Prof. Dr.-Ing. Gerd-Axel Ahrens

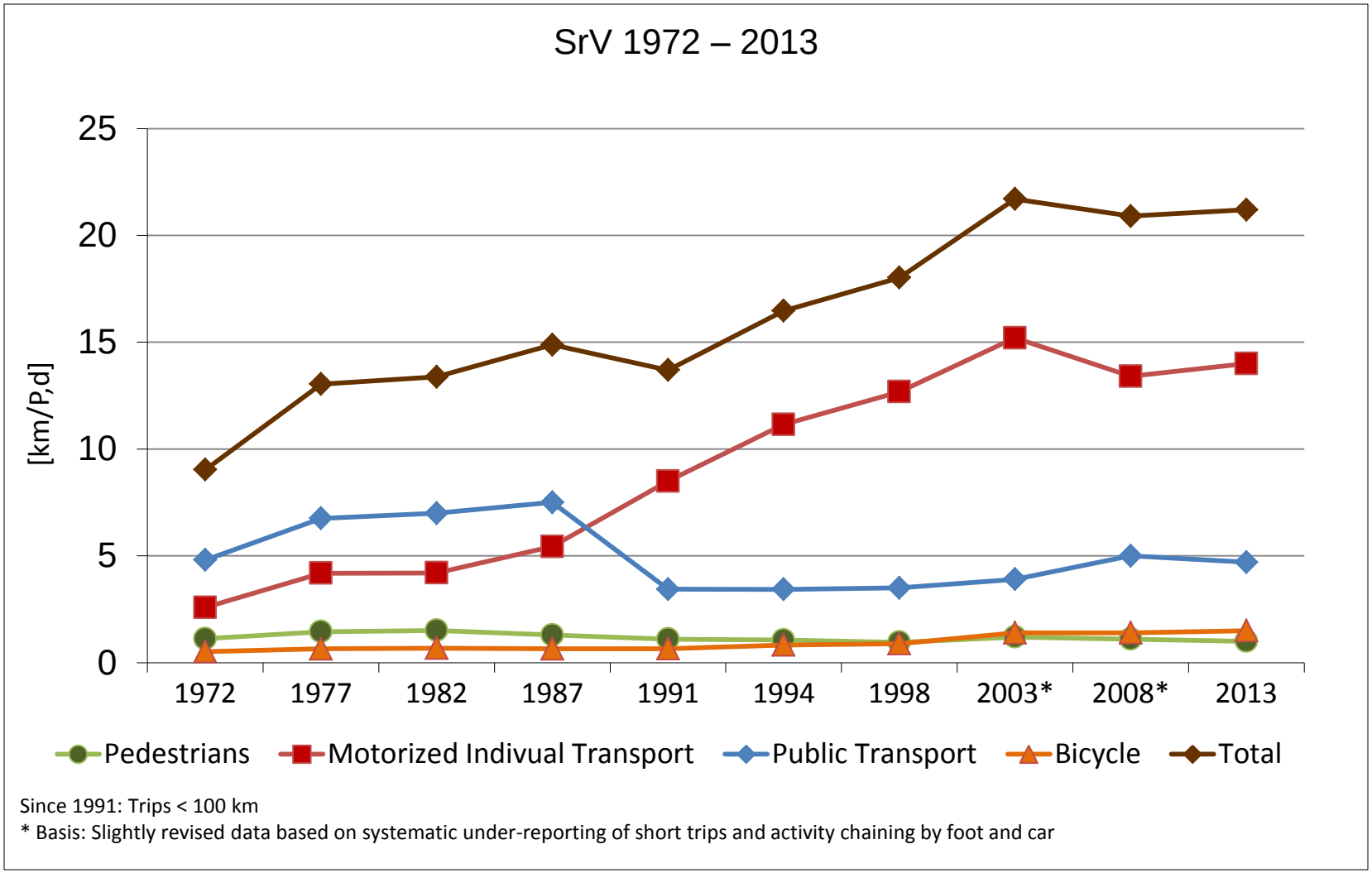
"Challenges and opportunities of urban mobility management in Europe"

4th Connective Cities Dialogue in Asia:
Practitioners' Workshop on
Sustainable Urban Mobility and Climate Change –
Reducing Air Pollution by Climate-Friendly Means of Urban Transport

September 27th to 29th, 2016 in Bangkok, Thailand

Content

Person-kilometers by mode

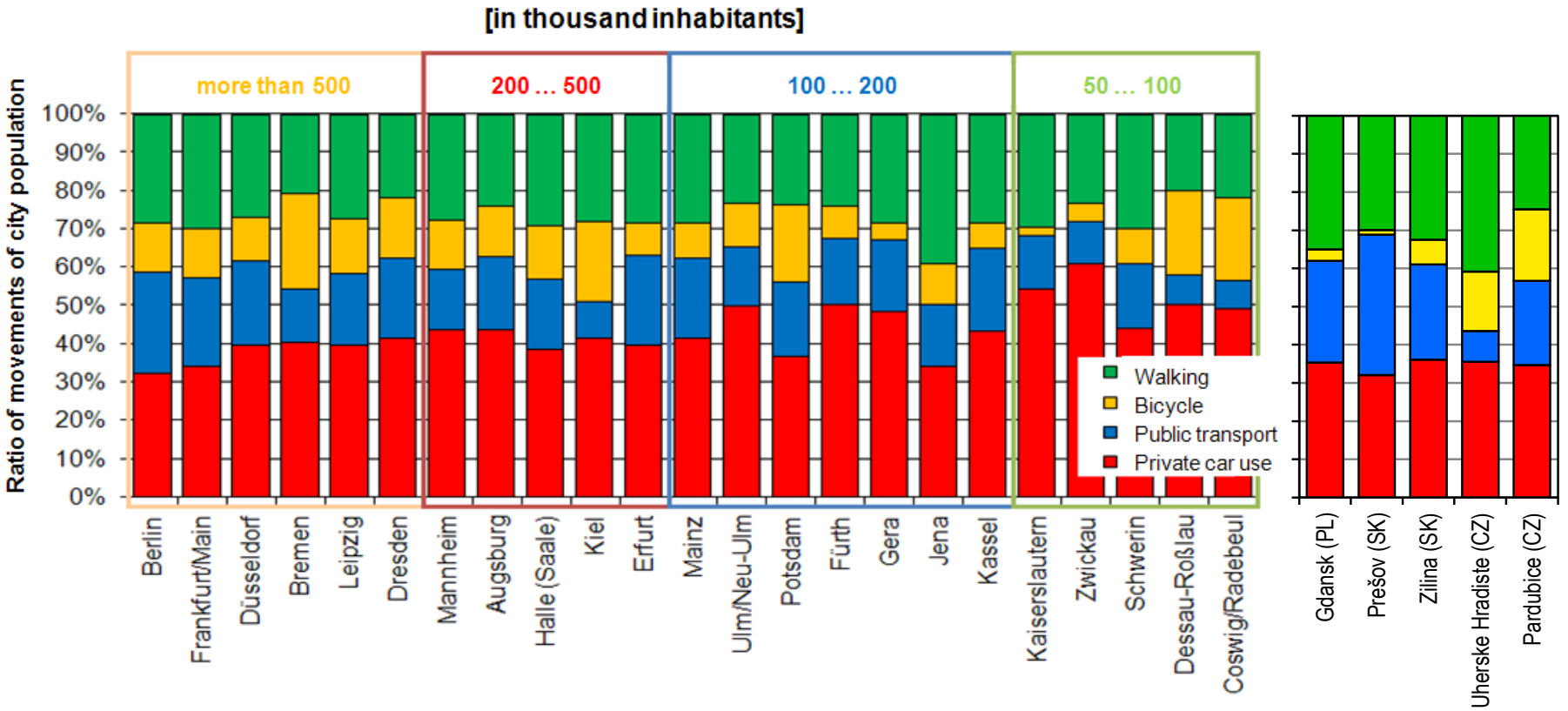


Since 1991: Trips < 100 km

* Basis: Slightly revised data based on systematic under-reporting of short trips and activity chaining by foot and car

Source: TU Dresden/vip: Survey 'Mobility in German towns – SrV 1972 - 2008' (www.tu-dresden.de/srv)

Modal Split in selected German and some Central European towns



Source: TU Dresden/vip: Survey 'Mobility in German towns – SrV 2008' (www.tu-dresden.de/srv) and survey implemented in the course of Central MeetBike

Complex tasks require planning

Accelerator

- Oil: Shrinking Reserve
- Climate Change
- Expensive Infrastructure
- Noise, Air Pollution, Accidents, Lack of Spaces

Goals

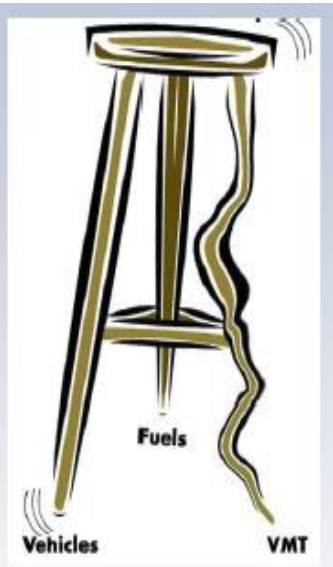
- Affordable mobility
- CO_2-free Transport
- Accessibility
- Quality of Life

Next Steps

- Energy turnaround
- Multi- and Inter-Modality
- Attractive Public Transport
- Pedestrians and Bicycles
- Escape the Growth Trap

Source: „Mobilität der Zukunft aus Verbrauchersicht“, Verbraucherzentrale Bundesverband e.V., page 2
http://www.vzbv.de/cps/rde/xbcr/vzbv/Mobilitaet-Broschuere-vzbv-2012.pdf

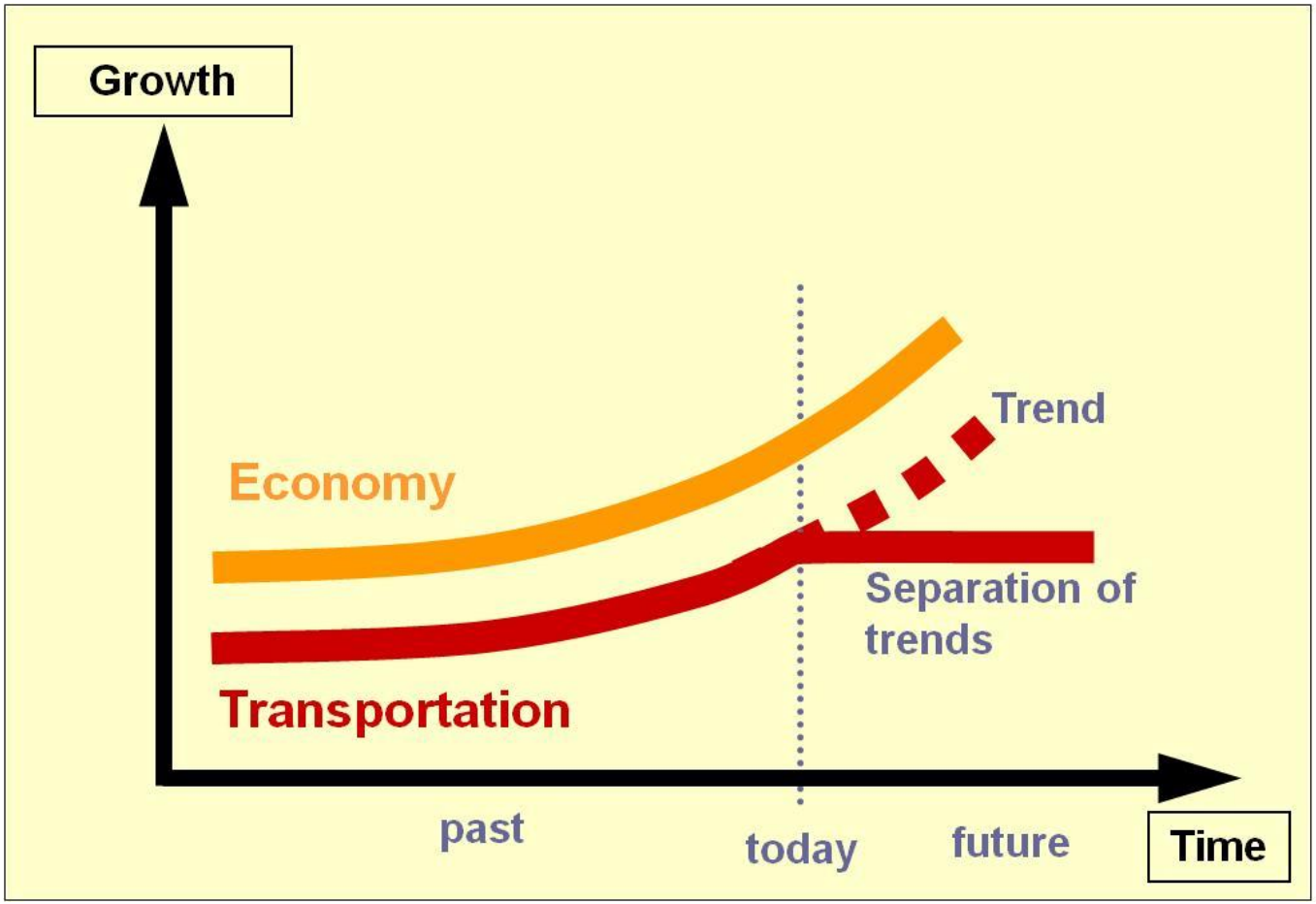
Transforming transportation



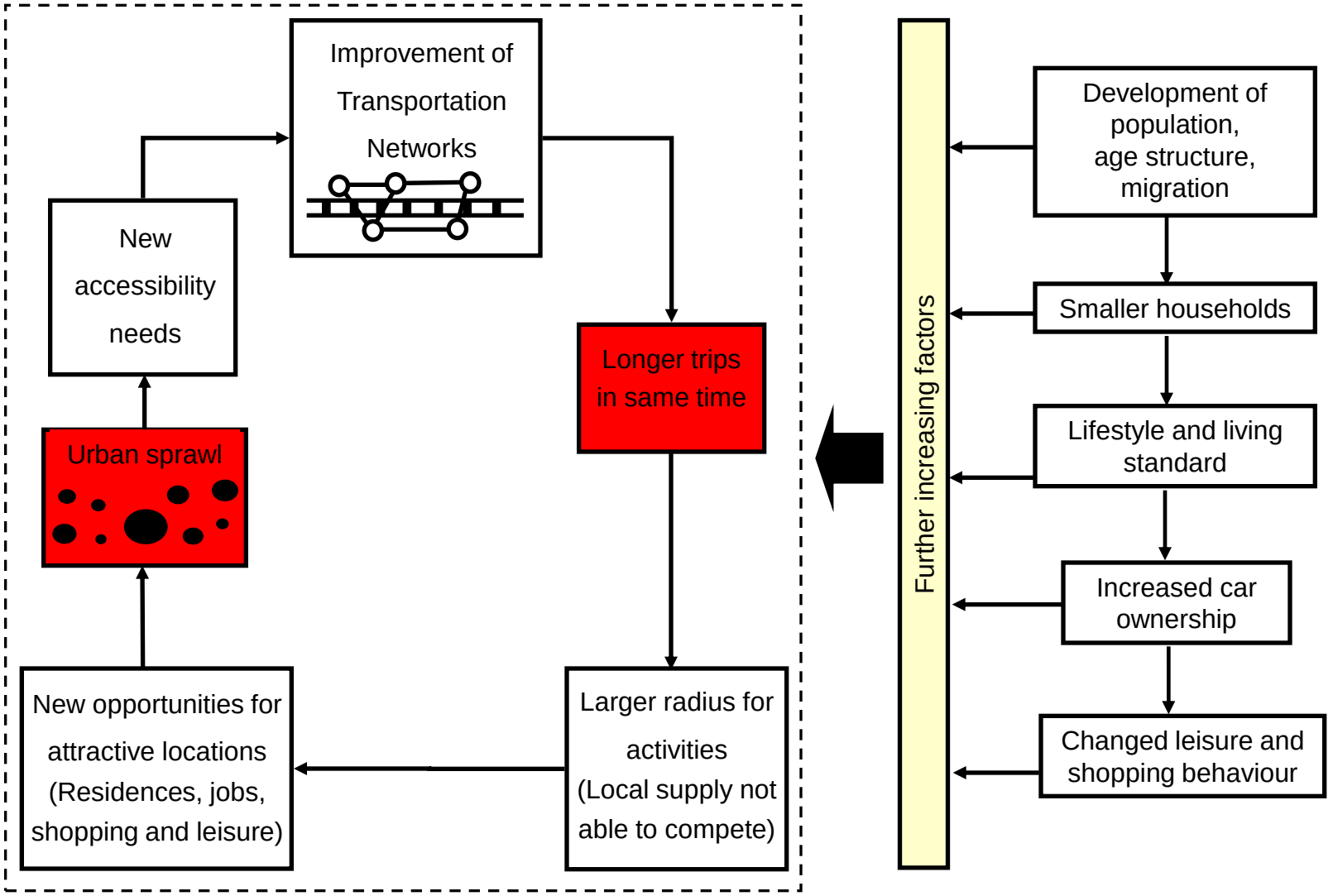
- Transforming vehicles *("easiest")*
- Transforming fuels *(hard)*
- Transforming mobility *(hardest)*

Source: Sperling, D.: Steps into Post-Fossil Mobility – A Vision and Policy Plan for Sustainable Transportation. "Our Common Future", Conference Session 5, Keynote Lectures "Future Technologies II: Mobility", Hannover and Essen, 2-6 November 2010

Main challenge – decouple traffic growth from economical growth



How to break the cycle?



More mobility with less 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.

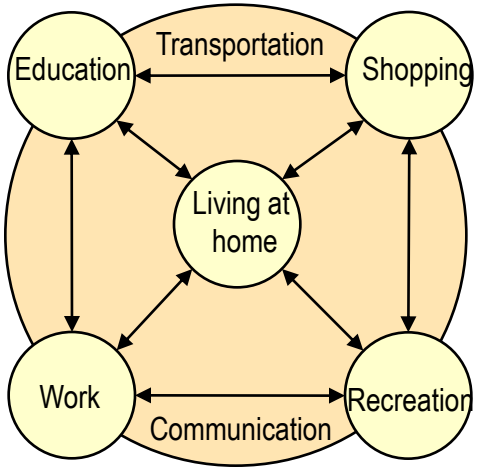
Activities of people are

- Living at home
- Working
- Shopping
- Education
- Recreation

Activities of goods are

- Gain of raw materials
- Production
- Processing
- Storage
- Consumption

Basic service functions



Did our daily mobility really increase?

Mobility of people:

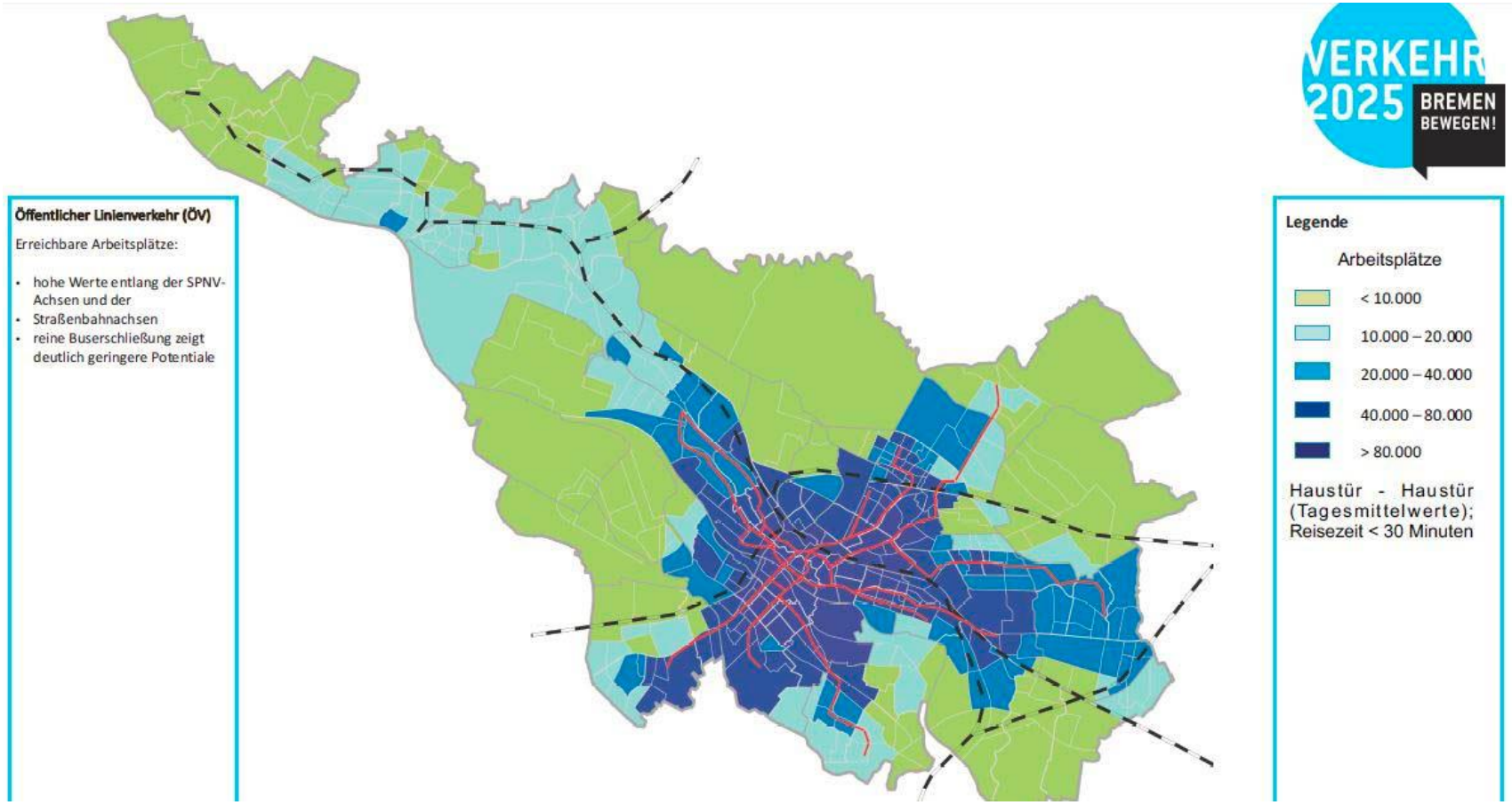
Ability of activities away from home though motorised or non motorised trips. [1)]

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.

Accessibility or identification of not integrated zones



Source: Freie Hansestadt Bremen – Der Senator für Umwelt, Bau und Verkehr (Planersozietät und IVV)

Basic understanding of sustainable transport

1. Hierarchy of modes in cities

Walking

Bicycling

Public Transport

Car Sharing, car pooling

Individual use of private cars

2. Hierarchy of strategies

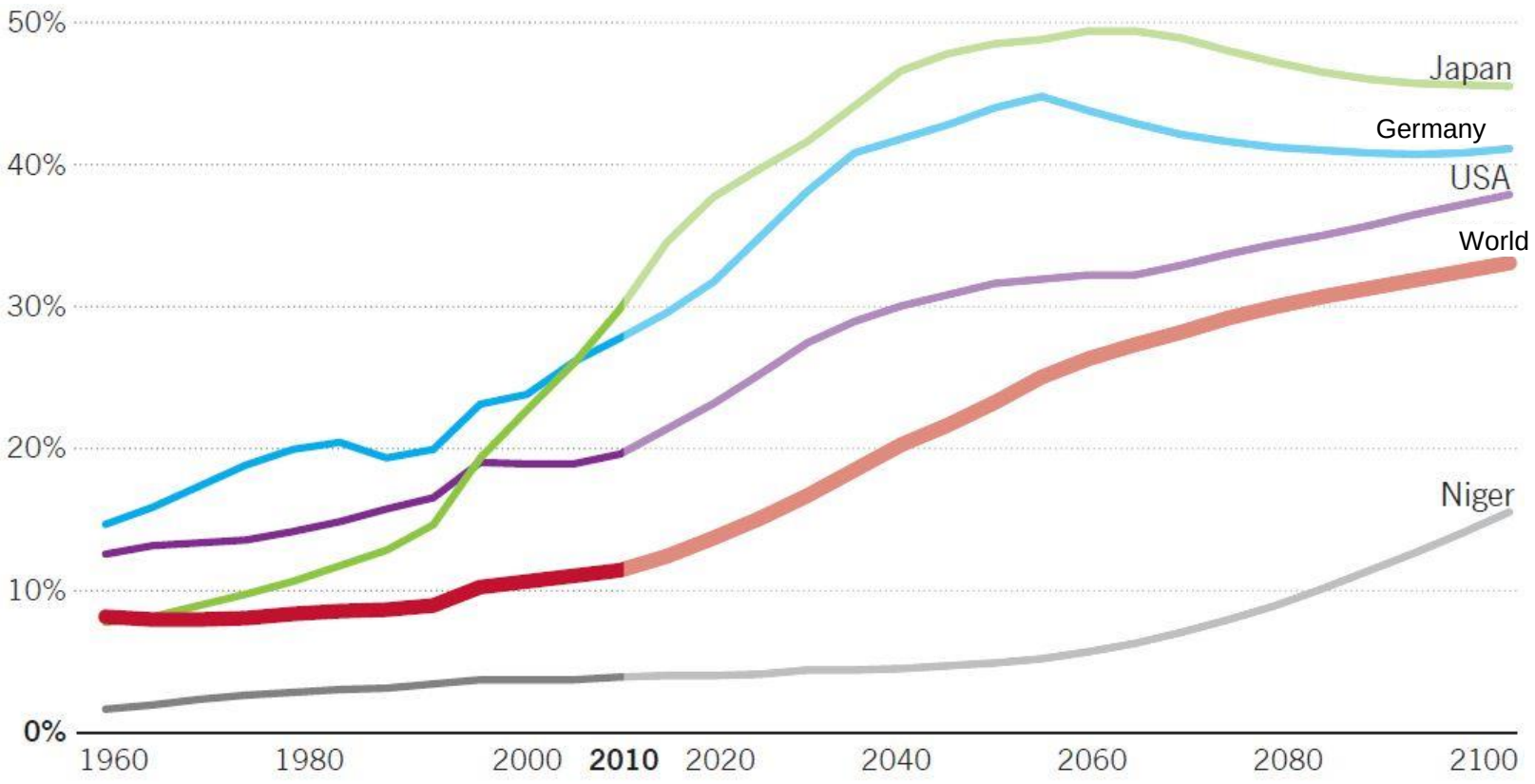
Avoid transport

Shift transport to sustainable modes

Operate necessary car traffic safely and compatible

Ageing of the world

Percentage of population older than 60 years in percent

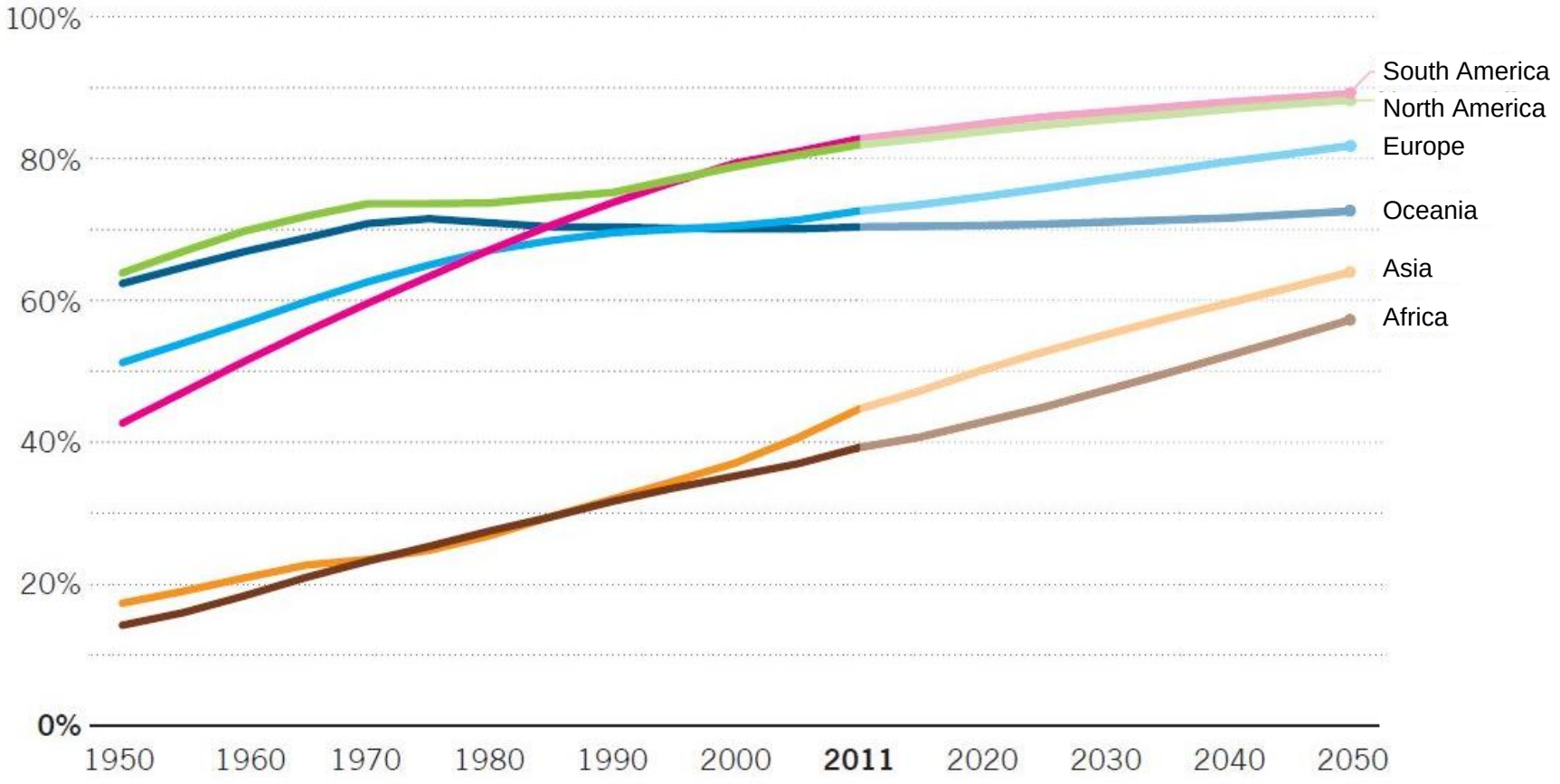


Quelle: UN World Population Prospects, the 2010 Revision

Cited by Huber, F. (2012): Die Zukunft der mobilen Stadt.
Presentation on a forum "Leipzig: Meine Mobilität" of Leipziger Verkehrsbetriebe on 26.11.2012

Future takes place mostly in cities

Percentage of urban population in continents

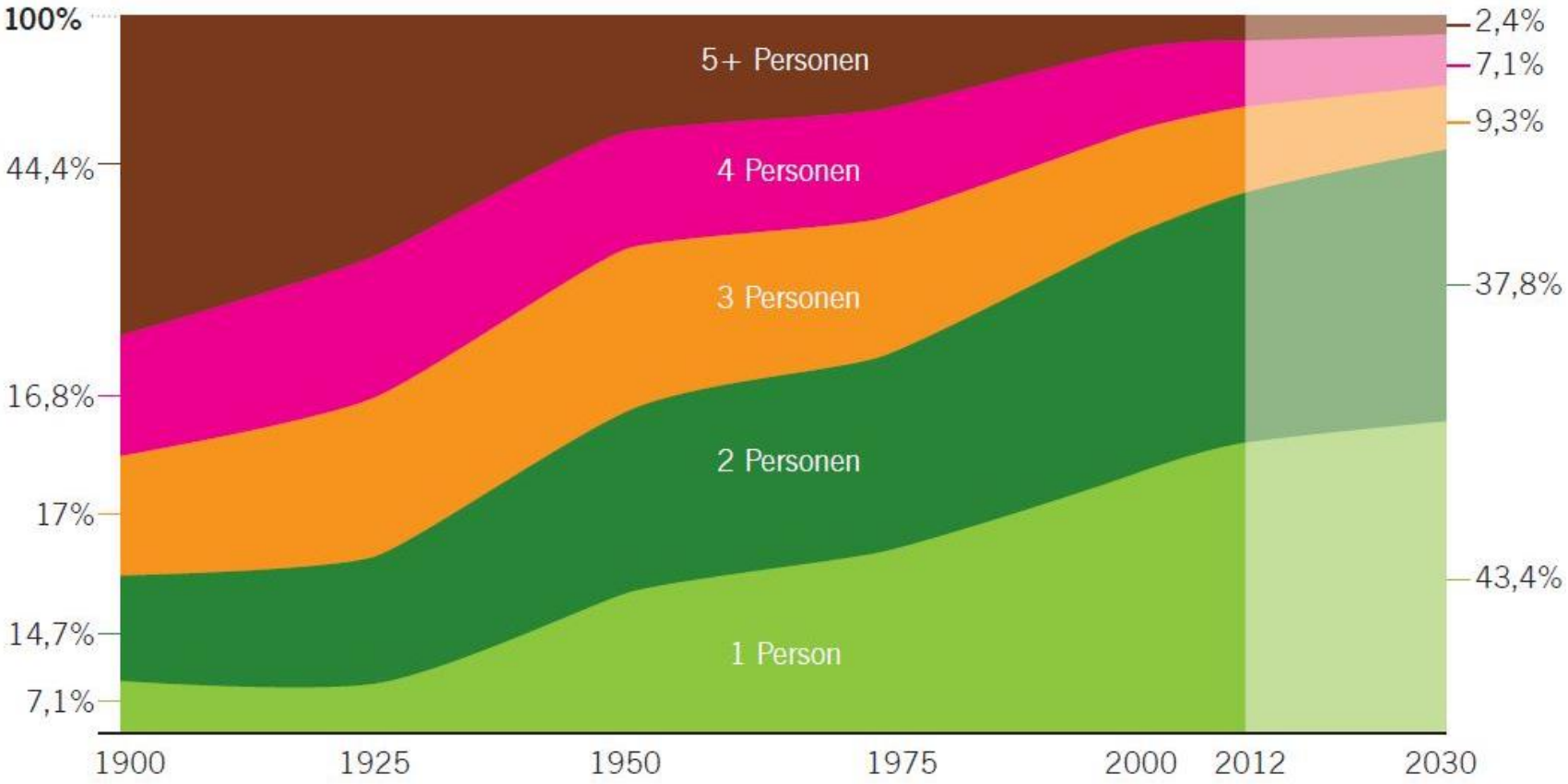


Quelle: UNO, World Population Prospects 2011

Cited by Huber, F. (2012): Die Zukunft der mobilen Stadt.
Presentation on a forum "Leipzig: Meine Mobilität" of Leipziger Verkehrsbetriebe on 26.11.2012

Urban life in small units

Householdsize in Germany (Percentage of households)



Quelle: Statistisches Bundesamt 2002 und 2012, DIW 1980

Cited byHuber, F. (2012): Die Zukunft der mobilen Stadt.
Presentation on a forum "Leipzig: Meine Mobilität" of Leipziger Verkehrsbetriebe on 26.11.2012

Planning?

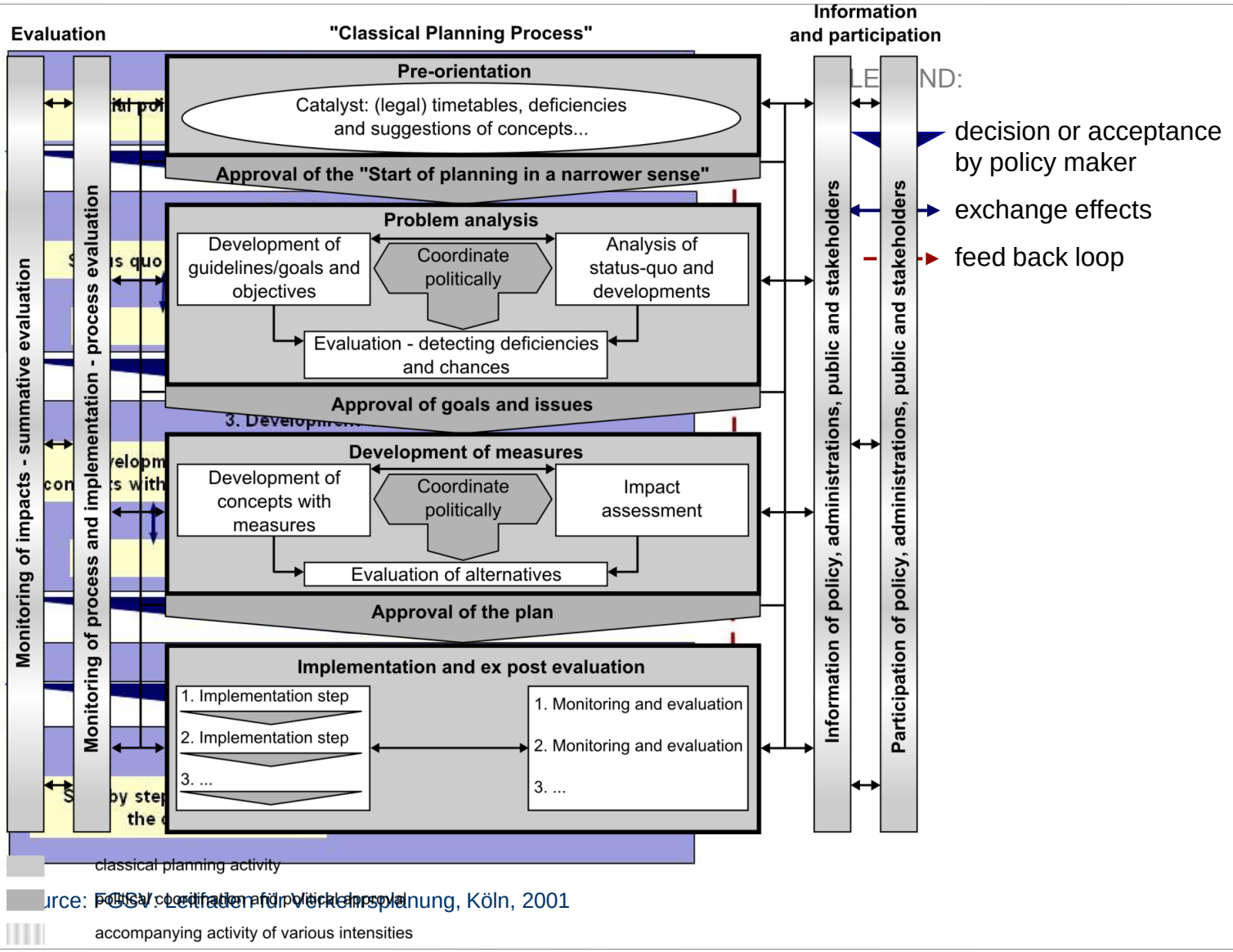
- **Muddling through?!**
- **Fulfilment of demand?!**

or

- **Influencing developments according to goals and objectives**

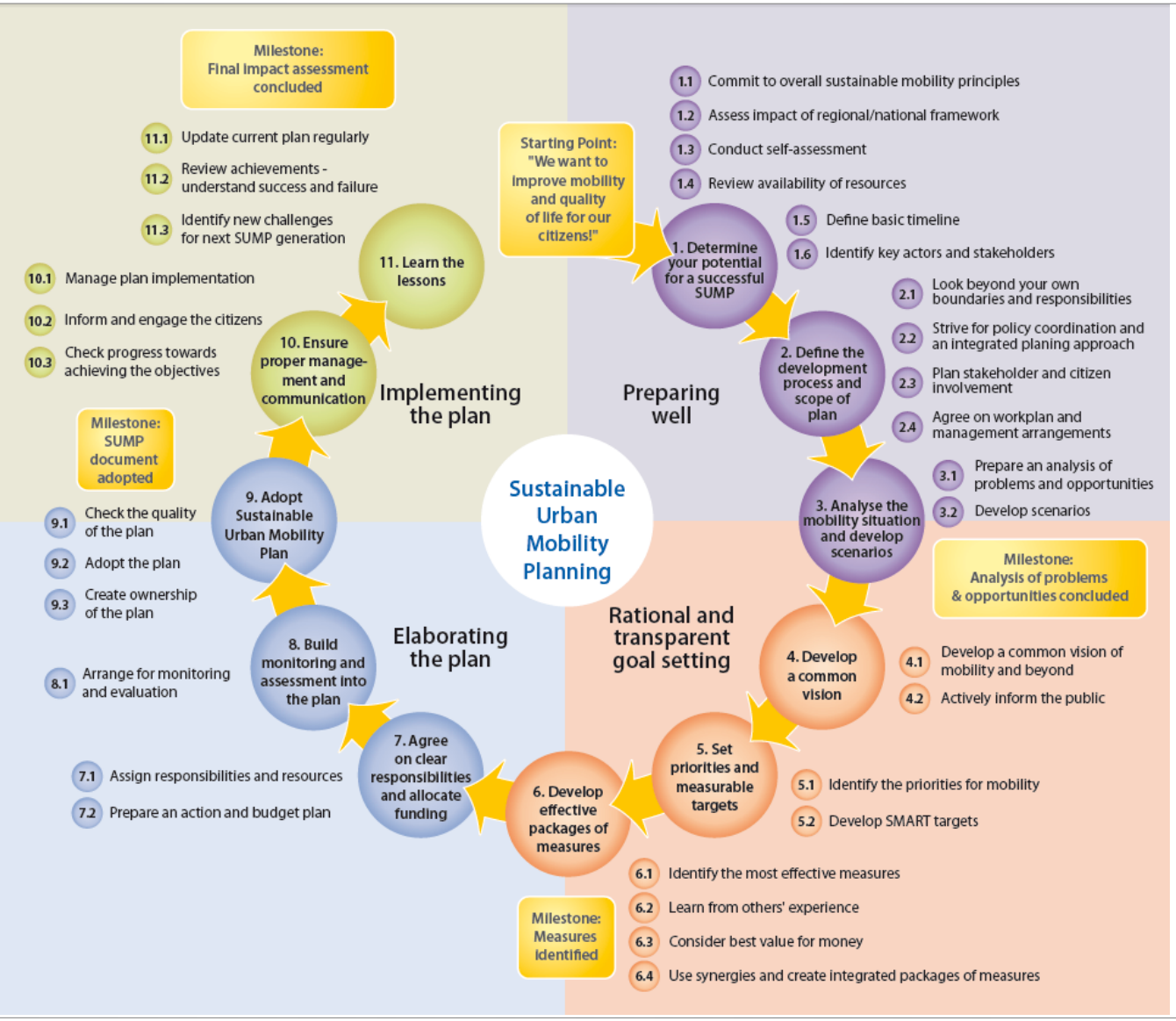
- **On the basis of analysis**
- **Using methods**
- **Using time**
- **Following intentions**
- **Achieving goals**
- **A learning process, gaining experiences and insights**
- **Solving conflicts**
- **Searching for consensus, finding compromises**
- **Weighing pros and cons**
- **Using scientific methods**
- **Preparing and making value oriented political decisions**

Goal oriented integrated planning process



Source: FGSV: Leitfaden für Verkehrsplanung, Köln, 2001

SUMP – Process with the same messages



Characteristics of SUMP and integrated transport planning:

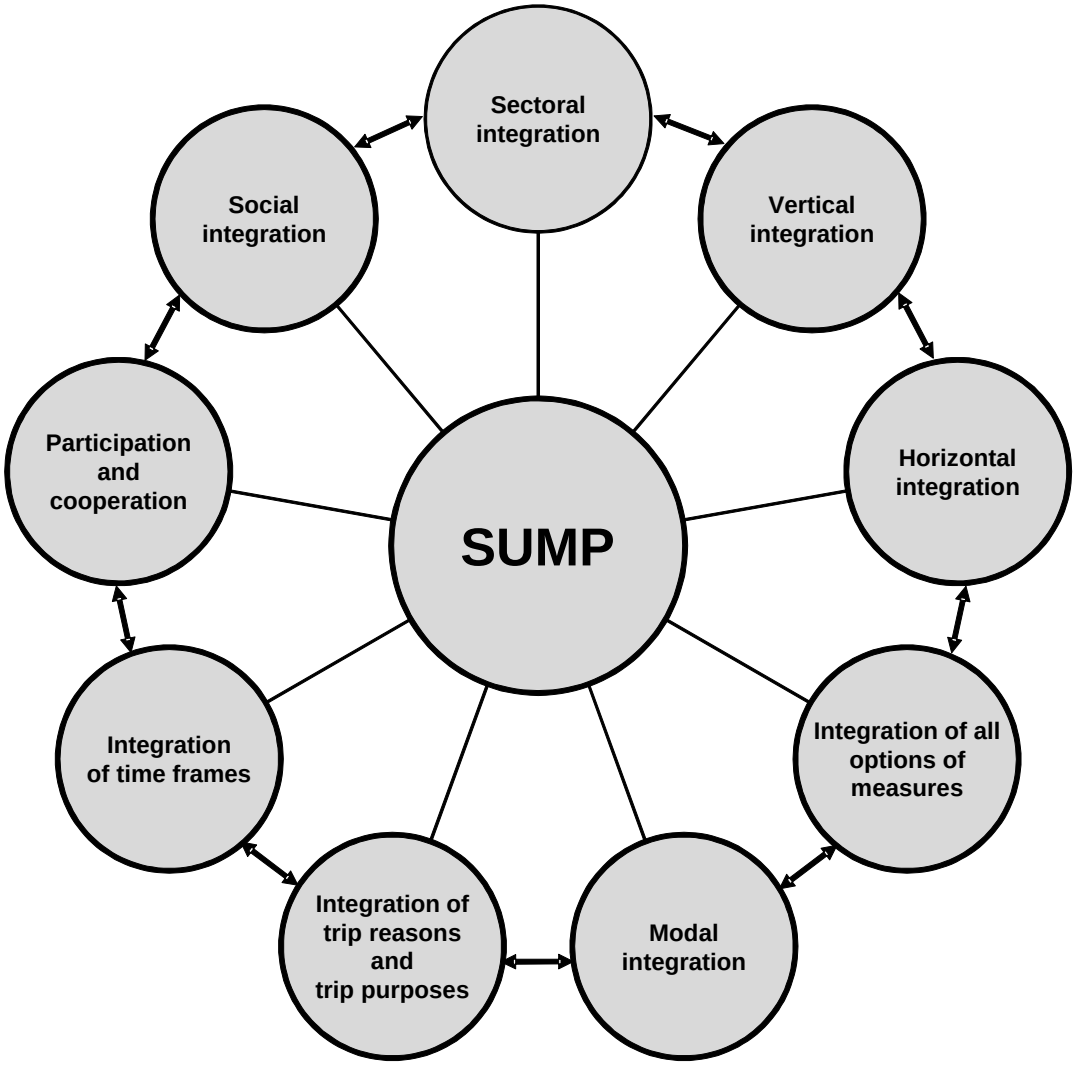
- Continuous process
- Cooperation and participation
- Clear goals and strategies
- Goal oriented control of demand
- Use of scenario techniques
- Integrated hard and soft measures
- Quality management: Evaluation and control of success

Source: Rupprecht Consult on www.mobilityplans.eu, Recommendations

European Union recommends Sustainable Urban Mobility Plans (SUMP)

Source:
http://www.eltis.org/mobility-plans/theSUMPprocess

Consideration of aspects of integration as a quality indicator



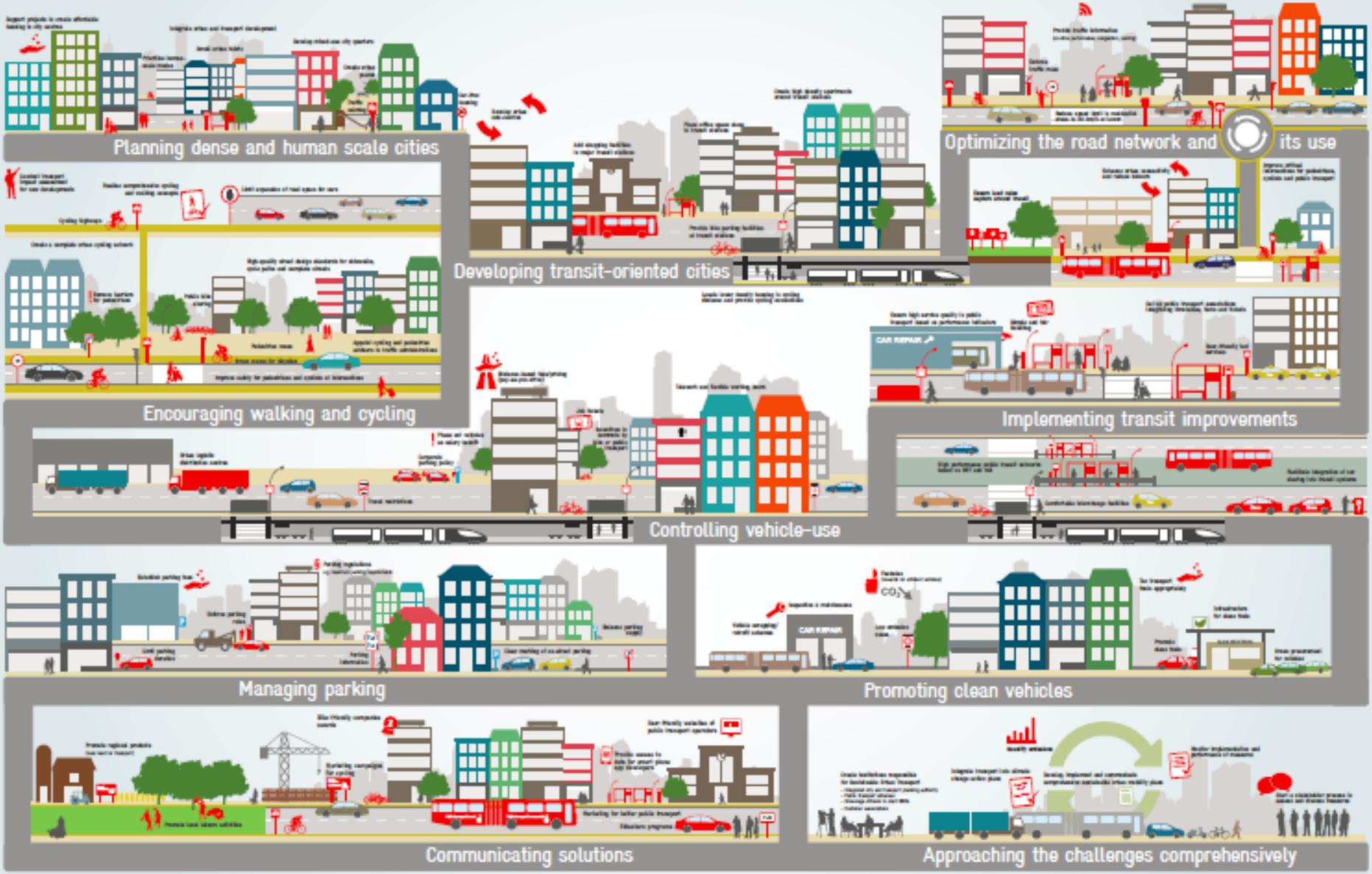
Range of integrated measures of mobility planning

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

10 PRINCIPLES FOR SUSTAINABLE URBAN TRANSPORT



BMZ

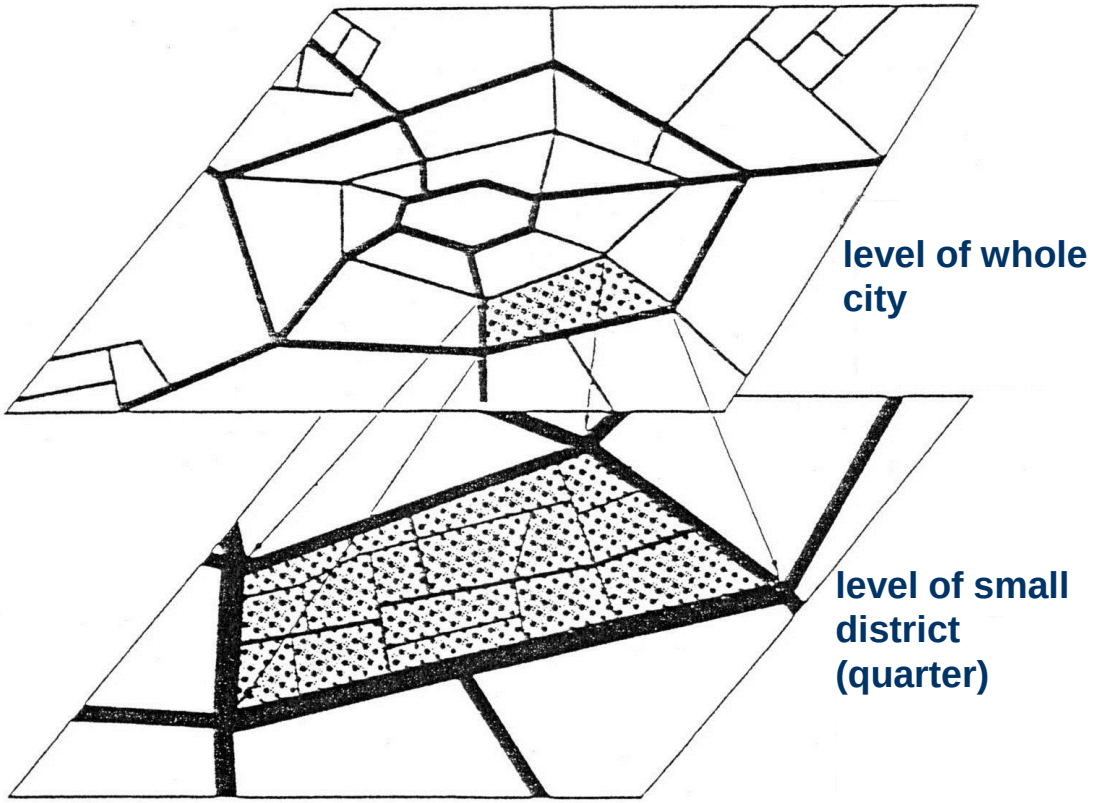
Implemented by giz

Hierarchy of network planning

Minimize arterials with sufficient capacities (channel principle)

in order

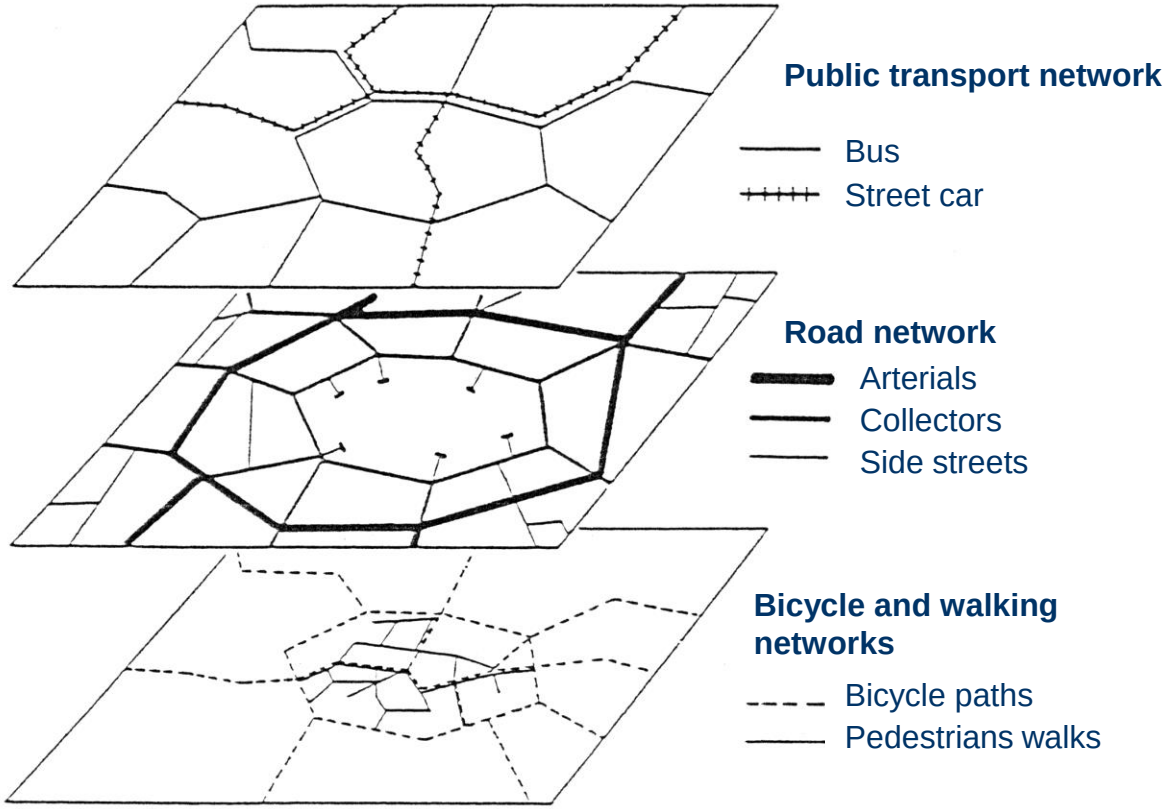
to maximize traffic calmed zones



Congruent transport networks

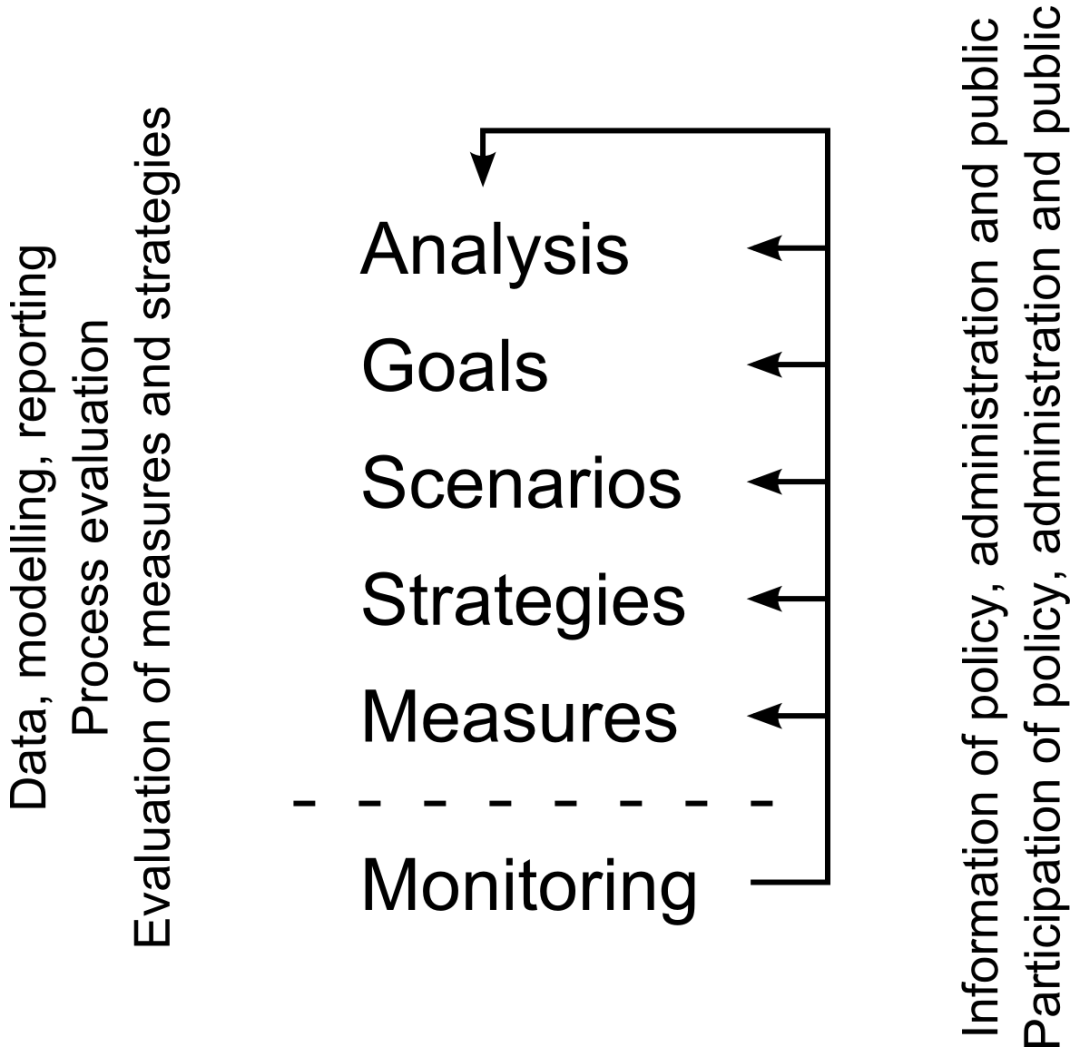
- „It is useful, to develop at first the individual networks by mode, but then they should fit together and enable intermodal trip making.“ [1)]

Superposition of network designs of different transport modes: [2)]



[1)] Source: Beckmann, K.J.: Grundlagen der Verkehrsplanung, RWTH Aachen, Vorlesungsmanuskript WS 03/04, Kap. 4
[2)] Source: Strack, Kötter: Straßen- und Wegenetze in: Steierwald,Künne (Hrsg.): Stadtverkehrsplanung, Berlin, 1994, S. 359

Conclusion: tackle the challenges with continuing SUMP



Thank you for your attention!

Prof. Dr.-Ing. Gerd-Axel Ahrens

+49 351 4633 29 75 or +49 173 60 72 472 (mobile)

gerd-axel.ahrens@tu-dresden.de

www.tu-dresden.de/vkw/ivst

Sources on sustainable mobility planning

www.german-sustainable-mobility.de

The German Partnership for Sustainable Mobility (GPSM) is serving as a guide for sustainable mobility from Germany

www.sutp.org

The Sustainable Urban Transport Project (SUTP) supports developing cities through the dissemination of best practice, policy advice and capacity building on sustainable urban transport.

www.slocat.net

The Partnership on Sustainable Low Carbon Transport (SLoCaT) promotes the integration of sustainable transport in global policies on sustainable development and climate change.

www.eltis.org

Eltis facilitates the exchange of information, knowledge and experiences in the field of sustainable urban mobility in Europe.