

Let's make integrated land-use and transport modelling useful

Prof. Dr.-Ing. Gebhard Wulfhorst

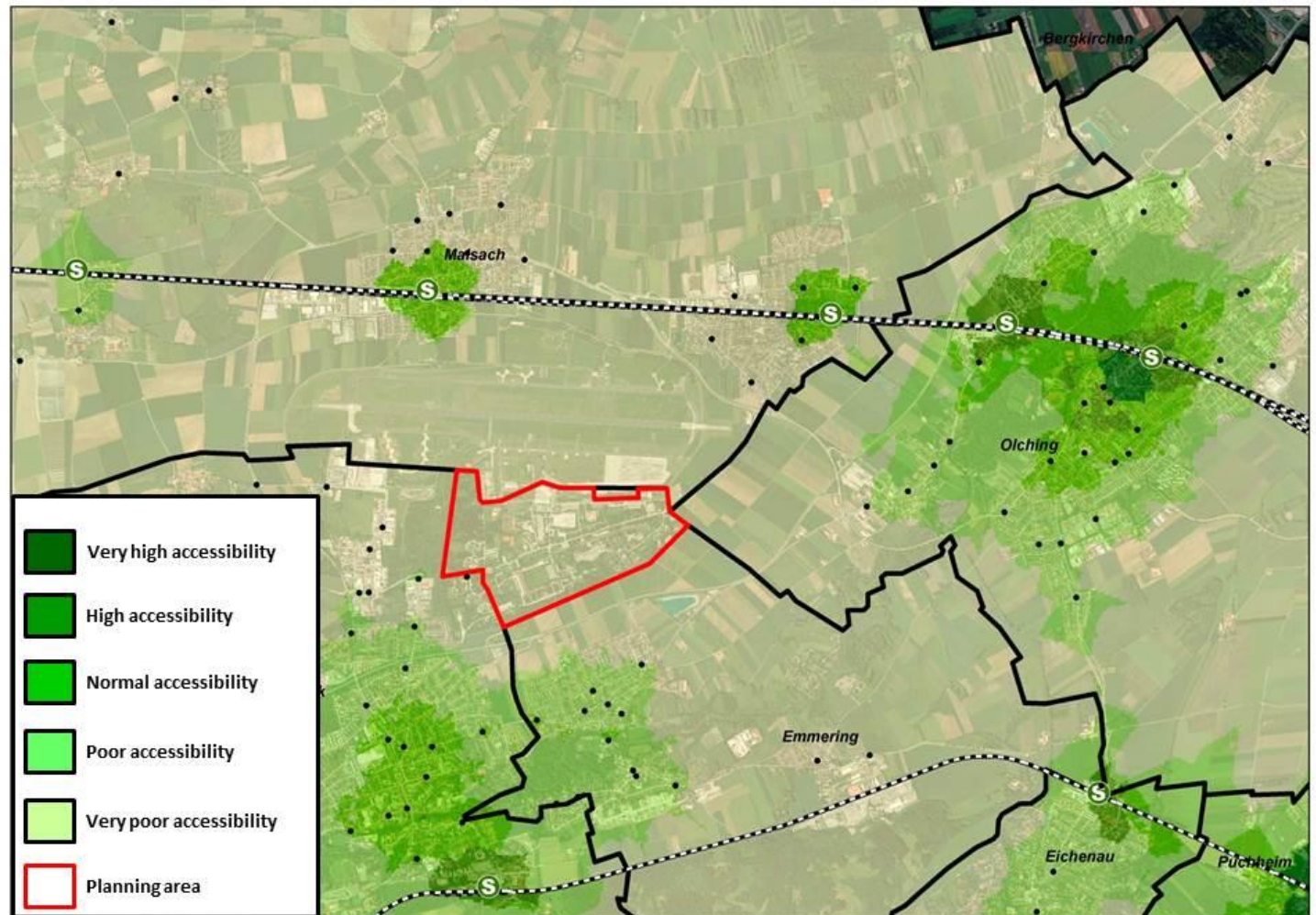
Chair of Urban Structure and Transport Planning

Technical University of Munich (TUM)

Symposium for the Integration of Land-Use and Transport Models

Raitenhaslach, 2nd Nov. 2016

„Sorry, but when I see these maps ...“



Urban growth at transport nodes



Source: <http://www.gadaa8.de>

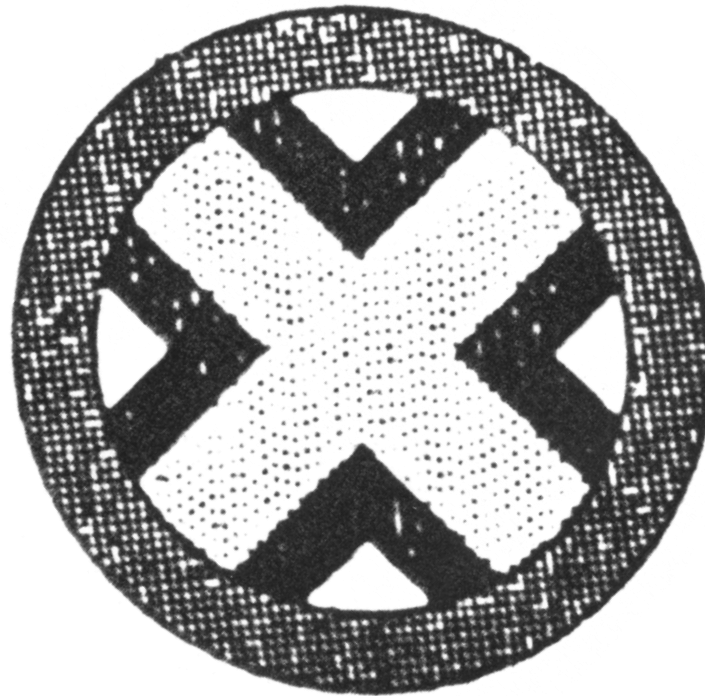
Transport decisions neglecting land-use impacts



2nd S-Bahn tunnel decided, 25th October 2016
 (> 3.4 billion Euro, B/C-ratio 1,0xxx ?, no change in urban structure!)

Sources: www.2.stammstrecke-muenchen.de
www.sueddeutsche.de/muenchen/nahverkehr-zweite-stammstrecke-fuer-muenchner-s-bahn-kommt-1.3220013

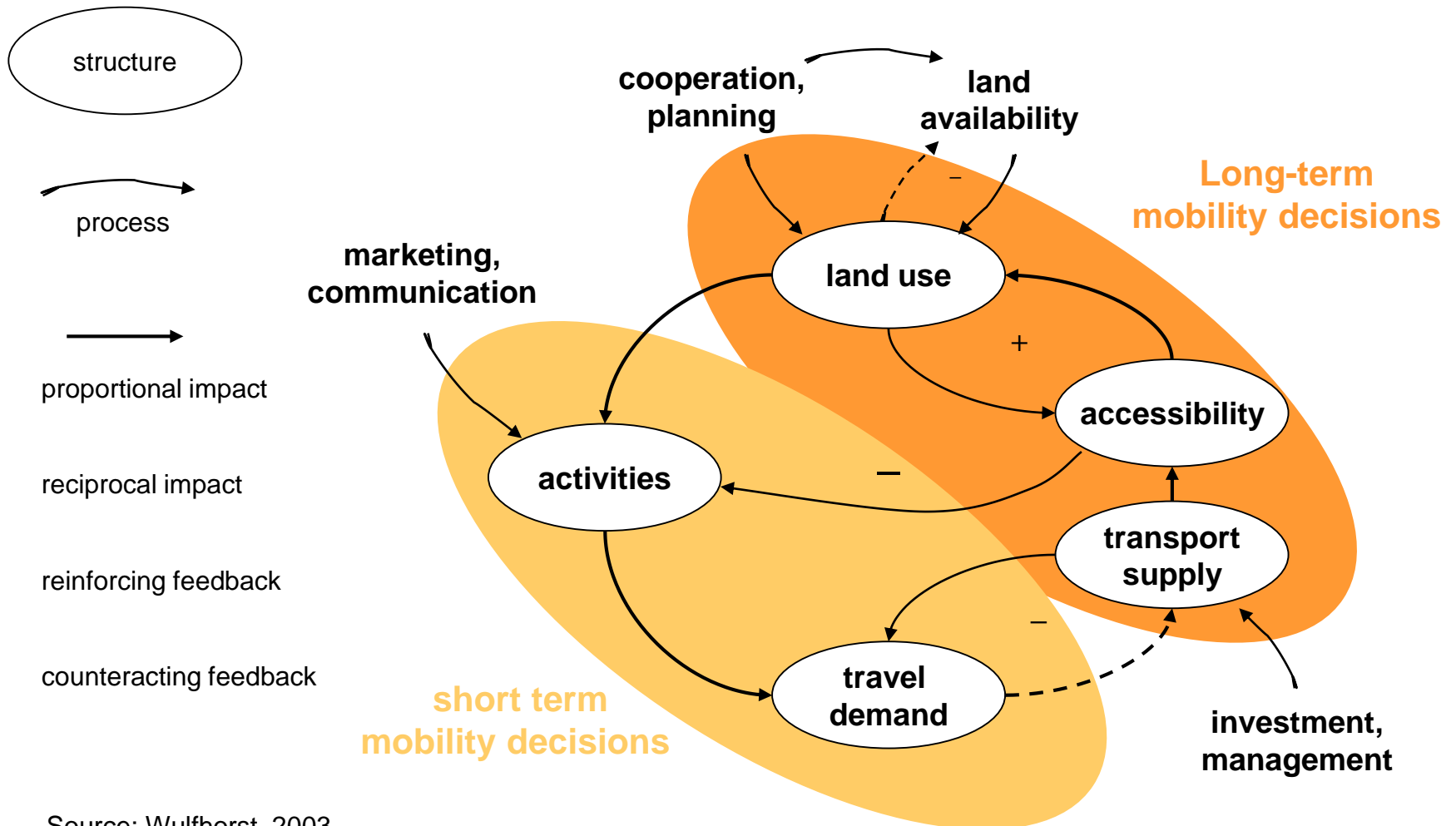
Integrated land-use and transport modelling



The egyptian hieroglyph for „city, town“

Source: adapted from Benevolo, 1983

Land Use and Transport Interactions



Source: Wulfhorst, 2003

Sustainable Accessibility: Vision - Strategy - Action

Spatial Structure

Transit-Oriented Development
Functional/Social Mix,
Urban Density,
Quality of public spaces,
Polycentric regions

Accessibility Planning

Transportation Supply

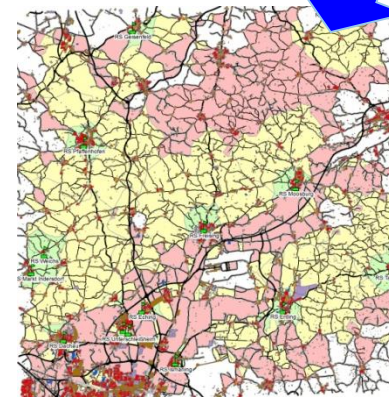
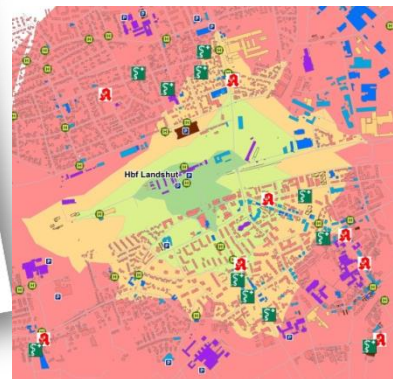
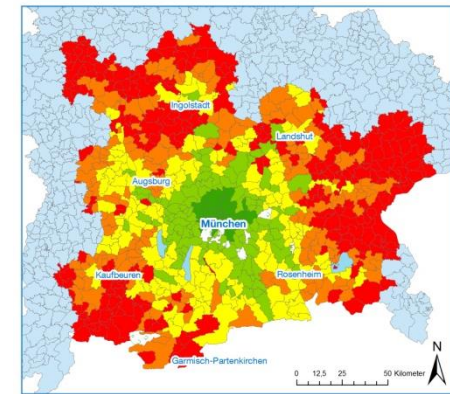
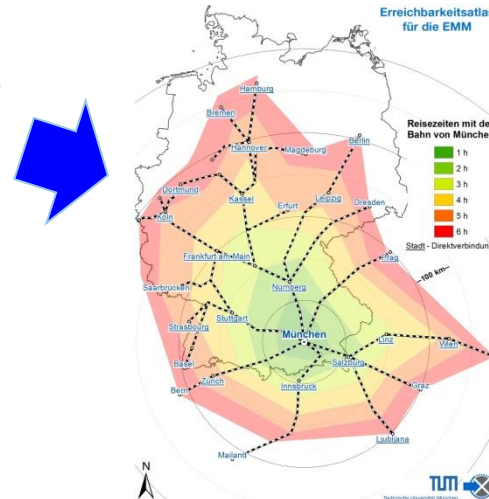
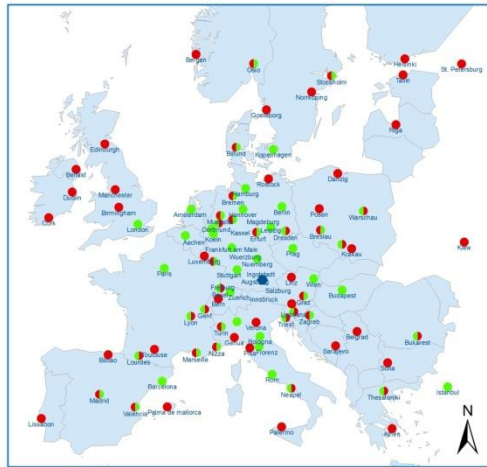
Interconnection
of existing networks,
Investment in sustainable
modes of transport,
Infrastructure and services

Transportation Demand Management

Marketing, Information
Consulting, Services,
Internalisation of
external costs

**Sustainable
Development in
Land Use and
Transport**

The tool: TUM Accessibility Atlas



Districts/Neighbourhoods

Counties/Municipalities

Metropolitan Region

National

The language: Accessibility and its definition(s)...

“the extent to which land-use and transport systems enable (groups of) individuals to reach activities or destinations by means of a (combination of) transport mode(s) (at various times of the day)”.

Geurs, K.T., van Wee, B., 2004

$$A_i = \sum_j D_j f(c_{ij})$$

A_i = Accessibility to destinations D from point/zone i
 D_j = Activity destinations (opportunities) at points/zone j
 c_{ij} = Generalised costs (time, price, comfort) of the trip
 cf. Hansen, 1959

A specific function of

- Urban structure (spatial attractiveness, urban functions, urban density, economic interest, opening hours, ...) and
- Transportation supply (access, network topology, speed, costs, capacity, congestion, frequencies, reliability, ...)

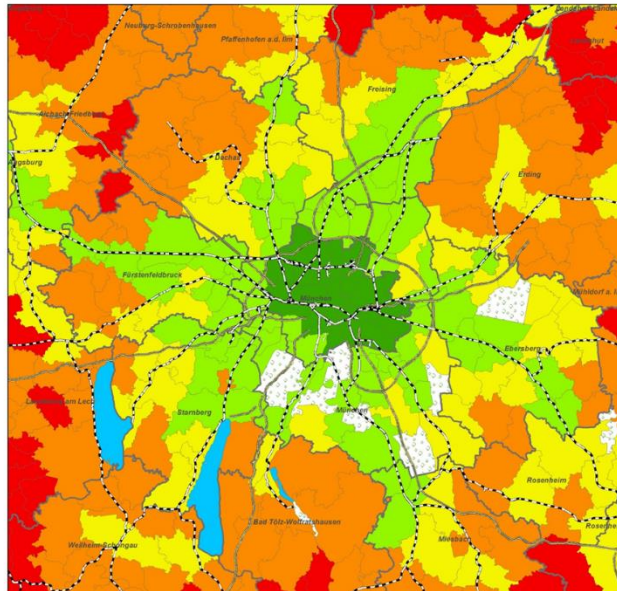
The (pilot) Workshop: people & communication

„Accessibility instruments for planning practice“

COST Action / www.accessibilityplanning.eu

Pilot Workshop in Munich

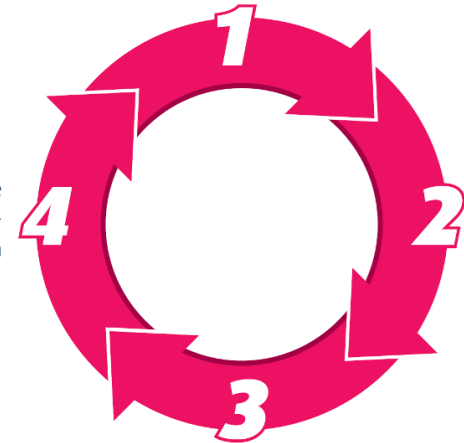
„Where should more than 200.000 new residents live within the Munich Region?“



Cost Action

Formulate planning goals and define criteria or outcome

Scan & evaluate effects on pre-defined criteria



Analysis of current situation

Develop intervention strategies



Useful tools: some success/assessment criteria

Improvement of **mutual understanding** of different partners, diverse background, interests

Creation of a **common platform** to connect to / **tools need to be:**

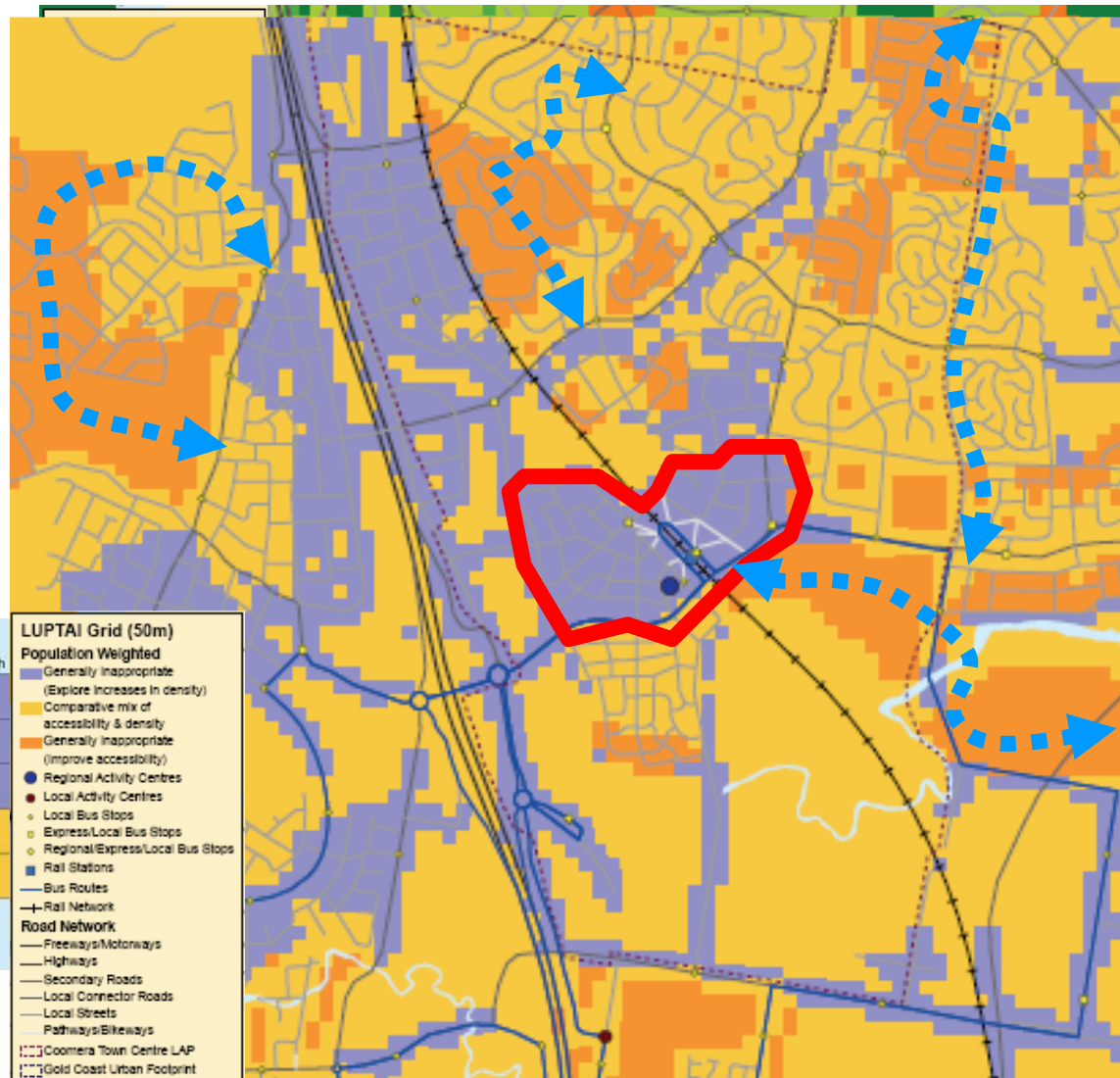
- **easy to understand** – as simple as possible – and/or well explained by a facilitator;
- **comprehensive enough** – sensitive about the planning options to be studied;
- **visually appealing** – to facilitate inspiration and convincing communication;
- **interactive** – so that partners can play with and test alternative scenarios; and
- **implemented in a dedicated setting** – within a creative working atmosphere.

Development of a **common language** by inspiration, based on working with the tool, discovering the linkages, the inter-connections, and the decision points;

Shared perspectives on challenges, scenarios, options, and individual choices;

A **better outcome** of the planning task by cooperation of all partners.

The translator? appropriate indicators!



LUPTAI
Land-use and
public transport
accessibility index
© Queensland Transport

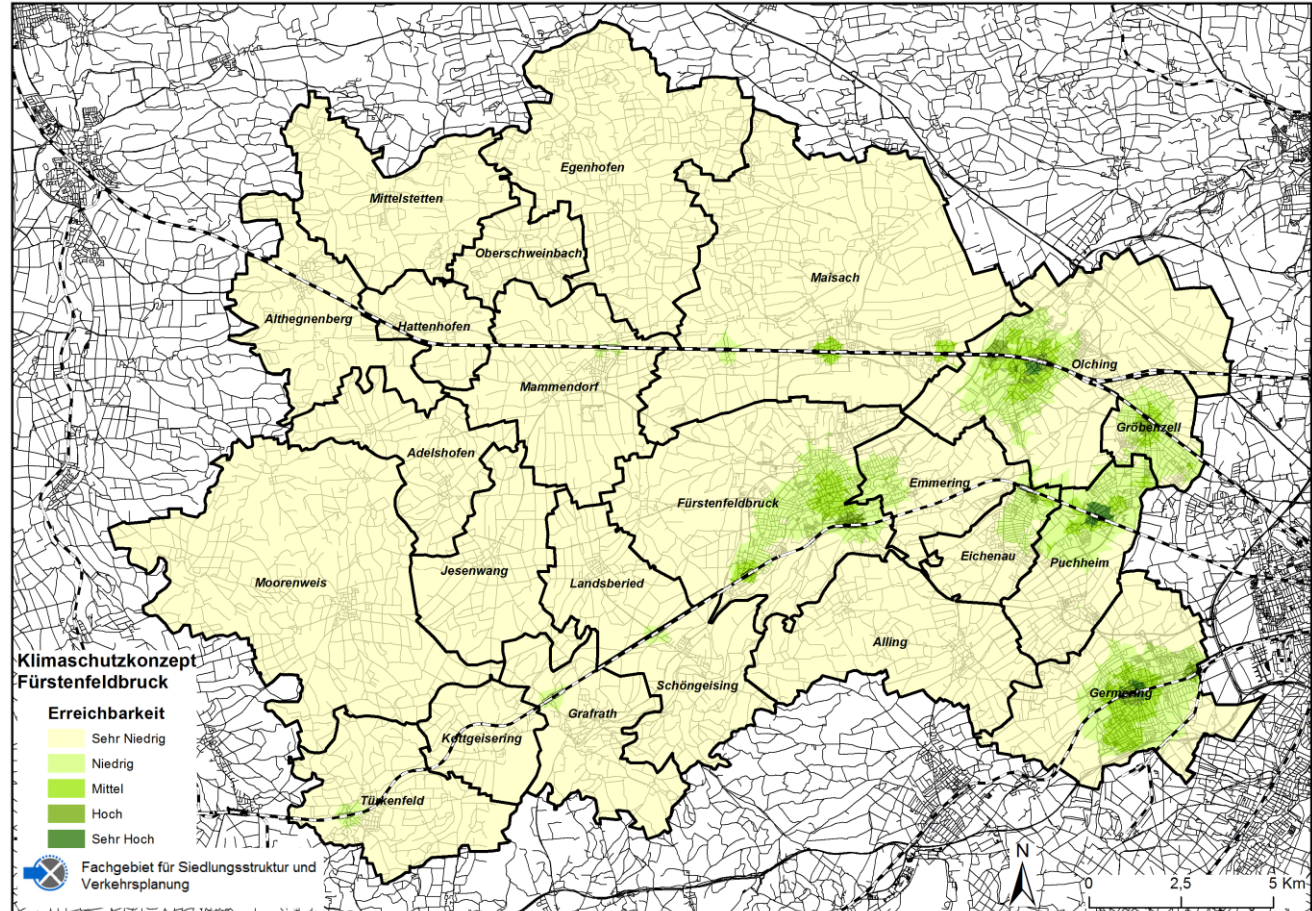
Good PT Acces
+ low density
→ re-urbanisation

Bad PT Access
+ high density
→ Improved PT

The Planning Process: FFB climate protection plan

Public Transport
Service Quality
(travel time,
frequencies,
connections)

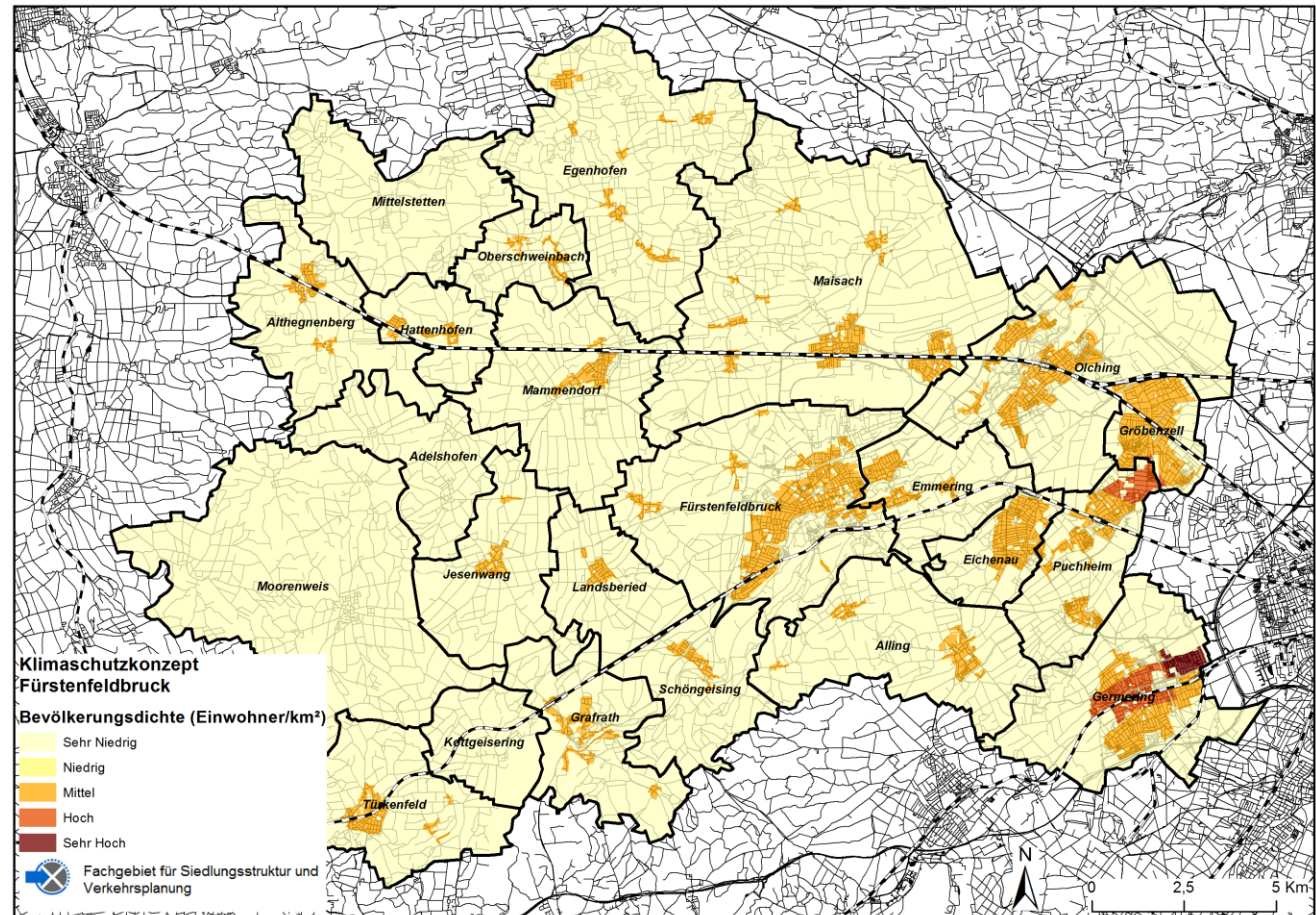
→ spatial
qualities



The Planning Process: FFB climate protection plan

Residential density
in the county of
Fürstenfeldbruck

→ as a potential
for transport



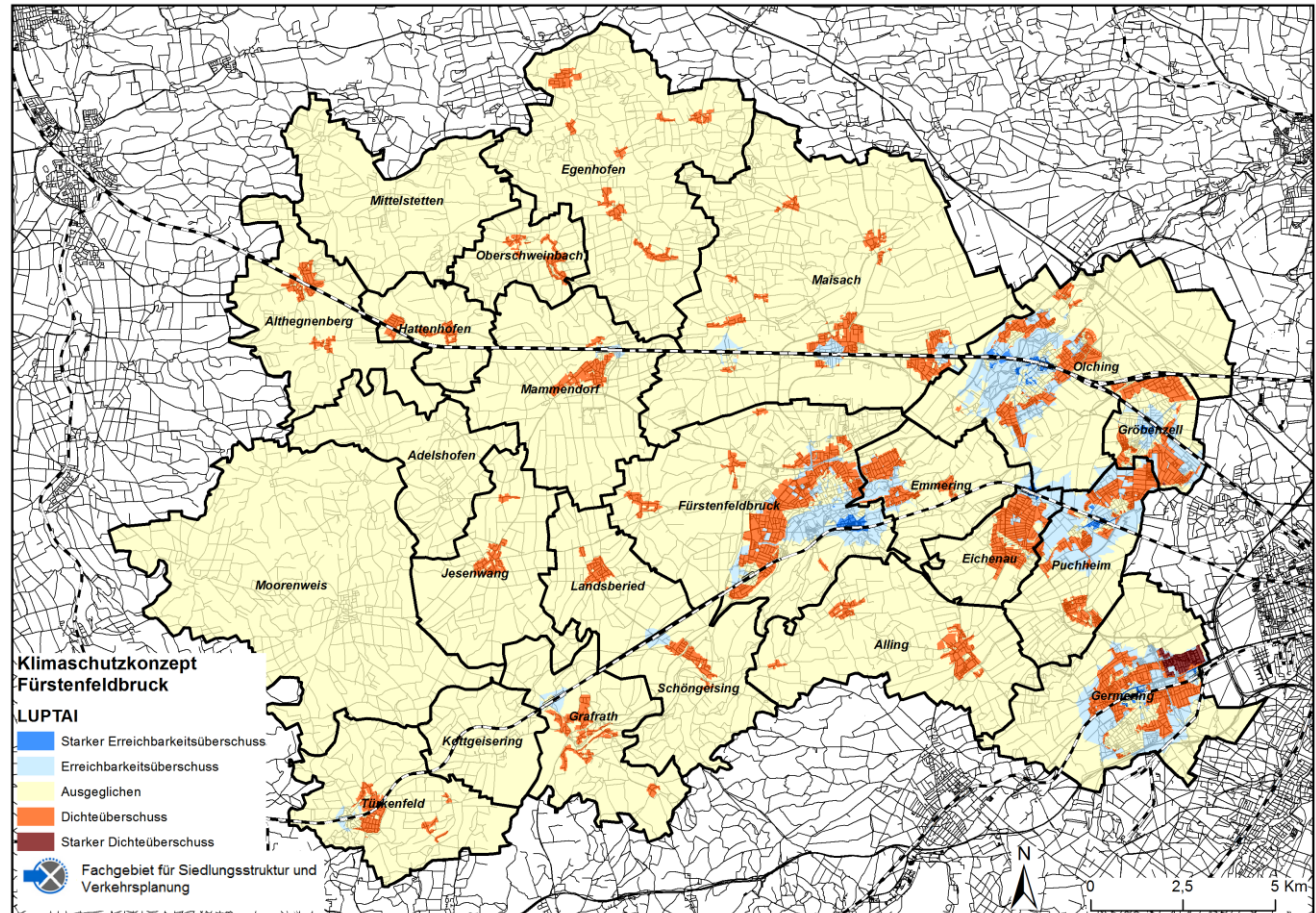
The Planning Process: FFB climate protection plan

Synthesis:

Accessibility
surplus in blue,

Density
surplus in red

→ Shared
Language ?



Model implementation

Overcoming the implementation gap (assumptions on process):

- 1/ **Experts** show an interest and translate it to stakeholders and decision-makers;
- 2/ **Stakeholders and decision-makers** refer to it, because of an expected benefit;
- 3/ **Professionals** make use of the tool in practice;
- 4/ **Policy makers** utilize the results for their own policy argumentation;
- 5/ The implementation of political decisions brings valuable influence on **transforming everyday situations**;

The Lab: an opportunity for common learning

**Hans Böckler
Stiftung**
Fakten für eine faire Arbeitswelt.



DFG



...

TUM School of Governance
new professorships in political science

HfWu / Sustainable Mobilities
Sven Kesselring

WiWi / Logistics & Supply Chain
Stefan Minner

mobil.LAB

HfWu / Urban Planning
Robin Ganser

MCTS / Soziologie
Sabine Maasen

**„Sustainable Mobility
in Metropolitan Regions“**

AR / Raumentwicklung
Alain Thierstein

IAS / BGU / Spatial Modelling
Rolf Moeckel

BGU / TSE
Costas Antoniou

BGU / SV
Gebhard Wulfhorst

BGU / VT
Fritz Busch



Deutsches Museum
VERKEHRSZENTRUM



Landeshauptstadt
München

SIEMENS

Some Conclusions

Generate **creative solutions**

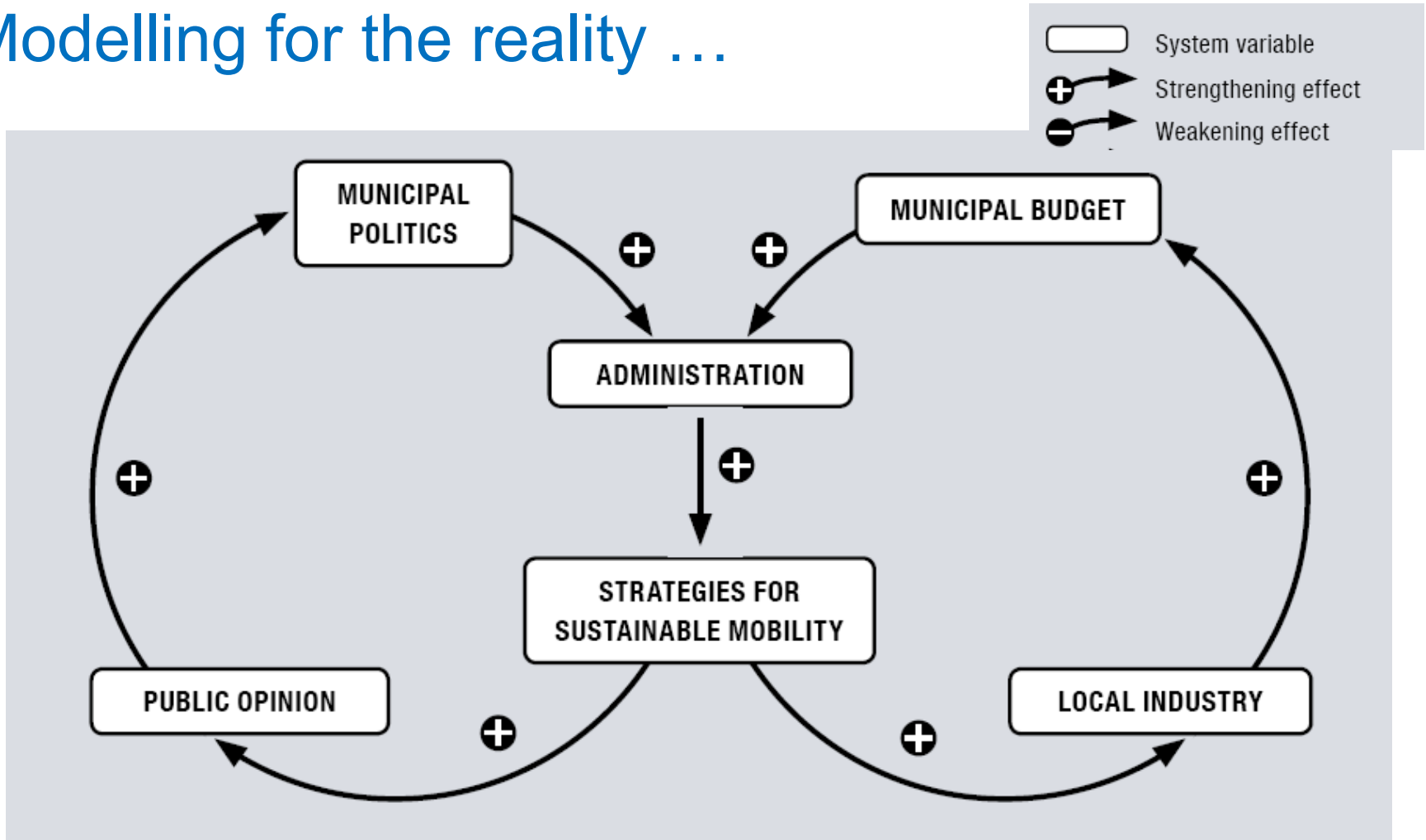
Facilitate translation between land-use / transport – and many more disciplines

Be **appropriate to the task** – and appropriate to the stakeholders

Involve stakeholders by dynamic and interactive mapping

Support sound **planning and decision-making** processes

Modelling for the reality ...



Source: Wulfhorst, Priester, Miramontes (2013): What Cities Want

... let's make it useful – together.

