

**Science Centre
North Rhine-Westphalia**

Institute of Work
and Technology



Institute for Culture
Studies

**Wuppertal Institute for
Climate, Environment and
Energy**

Perspectives of urban mobility

Dr. Karl Otto Schallaböck

Co-Director, Future Energy and Transport Structures

Wuppertal Institute

International Symposium

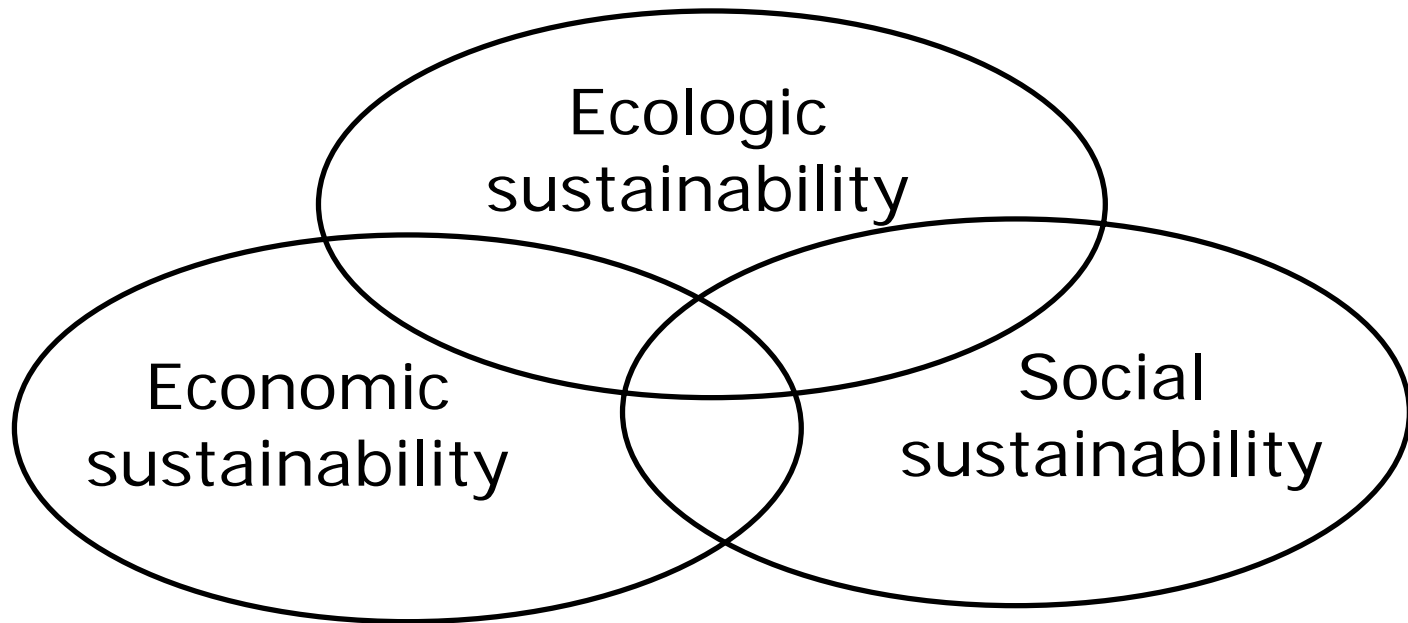
Sustainable City Traffic in Asia and Europe

Münster, Stadthaus 3, July 1/2, 2004

„Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.“

Brundtland-Report 1987

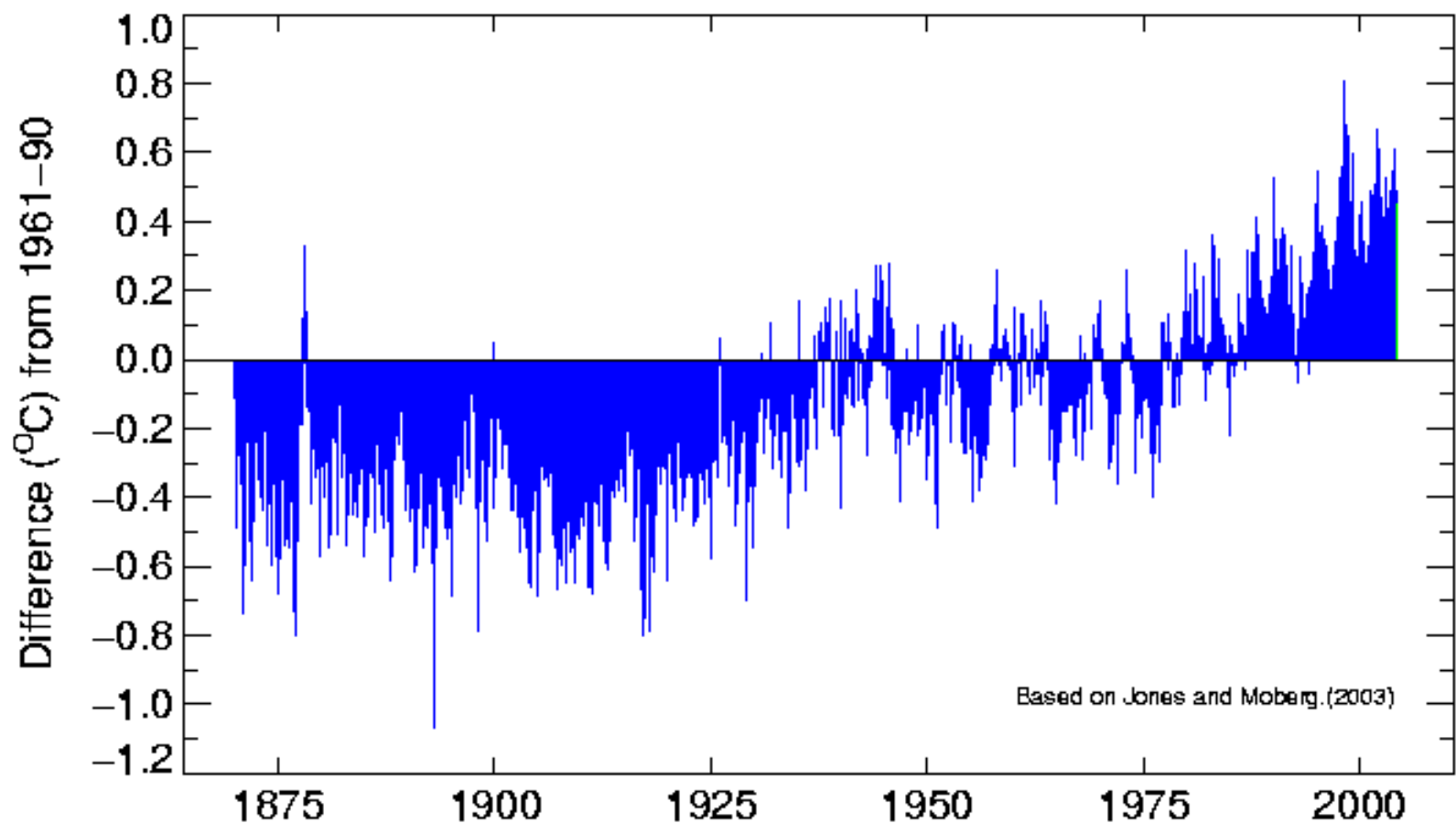
Main dimensions of sustainability



In the case of regionally limited consideration, additionally:

International sustainability

Global Average Near-Surface Temperatures Monthly anomalies, 1870 – May 2004



Climate change

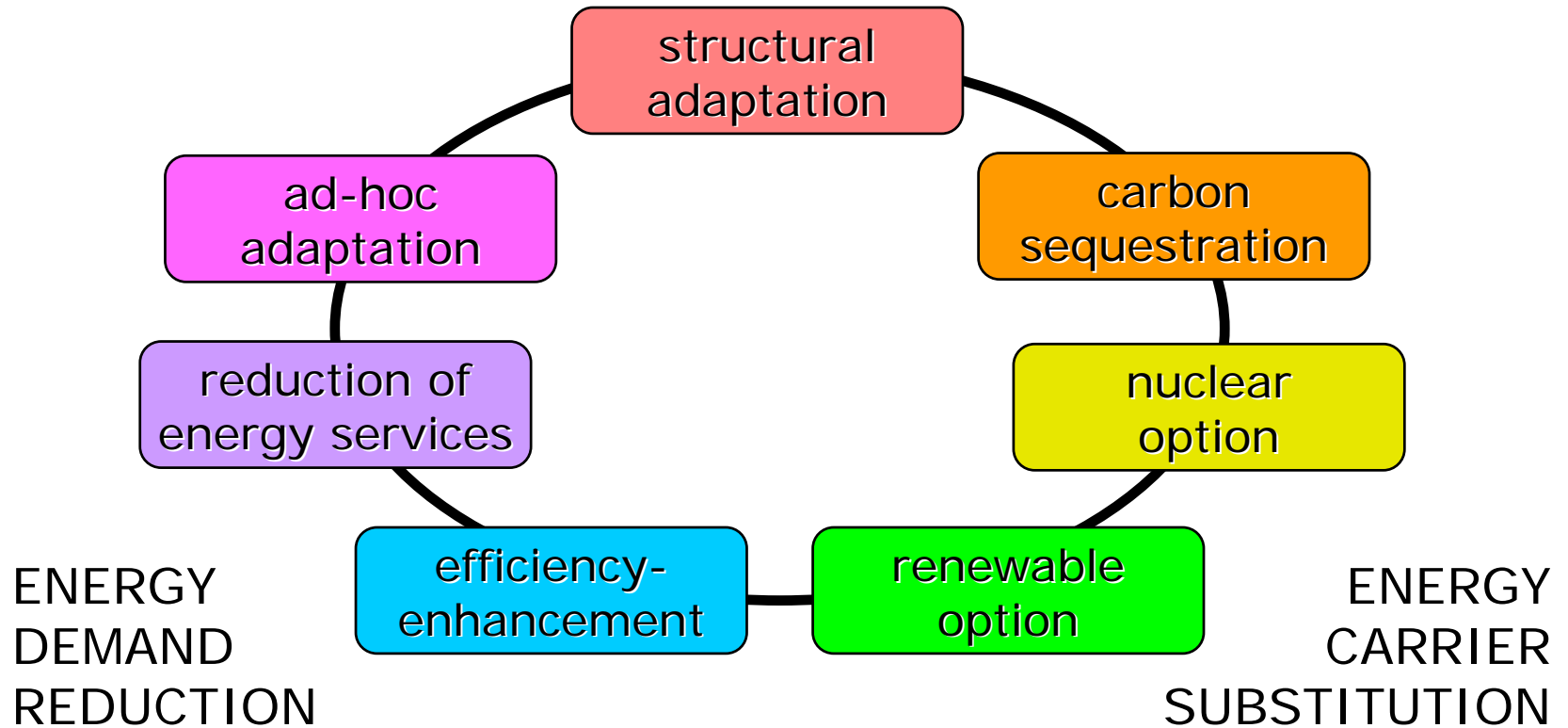
§ Early signals: more frequent and more pronounced extreme weather conditions, including heavy storms and hard rainfalls.

§ Mid-term perspective: substantial changes in regional climate, including modified temperature and precipitation patterns.

§ Long term perspective: fundamental changes, e.g. affecting sea level, the global marine circulation, vegetation a.s.o.

Energy strategies and options

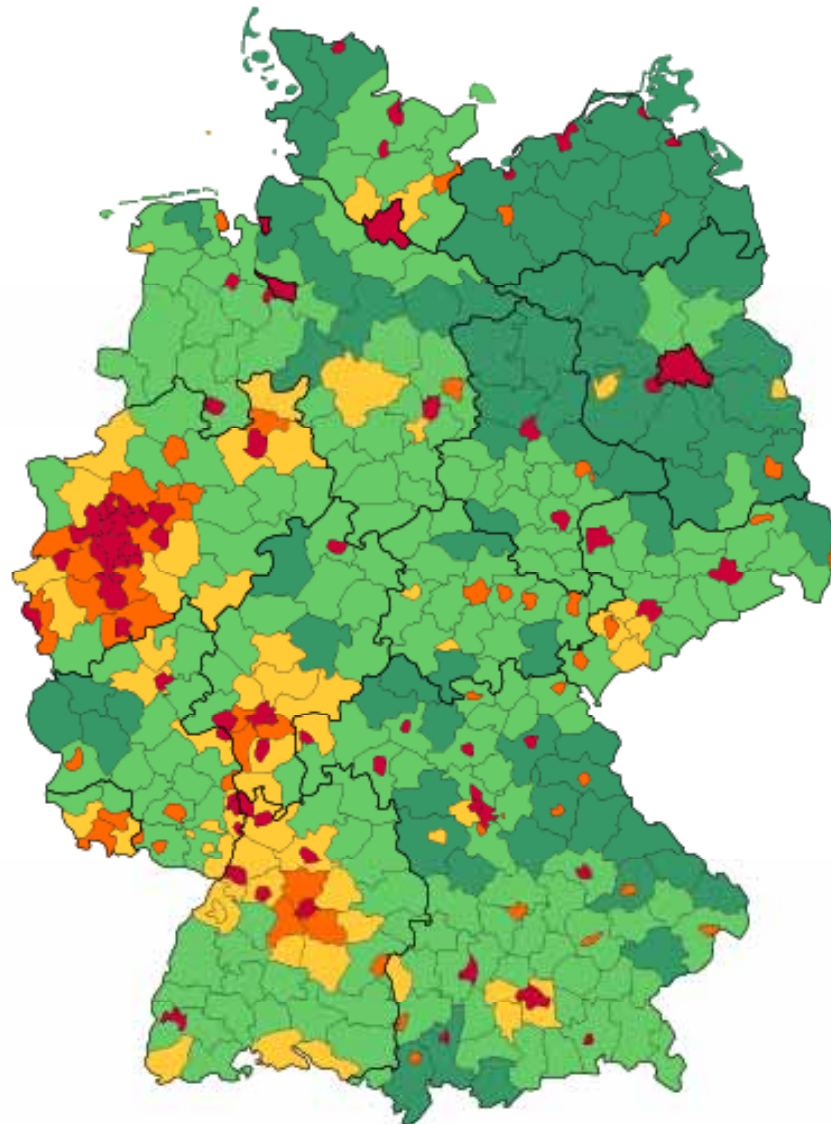
CONTINUATION OF THE FOSSIL-EXPANSIVE PATH



Urban structures: a rough comparison of main parameters

	<i>N-America</i>	<i>Europe</i>	<i>S-, SE-, E-Asia</i>
Pop. density	low (50 – 500)	medium (500-5,000)	high (5,000-50,000)
Pop. growth	weak	stagnation	high
Income	high	high	low (- high)
Main means of transportation	cars	mixed	non motorized
Age of urban structures	young	old	very old – very new

Population density, Germany 2001



Strukturdaten zur Europawahl 2004

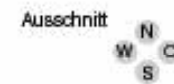
Fahren Sie mit der Maus über die Karte, um Werte anzuzeigen

Bevölkerungsdichte 2001

Einwohner je qkm am 31.12.2001

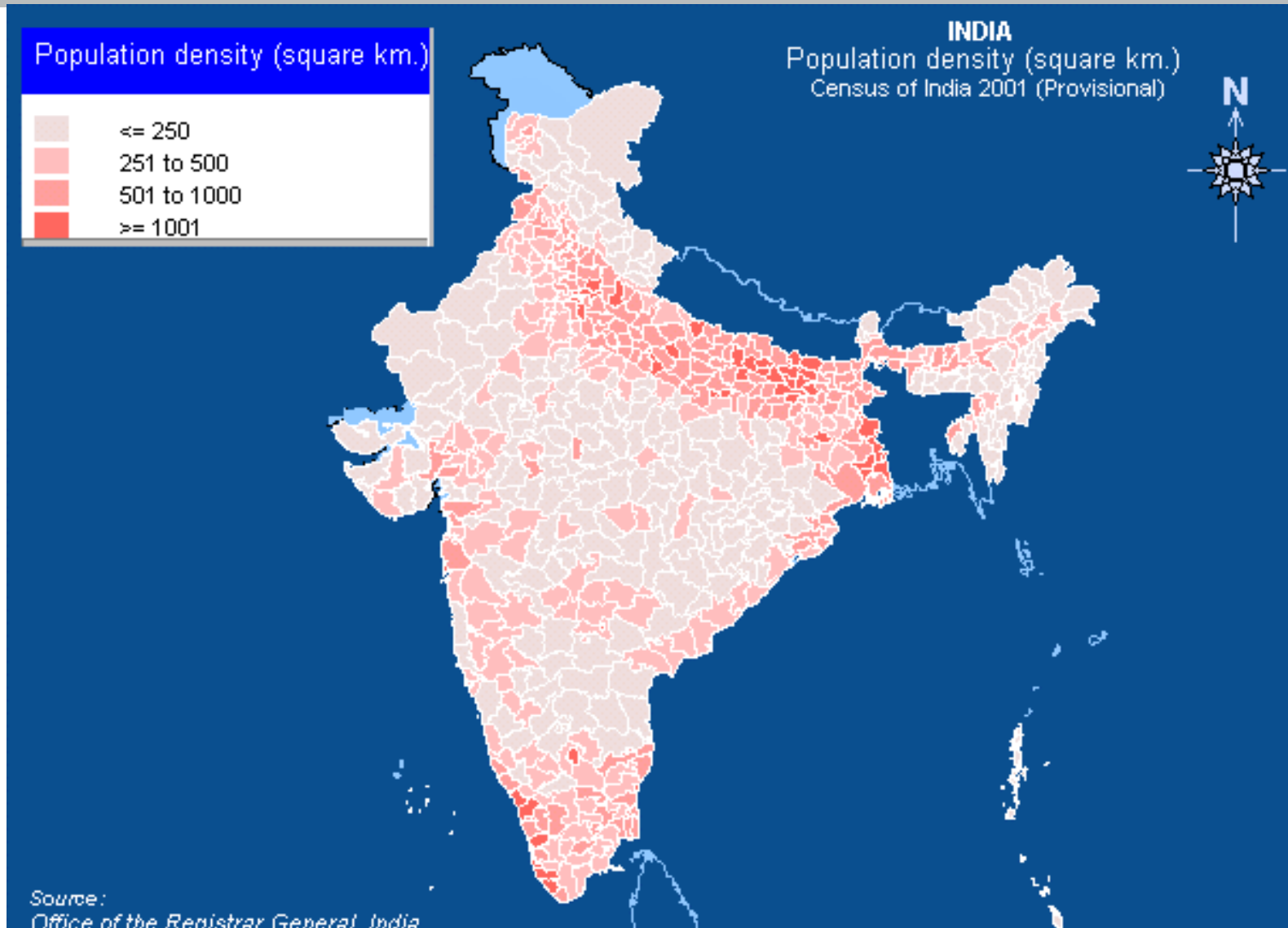
- 41 bis unter 100
- 100 bis unter 250
- 250 bis unter 500
- 500 bis unter 1000
- 1000 bis unter 3955

Klasseneinteilung

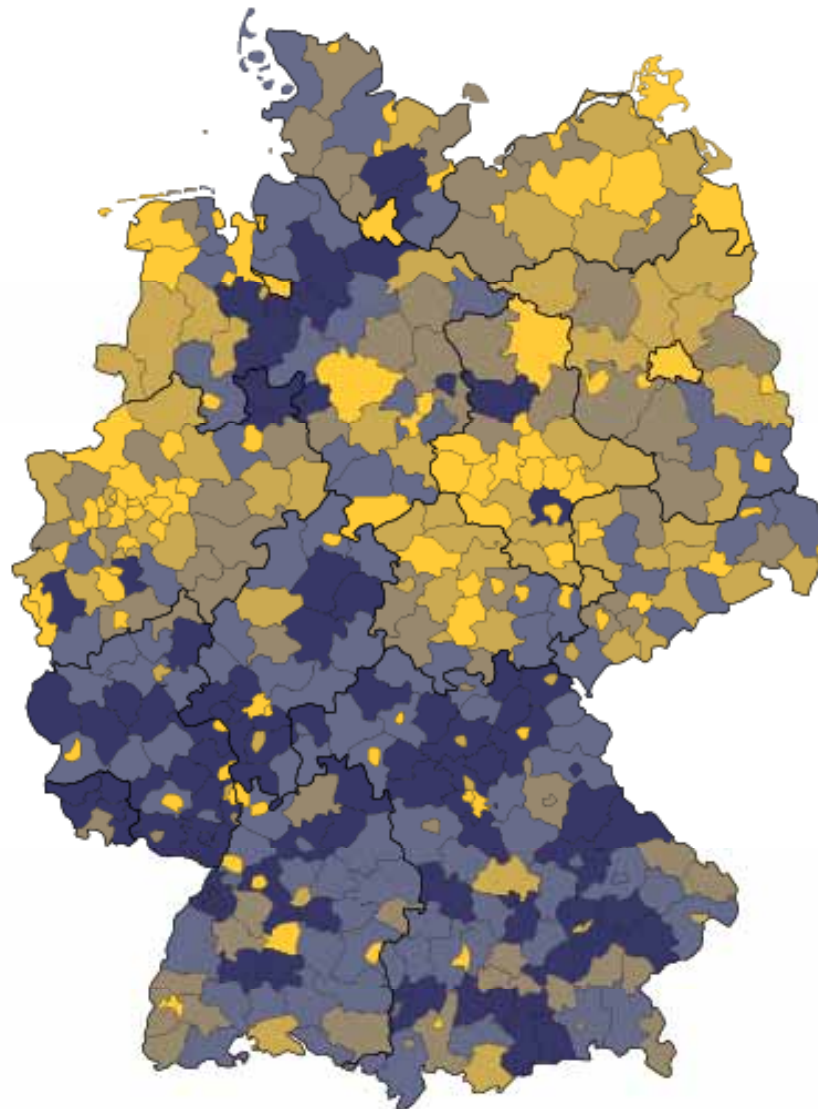


©

Population density, India 2001



Passenger cars per 1,000 inhabitants, Germany 2002



Strukturdaten zur Europawahl 2004

Fahren Sie mit der Maus über die Karte, um Werte anzuzeigen

PKW-Dichte 2002

PKW je 1000 Einwohner am 1.1.2002

- 365 bis unter 525
- 525 bis unter 545
- 545 bis unter 565
- 565 bis unter 585
- 585 bis unter 810

Klasseneinteilung

Farbschema



Ausschnitt



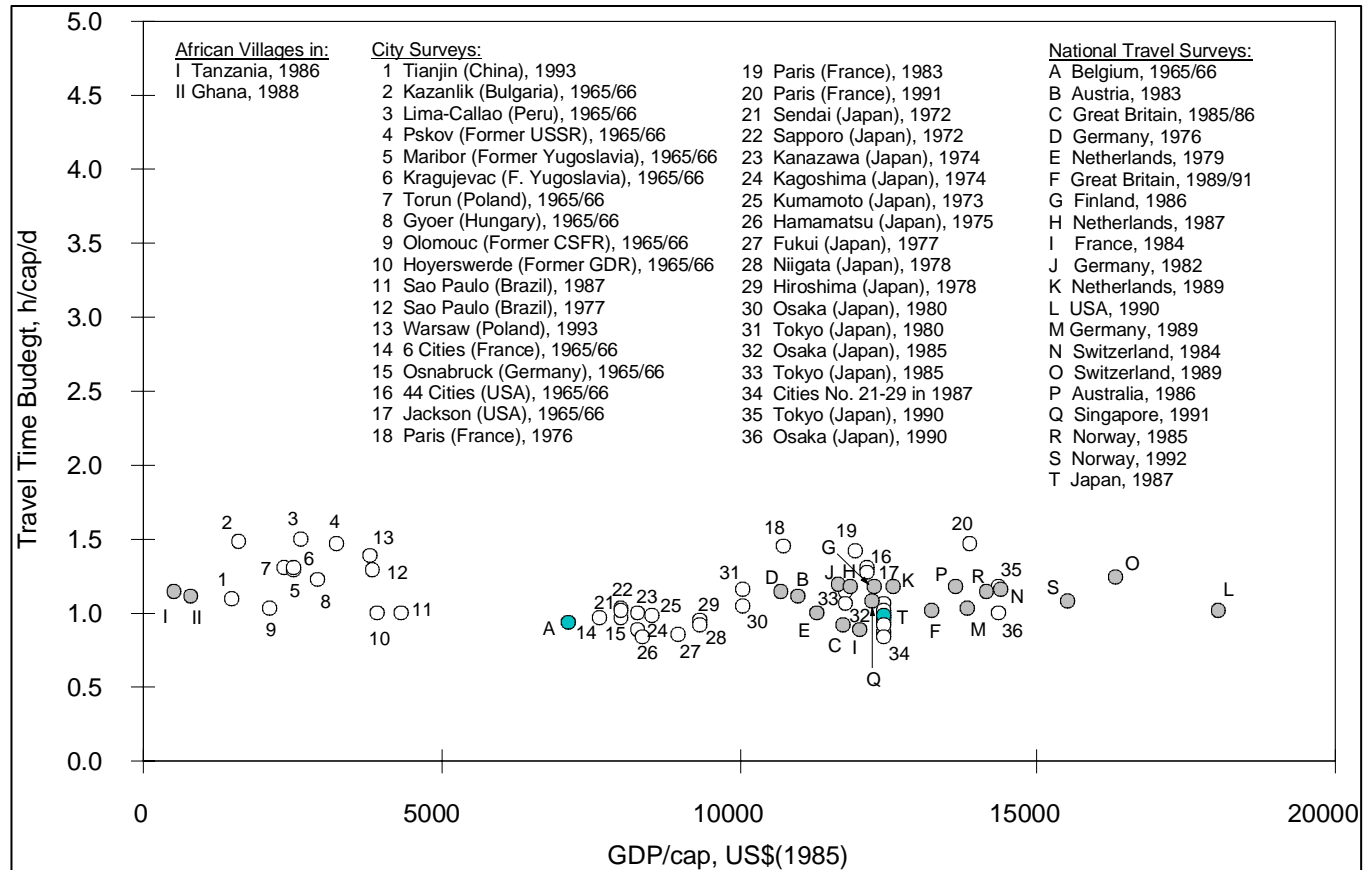
©

Passenger cars per 1,000 inhabitants in comparison, 2001

§ Italy	590
§ Germany	538
§ Japan	491
§ France	484
§ United Kingdom	476
§ Thailand	42
§ Philippines	27
§ Indonesia	15
§ Pakistan	8
§ China	8
§ India	5
§ Myanmar	4
§ Vietnam	3

Constant travel time: empirical results

Daily Travel Time Budget per capita



Source:
 Schafer and
 Victor (2000)

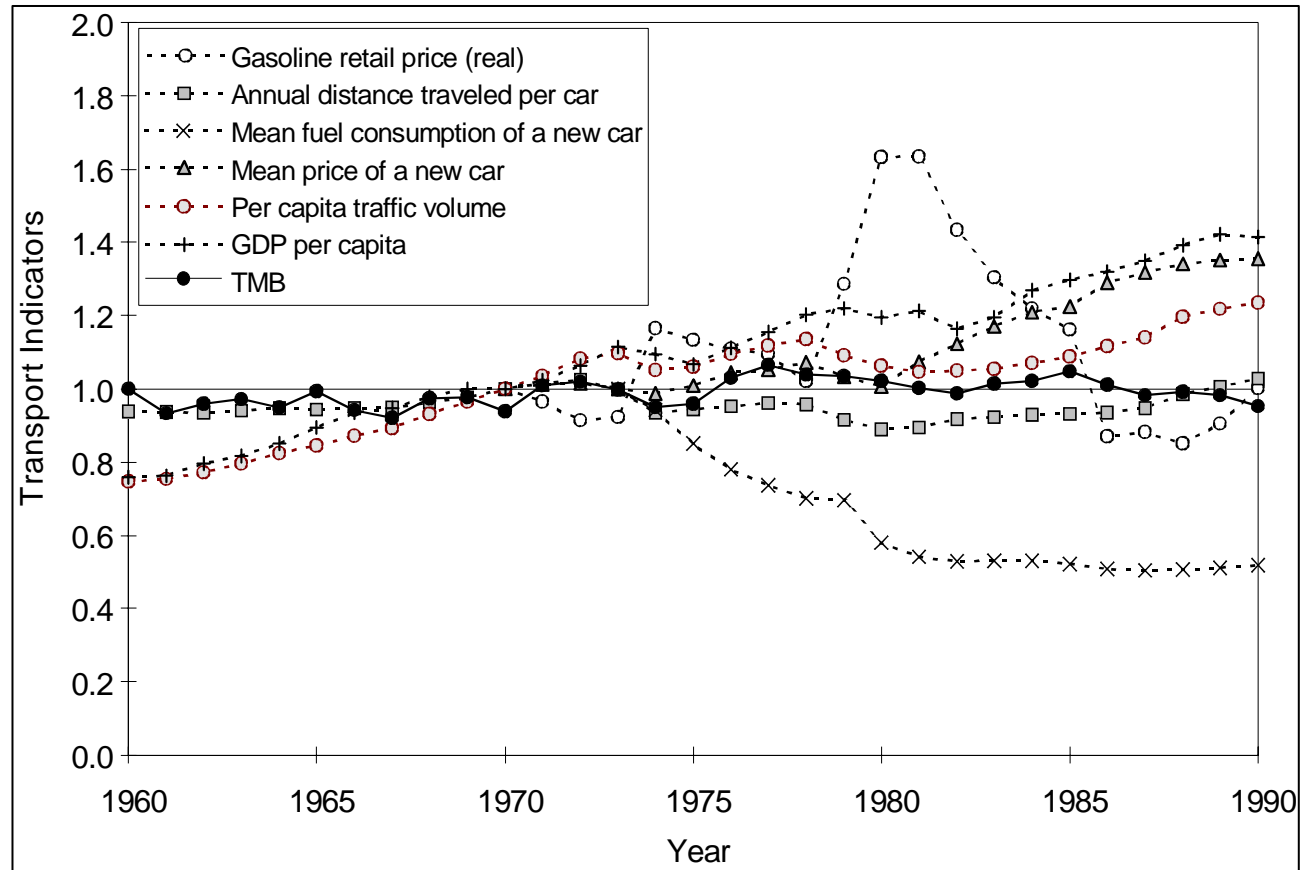
Constant travel time: hypothesis

§ The average daily travel time per capita comes to about 70 to 75 minutes, rather constantly.

§ This travel time equals a time-budget share of roughly 5 per cent.

Constant travel budget: empirical results

Transport Indicators (U.S.)



Source:
Schafer and
Victor (2000)

Constant travel budget: hypothesis

§ Also, the average money-budget's share of travel budget remains rather constant.

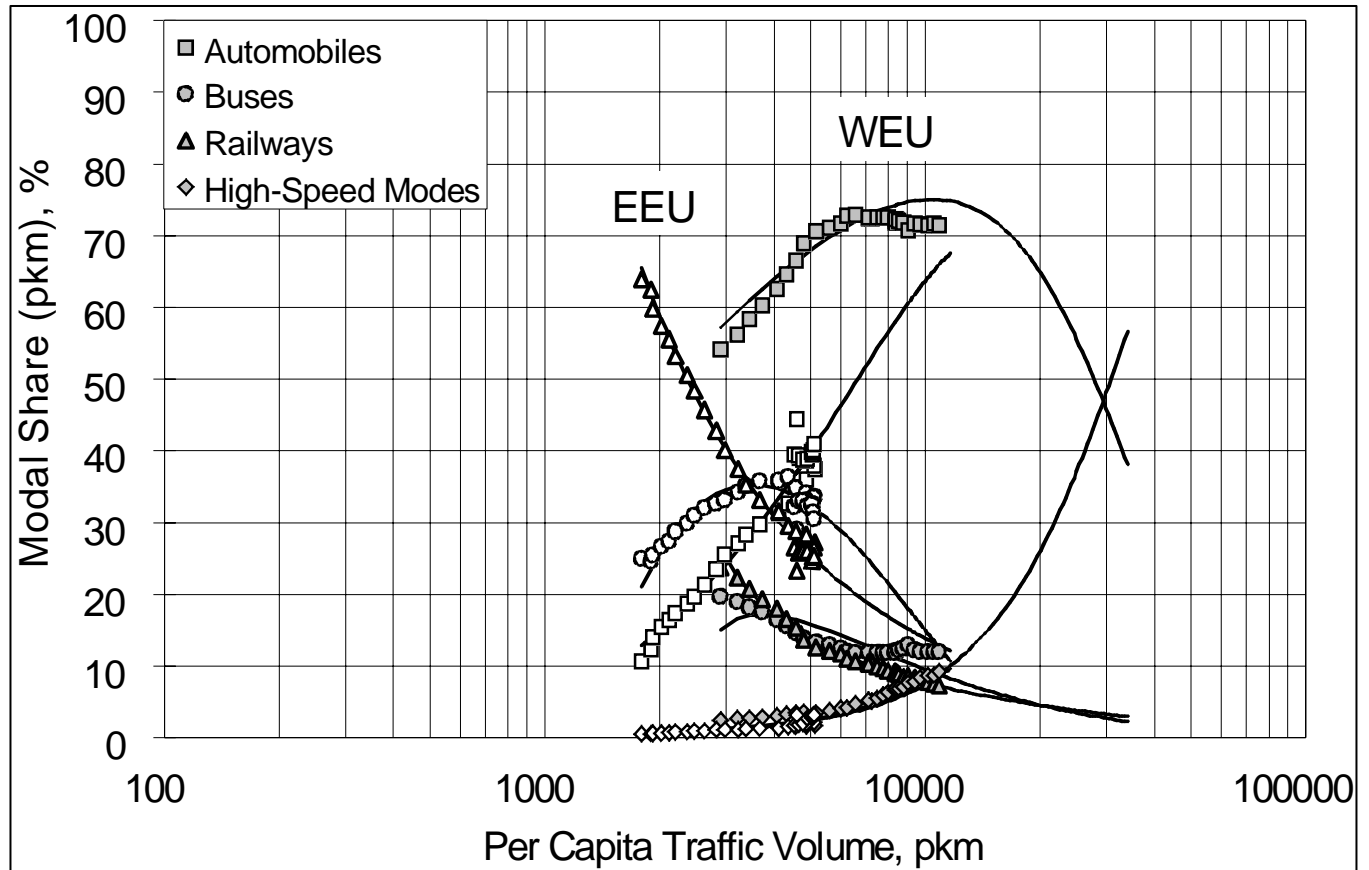
§ In industrialized countries this share mostly is in the range of about 10 to 15 per cent.

Development of modal split in Europe

Data points
1960 - 1990

Curves
1960 - 2050

Source:
Schafer and
Victor (2000)



Resulting trend: transport issues

§ Average speed is growing.

§ This does not reduce the time needed for transport, but expands the miles travelled, using the same time quantities.

§ Technically, the transport growth is spurred more by the change to other, faster means of transportation than by speeding up the individual components.

§ The additional miles mostly are not realized within the cities, but between the cities - including the transit of more cities, too.

Resulting trend: environmental issues

§ More travelled miles result in higher environmental burdens, generally spoken.

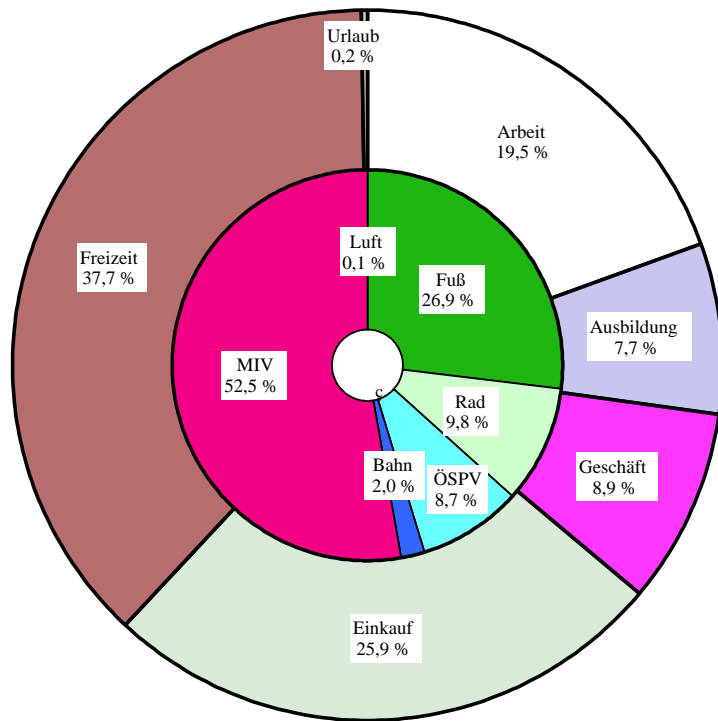
§ Since the growing speed is based primarily on the use of faster transport means with higher specific environmental burden, this creates an extra-burden for the environment.

§ But even using the same transport means, the environmental burden grows together with rising speeds, generally.

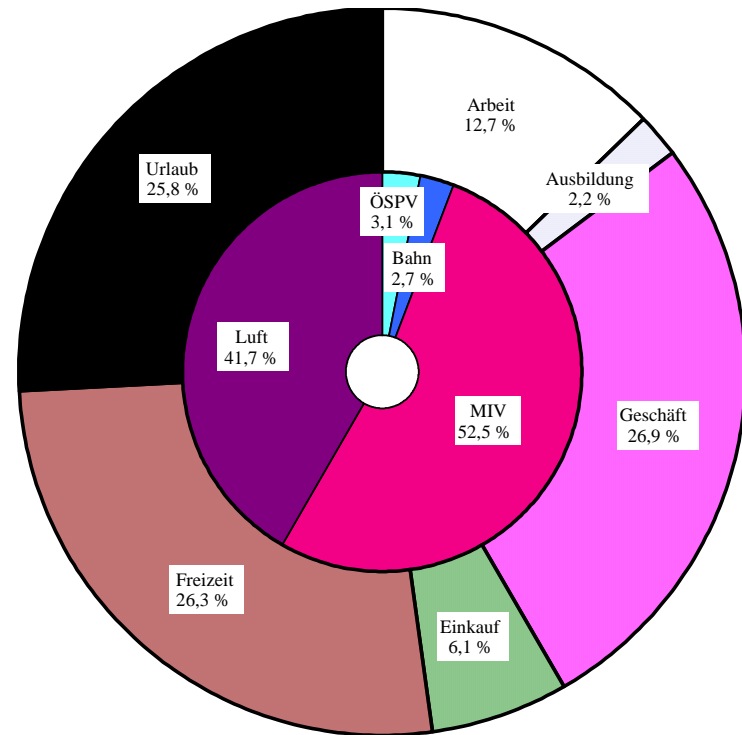
§ Until now, technical improvement could not compensate for that.

Passenger transport by modes and purposes, Germany 2000

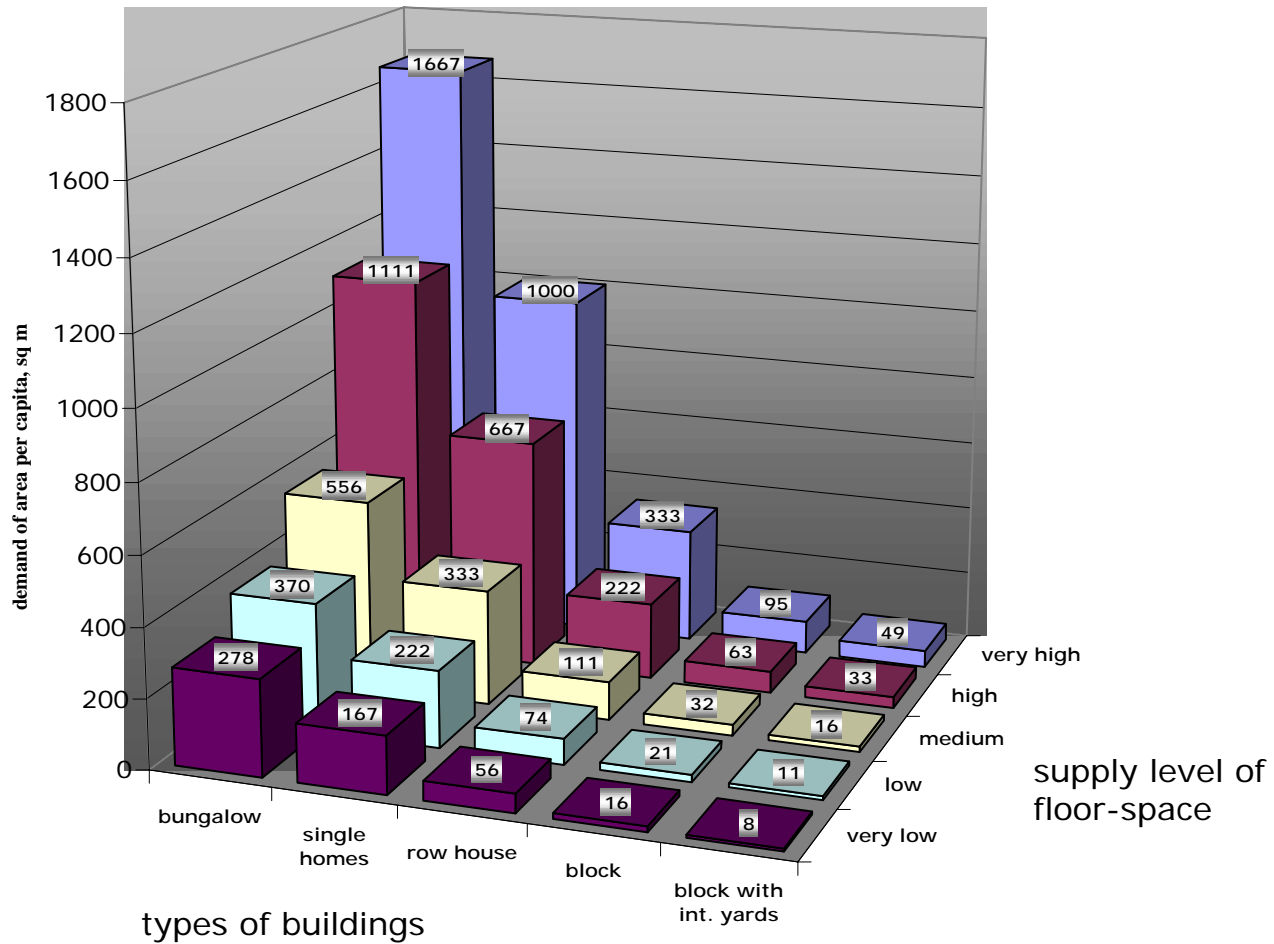
number of trips



greenhouse burden



Types of buildings & personal floor-space: spatial demand

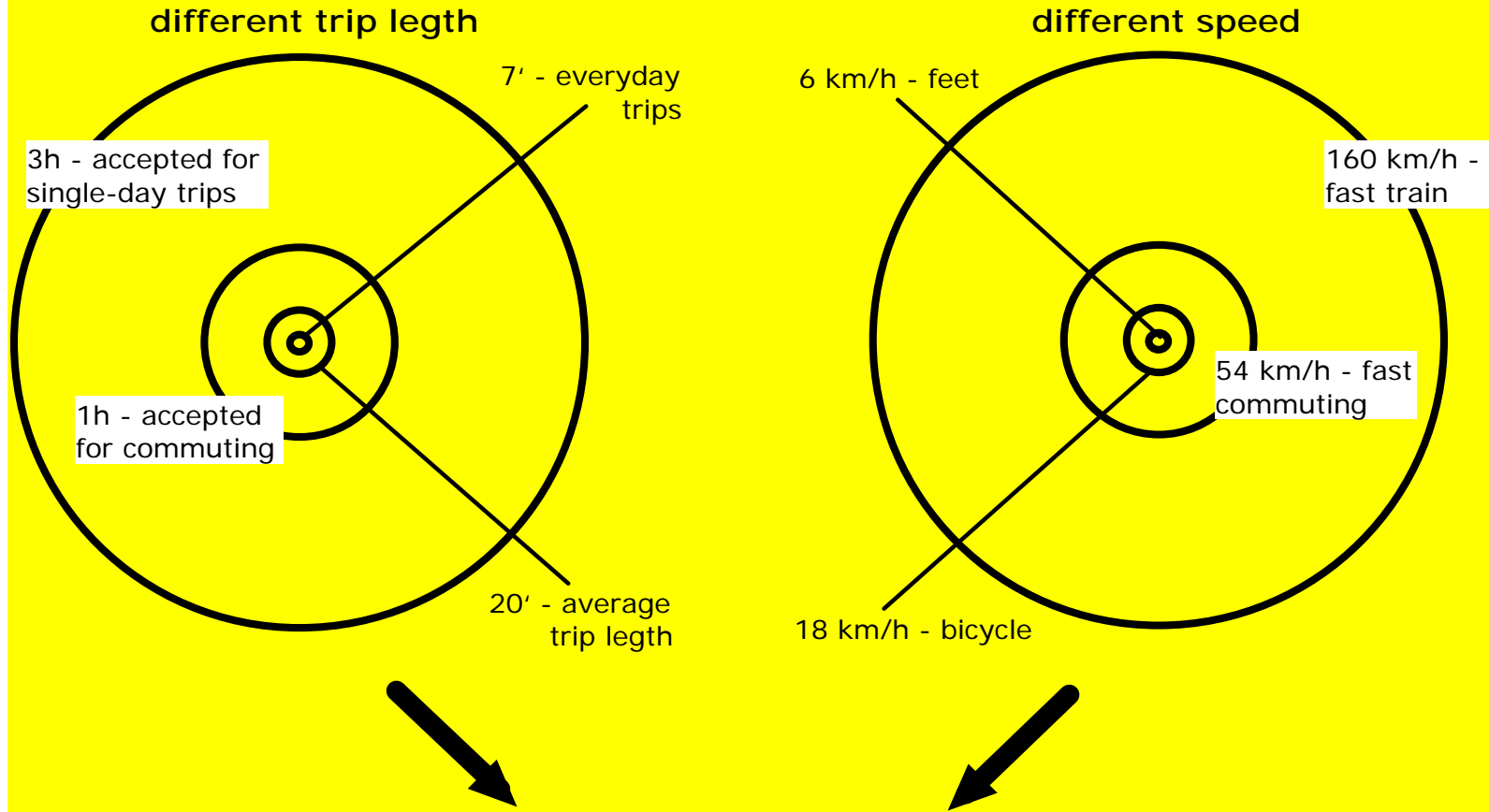


Urban transport: priorities

- § Save and improve the options of non-motorized transport.*
- § Make sure of well organized public transport systems, particularly bus systems.*
- § Limitate the adverse effects of passenger cars, including accident risks and emissions.*

Factor π in transport

Enhancing Urban Structures



guidelines for urban (transport) planning

Bottom line: Selected elements of an integrated approach

**Wissenschaftszentrum
Nordrhein-Westfalen**

Institut Arbeit
und Technik



Kulturwissenschaftliches
Institut

**Wuppertal Institut für
Klima, Umwelt, Energie**
GmbH

Thank you for your attention!

Have you visited our website?
<http://www.wupperinst.org>