

ESF Exploratory Workshop on

## **How To Measure Access:**

**Definition, Measurement and Consequences of a Changed Set of Objectives in Transportation Designed to Meet the Needs of People**

### **Scientific Report**

**Dresden, Germany, 26 - 28 September 2007**

**Convened by:  
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Co-sponsored by



*Lehrstuhl für Verkehrsökologie*

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## 2. Executive Summary

There's no question that transport is important for our society. Administrations invest a lot of money and resources into this sector of society in order to ease travelling. In the past, most measures and actions in transportation were meant to make traffic easier, cheaper and faster - resulting in more attractive travel. Consequently, urban sprawl was promoted, travel distances increased, more resources were consumed and environmental pollution increased. Motorized individual modes of travel grew constantly even as the felt "benefits" of travelling became smaller and smaller. Today, there is a feeling that people do not really reach more goals or accomplish more activities but instead simply drive longer distances and use more resources to satisfy the same needs as before. To satisfy the same level of "output" with higher levels of "input", however, is inefficient.

In order to measure both input and output efficiency, both "ends" and "means" have to be defined and measured. While this does not seem to be a problem with the means (resources, costs, instruments of transport), it is widely unclear how to measure the "ends," meaning the objectives of transportation.

The starting point for the workshop was the following question: What is the overriding objective in transport planning if "cost reductions" are no longer suitable? The answer to this question was found quite quickly even during preparations for the workshop: We must focus on human needs. The main benefits of transport are found in enabling people to satisfy their needs. There is increasingly consensus on this fact as it corresponds to the goal of sustainable transport development with its focus on human needs. The difficulty is in making this qualitative goal measurable, making it really usable for concrete transport planning. The following central questions resulted for the workshop from this line of argument:

- How can we define and substantiate the concept of "needs" as goal of transport planning?
- What kind of data should be collected to describe existing and satisfied needs for certain situations?

One way to solve this problem is to use the term "access." The Vancouver Principles defined at the OECD-Conference on "Sustainable Transport" in Vancouver 1996 state it clearly: "People are entitled to reasonable access to other people, places, goods and services." However, consensus on how to measure "access" under real world conditions does not seem to exist.

The concept of accessibility seems to be central for describing options people have for satisfying their needs. Surveys are another vital means for determining human needs and thus to measure access. Thus, the workshop focused on these two instruments and aimed at finding out their potential for making the goal of satisfying human needs measurable for concrete planning and at figuring out open questions for research.

Experts were invited from all over Europe and the United States covering the fields of accessibility and survey techniques/travel behaviour research. The concept was to invite a small number of high-level experts in order to be able to discuss intensively.

Additionally, there were various activities before the workshop: We wrote a background paper and sent it to all participants. It provided the basis for pre-workshop discussions, mainly about the definition of transport terms. Clear definitions are a vital basis for dealing with the questions posed for the workshop. We cannot substantiate the goal of satisfying human needs if we do not have clear definitions for the concepts to be used: access, accessibility, mobility, travel, traffic, transport, transportation. Which of these terms should we focus on if we intend to design a transport system for satisfying human needs?

Almost all participants sent their definitions by email in reaction to the background paper. In June 2007 Regine Gerike went to UC Davis to discuss those questions related to the topic of the workshop with Susan Handy. Several participants met at the World Conference on Transportation Research (WCTR) in Berkeley in June 2007 and discussed these issues there. All of this preparation and discussion meant that the workshop in Dresden was able to start from a high level of understanding and could proceed to the core questions quite quickly.

Almost all invited high-level experts attended. Todd Litman cancelled in advance in July, so we were able to invite Kevin Krizek instead. Unfortunately Susan Handy had to cancel at short notice, but we will include her in every step of future activities that come out of the workshop.

The workshop was held in Dresden over the course of 2 days. There were 18 participants from 9 different countries. The general atmosphere was very friendly and relaxed. Having a small group of high-level experts meant both that not much explanation was needed and that there were not too many presentations, leaving enough time for discussion. We had fruitful and interesting discussions bringing the different perspectives together with the final aim of advancing with the central question posed for the workshop. The workshop took place conveniently in the city centre so activities outside of the workshop could easily be done. On the first evening we explored the city by tram and had dinner in a restaurant overlooking Dresden. Some participants made use of the additional activities we offered and visited the historical "Grünes Gewölbe" (The Green Vault) or attended a ballet at the Semperoper.

The results of the workshop are of outstanding importance and provide very valuable input for our work here at TU Dresden. The complexity of the topic quickly became obvious and we concluded as a result that there is no simple superficial solution for making the goal of human needs usable for concrete transport planning that can be found in a two-day workshop and implemented in a short time. However, many approaches were discussed. It emerged that we will need to bring different approaches together: GIS-analyses as well as surveys.

The following steps for future joint activities were agreed upon. We decided to publish the results of the workshop and to apply for funding to create a research network. The

first proposal we will write is for the “ESF Research Networking Programme,” but we will also look for further funding. The goal of this network is to develop and test methods for quantifying human needs as the main benefit of measures in the transport sector, to make it usable for the assessment of measures. From there we aim at creating a Europe-wide scientific database on access and human needs. In addition, permanent networking activities are planned with one Summer School per year to exchange research results and bring together young scientists in the field. Furthermore, one meeting of the core expert group per year is planned.

We are grateful to the ESF for having funded this workshop which will hopefully be the first step in a long-term research cooperation dealing with a vital and up-to-date aspect of transport science.

### **3. Scientific Content of the Event**

The starting point for the workshop was the concept of human needs. This concept was identified as the central goal of transport planning according to the following main question: how can we define and substantiate the concept of “needs” as the goal of transport planning, and what kind of data should be collected to describe existing and satisfied needs for certain situations? In most cases, transport is not a (primary) need in and of itself but rather a means for satisfying people’s needs and is sometimes referred to as a secondary, derived need. Transport should above all enable people to satisfy their needs. The following points were addressed in detail in the workshop:

- **Clarification of Definitions:** In a first phase, Udo Becker presented the results of the pre-workshop discussions on wording and definitions. The aim was not to arrive at one commonly agreed set of definitions (which might be unrealistic) but instead to make clear which term someone uses for which context. All participants agreed on this intention and provided clear definitions of relevant terms in their presentations if necessary.
- **Establishment of common ground:** In the second phase, all participants recalled the perceived situation and research solutions, including problem definitions and possible approaches with a focus on measurable parameters.
- **Discussion of objectives in transport:** In a third phase, the different objectives of politicians and planners in the individual countries were discussed. This phase was completed quickly since all participants agreed that solely reducing transport costs is not a suitable objective for transport planning and that the overriding objective of transport is to enable people to satisfy their needs.
- **Development of approaches to measure “Access:”** All efforts to improve the current situation will have to provide a comprehensive and usable method to measure the potential for satisfying human needs as well as actual perceived and realised (transport) needs in the form of actual levels of access for different parts or groups of the population. Possible approaches to measure and research these parameters were discussed.

- Definition of research questions and projects, setting up a stable communication network: Finally, options for future networking were discussed.

The following two main aspects of the initially posed central questions were identified. Both aspects are closely related and will be dealt with in future work:

1. What might be a basic transport supply that enables all people to satisfy their basic needs?

This question is of increasing importance thanks to current societal trends like the ageing and shrinking of European societies as well as problems of stable resource supply. Of course, the development of a basic transport supply is a highly normative task that cannot be completed by scientific discussion. However, scientists can provide methods to get the data necessary for political decisions. Since even basic needs are various and contradictory and can be satisfied in different ways, a multi-dimensional interdisciplinary approach will be needed to establish indicators for a basic transport supply.

The second aspect concerns the assessment of measures in the transport sector. There will be always different ways to satisfy human needs. Thus, we have to rate the outcome of the measures proposed to better satisfy human needs. Scientifically established methods for determining the costs of measures exist, but the benefits are often quantified by cost reductions and not by the level of need satisfaction. This results in the second question:

2. What is the main benefit, the purpose, the overriding objective function of transport in general and of measures in the transport sector in special?

There is increasing consensus that the main benefits of transport are to be found in the satisfaction of human needs. This qualitative benefit has to be quantified in order to make it measurable for the assessment of measures.

Supposing that “access” might be a suitable term for substantiating the concept of human needs, the task is to develop methods to measure Access. The aim should be to measure access and to relate it to the costs of transport in order to find out the efficiency of measures.

Hence, two questions come out of the workshop. Both are closely connected since we will need the same methods to determine a basic transport supply as we do to assess measures in the transport sector. A combination of accessibility analysis on the one hand and questionnaires about actually realised levels of “access” and subjective perceptions of the objective transport supply on the other hand seems to be a suitable way to deal with the questions.

The tasks ahead will be complex since human needs defined this way can only be determined on a very detailed level. We should measure “access” for different blocks, suburbs, and demographic groups:

- We could for example measure the number of people in a block/subgroup and we could count accesses for certain needs.

- We could define deficiencies, benchmarks, and best practices.

And we should connect these "accesses" with „total generalised costs:"

- We could measure all costs, resources, pollutions, accidents, etc.
- We could then monetarise all costs into total general costs.

The final goal would be to combine costs and benefits in order to get a quantitative measure of efficiency in order to do one the following:

- satisfy basic (transport) needs which were set normatively at the lowest costs possible
- satisfy human needs as well as possible with a fixed amount of resources

#### **4. Assessment of the results, contribution to the future direction of the field**

The topic was discussed from the various perspectives of the areas presented by the participants. Manifold aspects and issues were raised; various ideas were generated. For these reasons there is now a wide range of valuable ideas for possible approaches.

The first task at hand is to structure the results of the discussion in a publication with longer introductory and concluding parts to be written by the organizers with papers of the participants in between. This publication will provide the basis for future networking and research.

The second task will then be to develop concrete concepts for measuring human needs as focus of transport planning. We plan to apply for funding to establish a research network aiming at completing the following tasks:

- Developing concepts for measuring human needs as the main goal of transport planning:
  - What data are needed for making the concept of human needs usable as a benefit component for assessment methods in the transport sector?
  - What methods are suitable for getting the data?

There will definitely be no one-dimensional indicator system. We need to include objective and subjective components by combining objective (accessibility) analysis with subjective surveys. The intention is to shape the ideas generated at the workshop into an applicable method for determining (human transport) needs with the help of a research network. The method will be developed and pre-tested on one study area by all partners, with TU Dresden as the leading partner. The second step should be then to apply the developed instrument to various European countries and to establish a Europe-wide scientific database for documenting human transport needs. This can be done by all partners for their respective home countries.

## 5. Final programme

The final programme can be found below. . Since Susan Handy had to cancel her participation just a few days before the workshop, her name was still in the final programme. Stefan Saalmink, a young scientist from the Netherlands, came into the group quite late and took Susan Handy's slot to present "Minds in Motion" (<http://www.mindsinmotion.net/>) as one option for building a research network.

Because the ESF-representative also had to cancel, Udo Becker presented the ESF-slides in his first introductory presentation.

The presentations and further information can be downloaded from the Internet at:

<http://vplno1.vkw.tu-dresden.de/oeko/esf>

(Login: ESF\_Workshop\_Access, Password: ESF2007).

<b>Thursday, 27<sup>th</sup> of September 2007</b>	
<b>Session A: Background and problem setting</b>	
9:00	<b>Welcome and organisational matters</b> <i>Prof. Udo Becker, TU Dresden, Chair of Transportation Ecology</i>
9:15	<b>Thematic introduction: basic problem, terminology, example</b> <i>Prof. Udo Becker, TU Dresden, Chair of Transportation Ecology</i>
9:45	<b>Key questions</b> <i>Dr. Hedwig Verron, Federal Environment Agency</i>
10:00	<b>On the use of knowledge, decision support and indicators in politics</b> <i>Dr. Eva Ericsson, Lund University</i>
10:15	<b>Mobility and spatial accessibility</b> <i>Dr. Veli Himanen, Relate Partnership</i>
10:30	<b>First questions</b>
10:45	<b>Coffee and tea, fruits</b>
<b>Session B: Accessibility – General Aspects</b>	
11:00	<b>Transport and social justice: complexity and normative policy goals</b> <i>Prof. Julian Hine, University of Ulster</i>
11:15	<b>Network and accessibility structures</b> <i>Prof. Aura Reggiani, University of Bologna, Department of Economics</i>
11:30	<b>Paradigm shift towards sustainable development</b> <i>Prof. David Banister, Oxford University Centre for the Environment</i>
11:45	<b>Discussion, consequences, open questions</b>
12:30	<b>Lunch</b>
<b>Session C: Spatial effects</b>	
13:45	<b>Travel behaviour – affected by objective spatial context and / or by subjective accessibility preferences?</b> <i>Dr. Joachim Scheiner, University of Dortmund</i>



14:00	<b>Transport infrastructure, accessibility and regional development</b> <i>Prof. Matthias Gather, Erfurt University of Applied Sciences</i>
14:15	<b>Discussion, consequences, open questions</b>
14:45	<b>Coffee and tea, fruits</b>
<b>Session D: Modal and gender aspects</b>	
15:15	<b>Measuring non-motorized accessibility: Issues, alternatives and execution</b> <i>Prof. Kevin J. Krizek, University of Colorado</i>
15:30	<b>Gender aspects of access</b> <i>Prof. Margaret Grieco, Napier University, Edinburgh</i>
15:45	<b>Discussion, consequences, open questions</b>
16:30	<b>Conclusions and consequences</b>
16:45	<b>End of sessions</b>
17:30	<b>Departure by streetcar: Sightseeing tour of Dresden</b>
19:00	<b>Dinner at a restaurant overlooking Dresden</b>

### Friday, 28<sup>th</sup> of September 2007

<b>Session E: Realised activities and needs / data acquisition</b>	
9:00	<b>Perception of mobility needs and transport accessibility in decisions about residential location - results of a qualitative sociological survey in Czech cities</b> <i>Mgr. Marketa Braun Kohlova, Charles University Environmental Center Prague</i>
9:15	<b>Examining the match between needs and measures: The case of Mexican immigrants in California</b> <i>Prof. Susan Handy, UC Davis</i>
9:30	<b>Networked or neighbored? - The dilemma of daily life</b> <i>Prof. Kay Axhausen, ETH Zürich</i>
9:45	<b>Quality of life and level of needs satisfaction in transport</b> <i>Prof. Linda Steg, University of Groningen, Department of Psychology</i>
10:00	<b>Discussion, consequences, open questions</b>
10:30	<b>Coffee and tea, sweets, fruits</b>
<b>Session F: Research Programme, Communication and Joint Project Work</b>	
10:45	<b>Consolidation of results to a shared understanding of transport planning objectives</b>
12:15	<b>Lunch</b>
13:15	<b>Practical matter: Organisation of a possible Research Network Work packages for a future project, publication</b>
15:00	<b>End of the workshop</b>

## 6. Statistical Information on participants

### Age Structure:

The average age of the participants was 46 (ages 25-30: 2; ages 31-35: 2; ages 36-40: 3; ages 41-50: 6; ages 51-60: 4; ages 61-70: 1).

### Gender Distribution:

The participants and organizers were made up of 8 women and 10 men among.

### Countries of Origin:

There was one participant from the Czech Republic, one from Finland, one from Italy, two from the Netherlands, one from Sweden, one from Switzerland, three from the United Kingdom, one from the United States and four from Germany.

## 7. Final list of participants

We were a rather small group of 15 participants and 3 organizers. This enabled us to discuss the topic in detail and with ample time for different aspects to be covered. Since all participants were dedicated experts in their fields, the discussion took place on quite a high level. Additionally, as the experts came from different fields that all touch on accessibility, everybody was able to both benefit from the workshop on the one hand and give valuable input on the other.

1	CZ	Marketa Braun Kohlova	Charles University Environmental Center
2	FI	Dr. Veli Himanen	Relate Partnership
3	IT	Prof. Aura Reggiani	University of Bologna
4	NL	Prof. Linda Steg	University of Groningen
5	NL	Stephan Saalmink	Trifolia, Sustainable Thinking
6	SE	Dr. Eva Ericsson	LTH Lund
7	SW	Prof. Kay Axhausen	ETH Zürich
8	UK	Prof. Julian Hine	University of Ulster
9	UK	Prof. Margaret Grieco	Napier University
10	UK	Prof. David Banister	Oxford University Centre for the Environment
11	USA	Prof. Kevin Krizek	University of Colorado
12	DE	Prof. Matthias Gather	FH Erfurt
13	DE	Dr. Jens Schade	TU Dresden
14	DE	Dr. Hedwig Verron	Umweltbundesamt
15	DE	Dr. Joachim Scheiner	Universität Dortmund
16-18	DE	Prof. Udo Becker, Juliane Friedrich, Dr. Regine Gerike	TU Dresden, Organizers