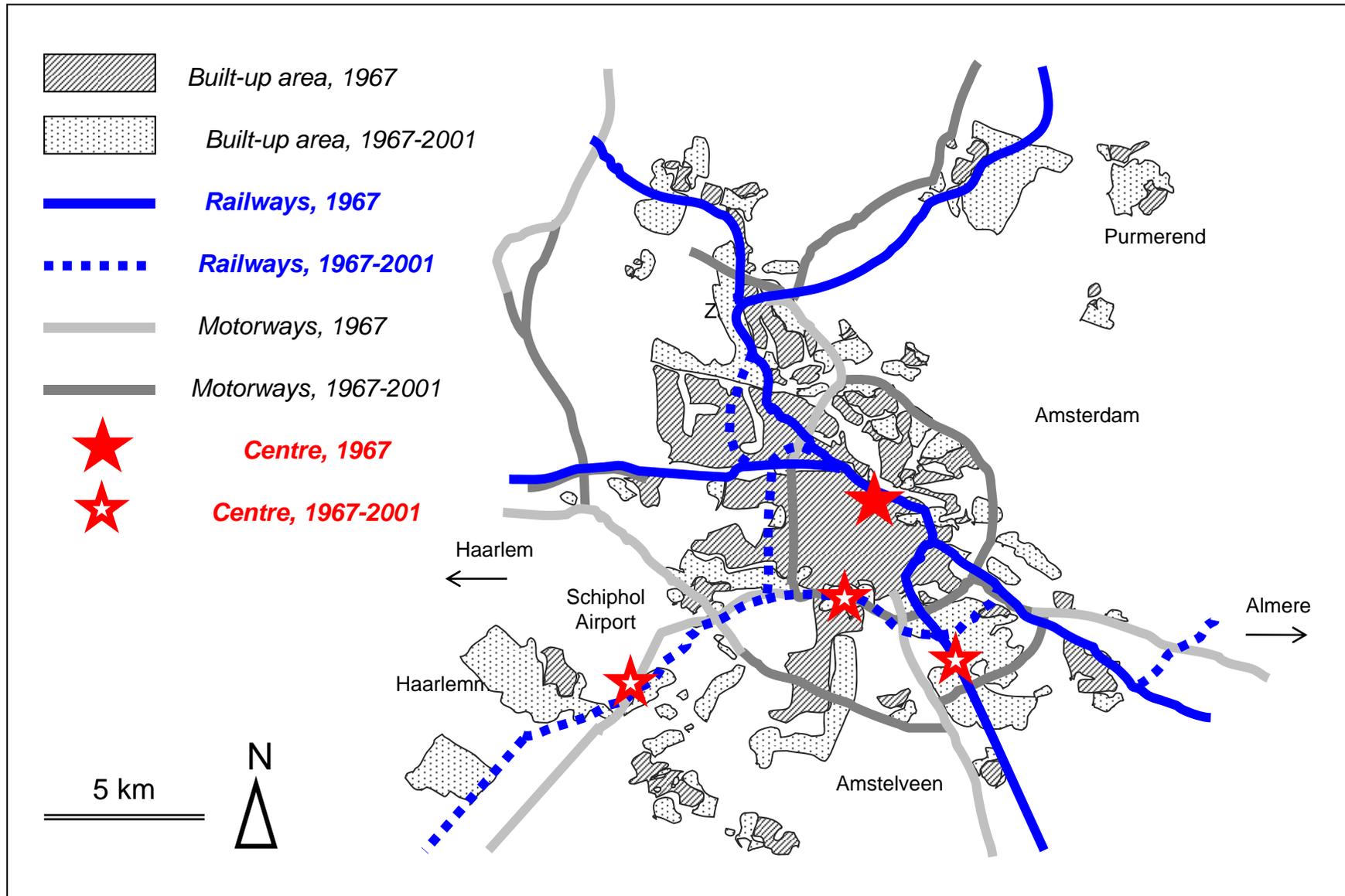
Developments in the railway network

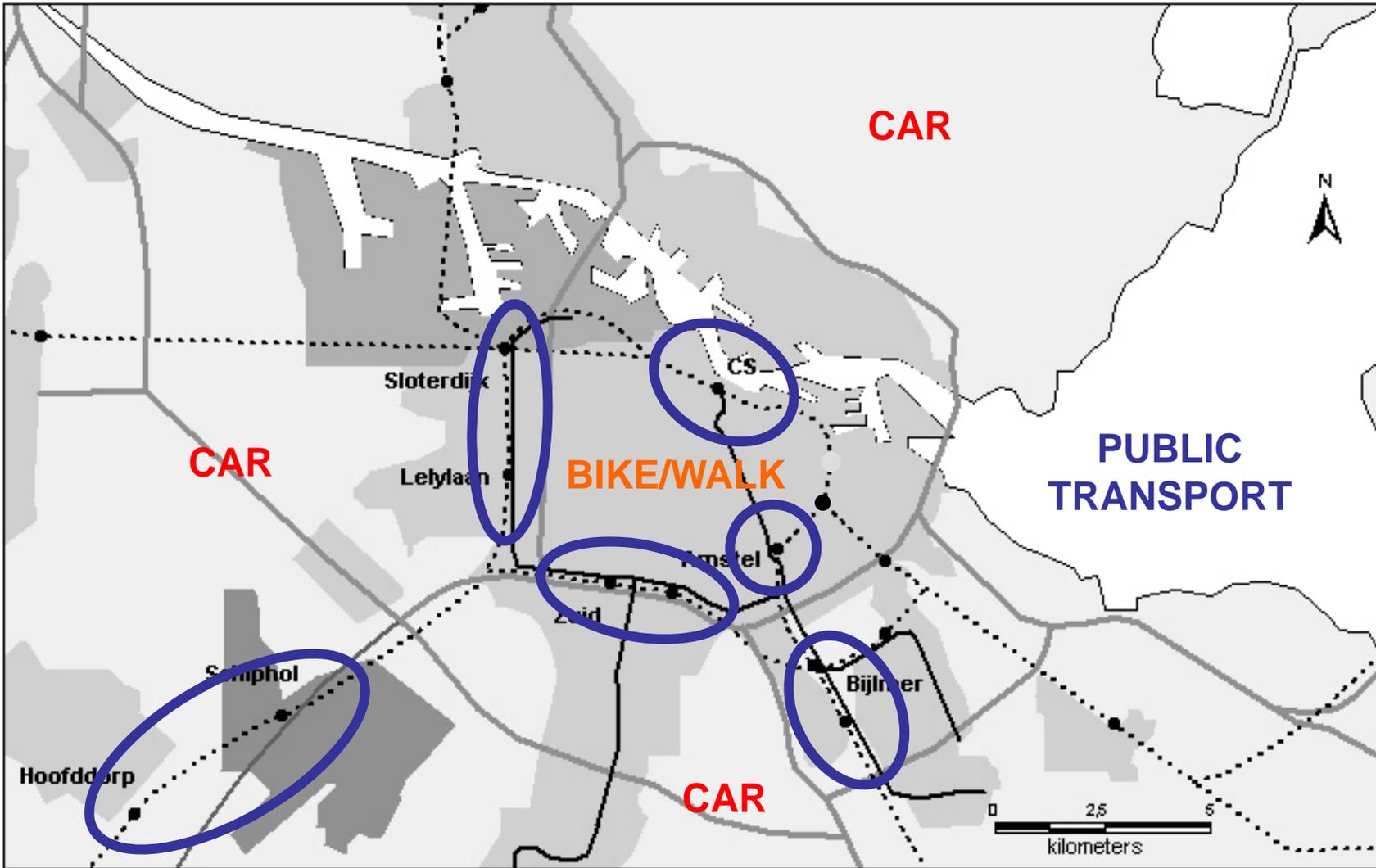


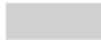
Developments in urban centres



Developments in urban centres

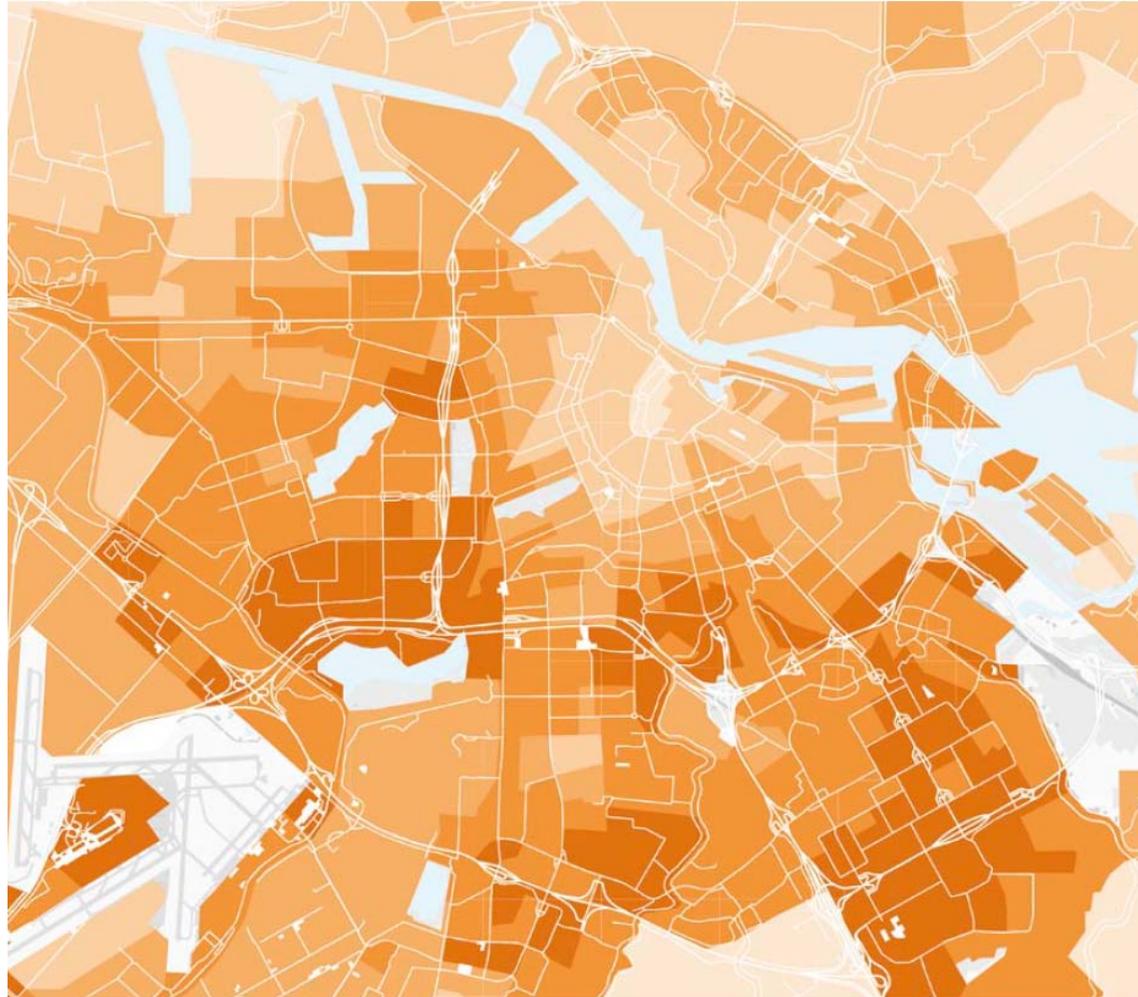




 Built-up area	 Railway	 Railwaystation
 Seaport	 Metro	
 Airport	 Motorway	

The corresponding urban form

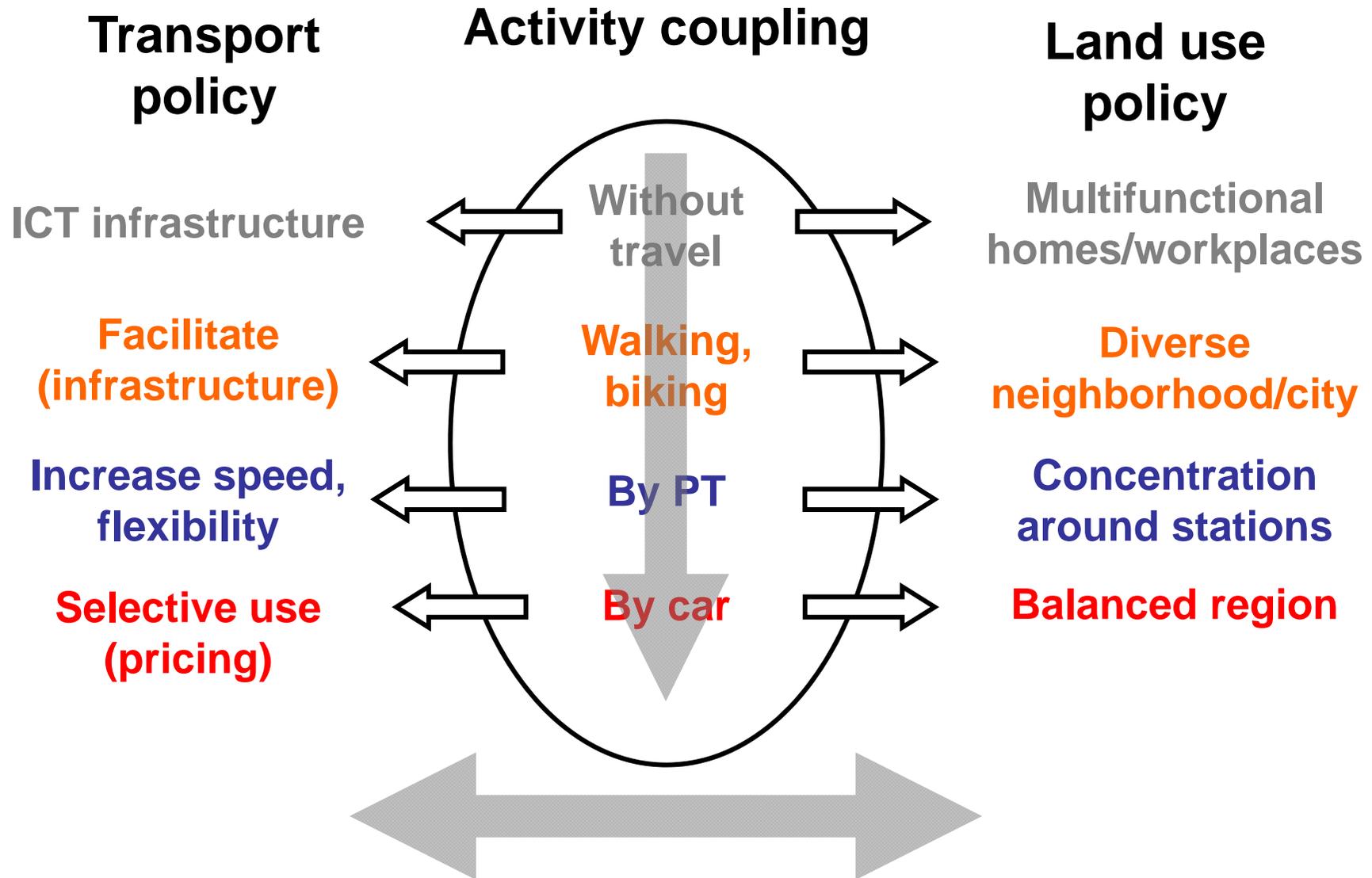
Accessibility by car (people and jobs within 30 minute travel)



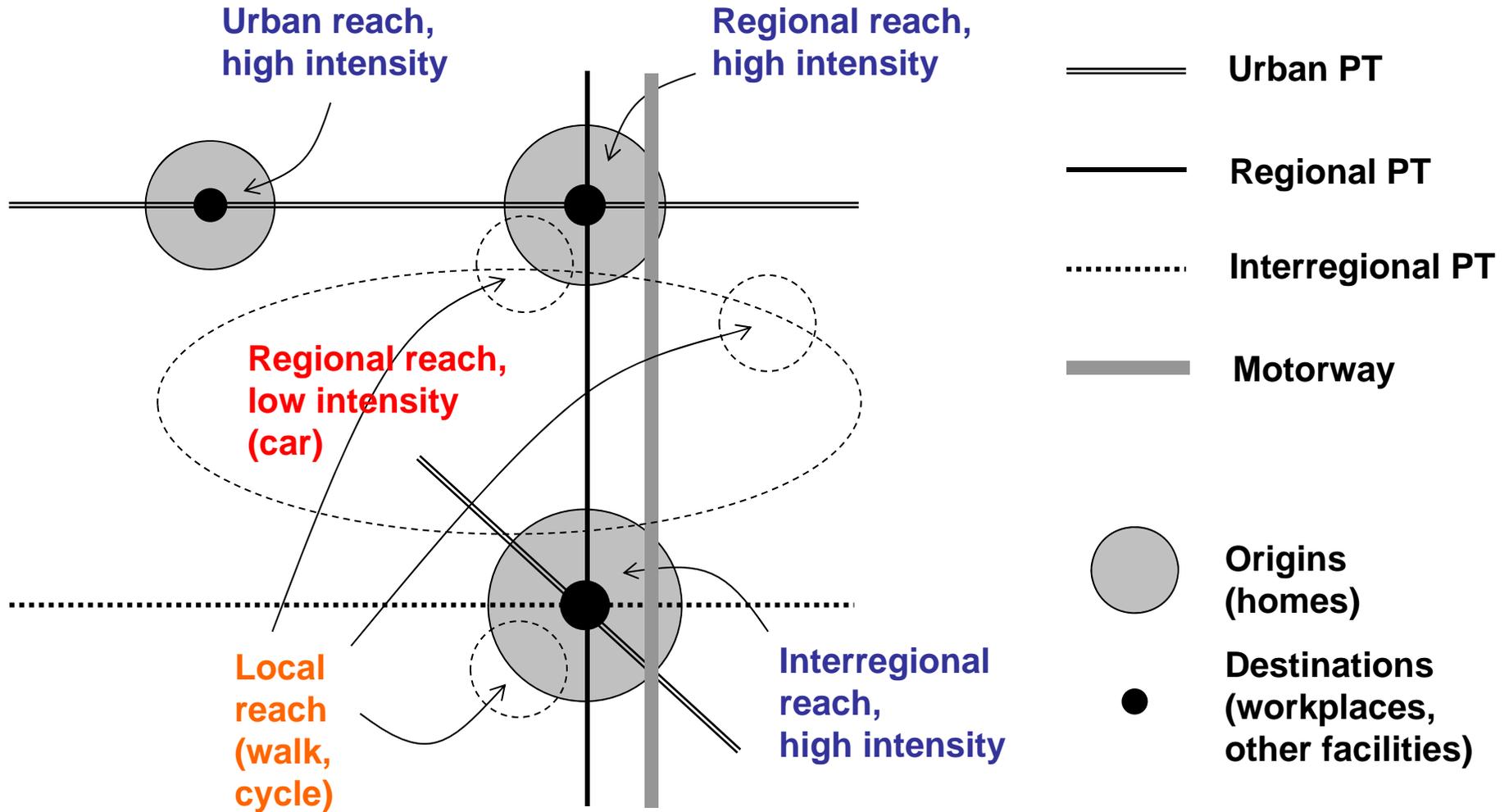
(dIVV Amsterdam)

What about other cities?

Solution space ('mobility environments')



The corresponding urban form



Let's discuss!

