Check Against Delivery
Embargoed until 8:45 PM, 4 November 2010

Perspectives for a Sustainable Mobility

by Professor Dr.-Ing. Gerd-Axel Ahrens
Technische Universität Dresden, Germany

Session 5, Keynote Lectures: "Future Technologies II: Mobility"
Our Common Future, Essen, November 4, 2010

Slide Presentation

Our Common Future

Hannover · Essen
2.–6. November 2010

VolkswagenStiftung · Deutsche Messe Hannover · Germany · Stiftung Mercator · Landeshauptstadt Hannover · RUHR.2010

Gerd-Axel Ahrens

Perspectives for a Sustainable Mobility

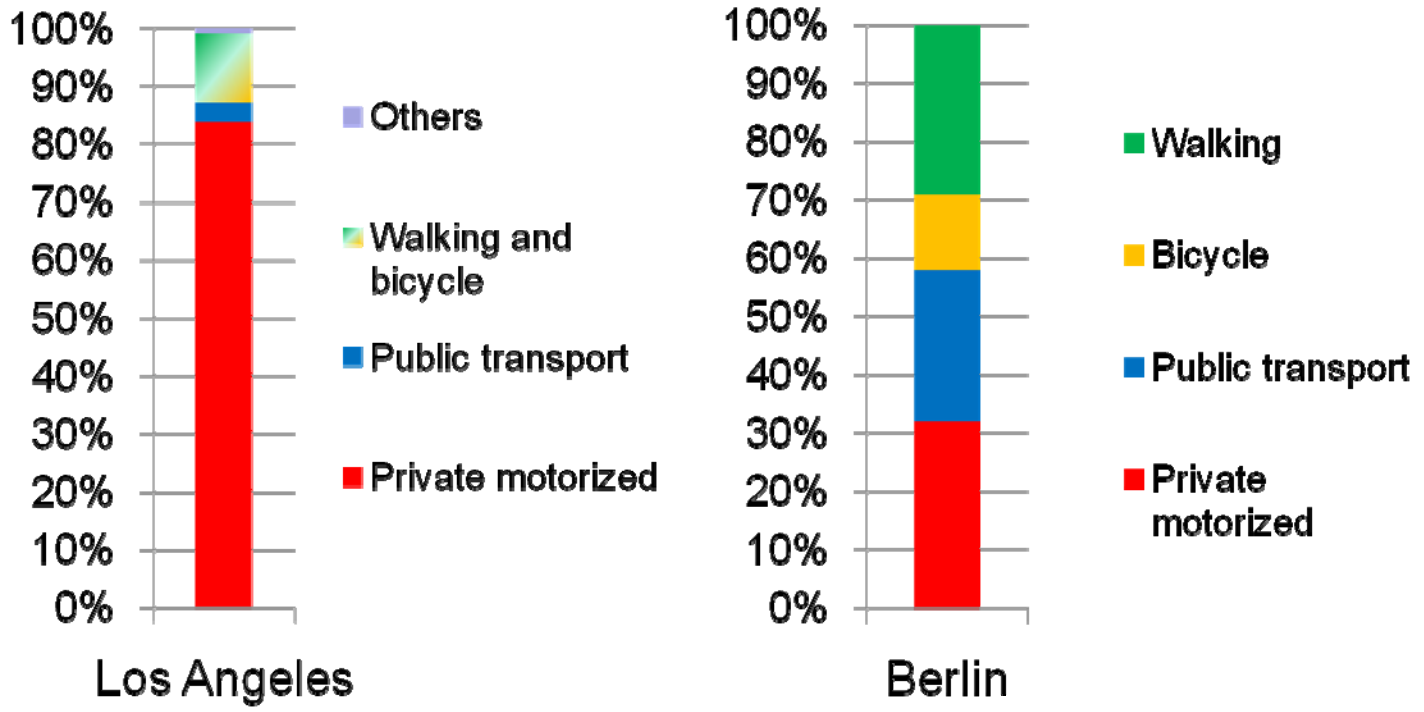
Technische Universität Dresden
‘Friedrich List’ Faculty of Transport and Traffic Sciences

1. Introduction
2. The myth of increased mobility
3. Recent trends in motorisation, car use and multi modal behaviour
4. Integrated sustainable mobility planning – the perspective to more sustainability?
5. Conclusion

World perspective

- 7 billion people of today might be more than 9 billion in 30 - 40 years
- By 2020 car sales in developing countries will increase by the factor 6
  (Booze & Company 2009)
- By 2025 China will be the largest automobile market and pass the United States
  (Goldman Sachs 2006)
- By 2030 the number of cars in the world will double
- Since 1990 CO_2-emissions of the transportation sector rose by almost 30 % in the EU
  (Eurostat 2010)
- Worldwide the transport sector causes about 13 % of all CO_2-emissions, this amount will continue to increase until 2030 by 40 % (IEA 2009)
- Megacity Beijing: Almost 50 % of the air pollution is caused by traffic (z-punkt 2010)

Modal Split Los Angeles and Berlin



Source: http://la.streetsblog.org/wp-content/uploads/2010/04/4_22_10_graph.jpg
TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Purpose of trips – the serving function of traffic

Trips are caused, when different activities have to take place at different locations. The location has to be changed to conduct the next activity.

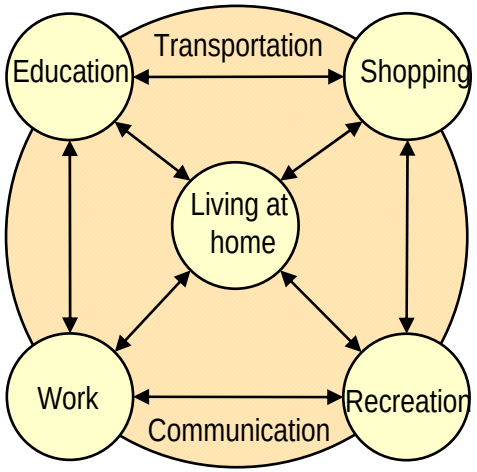
Activities of people are

- Living at home
- Work
- Shopping
- Education
- Recreation

Activities of goods are

- to gain of raw materials
- Production
- Processing
- Storage
- Consumption

Basic service functions



Definition of daily mobility

Mobility of people:

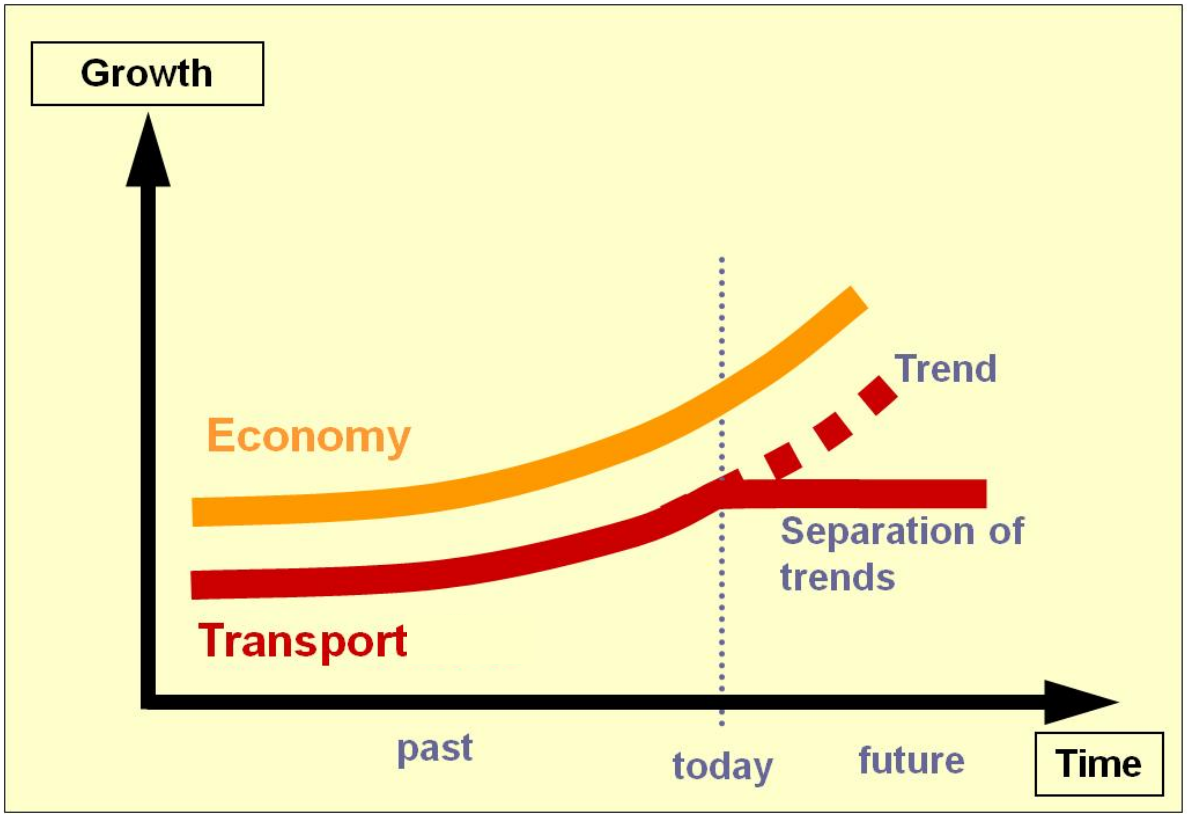
Ability of activities away from home though motorised or non motorised trips. [1)]

Descriptors of daily mobility:

1. Trips per day
   - 3 - 3,5 trips per day in Germany
2. Required time for daily trips
   - 70 – 80 min per day in Germany
3. Trips length in km per day
   - 1991 still 20 km, 2003 already 29 km per day
     (Mobility in activities, SrV)

[1)] Transport planning has the task to enable the participation of population and goods in individual activities or exchange of goods. The use of resources and negative effects have to be minimized. So we try to achieve as much as possible mobility with the least amount of traffic and effort.

Challenge of the future – decoupling traffic growth from economical growth



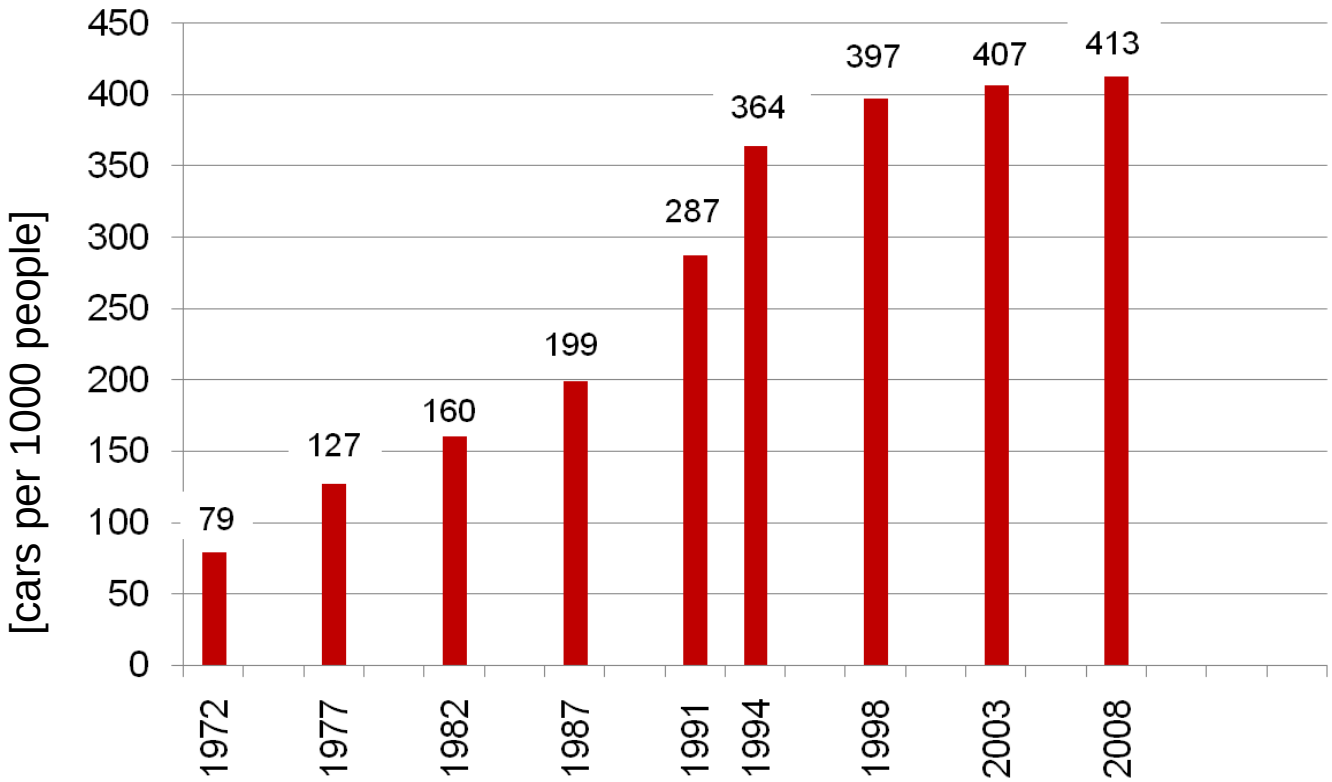
The data base

Examination area SrV 2008

- Total sample: 115.525 people
- 74 towns and communes
- 36 initiators
- 4 coordinated town-and-urban hinterland surveys
- 5 co-operations between town and local transport association
- One survey in rural area

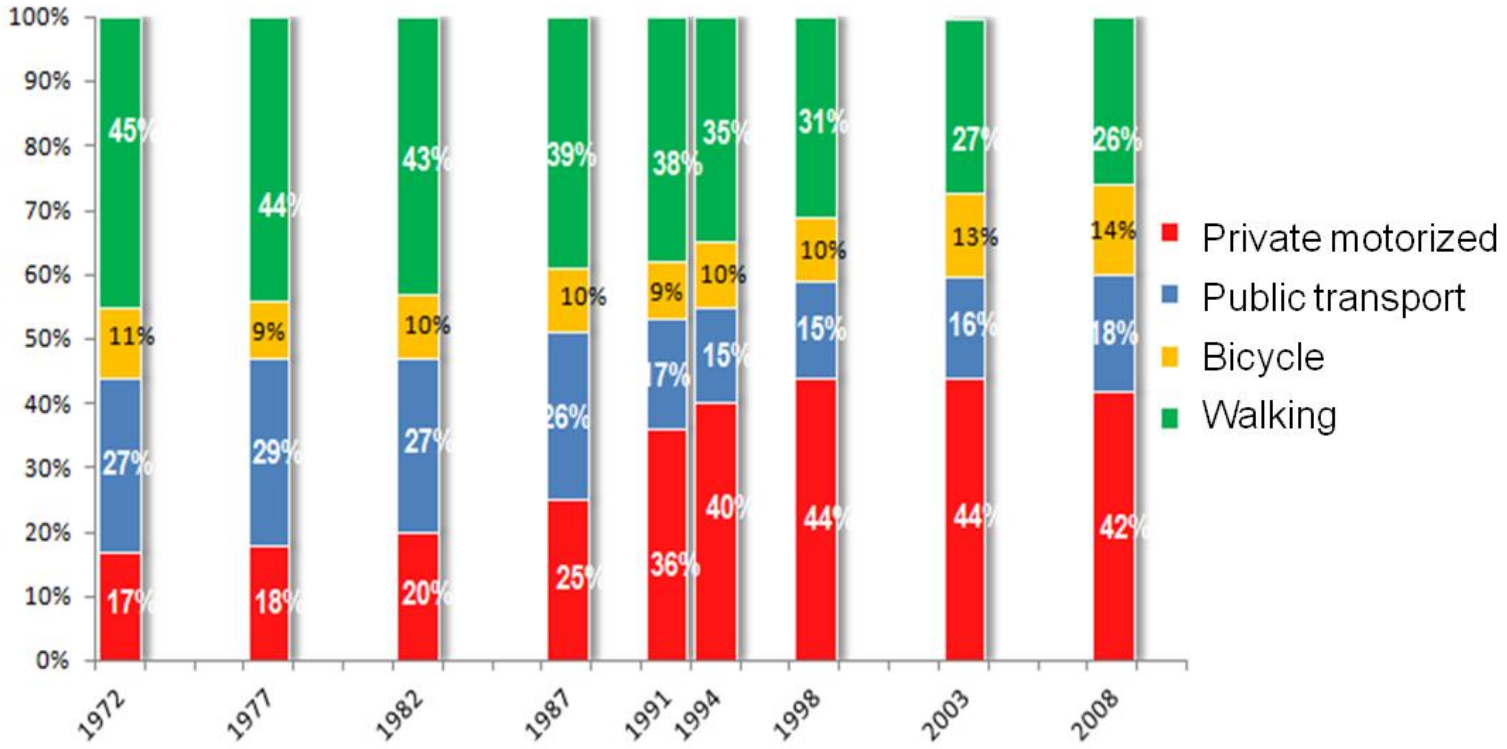
Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Development of motorisation in East German towns



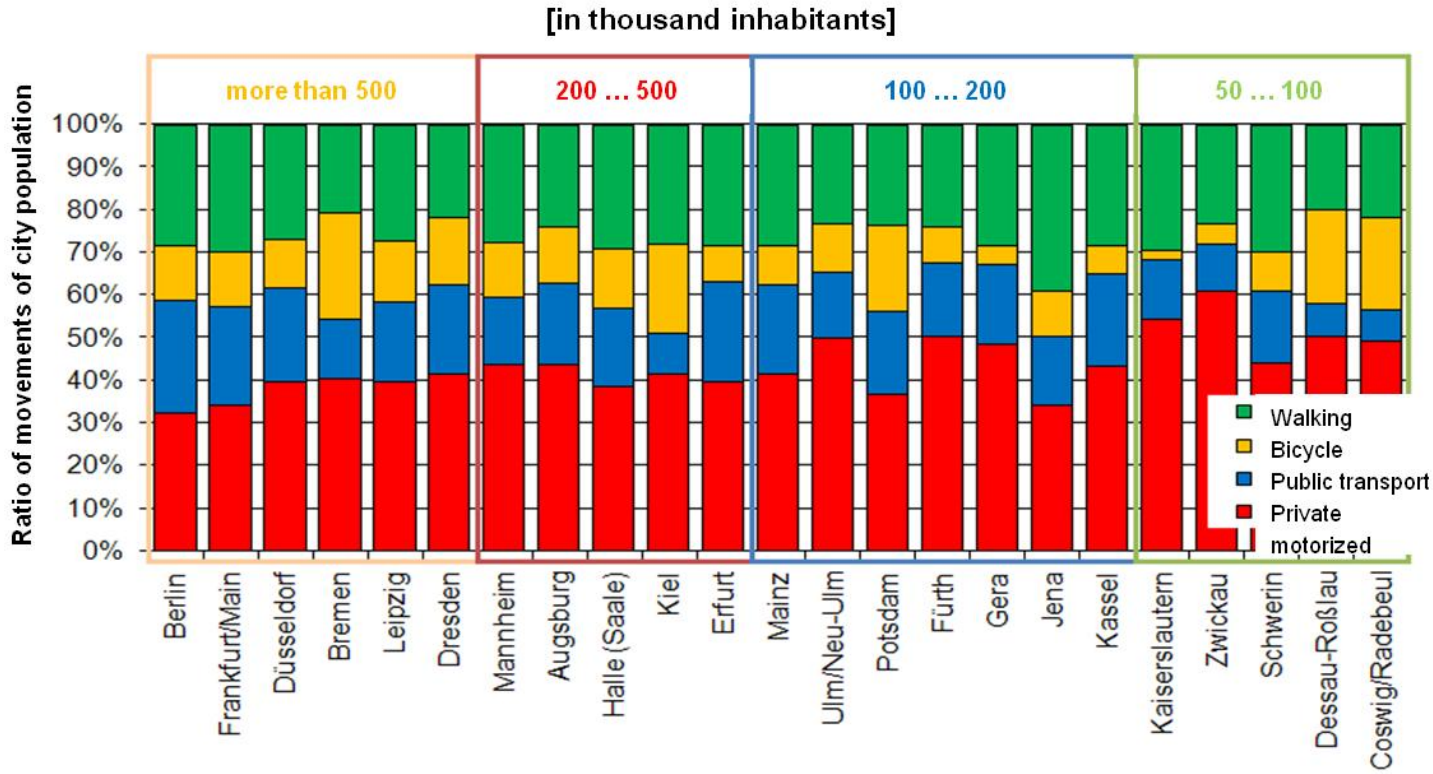
Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Modal split development in East German towns



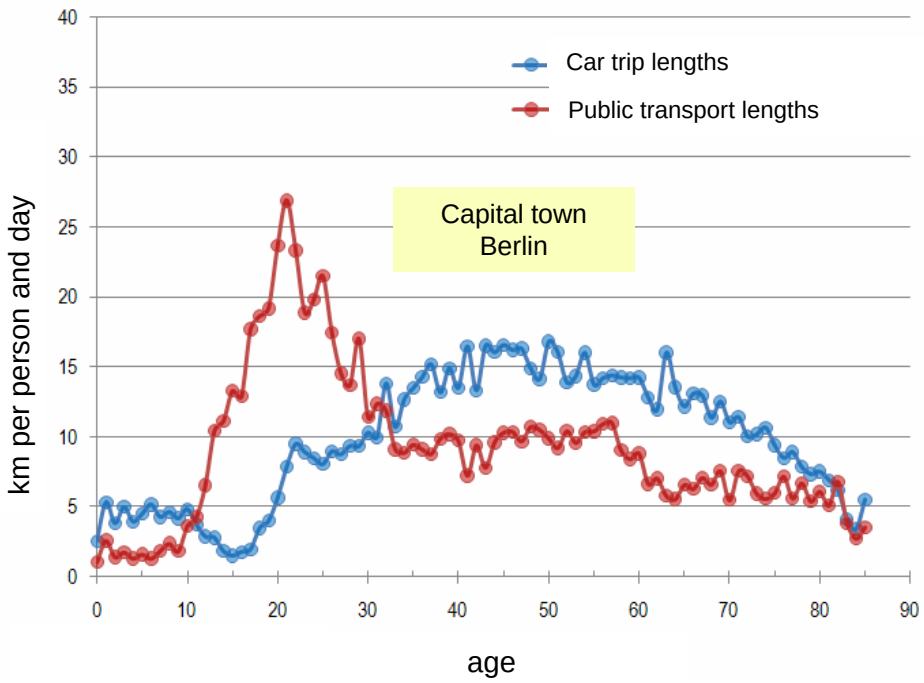
Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

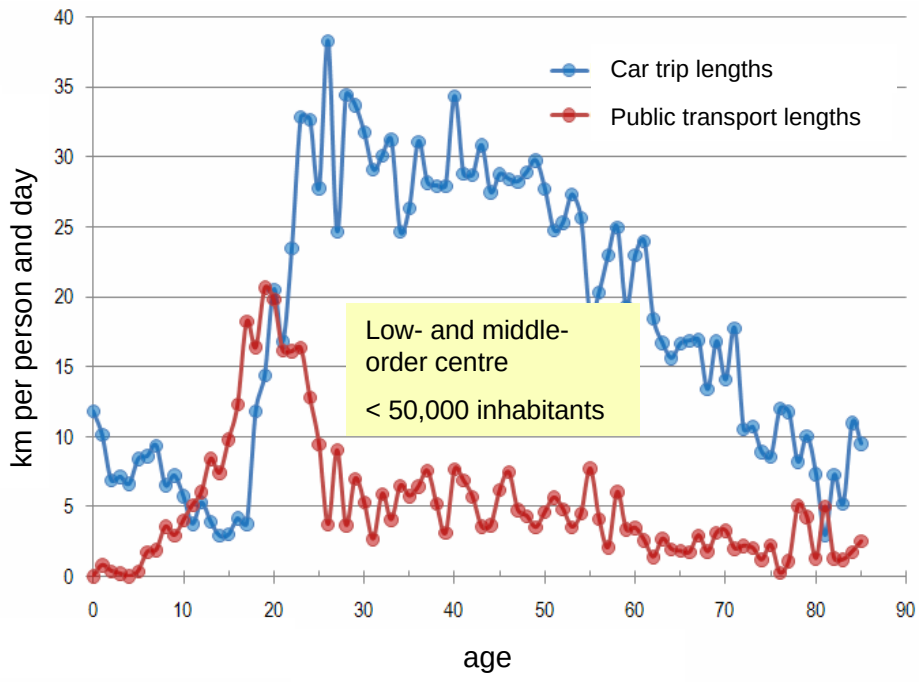
Modal split of 2008 of several German towns



Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

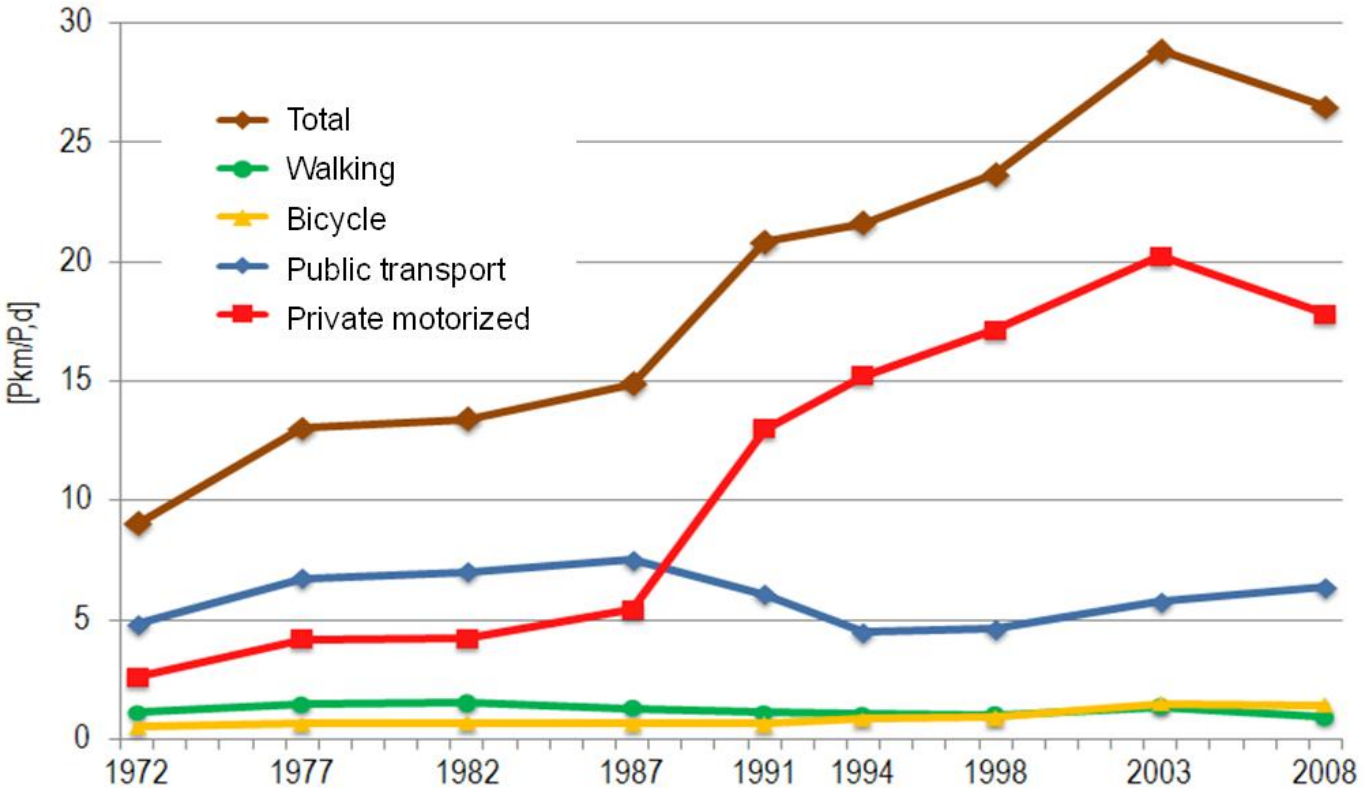
Age dependent modal split in Berlin and smaller towns





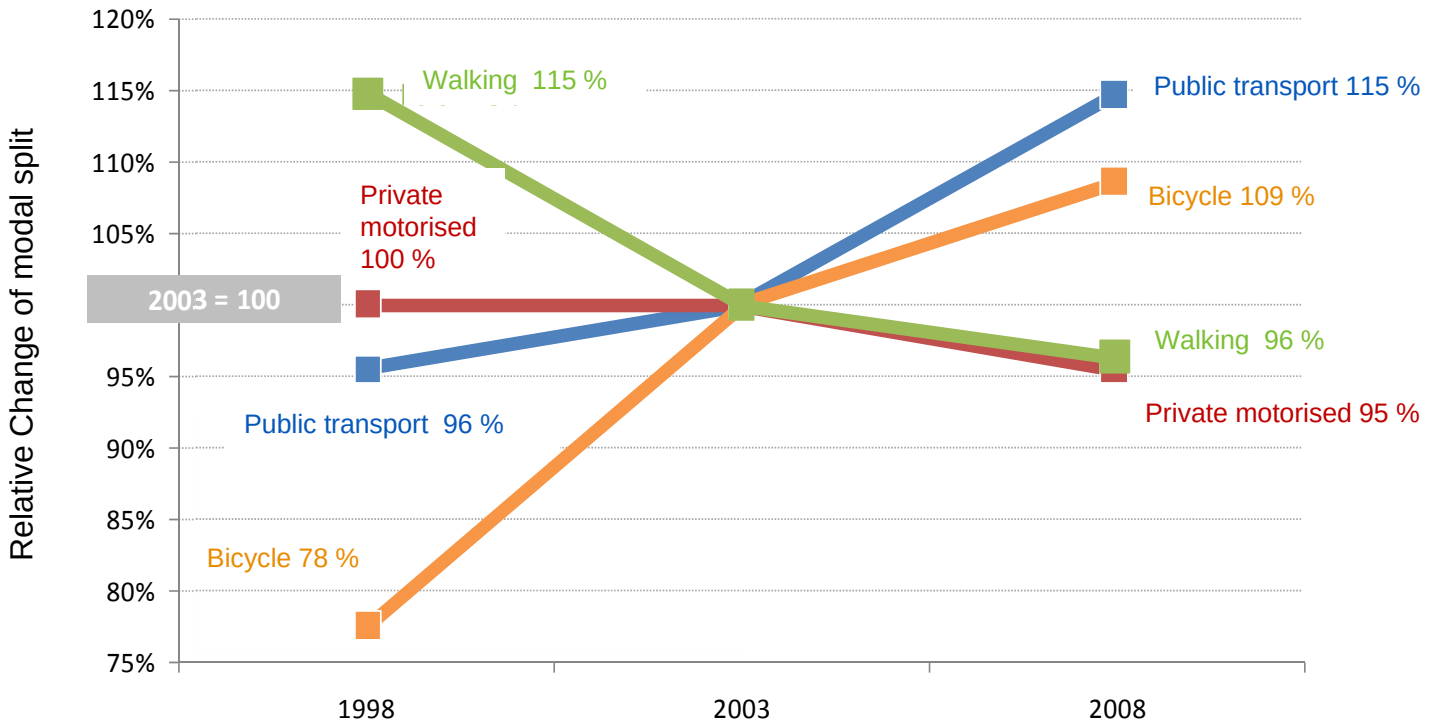
Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Development of daily trip lengths by modes in East German towns



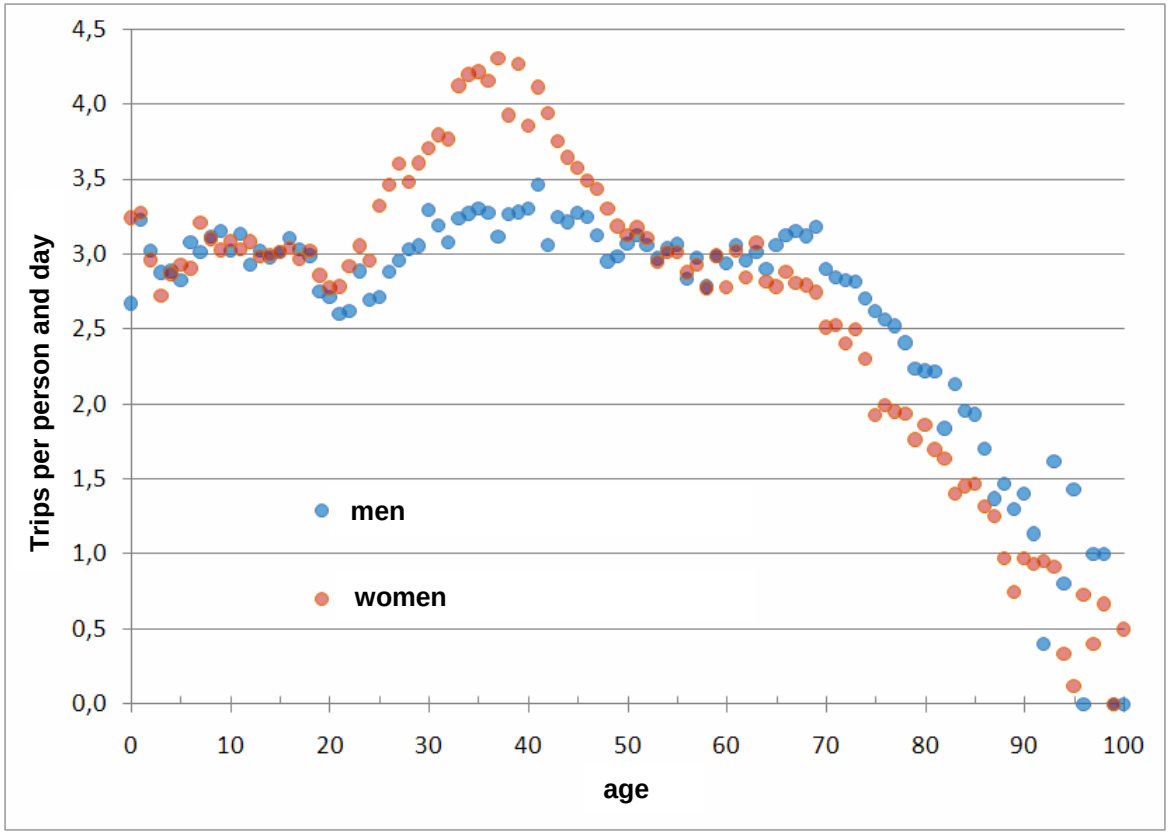
Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Relative modal split shifts in East German towns (2003 = 100)



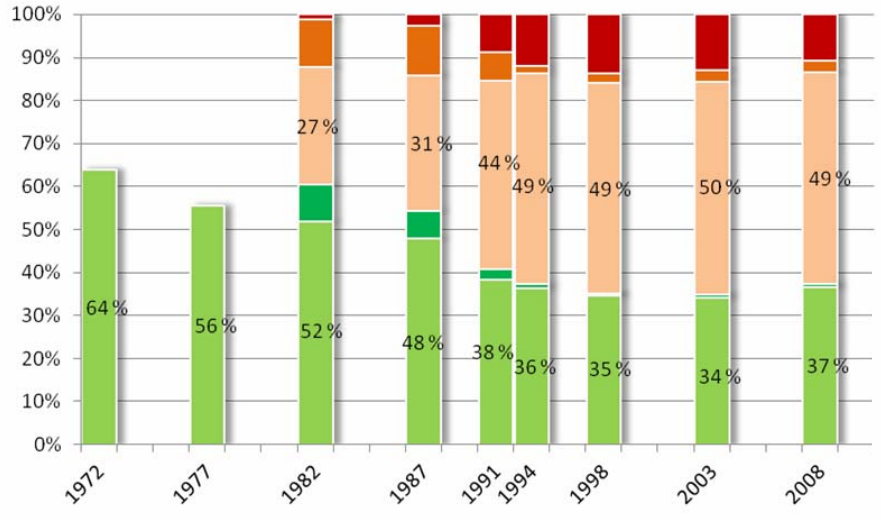
Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Increasing number of seniors travels less

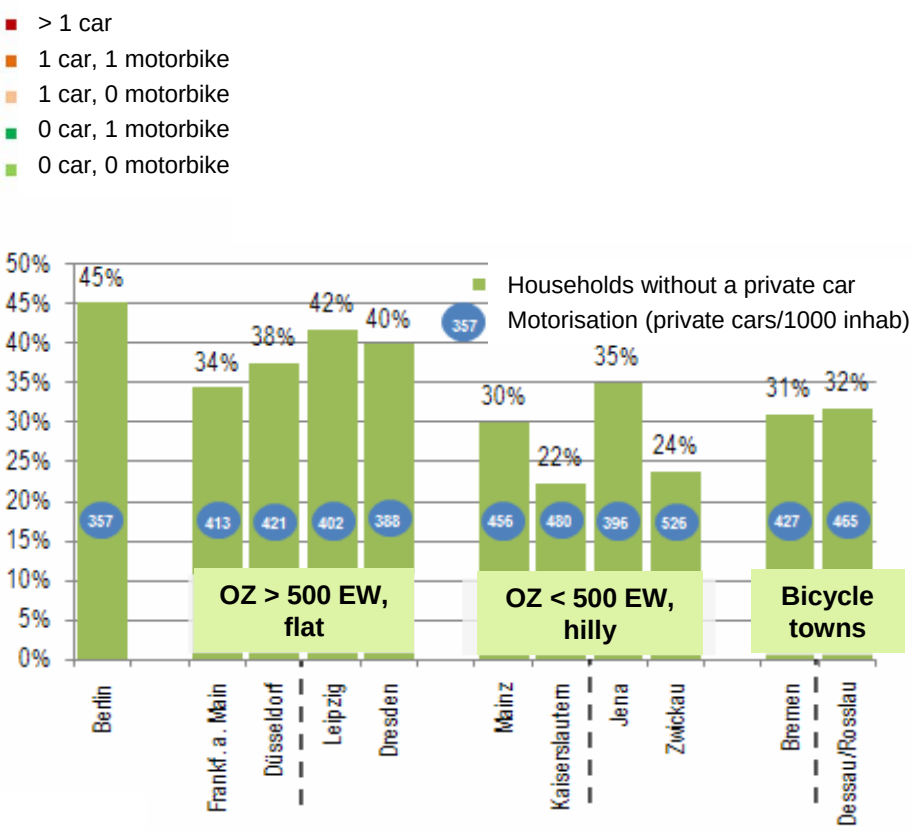


Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Increasing number of households without a car



Cars per household

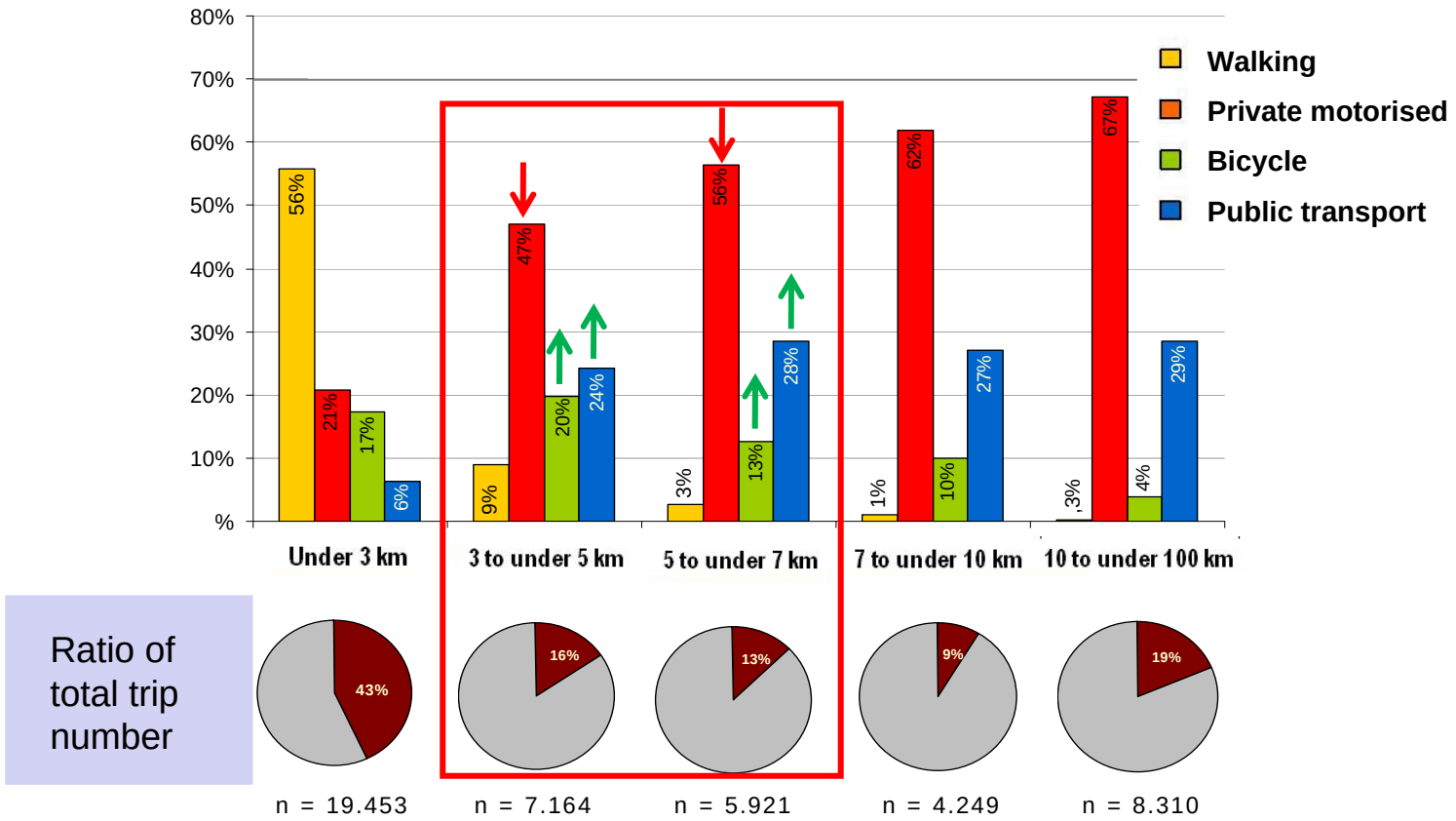


Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Change of values: new mobility preferences

- Living in cities becomes increasingly attractive (reurbanisation)
- Car use gets more important than car ownership
- Better information and new life styles allow choice of cheapest, fastest or most comfortable way to travel (with smart phones to individualised mobility concepts)

Modal split and trip lengths

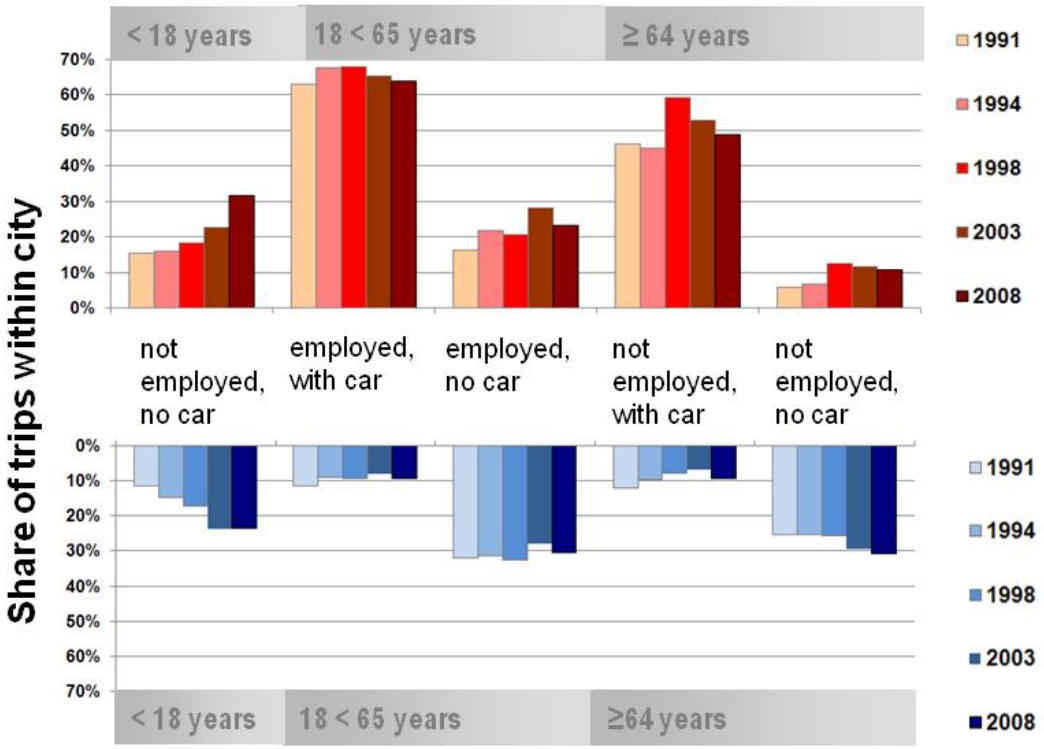


Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Car possession – main determinant of modal choice

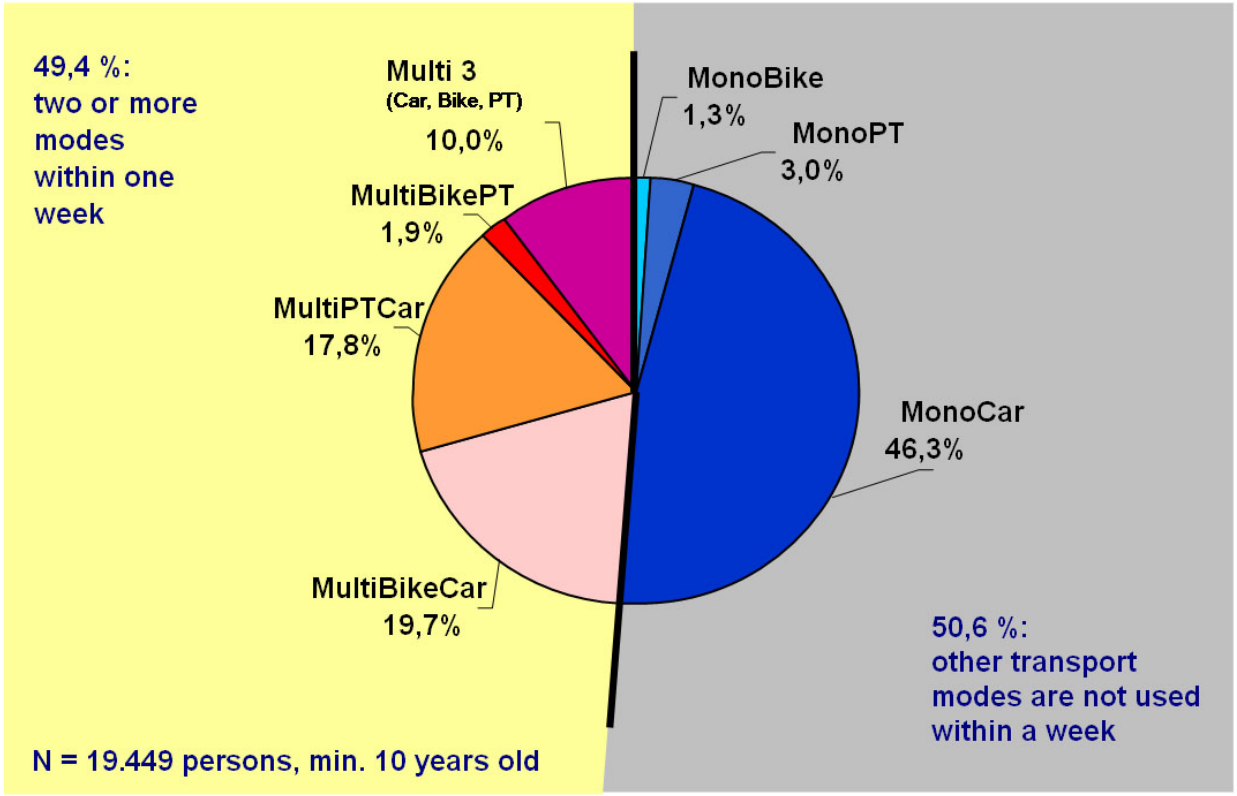
Automobile

Public transport



Source: TU DRESDEN/VIP: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv)

Multi modality is more intelligent



Source: Hausdorf, 2009; Data: MOP 1995 - 2006

Requirements, methods and measures are not new

(1) Avoid unnecessary and ineffective trips

(2) Shift trips – where it makes sense – to the most sustainable modes

(3) Operate the remaining, necessary road traffic safe, with minimal emissions and space

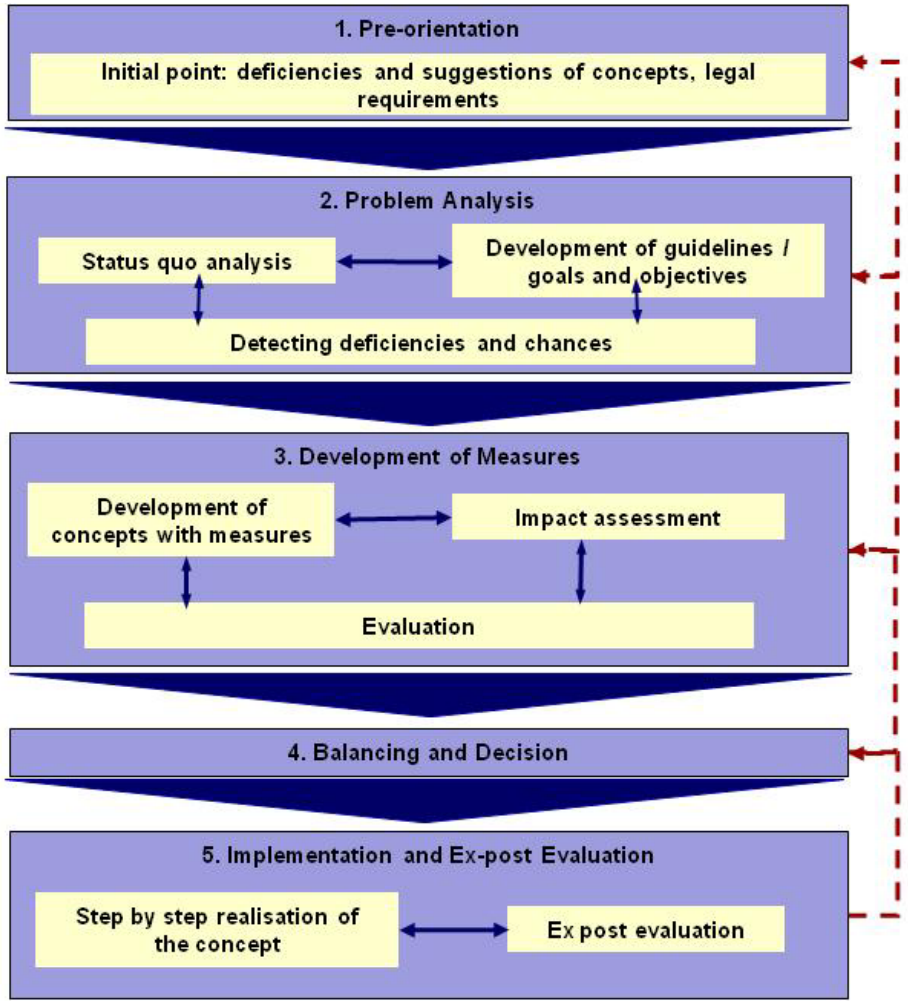
Integrated Mobility Planning

- „Anticipated systematic preparation and conduction of decision processes with the intention, to influence trips in a certain planning area according to goals and objectives through land-use measures, construction of facilities, police measures, operational management, price and information measures.“ (FGSV 1985)
- Generally as an interdisciplinary task orientated to the future.
- A continuous, iterative and transparent process.
- A process on different planning levels (federal, state, regional and local transport planning).
- An informal co-operative process, not regulated by laws.
- A process, mainly divided into 3 phases: problem analyses, development of measures, balancing and decision.

Integrated process of mobility planning

LEGEND:

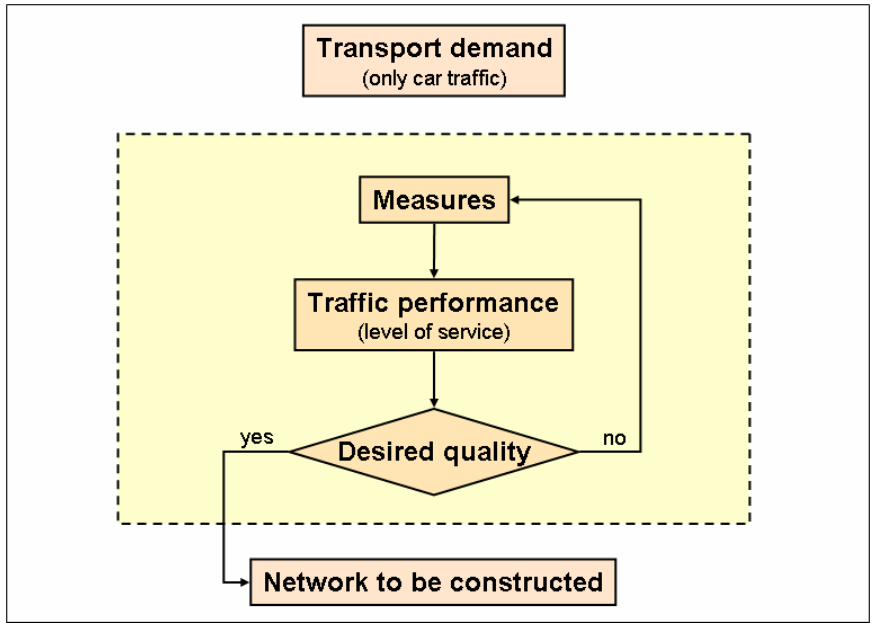
- decision or acceptance by policy maker
- exchange effects
- feed back loop



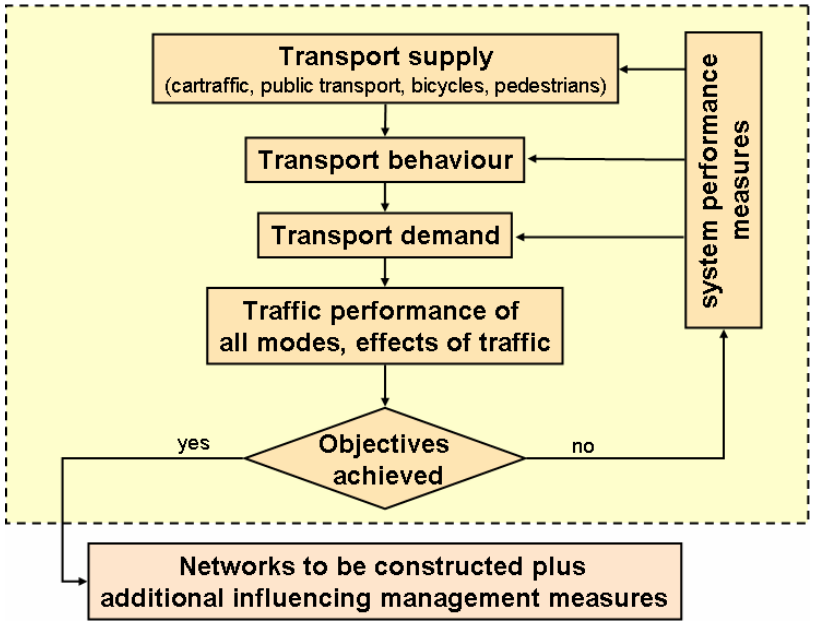
Source: FGSV: Leitfaden für Verkehrsplanung, Köln, 2001

Demand oriented planning versus influencing approaches

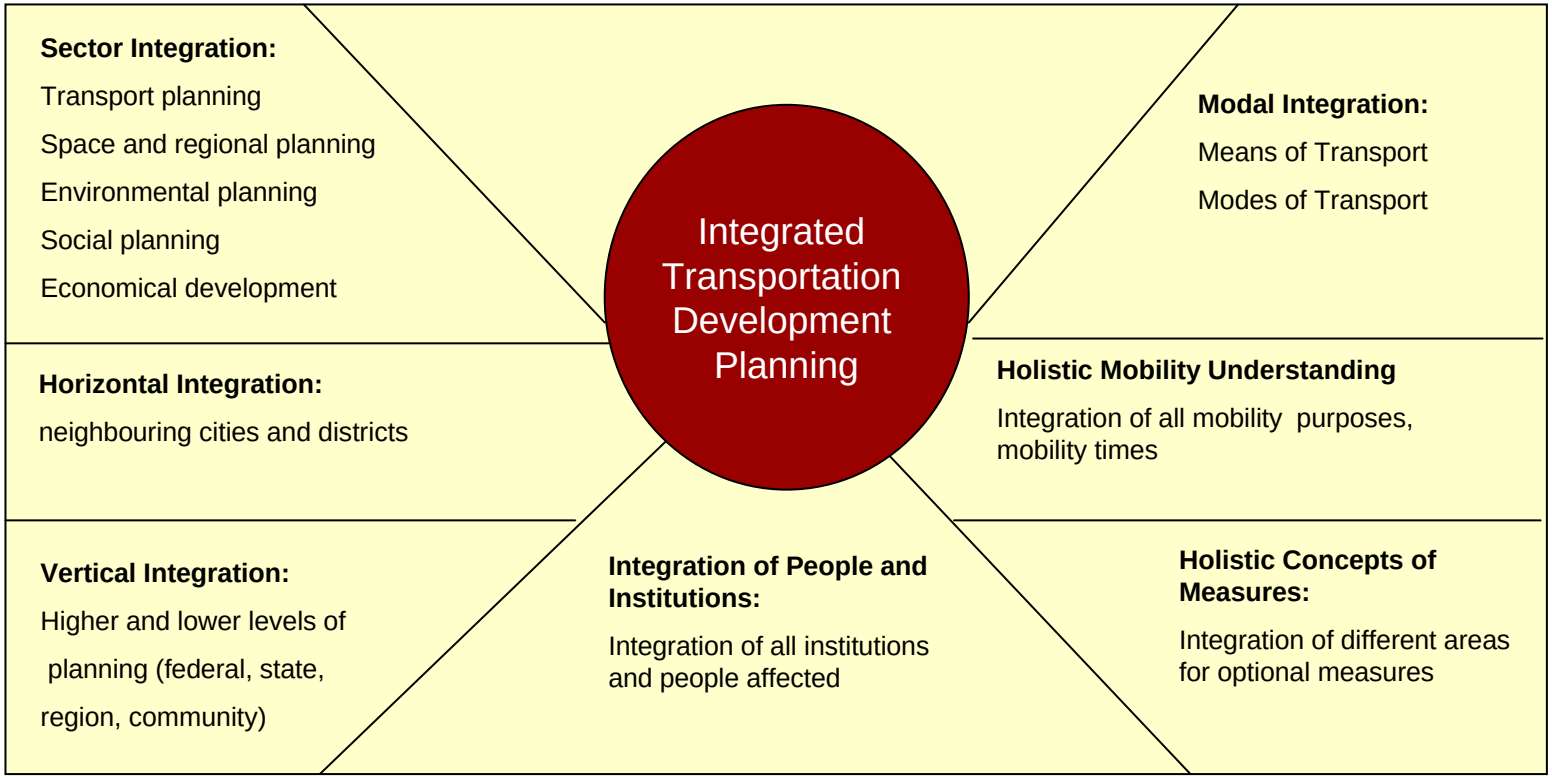
Demand oriented planning



Influencing planning



Aspects of integration in a holistic process of mobility planning



Source: BECKMANN K., KREITZ M.; Definition einer integrierten Gesamtverkehrsplanung, Stadt Region Land, issue 67, pp. 22, Rheinisch-Westfälische Technische Hochschule Aachen, Aachen 1999.

Range of integrated measures of mobility planning

0. **Land use planning**
   - Determination and control of land uses to reduce traffic demand
   - New developments in "integrated" zones or areas with public transport access

1. **Engineering**
   - Construction of routes and transport facilities for all modes, multi and inter-modal use
   - Vehicle improvements
   - Information technology, e. g. multi modal navigation systems

2. **Economy**
   - Taxation (vehicles, energy, ...)
   - User-financed systems
   - Road pricing
   - Fares
   - Land value capture
   - Parking management

3. **Enforcement**
   - Legislation, emission and other standards
   - Access restrictions, car free zones, emission-control zones
   - Speed limits
   - Safety control
   - Traffic guidance and control
   - Police enforcement, fixed quotas

4. **Education, Information**
   - Transport behaviour issues in school
   - Driver education
   - Public awareness, public relations
   - Mobility Management on all levels
   - Involvement of media
   - Public participation

5. **Organisational and logistic measures**
   - Improved efficiency (car-sharing, car-pooling, ...)
   - Differentiated supply also for inter and multi-modal use
   - Incentives, privileges for best practice approaches

CO_2-reduction concept of the Swedish Transport Administration

Reduced travelling with car
reduction of growth compared to business as usual
-40% = -20% compared to traffic today

	Potential to 2030
Urban planning for less car dependence	-10%
Improved public transport	-5%
Increased focus on cycling and walking	-5%
Car sharing	-5%
Teleworking and internet-shopping	-3%
Congestion charge, parking policy and fee	-5%
Lower speed limits	-3%
Fuel/CO_2 - tax	-13%
Total	**-40%**

Source: Johansson, H.: Transport and mobility in context of climate change mitigation. Presentation in the Swedish Transport Administration TRAFIKVERKET for the Scientific Advisory council of the German Federal Ministry of Transport , Building and Urban Development, Stockholm, 28.09.2010

Conclusion – barriers and challenges

Lack of integrated co-operation and intermodality

- Transport systems and transport operators concentrate on their particular needs and avoid more linkage and networking
- Holistic concepts often fail due to a lack of co-operation of the operators and sectoral thinking within the administration
- Investment budgets are often defined narrow for new transport infrastructure with counterproductive traffic inducing effects. They have to be defined broader to achieve goals in an integrated way.

Conclusion – chances in urban mobility

Individualised Public Mobility Coalition

Maximize

Public Transport

- trains and buses
- Public bicycles and pedelecs
- Public (electric) cars
- Taxis
- Alternative services
- Car sharing
- Car pooling

One accounting system

- Walking
- Cycling

Minimize

Individual private car use

Thank you for your attention!

Prof. Dr. Gerd-Axel Ahrens

TU Dresden
Verkehrs- und Infrastrukturplanung
01062 Dresden

Kontakt:
Tel.: 0351 / 4633 29 75
gerd-axel.ahrens@tu-dresden.de
www.tu-dresden.de/srv